

The Impact of Project Team Characteristics on Employee Performance and Well-being in the IT Sector: The Mediating Role of Collaborative Job Crafting

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of the Doctor of Philosophy degree**

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Abstract

Due to the increase in global competition and change in information technology, project teams are used to deal with organisational demands. However, challenges arising from specific team characteristics concerning poor technical self-efficacy, weak team identity and high avoidant attachment may pose a significant impact on an employee's performance and work-related well-being.

The present study aims to examine specific project team characteristics that may facilitate or act as a barrier to outcomes such as individual team members' in-role or extra-role job performance and levels of work engagement. Furthermore, the role of collaborative job crafting is explored in explaining the relationship between the characteristics of a project team and outcomes from the lens of conservation of resources theory.

Through an online survey, the data were collected at three time points with a 12-week interval between each time point and employed difference scores to measure the change in the outcome variables. A total of 125 project teams and 803 participants including project leaders from five multinational IT organisations had participated in the study and the data were analysed using multilevel structural equation modelling.

The original contribution of the thesis signifies that higher team-level information system self-efficacy leads to a decrease in in-role performance over time. However, based on conservation of resources theory, a team with collective higher information system self-efficacy that engages in collaborative job crafting behaviour, acquire key team resources, leading to a gain spiral that facilitates in an improvement of in-role and/or extra-role performance and work engagement of project team members over time. Contrary to the expected results, a stronger aggregated functional background social identity of a team depletes the resources of employees when engaging in collaborative job crafting activity, resulting in loss spirals. These findings give impetus to future multilevel and longitudinal investigations of the role of self-efficacy, social identity and team-level job crafting behaviours in project teams.

Keywords: self-efficacy, social identity, collaborative job crafting, conservation of resources theory, multilevel modelling

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Chapter 1 Introduction

The purpose of the following chapter is to outline a general introduction to the definition and nature of project teams, its origin and the relevance of them in today's organisation. The chapter also highlights some of the key benefits of project teams and proceeds towards the problem statement, which focuses on an array of challenges that the present study aims to answer through specific research questions.

Project teams in the information technology (IT) sector are valuable for a business as they enable to reconstruct individual work procedures into team processes to enhance organisational effectiveness (Banker et al., 1996; Dulebohn and Martocchio, 1998). Due to the critical importance of IT project teams within organisations, as well as their continued low success rate (Kendra and Taplin, 2004; Standish Group, 2009), project teams have been widely studied by organisational researchers, however, there is still a lack of consensus on how to define project team success and which factors strongly contribute to its success (Liu and Cross, 2016). Since the composition of a team has an influence on the performance of employees (Gibson and Vermeulen, 2003; DeRue et al., 2008; Morgeson, Reider and Campion, 2005; Higgs, Plewnia and Ploch, 2005), therefore, specific project team characteristics that may contribute to an individuals' performance in relation to their in-role and extra-role responsibilities need further investigation. To further boost the performance of employees, another key challenge faced by project team managers is keeping the workforce engaged (Salanova, Agut and Peiro, 2005). Without engagement, employees may face difficulties in meeting project deadlines, which could hinder the completion and success of a project (Panteli, Yalabik and Rapti, 2018). Therefore, it is important to assess the project team characteristics that might promote the work engagement of employees. Moreover, failures of the projects in the IT sector are considered widespread (Love et al., 2005; Lubbe and Dan, 1999) and job crafting can offer flexibility through redesigning of the work to team members to achieve success (Demerouti, 2014). The present study accomplishes this by investigating the role of collaborative job crafting process from the perspective of conservation of resources theory (Hobfoll, 1989). Studies on collaborative job crafting have focused on call centre teams (McClelland et al., 2014), preschool teachers (Leana, Appelbaum and Shevchuk, 2009) and health service industry (Tims et al., 2013), however, there is a potential gap to examine the role of collaborative job crafting in IT project teams. This is the first study that considers that IT project team members can be proactive and do something together to alter or adjust their work tasks to perform better by engaging in collaborative job crafting activity.

1.1 Origin and Importance of Project Teams

Teams enable firms by organising employee resources to support the completion of complex and non-routine tasks (Alsharo, Gregg and Ramirez, 2017). One of the most important developments in management during the 1970s has been the widespread application of project teams to a variety of complex tasks (Wilemon and Thamhain, 1983). To overcome challenges posed by today's diverse and complex working environment (Lewin, 1951), and to work dynamically and creatively towards the desired goal of a business (Jassawalla and Sashittal, 1999), project teams are often used to deal with organisational demands which have larger scope beyond the capability of individuals (Paris, Salas and Cannon-Bowers, 2000).

Projects are key for organisations to meet their strategic goals of growth, innovation, expansion of business and new product development (Anantatmula, 2016). Furthermore, project teams enable to organise workforce and structure it in a way that is specific, measurable, attainable, realistic and time-constrained (Duggan, 2019). Projects demand multiple skills and discipline to improve success and enhance performance, and therefore they typically outperform individuals (Anantatmula, 2016).

1.2 Study Context

IT projects are well-known for having high failure rates (Goatham, 2009; Keil, Tiwana and Bush, 2002). It is estimated that about one-third of all IT projects either fail or are abandoned and around 40 per cent of application development projects are cancelled before completion (Oz and Sosik, 2000). IT projects operate in highly dynamic environments under time and cost pressures (Hartman and Ashrafi, 2002). Therefore, the present study finds adequate reasons to focus on the factors or barriers that may contribute to project success in the IT sector. Although, the context of the present study focuses on the IT sector, nevertheless, project teams are also relevant to other sectors due to an increasingly global competition in the marketplace and rapid change in information technology (Paris, Salas and Cannon-Bowers, 2000) that enables to carry out tasks faster, better, and with more flexibility (Thamhain, 2004).

1.3 Types of Teams

There are five general types of teams and each is associated with many defining characteristics: work teams, management teams, parallel teams, project teams and actions teams. Table 1.1 below summarises the types of teams (Cohen and Bailey, 1997).

Table 1. 1 Types of Teams

Type of Team	Purpose and Activities	Life Span	Member Involvement	Specific Examples
Work Team	Produce goods or provide services.	Long	High	Self-managed work team, production team, maintenance team, sales team.
Management Team	Integrate activities of subunits across business functions.	Long	Moderate	Top management team.
Parallel Team	Provide recommendations and resolve issues.	Varies	Low	Quality circle, advisory council, committee.
Project Team	Produce a one-time output (product, service, plan, design, etc.).	Varies	Varies	Product design team, research group, planning team.
Action Team	Perform complex tasks that vary in duration and take place in highly visible or challenging circumstances.	Varies	Varies	Surgical team, musical group, expedition team, sports team.

Notes: Different types of teams

The present study focuses on project teams, which like traditional projects are responsible to deliver the desired product or service. Moreover, projects in the IT sector are typically complex, dynamic, and involve unstructured tasks (Brodbeck, 2001; Kraut and Streeter, 1995). Execution of these projects requires knowledge and expertise from many domains (Curtis, Krasner and Iscoe, 1988). Ideally, a project team in the IT sector is staffed so that both the levels and the distribution of knowledge within the team match those required for the successful completion of the project (Walz, Elam and Curtis, 1993).

The present study defines a project as a “unique venture with a beginning and an end, undertaken by people to meet established goals with defined constraints of time, resources and quality” (Baker and

Baker, 1992, p6). The additional characteristics of a “project team are goals, people, schedules, budgets, equipment and supplies, conflicts and interdependencies between other business projects and strategies” (Baker and Baker, 1992, p8-9). Moreover, the members of a project team may use their expertise in the form of their knowledge on and off a project (Leinonen and Bluemink, 2008).

1.4 Definition of Project Teams

A team is defined as a group of a small number of people working towards a common goal and objectives with complementary skills and is held mutually accountable for their working approach (Zenun, Loureiro and Araujo, 2007). Project teams are referred to as teams that carry out defined, specialised and time-limited projects that disseminate upon completion of the project (Chen, Donahue and Klimoski, 2004). Project teams are formed to take on “one-time” tasks that are generally complex and require vast input from members with different types of training and expertise (Colquitt, Lepine and Wesson, 2009). Once a project is completed, team members return to their different units or are reassigned to a new project team (Child, 2005).

According to Lundin and Soderholm (1995), project teams are a special case in the temporary organisations which also includes task forces, program committees, and action groups. A project is sometimes defined as a “temporary and unique endeavour undertaken to deliver a change in the organisation (e.g., a gap between a start and a final state regarding processes, performance, product or service” (Vidal, Marle and Bocquet, 2011, p718). Project teams are also defined as a selected group of individuals with complementary skills and disciplines who are required to work together on interdependent and interrelated tasks for a predetermined period to meet specific purpose or goal (Anantatmula, 2016).

The key characteristics of a project team (Moura, Dominguez and Varajao, 2018) include members who –

- socially network (either face-to-face, virtually or both ways);
- are committed to general purposes and common goals;
- are brought together to perform organisationally relevant projects;
- exhibit interdependencies for goals, workflow and outcomes;
- have complementary skills and pursue different roles and responsibilities,
- are together embedded in an encompassing organisational system, with boundaries and linkages to the broader system context and task environment.

The words “team” and “group” are used interchangeably in the present study, although the term “team” is more frequently used in the literature review. The academic literature refers to the word “group” such as group coordination and group effectiveness while the management literature has used the word “team” such as team effectiveness and team performance (Harvey et al., 2005) and it is sometimes difficult to distinguish between them (Guzzo and Dickson, 1996). However, there are significant differences between a ‘team’ and a ‘group’ (Korsgaard, Brodt and Sapienza, 2003). A team works together and shares a common goal, while individuals who form a group are independent of each other as they do not require a coordinated effort like teams (Katzenbach and Smith, 1993). Nevertheless, there is no distinction made between the two in the present study.

1.5 Benefits of Project Teams

One of the biggest advantages of project teams is the shortening of the time it will take to bring a new product from the initial idea to its finalised stage. This shortening will provide an advantage over the competitors and result in overall cost savings to develop the new product (Fleming and Koppelman, 1996). Specialised professionals, experts, and consultants from different backgrounds, education and experience can form part of a project team, which may facilitate sharing and transferring of knowledge (Fong, 2003; Wong, 2006; He, Butler and King, 2007; Huang, Hsieh and He, 2014). Additionally, project teams also enhance creativity and innovative thinking that brings benefits at both the organisational and individual-level (Sethi, Smith and Park, 2001; Jackson, May and Whitney, 1995; West and Anderson, 1996).

Project teams have flat and lean organisational structures, which contributes to the avoidance of many bureaucratic procedures and hierarchical relationships that could hinder both efficiency and direct open communication (Cormican, Morley and Folan, 2014). Furthermore, effective project teams demonstrate characteristics of having a clear goal, competent team members, result-oriented structure, collaborative work environment, recognition, external/management support, motivation, high-level of commitment, and principle centred leadership (Asproni, 2004; Sudhakar, Farooq and Patnaik, 2011).

Projects in the IT sector produce intangible outcomes through entailing knowledge-intensive work requiring diverse expertise such as business knowledge and processes as well as emerging IT techniques or skills (Lientz and Rea, 1999; Pee, Kankanhalli and Kim, 2010).

1.6 Problem Statement

Based on a survey, twice as many IT projects are considered to be ‘less successful’ than considered successful (Waterbridge, 1995; Love et al., 2005). Managers have reported that 56% of project teams missed their deadlines or were often exceeded (Tukel and Rom, 1998) and meeting these deadlines are crucial for project success and overall performance (Gevers, Eerde and Rutte, 2009). Furthermore, reaching the set goals of the project with tight completion dates places pressure on team members (Gallstedt, 2003), which may affect their well-being. One of the crucial parameters of well-being is employee engagement, as 38% of engaged employees are more likely to participate in discretionary efforts than unengaged counterparts (Shuck, Reio and Rocco, 2011).

Project teams rely on communication and collaboration across team boundaries to achieve project efficiency (Lee and Sawang, 2016). The spanning of a boundary refers to project team members’ efforts to operate external linkages from within an organisation (e.g., across marketing teams) or across organisational boundaries (e.g., to external customers or suppliers) (Marrone, 2010). Especially boundary spanners need to deal with interpersonal relationships and project environments inside and outside their teams (Friedman and Podolny, 1992; Qu and Cheung, 2013). Therefore, understanding team members’ relational orientation, which is how they perceive project environments and interact with other stakeholders requires attention (Lee and Sawang, 2016). Moreover, employees need technical skills when working in IT projects to perform a particular task such as using software tools and these are more important in ensuring that a technical task or duty is performed properly (Napier, Keil and Tan, 2009; Mtsweni, Horne and Poll, 2016). Having the self-confidence to use technical skills among employees to accomplish complex tasks is highly important (Hardin et al., 2013; Jung and Sosik, 2003). Project teams are typically cross-functional whereby members are representatives of various organisational subunits who have been assigned to a project due to specific expertise (Scott, 1997). A person’s sense of belonging to a social category is determined by their identification (Ashforth and Mael, 1989) and this identification with a team is linked to improved well-being and other outcomes such as cohesiveness (Kramer, 1991). Elements of an effective project team may focus on *employee relationships*, *skill self-efficacy* and *social identification* as some of the desired characteristics. Figure 1.1 below displays the desired characteristics that are derived from the review of the literature in the present study and discusses the problems associated with each of them.

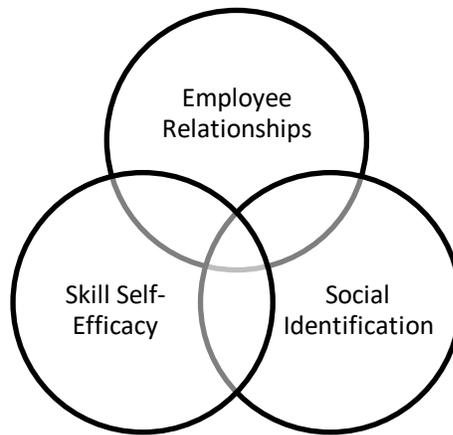


Figure 1. 1. Desired characteristics of a project team

The greatest threat to the success of any IT project is the failure to communicate (Liebowitz, 1999). The nature of IT projects require high levels of interactions between team members throughout the project lifecycle and thus relationships will develop among team members for problem-solving (Leonard and Zyl, 2014). Individuals in most project teams have no prior personal relationships, which makes them more task-oriented and exchange less social-emotional information, leading to depletion of social rapport (Martins, Gilson and Maynard, 2004; Lu, 2015). However, certain employees display lower levels of commitment and group identification as they are more concerned about fulfilling their own self-interests over those of the team (Korsgaard, Brodt and Sapienza, 2003). This could further affect any interactions among such employees.

Attachment styles are important constructs of attachment theory, which explains how individuals perceive, react and cope with stress arising from interpersonal relationships (Mikulincer and Florian, 1995). Individuals who are insecurely attached perceive others as unreliable and mostly prefer to work alone without the need to socialise with others (Feeney and Collins, 2001). In fact, among insecure attachment, individuals who are high on attachment avoidance demonstrate more negative content about teams (Rom, 2008), seek independence in groups (Rom and Mikulincer, 2003) and avoid interdependence with teams (Keating et al., 2014). This can prove to be challenging in project teams, whereby individual team members need to venture beyond team boundaries to seize innovation opportunities (Crawford and Lepine, 2012).

One of the potential areas for future research in attachment theory involves looking into attachment styles of employees involved in project teams (Lee and Sawang, 2016). Previous research emphasises that working is a relational act which is performed within interpersonal contexts and any decision, experience

or interaction within the work setting is understood, inclined, and bent by such relationships (Blustein, 2011; Bowen, Siehl and Schneider, 1989). The relationship orientations are relevant for understanding individual's work attitudes and emotions and therefore, the present study examines the dimension of employee working relationships from the perspective of attachment theory and the effect it may have on individual team members' performance and well-being in the context of project teams.

The technical expertise of an individual plays an important role in project teams and is directly related to the success of the project (White and Leifer, 1986; Dakrory and Abdou, 2009). One of the biggest challenges in complex project teams is the inclusion of team members who are considered technophobic or employees who lack the confidence when using the functionalities of the relevant software (Townsend, DeMarie and Hendrickson, 1998). Moreover, with an intricate set of technologies, lack of confidence to use appropriate skills to manage any technical problems may have a negative effect on employee well-being, which may directly affect an individual performance (Ryssen and Godar, 2000; Kayworth and Leidner, 2000). This highlights the relevance of strong technical skills of individual members in a project team to perform complex tasks and achieve success (White and Leifer, 1986; Dube and Pare, 2001).

Furthermore, soft skills of employees relevant to a project team such as leadership skills, communication skills, proactivity, intercultural skills, decision-making skills and emotional skills have been examined (White and Leifer, 1986; Shin, 2004; Spitzberg, 2006, Troth et al., 2012; Krumm et al., 2016). However, soft skills and technical skills are both equally important towards the facilitation of the delivery of a successful software development project (Pant and Baroudi, 2008). Moreover, self-efficacy motivates individuals to improve their competence (Schunk, 1995) and there is scope to examine this in IT project teams. The present study primarily focuses on general technical proficiency levels of employees in using software tools and their perceived self-efficacy in project teams to achieve their individual performance and improve the levels of well-being.

In the past three years, more than 6 out of 10 respondents have reported that their companies' teams have become more diverse through a survey conducted on 821 business executives from 14 countries (Ernst and Young Global Limited, 2013). Diversity in project teams results in a lack of cohesion among team members (Keller, 2001). Differences in opinions and perspectives due to the varied functional expertise of individuals can lead to an increase in task conflicts (Pelled, Eisenhardt and Xin, 1999; Jehn, Northcraft and Neale, 1999). However, teams that are functionally diverse in nature tend to perform better in turbulent environments and are more capable of sustaining performance at high levels (Keck and Tushman, 1993; Keck, 1997). Although, diversity is beneficial to project teams, the differences in experience or value of individuals within a heterogeneous team (Dougherty, 1992) can create an

environment of hostility, discomfort and tension (Jehn, Northcraft and Neale, 1999; Tajfel and Turner, 1986), which may directly affect the individual team members' performance and well-being.

Based on social identity theory or intergroup relations, an individual may categorise themselves to a particular group depending on their knowledge (Hogg and Abrams, 1988), which may facilitate them to view things from a group's perspective (Stets and Burke, 2000), leading to greater commitment (Ellemers, Spears and Doosje, 1997). Therefore, if a team member strongly socially identifies with his or her functional background, they will gain more self-esteem and enhance the attractiveness of that background (Randel and Jaussi, 2003). Despite the benefits of social identity in explaining the group behaviour, there is scope to investigate its role in project teams (Scott, 1997). The present study adds a new element by investigating the role of functional background social identity within IT project teams and how it may facilitate individual team members' performance and well-being. Key challenges associated with project team characteristics are summarised in Table 1.2 below –

Table 1. 2 Challenges Associated with Project Teams

Challenges	Disadvantages	Authors	Existing Gap
Functional Background Social Identity (Collective background social identity of a project team)	Diversity with regards to different functional expertise of employees leads to differences in the member's opinions and perspectives, which can result in task conflicts and lack of cohesion.	(Puck, Neyer and Dennerlein, 2010; Kankanhalli, Tan and Wei, 2006; Jehn, Northcraft and Neale, 1999; Backevik, Tholen and Gren, 2019; Pelled and Adler, 2004; Scott, 1997; Williams, Karau and Bourgeois, 1993; James and Greenberg, 1989)	Do project teams with stronger functional background social identity have outcomes in terms of improved individual team members' performance and well-being?
Information System Self-Efficacy (Aggregated information system self-efficacy of a project team)	Poor information system skills can create challenges in using technology due to obstacles such as lack of confidence (employees who are uncomfortable	(White and Leifer, 1986; Mtsweni, Horne and Poll, 2016; Townsend, DeMarie and Hendrickson, 1998; Dube and Pare, 2001; Ryssen and Godar,	What is the role of higher team-level information system self-efficacy in the performance and well-being of individual team members?

with the computer and other telecommunications technologies). Additionally, team members face the challenge to gain proficiency across a wide range of technologies to perform complex tasks. This results in low employee well-being due to technical uncertainty.

<p>Avoidant attachment (Collective avoidant attachment of a project team)</p>	<p>Individuals with high avoidant attachment style display more negative content about teams, seek distance and perceive closeness to a team as unnecessary.</p>	<p>(Lee and Sawang, 2016; Rom, 2008; Rom and Mikulincer, 2003; Keating et al., 2014; Collins and Read, 1990; Leiter, Day and Price, 2015)</p>	<p>Do project teams with high avoidant attachment have a negative effect on individual team members' performance and well-being?</p>
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Notes: ISSE = Information System Self-Efficacy

The above challenges highlight the importance of focusing on elements such as specific characteristics in terms of collective information system self-efficacy, functional background social identity and attachment avoidance of a team, as they represent a valuable, rare or inimitable human capital resource that a project team will have at its disposal (Barney and Wright, 1998; Williams and Sternberg, 1988). A project team is successful based on the performance of individual team members (Ludden and Ledwith, 2014; Gordon and Curlee, 2011), and therefore, individual performance is of core interest to the present study. Individuals perform a wide variety of tasks, which may fall within the prescribed duties known as in-role performance or that may be considered beneficial but not mandatory such as 'helping a co-worker' called extra-role performance (Katz and Kahn, 1978; Schnake, 1991). The present study examines individual performance through an employee's contribution to the task, comprising of both in-role and extra-role duties.

Furthermore, work engagement is a crucial predictor of positive attitudes towards the organisation and job performance (Costa, Passos and Bakker, 2014). Nevertheless, an employee's engagement in most project team settings has not received much attention (Yalabik and Panteli, 2015; Gilson et al., 2015). Apart from specific team characteristics, the role of proactive behaviour such as collaborative job crafting is examined in IT project teams that will enable team members to collectively alter their work (Tims et al., 2013) to make it more meaningful and engaging (Demerouti, 2014). The present study examines the factors or barriers that may contribute to an individual team members' performance and well-being, as identifying these factors will enable the managers and organisations to take necessary action to improve the project team outcomes.

1.7 Contributions of the Study

The findings of the present study will rebound to the benefit of the organisations employing IT project teams. Based on previous studies, project teams in the IT sector have high failure rates (Goatham, 2009; Love et al., 2005) and work under constant time and cost pressures (Hartman and Ashrafi, 2002). As project teams are constructed out of members with different functional specialisations/technical expertise for specific purpose and time (Shukla and Srinivasan, 2003), it is important to assess the individual contribution of an employee to the team to predict the overall team performance. Employees who are part of such teams bring in different attributes that contribute to the overall characteristic of the whole team (Williams and Sternberg, 1988). The impact of specific team characteristics on outcomes such as an individual performance (in-role and extra-role performance) and employee well-being (work engagement) will provide a clear understanding of the team qualities that might enable successful completion of a project. By focusing on the specific characteristics of project teams, the present study hopes to add to the self-efficacy theory, social identity theory (Tajfel and Turner, 1986) and attachment theory (Bowlby, 1982; Bartholomew, 1990) by exploring their effects on outcomes from an overall team perspective. Moreover, the influence of project team characteristics on outcomes through team processes such as collaborative job crafting is another important contribution, which will help to explain what motivates employees in project teams to craft their jobs to meet the challenging job demands. The present study explores the role of collaborative job crafting between project team characteristics and outcomes and aims to understand the reasons on how employees invest or use their resources through the application of conservation of resources theory (Hobfoll, 1989).

Methodologically, the study employs a three-wave longitudinal design with a 12-week interval between each phase and explores the causal effects on how specific project team characteristics may enhance or act as a barrier towards an individual team member's performance and work-related well-being. As a

matter of fact, shorter time lags (such as 12 weeks) are considered optimal in providing essential information about the causal effect over time in panel studies (Dormann and Griffin, 2015). Practically, the findings of the study aim to provide valuable information to team leaders and organisations employing project teams in the IT sector by encouraging specific team characteristics to boost the performance and well-being of employees.

1.8 Research Questions

The present study aims to answer the following key research questions –

1. How do project team characteristics such as information system self-efficacy, functional background social identity and avoidant attachment style influence employee's in-role and/or extra-role performance?
2. How do project team characteristics such as information system self-efficacy, functional background social identity and avoidant attachment style influence employee work engagement?
3. What is the role of collaborative job crafting in the relationship between specific characteristics of a project team and employee's in-role and/or extra-role performance?
4. What is the role of collaborative job crafting in the relationship between specific characteristics of a project team and employee work engagement?

1.9 Structure of the thesis

The thesis is structured and organised in the following way –

Chapter 2 outlines the theoretical frameworks in teamwork and includes both input-process-output (IPO) models and input-mediator-output-input (IMOI) models. These models have listed some key characteristics and team processes that have contributed to the effectiveness of a team. Specific variables are derived from these models based on the gap in the existing literature on project teams and the chapter concludes with a summary of the key variables derived from the frameworks.

Chapter 3 focuses on the direct effects of project team characteristics on outcomes from the variables derived in the previous chapter. Related theories are discussed and relevant studies are critically reviewed. The chapter forms the basis for the development of hypotheses based on the direct effects of the predictors on the outcomes. This will help in answering the first two research questions of the present study.

Chapter 4 is based on the job demand resources model and conservation of resources theory, which guides in the development of hypotheses based on the indirect effect of predictors on outcomes through collaborative job crafting. The primary focus of the chapter stems from gain and loss spiral corollaries by exploring the role of collaborating job crafting. This will assist in answering the remaining research questions of the present study.

Chapter 5 details the methodology employed by the present study. The rationale for choosing the quantitative design and analytical approach is detailed, along with the research design involving the process of data collection. It also focuses on the procedure employed in contacting the organisations and teams for the research and how the data is aggregated. The chapter concludes by including the measures of each variable and the relevant studies from where they have been adopted.

Chapter 6 states the findings of the present study. It details the test of the competing models by presenting the results of the multilevel confirmatory factor analysis. The results of the aggregated data are presented to inform the reader about the variables that represent higher-order constructs in the measurement model. The chapter reports both the direct and indirect effects between variables and concludes by discussing the results of the tested hypotheses.

Chapter 7 summarises the findings from previous chapters and explains the theoretical contributions of the present study. Based on the results, it discusses the impact of the direct effects of project team characteristics on outcomes and indirect effects through collaborative job crafting. The chapter concludes with the contributions of the findings and explains the practical implications of the results.

Chapter 8 elaborates on the limitations of the research and proposes recommendations for future research. The chapter concludes the findings of the overall thesis.

Chapter 2 Review of the Literature

The following chapter outlines the nature of IT project teams and some of the key theoretical frameworks in teamwork as they have contributed significantly to the effectiveness of a team. This is then followed by the discussion of the specific variables which are derived from these frameworks to explore them in the context of project teams. The variables are examined from the perspective of existing theories and the potential gap in the project team literature. The chapter concludes with a summary of the derived variables.

2.1 Nature of IT Project Teams

Projects are temporary structures that are engaged in the unique creation of product or services. They require cross-functional skills for successful execution and are characterised by performance constraints and environmental uncertainties (Turner and Simister, 2004). According to Williams (1999), project tasks include interdependency and uncertainty, as projects are complex purposeful groups of interdependent activities that function with considerable uncertainty and can have multiple stakeholders being involved in it.

Projects in the IT sector consists of professionals from a wide range of backgrounds, being individuals from functional business units, end-user client industries, IT professional consultancy firms or other relevant stakeholder organisations (Jiang, Motwani and Margulis, 1997). All of these individuals in an IT project are responsible for the execution of certain tasks and responsibilities, which when executed in coordination, the goals of the project are accomplished (Randeree and Ninan, 2011).

The characteristics of IT projects are no different to any other project in other sectors, as team members often work in cross-functional teams with individuals from diverse skills, have dual reporting lines, work in a matrix structure and have a temporary duration (Webber, 2002). The present study focuses on IT project teams due to its continued low success rate (Goatham, 2009; Standish Group, 2009) since they operate under highly dynamic environments of time and cost pressures (Hartman and Ashrafi, 2002). Such teams work on multiple projects simultaneously with multiple goals and values, which require leadership that is energised and communicate the project vision, highlighting the value of shared goals as well as consequences (Barber and Warn, 2005). The level of contribution from different members in the project may not be of equal measure, and this could impact the overall team performance and commitment (Webber, 2002). Due to a complex working environment of an IT project team, factors that may accelerate its success requires investigation.

Furthermore, project teams are not just co-located, but also global in nature that involves individuals distributed across various countries and organisations (Binder, 2007). In today's more complex technological and multinational environment, the group has re-emerged in importance as project teams (Fisher, 1993; Nurick and Thamhain, 1993; Thamhain and Wilemon, 1996), supported by modern information and communication technologies, which is consistent with the concepts of stakeholder management (Newell and Rogers, 2002) and learning organisations (Senge and Carstedt, 2001).

Based on the above nature of the project teams and their widespread use in the IT sector, the present study develops the conceptual framework based on the theoretical framework in teamwork. Theoretical frameworks in teamwork have studied teams in various contexts where groups work on complex goal-directed tasks (Salas, Cooke and Rosen, 2008). These teamwork theories are grounded in empirical data arising from business strategising, project-based work environments, hospital operating theatres, warships, natural disaster emergencies, and accident and emergency centres (Hollenbeck, Beersma and Schouten, 2012), all of which may involve complex working groups.

2.2 Theoretical Frameworks in Teamwork

The review includes Susan Cohen's team effectiveness model, input-process-output models and input-mediator-output-input models in teamwork and project teams. These studies have listed some predominant characteristics and team functions that have contributed to the performance and effectiveness of a team in different organisational settings including project teams.

2.2.1 Susan Cohen's Team Effectiveness Model (1994)

To analyse the characteristics of a project team, Cohen's team effectiveness model can be used as an organising framework by identifying its strengths and weaknesses. Cohen's model is derived from an extensive review of the literature through the examination of other team effectiveness models (Cohen, 1994). Originally, the framework for team effectiveness model was based on traditional teams but was later modified to fit complex project settings (Cohen, 1994). One of the important parameters that were added to the group composition was information system skills, as these are required to perform a particular task in software development projects and accomplish the goals of the project (Cohen, 1994; Mtsweni, Horne and Poll, 2016).

The original model focuses on group characteristics and composition of a team. Composition is a crucial part of group characteristics in any team which influences performance (Belbin, 2002; Senior, 1997) in

the form of individuals bringing in their skills, ability, knowledge and background (Morgan and Lassiter, 1992) and how these varied capabilities allow a team to draw from different sources of information (Hoffman and Maier, 1961).

One of the important components mentioned in the group composition of Cohen's model includes technical skills, information system skills and interpersonal skills that are important for project members to actively function in a team environment. Cohen's team effectiveness model is based on traditional teams which are collocated but these are found to be very relevant for complex project teams (Pinsonneault and Caya, 2005). However, there are a few drawbacks of the model. Firstly, the model limits itself as there is no process variable which may influence the relationship between group composition and team performance or attitudinal outcomes. Secondly, although the model highlights the relevance of skills, the term technical skills and information system skills seem to be interrelated to each other and the framework does not clearly distinguish between the two variables.

From the Cohen's team framework, the present study would like to draw on information system skills as these are the vital skills for project team members to function effectively and accomplish tasks using software tools (Duarte and Snyder, 2001). The confidence that individuals hold in their abilities and competence is crucial to ensure the success of continued efforts and engagement with one's work (Stajkovic and Luthans, 1998), as self-efficacy beliefs have proven to be a proxy of actual competencies (Bandura, 1997). Apart from other skills, technical skills are equally important in successful delivery of a software development project (Pant and Baroudi, 2008) such as using software tools for functioning and self-efficacy motivates individuals to improve their competencies (Schunk, 1995). The present study assesses the role of perceived self-efficacy in information system skills to utilise technologies in a project team (Bandura, 1982) and its influence on outcomes such as individual team members' performance and well-being.

2.2.2 Input-Process-Output (IPO) Models in Teamwork

Some important theoretical frameworks have contributed to the understanding of effective team management and the processes that help to contribute to individual performance and well-being. The present study draws from IPO models such as Klimoski and Jones (1995) and Zigurs, Khazanchi and Mامتjanov (2008) which are based on team effectiveness and virtual project management respectively.

2.2.2.1 Team Effectiveness Model by Klimoski and Jones (1995)

Team effectiveness model proposed by Klimoski and Jones (1995) adopts the input, process and output approach which is characterised by the following input variables such as organisation, norms, composition, leadership and size of a team. The process variables identified in the framework include the use of skills, strategies, effort level and coordination, potency, and compatibility. According to Klimoski and Jones (1995), interpersonal relationships between the team members, distrust among individuals and levels of compatibility are factors that strongly influence the effectiveness of a team. Exceeding the level of efforts by an individual does not necessarily equate to the success of a team, especially where there is no team strategy (Klimoski and Jones, 1995). The outcome variables of the model are task accomplishment, quality of outcomes, satisfaction and emotional tone, and turnover. The task accomplishment and quality of outcomes are deliberately separated since accomplishing a task do not necessarily equate to the quality of the outcome. Moreover, team composition can influence the social integration of the team in terms of turnover as well as the performance and effectiveness of a team.

Besides emphasising on environmental demands on a team, there are significant drawbacks of this framework. Firstly, there is no clear distinction made between the individual and the team, and due to the very nature of a clear linear process without any feedback loops; some of the nuances are hidden. For example, it is unclear as to whether size as an input variable influences task accomplishment of an individual or the whole team. Secondly, the framework does not clearly distinguish between project teams and teams in general, so there is confusion regarding what type of teams the model is referring to in the framework.

Size of a team is an important factor that can be controlled for in the present study. The group size may have a strong influence on the outcomes of a team depending on the number of members contributing to the project goals (Harrison et al., 2002; Jackson et al., 1991). Previous research has studied demographic characteristics such as team size in project teams (Hoegl, 2005; Weiss and Hoegl, 2016). The present study controls for team size as it has strong consequences for a variety of team processes and outcomes (Harrison et al., 2002; Jackson et al., 1991). When groups grow in size, there are problems associated with a team's functioning (Blau, 1970). Additionally, larger teams may have difficulty in maintaining close working relationships among its members.

2.2.2.2 Positive Team Working Model

A positive and effective team working model by Richardson and West (2010), presents an input, process and output approach which offers fundamental socio-emotional requirements of team-based work and team development to perform tasks most effectively.

The model involves input variables such as an inspiring team task, positively valued team diversity, ensuring clear and evolving roles, encouraging positive team relationships and developing team attachment. Previous research has demonstrated that the tendency of individuals to develop an attachment to significant others and the nature of their attachment can have a strong influence on the degree to which they identify with their team, and in turn, to which they trust and cooperate with the team (Korsgaard, Brodt and Sapienza, 2003). This leads to a genuine interest in each other's well-being among individuals (Richardson and West, 2010).

The process variables identified by the positive teamwork model includes potency, optimism, learning, reflexivity, trust, supportive leadership and social support. The output variables in the model are heightened team performance, team member well-being, organisational altruism, inter-team cooperation and innovation. These are produced if all the input and the process variables discussed above are in place. A positive team working leads to increased team performance (West, 1996) and is associated with well-being outcomes such as job satisfaction and role clarity (Mickan and Rodger, 2005). It also leads to a climate of organisational altruism whereby, team members demonstrate helping behaviours within and across teams, and show a genuine concern for each other's well-being.

The positive teamwork model combines traditional theories with positive psychological principles to promote effective team functioning and achieve optimal well-being in the workplace. However, the model has a few drawbacks. Firstly, although the model focuses on positive team elements, it is not clear whether the same model can be applied to get similar results for project teams. An individual's attachment to significant others explains employee behaviour at work (Richards and Schat, 2011) and how individuals who make up a team can influence team functioning depending on their attachment style (Mikulincer and Shaver, 2007). Hence, to develop good working relationships, one can argue that it is important to understand the individual team members' global attachment orientations with significant others for their influence on team processes and outcomes (Griffin and Bartholomew, 1994). Secondly, the output variables in the model refer to heightened team performance and team member well-being. The model does not highlight any specific contribution to the overall team performance made by an employee (such as an individual's contribution to their performance) that may get affected by the inclusion of input

and process variables mentioned in the framework. Similarly, well-being is a very generic term and the model does not identify the specific aspect of well-being that might get positively influenced by the input and process variables.

From the positive teamwork model, the present study investigates the role of an employee's attachment style (Bowlby, 1982; Mikulincer and Shaver, 2007; Bartholomew, 1990) within a group and its influence on team processes and outcomes. There is scope to examine the importance of relationships in project teams (Lee and Sawang, 2016). Although research in adult attachment is centred on parent-child relationships (Bowlby, 1969), it has identified similar attachment dynamics in organisational relationships as well (Hazan and Shaver, 1990). These include relationships with the leader, co-workers, mentor, and the organisation for social support and membership (Yip et al., 2018). Previous researchers have posited that knowledge of attachment style is an important antecedent for understanding employee performance, psychological well-being and other organisational outcomes (Harms, 2011; Lanciano and Zammuner, 2014). The present study examines an employee's relational orientation from the perspective of attachment theory in project teams and specifically focuses on attachment avoidance as such individuals seek distance in teams (Rom and Mikulincer, 2003) and view themselves as independent of the team (Keating et al., 2014).

2.2.2.3 Framework for Effective Virtual Project Management

Effective virtual project management demonstrates the key concepts which identify factors that are relevant for efficiently managing a project in a complex environment (Zigurs, Khazanchi and Mametjanov, 2008) and follows the classic IPO model. According to Zigurs, Khazanchi and Mametjanov (2008), the output of a team is multi-dimensional as it includes team effectiveness, satisfaction and commitment of team members. The three characteristics that define the outcome of a team are team performance, team well-being and member support. Zigurs, Khazanchi and Mametjanov (2008) have identified virtuality, collaboration and technology, and project and member characteristics as key inputs in the framework for virtual project management.

The framework offers valuable information about distributed project management but has a few limitations. Firstly, project and member characteristics combine two attributes into one variable and there may be certain factors such as member characteristics in terms of their specified knowledge which may have a stronger influence on project outcomes rather than the project characteristics. Secondly, the framework talks about the accomplishment of the task focusing on human aspects such as team performance. However, a task can either be related to an individual's specific job duties or fall outside the

scope of one's job responsibilities. The study fails to distinguish between the two, leading to additional uncertainty. This can be further expanded to understand the accomplishment of the tasks by individual team members (Williams and Anderson, 1991) and their overall contribution outside the parameter of their job duties (Dyne, Cummings and Parks, 1995). Furthermore, team well-being is another important output variable in the study. The framework emphasises on team bonding and process satisfaction with technology as key elements of well-being. Nevertheless, there are other aspects of well-being such as work engagement, which is a motivational concept that draws on self-involvement and its understanding in complex project teams will aid in contributing to its effectiveness (Panteli, Yalabik and Rapti, 2018).

From the framework proposed by Zigurs, Khazanchi and Mametjanov (2008), the present study identifies key variables for further exploration. Performance at the workplace determined by an individual behaviour that is focused on each employee's role, whereby contribution based on the prescribed duties is referred to as in-role performance and responsibilities that fall outside the formal job description is called extra-role performance (Katz and Kahn, 1978). Each individual's contribution to the task makes a project successful within a team (Gordon and Curlee, 2011) and therefore, it is important to assess the individual team members' contribution to the project. Previous research in the literature on project teams have measured outcomes in terms of effectiveness (Cramton and Webber, 2005; Schweitzer and Duxbury, 2010), including the sub-dimensions of effectiveness such as cost, schedule and operability (Aitsahlia, Johnson and Will, 1995; Scott-Young and Samson, 2008). Nevertheless, there is scope to examine performance in the light of employee's contribution to their in-role and extra-role performance (Katz and Kahn, 1978; Biddle 1979).

An employee's well-being is drawn as another important outcome for a project team, as the temporary and dynamic nature of projects may put pressures on an employee, such as work overload, uncertain requirements and multiple role demands (Turner, Huemann and Keegan, 2008). Employees with improved well-being are better able to deal with interpersonal relationships and stressful working environment (Adamovic, 2017).

2.2.3 Input-Mediator-Output-Input (IMOI) Models in Teamwork

The following IMOI models in teamwork have been adopted as they demonstrate the effect of team composition and team processes on the performance and well-being of employees. Based on the variables derived from previous frameworks (such as in-role/extra-role performance and well-being), the following studies were found to be relevant and provide further support in designing the conceptual model of the present study.

2.2.3.1 Model of Demographic Impacts on Team Reflexivity and Team Outcomes

A study by Schippers and her colleagues proposed an IMOI model on the impact of diversity on team processes and outcomes (Schippers et al., 2003). The model is characterised by overall diversity as an input variable which includes gender, age, educational level and tenure as its defining factors. It looks into combined effects by computing the overall diversity (Flynn, Chatman and Spataro, 2001) and also measure the separate effects of it on a team outcome (Knippenberg, Dreu and Homan, 2004). Team reflexivity is the process variable in the framework which leads to indirect effects between the input and the outcome variables. The output variables in the model are satisfaction, commitment and performance, and the input and output variables are moderated by outcome interdependence and group longevity.

The model investigates the role of diversity on team process and outcomes; however, there are a few drawbacks. Firstly, the model examines the effect of the overall diversity but has not taken other forms of diversity in terms of race or functional background due to the sample teams performing very different tasks to each other (Schippers et al., 2003). Secondly, the result of the study will be difficult to interpret for project teams. Although the model focuses on teams, whether the same results can be expected in the case of project teams is something that needs further attention. Thirdly, the study employs a cross-sectional analysis which does not allow for testing of causality. Longitudinal or experimental research will be more appropriate to understand team development over time (Schippers et al., 2003). Finally, an individual's tenure in the team is an input variable in the model; however, the overall tenure of a team is also important to consider since the more time team members have spent together, they develop better relationships leading to improved outcomes (Katz, 1982).

The present study examines the relationship between diversity in terms of an individual's functional expertise. Functional background diversity has a stronger effect on performance than other diversities such as age, race and gender (Pelled, 1996). The concept of functional diversity is examined from the perspective of social identity (Tajfel and Turner, 1986). Social identity is thought to provide psychological stability that holds teams which are complex in nature and allow their members to act as a coordinated unit (Desanctis and Poole, 1997; Mansour-Cole, 2001; Wiesenfeld, Raghuram and Garud, 2001). Employees with stronger social identity gain self-esteem and a sense of worth that enables them to buffer their well-being when threatened (Haslam et al., 2009). This may result in improved individual performance, which may directly influence an employee's contribution to their tasks. However, there is scope to investigate the benefits of social identification in project teams (Scott, 1997). Additionally, the effects of team tenure have been examined on overall team performance in self-managing teams (Stoker, 2008). The present study controls for team tenure, since the longer the team has been in existence, the

longer its team members may have developed harmonious working relationships and therefore would have had more interactions (Katz, 1982).

2.2.3.2 Job Demand Resources Model

Bakker and Demerouti (2014) proposed a job demand resources (JD-R) model, which examines the relationship between the job and personal resources, and their influence on work engagement and performance of individuals. The job demand resources model posits that every occupation have risk factors associated with stress and these factors can be classified into job demands and job resources (Bakker et al., 2003a; b; Demerouti et al., 2001a; b). Job demands refer to the physical, psychological or social aspects of the job that require sustained efforts or skills, whereas job resources refer to the physical, psychological or social aspects of the job which are necessary to deal with the demands (Bakker and Demerouti, 2007).

According to the model, independent variables like job resources in the form of social support from colleagues and supervisors, skill variety, performance feedback, and autonomy triggers a motivational process, which initiates work engagement among employees and leads to higher performance (Bakker and Demerouti, 2008). Similarly, personal resources whereby, employees who gain positive self-evaluations are linked to the ability to recover from stressful situations (Hobfoll et al., 2003), in turn, contribute to work engagement and mobilise job resources. Both job resources and personal resources are mutually related to each other, however, personal resources can be independent predictors of work engagement (Xanthopoulou et al., 2009). Also, employees gain their motivational potential when confronted with high job demands such as workload, emotional demands and mental demands (Bakker and Demerouti, 2008). Workers who are engaged in turn positively affect job performance through the creation of own job and personal resources in the form of job crafting (Bakker, 2011). Job crafting represents a proactive behaviour, whereby employees alter their job or task characteristics (Tims, Bakker and Derks, 2012) to improve the working conditions and make their job more meaningful, engaging and satisfying (Demerouti, 2014). From a JD-R perspective, employees may craft their job to achieve a balance between job demands and job resources with their abilities and needs (Tims and Bakker, 2010).

The JD-R model presents an overview of the concept of work engagement and its common predictors which influences the job performance. However, there are a few limitations to this model. Firstly, the overall model does not clearly distinguish between individual work engagement and team-level work engagement. Secondly, there are two forms of job crafting: one at the individual-level and the other at the team-level, and it is difficult to comprehend the type of job crafting referred to in the model.

From the JD-R model, the present study asserts work engagement as a crucial outcome variable. In the project team context, research on work engagement is limited and there is additional scope to investigate the potential effects of specific factors on outcomes such as work engagement (Gilson et al., 2015). This is further echoed by the sentiments of Fineman, Maitlis, and Panteli (2007), who calls for research to understand the role of emotions from the point of view of work engagement model, which is characterised by vigour, absorption and dedication in the context of complex project teams. The other positive components of subjective well-being such as job satisfaction of team members have been examined as an outcome in software development project teams (Acuna, Gomez and Juristo, 2009; Tripp, Riemenschneider and Thatcher, 2016). Moreover, research on job crafting is still in its infancy (Demerouti, 2014) and there is scope to understand its role in project teams. Therefore, job crafting is another important variable that is drawn from the model. The present study focuses on collaborative job crafting which is the collective redesigning of the work by a team on the allocation of resources for the accomplishment of the tasks (Tims et al., 2013) since they contribute to performance and well-being of employees (Tims, Bakker and Derks, 2012). Moreover, the studies on collaborative job crafting are restricted to call centre teams (McClelland et al., 2014), education (Leana, Appelbaum and Shevchuk, 2009) and health service industry (Tims et al., 2013), and can be further extended to other sectors such as IT project teams.

Finally, the present study applies conservation of resources (COR) theory (Hobfoll, 2001) to the context of project teams. The primary belief of COR theory is that individuals obtain, retain, foster and protect things that they value the most to resist stress that may occur when the key resources are threatened or lost. These resources are broadly defined and include objects, conditions, personal characteristics and energies (Hobfoll, 1989). Objects are resources that are valued for the physical nature (e.g., transportation, shelter), conditions are resources which help in obtaining other valued conditions (e.g., seniority, tenure), personal characteristics are considered prized aspects of the self and aid in acquiring other valued states (e.g., skills, self-esteem) and energies are the resources that supplement access to objects, conditions and personal resources (e.g., knowledge, money and time) (Hobfoll and Lilly, 1993).

The basic tenet of COR theory is the motivation of human behaviour to acquire or conserve resources for survival (Hobfoll et al., 2018). The present study posits that individuals or groups having sufficient resources such as higher self-efficacy or stronger social identity are not just able to maintain their resources in challenging circumstances, but also gain new resources (Vera, Rodríguez-Sánchez and Salanova, 2017) by engaging in the process such as job crafting.

2.3 Antecedents from I-P-O Perspective

Interestingly, input-process-output model (IPO), the generic model for an early conceptualisation of team performance, was inspired by theories from the social psychology of small groups and industrial organisational psychology (Cooke, Gorman and Rowe, 2009). It was suggested that team interaction processes be studied as mediators of the effects of the individual, group and environmental factors on team output (Cooke, Gorman and Rowe, 2009). Cognitive perspective stresses the influence of group work on processes such as how individuals deal with information, how they assess and how they solve problems (Bossche et al., 2006). Input factors have been studied in the IPO framework such as workgroup confidence (Hyatt and Ruddy, 1997), collective efficacy (Little and Madigan, 1997; Marks, 1999), and team drive (Chen et al., 2002) on different processes and outcomes. Input factors in the form of behavioural elements referring to the evaluation and use of appropriate information to arrive at a strategy to accomplish mission in teams (Ilgen et al., 2005), have also been examined in IPO models such as functional diversity (Drach-Zahavy, 2001), demographic attributes in terms of race/ethnicity (Riordan and Shore, 1997), and personality traits (Barrick et al., 1998) on various team processes and outcomes. Finally, social elements reflect the affective feelings that team members hold towards each other and the team (Ilgen et al., 2005), and have examined input factors such as satisfaction with the group (Bishop and Scott, 2000) and person-group fit (Kristof-Brown, Jansen and Colbert, 2002).

The present study has selected the antecedents involving information system self-efficacy based on cognitive perspective, functional background social identity based on behavioural element and attachment avoidance based on social factor with each representing a broader category on its own. These antecedents are examined in IT project teams to understand their influence on processes such as job crafting and outcomes.

2.4 Summary and Conclusion

Despite the gaps and limitations of previous studies, there has been some positive contribution to the studies of teamwork and specifically project teams. There are also other variables in the above frameworks that can be explored rather than those mentioned here in the thesis for project teams. Nevertheless, the following variables are derived based on the gap in the existing literature in project teams with regards to specific characteristics including technical skill and self-efficacy (Pant and Baroudi, 2008; Schunk, 1995), social identity (Scott, 1997), and relationships from the point of view of attachment styles (Lee and Sawang, 2016; Yip et al., 2018) of employees within project teams and their impact on

individual outcomes (in-role and/or extra-role performance and work engagement). The present study also examines the role of job crafting as an action team process (Wrzesniewski and Dutton, 2001) from the perspective of COR theory (Hobfoll, 1989). Below is a summary of the variables that have been derived from the above frameworks –

- The variables are based on IPO approach, whereby input (specific project team characteristics), process (collaborative job crafting) and output (in-role and/or extra-role performance and work engagement) variables have been examined in the light of the COR theory.
- Project team characteristics in terms of perceived self-efficacy (Bandura, 1982) in using information system skills (Cohen, 1994), social identity (Tajfel and Turner, 1986) in relation to functional background (Bunderson and Sutcliffe, 2002) and attachment style (Richardson and West, 2010) of employees focusing on attachment avoidance (Bartholomew, 1990) as input variables.
- Employee performance as in-role and/or extra-role job duties of individual team members as an output variable, since effective business functioning, requires individuals to not only carry their prescribed duties but also engage in behaviours that go beyond the formal responsibility (Katz and Kahn, 1978, Biddle, 1979) as the output variable.
- Employee well-being with regards to individuals who are fully engaged and who are competent not only with their in-role job performance but also take a step beyond their employment contractual agreement (Bakker, Demerouti and Verbeke, 2004; Markos and Sridevi, 2010) as the output variable.
- The role of collaborative job crafting as a process variable in the relationship between project team characteristics and outcome variables (employee in-role and/or extra-role performance and work engagement), as it has a positive influence on the psychological well-being of employees (Berg, Grant and Johnson, 2010) and other organisational outcomes such as work engagement and performance (Tims, Bakker and Derks, 2012).

The variables derived above are discussed in the following chapters. In the next chapter, related theories based on specific project team characteristics and outcomes are examined, and any relevant studies are looked into deriving direct effect hypotheses of the present study.

Chapter 3 Project Team Characteristics and Outcomes

The chapter focuses on specific project team characteristics which include information system self-efficacy, functional background social identity and avoidant attachment style that may influence individual team members' performance and well-being. The chapter is broadly classified into two key themes: individual outcomes and project team characteristics. Based on the IPO framework, the following sections examine relevant studies and elaborate on the existing theories to explain the relationship between input (project team characteristics) and output (in-role and/or extra-role performance and work engagement) variables to help in the formulation of the direct effect hypotheses.

3.1 Individual Outcomes

The present study examines the outcomes in terms of individual team members' performance and well-being (Zigurs, Khazanchi and Mamejtanov, 2008; Richardson and West, 2010). The extent to which a member contributes to the overall achievement of a team's goal has been conceptualised as an individual performance (Barry and Stewart, 1997; Shaw, Duffy and Stark, 2000). An individual team member contributes to the overall performance by engaging in behaviours that contribute to the task and interpersonal concerns of the team (Barry and Stewart, 1997). The success of a project is dependent on the performance of each individual's contribution to the team's task (Gordon and Curlee, 2011; Ludden and Ledwith, 2014).

When an employee has improved individual-level performance and well-being, this leads to a better overall organisational performance (Judge et al., 2001; Taris, 2006; Bakker, Emmerik and Riet, 2008; Koys, 2001). Therefore, it is important to assess the performance level and mental well-being of each employee within a team as it can be a crucial indicator of overall team performance and a significant contributor to project team success. Employee performance is measured through in-role and extra-role performance, while well-being is measured through work engagement (output variables).

3.1.1 In-Role and Extra-Role Performance

Katz and Kahn (1978) officially coined the concept of in-role performance, which is associated with the core task behaviour. In-role performance refers to the specific formal job duties which are related to the employees (Borman and Motowidlo, 1997). William and Anderson (1991) argued that in-role performance is associated with tasks, duties and responsibilities that form part of the job description and directly or indirectly play a significant factor in contributing to the organisational core technical

processes. In-role performance is evaluated through four categories: the rating, the quantity standard, the quality standard and the document data record such as the record of absence, delay of work and work safety (Zhu, 2013).

Extra-role duties are more often the activities which are voluntarily performed by the employees to contribute to overall performance (Organ, 1989). Dyne, Cummings and Parks (1995) and Katz (1964) have classified extra-role performance within a wide range of organisational context and identified certain behaviours such as helping co-workers, self-training, requesting for change and inheritance of certain characteristics as extra-role, which makes an individual less likely to be incorporated into formal job descriptions, and more likely to be regarded as voluntary in nature.

Employees with high energy levels spend less time accomplishing their in-role tasks with least efforts (Hockey, 2000), which leaves them with additional resources to spend on extra-role activities. According to Sonnentag (2003), one of the reasons proactive behaviour is supported by vigour is due to the amount of energy employees spend extra effort in self-starting and persisting in extra-role behaviour. In fact, engaging in extra-role responsibilities can actively help an employee to regenerate new resources through upgrading their skills and knowledge, and reducing their extra energy and time to perform a difficult task at the expense of contextual performance (Griffin, Neal and Neale, 2000; Halbesleben and Bowler, 2007).

Individuals in a particular job perform a varied set of tasks, thereby enacting different roles (Katz and Kahn, 1978; Ilgen and Hollenbeck, 1991; Biddle, 1979; Graen, 1976). These roles are enacted either separately or simultaneously based on the network of intertwining tasks and responsibilities within an organisation or a team (Biddle, 1986; Ashforth, 2001; Stryker and Burke, 2000; Katz and Kahn, 1978). Roles may be defined by individuals based on time horizons (such as long term or short term) or individual versus collaborative efforts (Parker, 2007; Ashforth, 2001). Additionally, roles may be contingent upon individual differences, socialisation and role orientation (Parker, 2007; Graen, 1976; Saks and Ashforth, 1997; Morrison, 1994; Hofmann, Morgeson and Gerras, 2003; Parker, Wall and Jackson, 1997; Salancik and Pfeffer, 1978).

Roles may be classified as falling within the prescribed job (in-role performance) or that is considered beneficial for the role but not mandatory (extra-role performance) (Katz and Kahn, 1978; Organ, 1990). The definition of a role takes shape based on the perceptions of an individual's role preference, role ability and expectation of others (Turner, Chmiel and Walls, 2005; Graen, 1976). Research demonstrates that there is enough discretion within an organisation or a team and its job for individuals to make decisions about which task(s) to perform (Morgeson, Delaney-Klinger and Hemingway, 2005). As effective organisational functioning is predicated on extra-role behaviours (Katz, 1964; Katz and Kahn,

1978), some individuals manage to fulfil broader roles than others (Hofmann, Morgeson and Gerras, 2003; Morrison, 1994).

Individuals generally behave in ways that are consistent and in line with their defined roles (Jain and Cooper, 2012). In-role and extra-role performance are considered to be important components of the effective organisational operation, as they facilitate the social functioning of the organisation, aid in increasing efficiency and reduce friction (Katz and Kahn, 1978). Moreover, they not only promote better performance among employees but also facilitate greater performance improvement (Parker, 2007). Therefore, in-role or extra-role duties are instrumental to workgroups and teams. In the light of the present study, the research aims to understand the factors resulting in individual team members to broaden their roles by fulfilling their prescribed duties (in-role) and also engage in additional activities (extra-role) that may be beneficial for a project team.

Several predictors influence individuals taking on greater role breadth such as the various characteristics of employees (LePine and Dyne, 2001; Bateman and Crant, 1993). Individuals with higher levels of ability will perform at higher levels (Hunter and Hunter, 1984), suggesting that increased role breadth might be dependent on an employee's ability and skill to take on additional tasks (Morgeson, Delaney-Klinger and Hemingway, 2005). In addition, other factors such as increased autonomy will provide greater flexibility to individuals in how they define their roles, as they will have higher discretion in deciding how to perform that specific task (Troyer, Mueller and Osinsky, 2000; Fried et al., 1999). The present study aims to understand the individual team members' contribution to their in-role or extra-role performance based on specific characteristics of the group such as stronger functional background social identity and high avoidant attachment style in the light of IT project teams.

3.1.2 Work Engagement

Team member well-being is considered an important aspect in shaping member's feeling and performance, given the fact that there is strong anecdotal evidence that project work is stressful due to workload and time pressure (Wilemon, 2002; Zika-Viktorsson, Sundstrom and Engwallc, 2006; Chiocchio et al., 2010). In setting out to measure well-being, it is important to first specify the desired scope. The broadest scope is 'context-free well-being' which refers to global happiness, life satisfaction and similar constructs such as positive feeling, self-esteem etc. Moreover, there is 'domain-specific well-being' that refers to a segment of the life of an individual in terms of one's job, family, health and leisure. Lastly, there is 'facet-specific well-being' that refers to a particular aspect of one's domain such as

satisfaction with the payment received from the job or working conditions of an individual (Warr, Cook and Wall, 1979).

Job-related psychological well-being is an aspect of domain-specific well-being which reflects any positive or negative assessment of an individual's work (Schaufeli, 2012). Warr (1987; 1990) has defined job-related affective well-being at the workplace as a component of mental health, while others are autonomy, aspiration, competence and integrated functioning. In the present study, the term well-being of an individual refers to Warr's definition of job-related affective well-being (Warr, 1990).

Well-being at work focuses on psychological and subjective aspects. A proposed concept of well-being is the term 'subjective well-being', which is referred to as an overall experience in a person's life and often reflects self-described happiness. This is measured as job satisfaction, organisational commitment and positive affect in the form of high energy, excitement and enthusiasm at work by individuals (Diener, 1984; Simone, 2014). On the other hand, negative effects in the form of depression, anxiety, anger and tiredness are some of the constructs which define negative emotions (Simone, 2014). Well-being also refers to meaning and self-realisation in the form of job involvement, thriving, flow and intrinsic motivation. These are constructs in organisational behaviour which overlap with 'eudaimonic well-being' (Simone, 2014). A further aspect of well-being is social well-being, which primarily refers to the social integration, cohesion and a sense of shared consciousness in meaningful communities by the individuals at the workplace (Keyes, 1998).

Figure 3.1 below measures and conceptualises the concept of overall well-being at work and its different aspects (Fisher, 2014, p15).

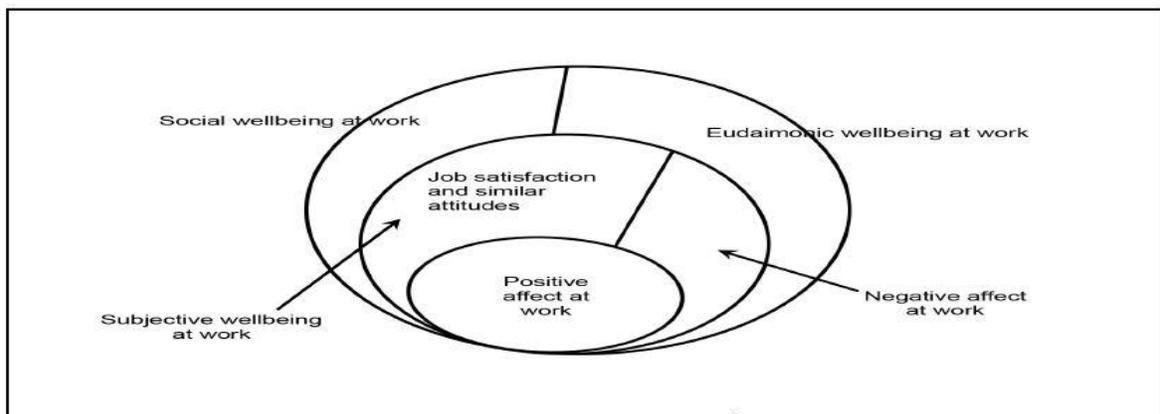


Figure 3. 1. Model of overall well-being at work

Subjective well-being (SWB) can be applied to the workplace, whereby employees have a high related SWB when they experience positive emotions and infrequent negative emotions indicated through engagement, happiness or satisfaction (Diener, Sandvik and Pavot, 1991). In the present study, the positive component of subjective well-being is taken into consideration in terms of work engagement of individuals within project teams (Bakker and Oerlemans, 2011). Schaufeli and his colleagues defined work engagement as a “positive and fulfilling work-related state of mind, which is characterised by vigour, dedication and absorption” (Schaufeli et al., 2002, p74). Vigour is described as an ability to have the strong mental resilience to face challenges at work and having high levels of energy. Dedication is characterised by the ability to get strongly involved in tasks and getting a sense of significance, exuberance and challenge. Absorption refers to being fully absorbed into work and having difficulties in disconnecting from it (Bakker and Demerouti, 2008). Thus, employees who are more engaged feel vigorous and strong, and are more immersed in their work activities and feel enthusiastic about those activities (Bakker, Emmerik and Euwema, 2006).

Employees who are more engaged experience active and positive emotions, which seem to broaden people’s thought-action repertoire (Fredrickson, 2001). Engaged workers have better health and therefore can invest all their energy resources to the work (Bakker and Oerlemans, 2011) through which they can create their own resource pool in terms of personal and job resources (Bakker and Demerouti, 2008). Work engagement has a relation to meaningful business outcomes at an extent that is important to many organisations (Harter, Schmidt and Hayes, 2002). Moreover, this aspect is the common operationalisation of work-related well-being within workgroups (Blanchflower and Oswald, 1999).

Engaged team members are known to perform well in their in-role duties and go the extra mile at work with extra-role performance (Bakker, Demerouti and Verbeke, 2004). One of the key drivers for work engagement is job resources which play an essential role in encouraging individuals to grow, learn and develop themselves at work, and act as an external factor in achieving organisational goals (Deci and Ryan, 1985; Ryan and Frederick, 1997). Social support from supervisors and colleagues, working opportunities, independence at work, feedback on performance and skill variety are some of the job resources which are positively associated with work engagement (Bakker and Demerouti, 2007; Schaufeli and Salanova, 2007). On the other hand, job demands such as workload, emotional demands, time demands, the complexity of the job and work conditions require sustained physical and/or psychological effort or skills (Bakker, Demerouti and Verbeke, 2004; Bakker and Demerouti, 2007; Nahrgang, Morgeson and Hofmann, 2011).

To feel more engaged in one's work, it is imperative that employees have the necessary job resources to perform their tasks successfully and to cope with the demands of the role. Bakker and Demerouti (2008) state that job characteristics have a profound impact on employee well-being such as work engagement. Individuals protect resources that they value the most and seek to replace these resources when threatened (Hobfoll, 1989). Thus, engaged employees are more capable of dealing with the imbalance between key resources and demands in their work (Hakanen and Roodt, 2010), and the more resources they have, the more likely they are successful in achieving their work roles (Schaufeli and Bakker, 2004; Salanova and Schaufeli, 2008). However, there is further scope to examine the drivers of work engagement in the context of project teams (Yalabik and Panteli, 2015) and explore any specific project team characteristics that may boost the levels of work engagement of team members.

3.2 Project Team Characteristics

One of the key inputs by a leader into the team functioning and behaviour of a team is based on its composition, which primarily refers to the characteristics and skills of the individuals who are part of the team as well as how those attributes are evenly distributed within a team. This is specifically more important in the case of project teams, where the team members come with varying levels of training, expertise, education and background (DiTullio, 2010; Kozlowski and Bell, 2003). The composition of a team has been linked with performance with regards to a team's ability to adapt to the dynamic task environments (Gibson and Vermeulen, 2003; DeRue et al., 2008) and circumstantial performance (Morgeson, Reider and Campion, 2005). Moreover, team composition has a clear relationship with performance based on task complexity (Higgs, Plewnia and Ploch, 2005).

A project team represents a human capital resource which can be a source of competitive advantage if it is valuable, rare and inimitable (Barney and Wright, 1998; Wright, MacMahan and McWilliams, 1994). This resource may exist at the unit-level on a continuum ranging from homogeneity or heterogeneity to knowledge, skills and abilities of employees at the individual-level (Chan, 1998; Klein and Kozlowski, 2000b; Bliese, 2000). Previous literature on workgroups and teams identified how team members combine their resources, knowledge and skills to meet the task demands (Ilgen et al., 2005; Kozlowski and Ilgen, 2006). Effective completion of a team's task with high complexity such as due to a high interdependence requires greater levels of team member's behavioural synchronisation and coordination, and is sometimes based on the similarity among the individual's knowledge, skills, abilities and other characteristics needed to perform such tasks (Ployhart and Moliterno, 2011).

Each team member may contribute in terms of specific traits, knowledge or skills to the collective pool of characteristics that a project team will have at its disposal (Williams and Sternberg, 1988). In other words, the contribution made by each team member may add to the resource pool of the whole team or it may further diminish their collective resources to perform complex tasks (Hobfoll, 1988; 2001). A project team with aggregated attributes representing higher information system self-efficacy, stronger functional background social identity and high avoidant attachment style defines an inimitable human capital resource called team characteristics, which may lead to a change in the individual team members' contribution to their tasks and their levels of well-being.

The present study elaborates on project team characteristics by looking at specific attributes such as information system self-efficacy (Bandura, 1982), functional background social identity (Tajfel and Turner, 1986) and avoidant attachment style (Bartholomew, 1990) that exist in teams, which defines the characteristics of that team (as input variables). The following sections explain these attributes and their relationship with organisational outcomes such as the individual team members' performance (in-role and extra-role performance) and well-being (work engagement).

3.2.1 Information System Self-Efficacy

Project teams use information technology to establish channels of open communication and formalise project processes (Anantatmula, 2008). Team members in projects use information system skills such as possessing technical knowledge, being analytical and understanding the business (White and Leifer, 1986). Each team member must have a strong set of information system skills to use technology and tools that are available in integrated software packages such as Microsoft Project, Collabtive and Primavera Project Planner based on the complexity of the projects (Liberatore and Pollack-Johnson, 2003; Mishra and Mishra, 2013).

Information system skills include the following (Duarte and Snyder, 2001) –

- Ability to use the appropriate technology to communicate, coordinate and collaborate with other team members
- Ability to access training or help with new technology
- Ability to plan and conduct team meetings
- Knowing the etiquette of using the technology

Information system skills influence the work behaviour of an individual that has a critical factor in contributing to the job performance (Gillard, 2009; Mtsweni, Horne and Poll, 2016). The present study

measures an employee's information system skills within a project team and their self-confidence in using software tools to achieve work-related outcomes. This context-specific construct is referred to as information system self-efficacy.

The variable information system self-efficacy postulates from self-efficacy theory, which is a person's belief that he or she is capable of performing a particular task successfully (Bandura, 1977b; 1997). According to Bandura's description of the self-regulation system, human behaviour is influenced by the choices people make, their goals and the effort they apply to a particular task (Iroegbu, 2015). Self-efficacy has powerful effects on learning, motivation and performance, as individuals perform only those tasks that they believe they will be able to perform successfully (Bandura, 1982). Individuals who perceive themselves as highly efficacious activate sufficient effort, resulting in successful outcomes, whereas those with low self-efficacy are likely to cease their efforts prematurely and fail the task (Bandura, 1977b; 1986).

There are four major sources of information used by individuals when forming their self-efficacy judgments (Bandura, 1977b). First is based on performance accomplishment, which is focused on past experiences with the specific task being investigated (Saks, 1995; Gist and Mitchell, 1992; Silver, Mitchell and Gist, 1995). Second is the vicarious experience, which is gained by observing others perform activities successfully (Gist and Mitchell, 1992; Bandura, 1978). The third is the social persuasion, whereby people are led through suggestion into believing that they can cope successfully with tasks (Bandura, 1977b; Bandura and Cervone, 1986). The final source of information is the physiological and emotional states influencing self-efficacy judgments related to specific tasks (Bandura, 1988).

Self-efficacy theory suggests that self-efficacy judgments are relatively task-specific (Bandura, 1977b; 1978). The influence of self-efficacy beliefs on individual functioning and behaviour within organisational settings has been largely confirmed by empirical studies. Self-efficacy has been linked to higher work engagement (Bakker, 2011) and better work performance (Bandura, 1997).

Some project teams involve employees operating remotely from each other without any fixed time frames and are heavily dependent on communication technologies such as emails, web conferencing or intranet (DeSanctis, Staudenmayer and Wong, 1999; Snow, Lipnack and Stamps, 1999; Christie and Levary, 1998). These technologies enable workers to perform different tasks effectively and efficiently, as they connect individuals from different locations and facilitate different departments or organisations to work together. Therefore, individuals require self-efficacy in information system skills to perform complex tasks in project teams (Sparrow and Daniels, 1999; Christie and Levary, 1998).

Employees who perceive themselves as highly self-efficacious in using their information system skills within a team will be able to competently perform tasks through software tools and will achieve better mental well-being. In fact, employees who have higher self-efficacy will put in more efforts towards the completion of the tasks and achieve positive mental health. As personal self-efficacy is possibly able to generate greater interest in the activity itself, as compared to perceived inefficacy (Bandura and Schunk, 1981), it represents judgments of how well the person can perform action, how much effort he or she will spend and how long he or she will persist in difficult situations (Bandura, 1977a; 1977b). Employees in project teams who have high self-efficacy in their information system skills will be able to work with technology at ease and accomplish complex tasks. Moreover, employees who collectively have higher self-efficacy within project teams will be able to put in more efforts towards their tasks that may lead to improved individual team members' in-role and/or extra-role performance and well-being. Therefore, a project team with higher information system self-efficacy is likely to benefit by each individual team member performing better in their in-role and/or extra-role duties and by improving their levels of work engagement over time.

Staples, Hulland and Higgins (1998) asserted that employees with high levels of IT skills and experience had higher levels of remote work self-efficacy, leading to better performance and job behaviours. The findings focused on self-efficacy theory, however, combining IT skills and self-efficacy scales as a single construct in the context of a project team and its effect on outcomes such as in-role or extra-role performance may provide new insight. Moreover, the cross-sectional nature of the design limits the ability to draw causal inferences and results could gain from a panel study to detect a change in performance over time. Additionally, measuring performance based on the in-role or extra-role responsibilities of an employee within project teams from the IT industry may throw light on an individual's contribution to the overall team's goal.

Wade and Parent (2001) suggested that deficiency in technical skills leads to lower job performance, whereby performance was based on the overall contribution to a firm's goals in terms of the number of direct reports and salary level. However, one of the limitations was the concerns over the reliability and validity of the approach to data collection from coverage bias. Since the results were based on a cross-sectional design, it is difficult to establish causality and a longitudinal study may assist in exploring the impact of technical skills on performance over some time. Furthermore, assessing the role of technical skill self-efficacy in other organisational settings such as a project team may offer a different perspective. Moreover, examining in-role or extra-role performance of employees may help in understanding the effects of technical skill self-efficacy on the overall contribution made by an individual.

A study conducted by Dube and Pare (2001) stated that technological proficiency among project team members was dependent on the success of the team in terms of effective communication and knowledge sharing. For active participation of team members in group functioning, it is highly desirable for employees to be knowledgeable and comfortable with various technologies for active contribution to the team (Dube and Pare, 2001). However, the results were not supported by any methodological and statistical evidence. Moreover, the focus can be further broadened by assessing the role of self-confidence in utilising the technical skills of employees in IT project teams to assist in understanding their capabilities of accomplishing a task.

Beauregard (2012) postulated that general self-efficacy was positively associated with the extra-role performance of public sector employees. Conversely, a general self-efficacy scale was used to measure efficacy and this needs to be further expanded to recognise the impact of construct specific self-efficacy on the extra-role performance of employees in project teams of the IT sector. Another important limitation was the employment of cross-sectional design in obtaining results which led to an inconclusive assessment of causality; however, a longitudinal approach might be beneficial in answering the cause and effect on performance over time.

Chen (2017) asserted that computer self-efficacy had a direct positive association with learning engagement of middle-aged students within schools. Conversely, extending the impact of technical skill self-efficacy of employees on work engagement in IT project teams requires further attention. Moreover, the results were derived from a multilevel data with repeated daily diary measures of the participants, whereby the daily diary measures were distributed once per day over a consecutive seven day period. Nevertheless, assessing the impact of technical skill self-efficacy on work engagement over an extended time lag may benefit the existing results.

Based on the above review, the following hypotheses are suggested for information system self-efficacy –

Hypothesis 1a: Higher team-level information system self-efficacy in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time.

Hypothesis 1b: Higher team-level information system self-efficacy in project teams has a positive association with a change in the work engagement of individual team members over time.

3.2.2 Functional Background Social Identity

Diversity is one of the positive factors that accelerate the effective functioning of a team. It brings in different ideas, innovation and creativity that facilitate better team performance (Cox, 1993). In organisational workgroups, diversity focuses on differences in age, gender, functional or technical background and tenure of the firm (Jackson, May and Whitney, 1995). Another perspective of diversity is the difference in terms of expertise, skills and experience in a team called cognitive diversity (Miller, Burke and Glick, 1998).

Pelled (1996) has categorised team diversity into high and less job-related attributes: highly job-related attributes such as education, background and functional expertise has a stronger impact on the performance of a team than less job-related attributes such as age, gender and ethnicity. A further aspect of team diversity is defined as deep-level diversity which refers to the differences in the attitudes, values and beliefs of team members that are learnt over time through interactions. Another aspect is surface-level diversity, which refers to the immediate visible biological characteristics such as age, race/ethnicity and gender (Harrison, Price and Bell, 1998). The present study focuses on deep-level diversity in terms of highly job-related attributes since these have a significant effect on the outcomes of a team (Pelled, 1996).

Deep-level diversity is less detectable in teams in the form of education, technical abilities, functional background, organisational tenure, personality, characteristics and values (Milliken and Martins, 1996). Empirical research demonstrates mixed results on how deep-level diversity affects performance (Mathieu et al., 2008; Miura and Hida, 2004). Some researchers believe that deep-level diversity yields positive effects in some contexts, while negative effects in others (Milliken and Martins, 1996). The present study focuses on functional diversity, as its diverse and non-overlapping expertise, and knowledge base can yield a powerful influence on team performance (Horwitz and Horwitz, 2007). According to Bunderson and Sutcliffe (2002), three types of functional diversity are conceptualised as –

- Dominant functional diversity refers to the diversity of functional areas where team members have spent the majority of their career.
- Functional background diversity refers to the diversity where team members have different functional backgrounds to each other.
- Functional assignment diversity refers to the diversity in allocating different functional assignments to team members.

The present study explores the role of functional background diversity as the main parameter of deep-level diversity in the proposed conceptual model. This is highly relevant in most project team's

functioning due to the very nature of bringing in people from different departments and backgrounds to work for a common purpose (Pearce, Powers and Kozlowski, 2015; Zenun, Loureiro and Araujo, 2007). Moreover, functional diversity tends to have a much stronger effect on team performance rather than other demographic diversities such as age, gender and race (Pelled, 1996).

Individuals working in an organisation or a team are different in many attributes such as age, gender, occupation, functional background and/or conscientiousness. The psychological manifestations of categories such as gender or functional background are termed as identities (Sherif, 1982). Based on the definition of Tajfel, social identity is defined as a part of an individual self-concept which derives from his or her knowledge of membership in a social group together with the value and emotional significance attached to that membership (Tajfel, 1978). Given that multiple identities can exist in a group, it is important to consider how they interact and influence with one another within a group context (Bodenhausen, 2010).

Carton and Cummings (2012) have developed a typology of subgroups in work teams, and these include identity-based subgroups, resource-based subgroups and knowledge-based subgroups. Identity-based subgroups are rooted in the theories of identification and outgroup homogeneity (Messick and Mackie, 1989; Brewer, 1991). Resource-based subgroups are rooted in theories of inequality, organisational classes and ranks (Blau, 1977; Kluegel and Smith, 1986). Knowledge-based subgroups are rooted in the theories of adaptation and requisite variety (Ashby, 1958; Volberda and Lewin, 2003). The present study posits on the superordinate/subordinate theories of identification and theories of multi-group identification such as optimal distinctiveness (Carton and Cummings, 2012).

Individuals make determinations about which people belong to their subgroup to simplify their social world by making affiliations with those who they believe share the same sense of identity (Hogg and Terry, 2000; Carton and Cummings, 2012). An individual member functioning in a cross-functional team derives self-esteem by socially identifying with groups to a specific functional background and will be further motivated to enhance their potential for self-esteem (Tajfel and Turner, 1986). Social identity provides a place in the social world for employees with stronger social identification (Simon and Klandermans, 2001). Moreover, it refers to an enduring state that reflects an individual's readiness to define themselves as a member of a social group (Haslam, 2001). Employees tend to act and feel in congruence in salient aspects of their social groups when they have a stronger social identification (Edwards, 2006), resulting in positive behaviours on behalf of groups that embody their social identities (Ashforth and Mael, 1989; Ellemers, Gilder and Haslam, 2004).

The process of social identification provides insight into an employee's collective behaviours and attitudes (Postmes, Haslam and Swaab, 2005). Furthermore, through the lens of social identity, useful concepts are used to explain such as organisational commitment, motivation and employee interaction (Ashforth and Mael, 1996). An individual with a stronger social identity has a collective team or an organisation perspective as opposed to a strictly individual conceptualisation of the self (Randel and Jaussi, 2003).

Therefore, the present study focuses on the social identity aspect of functional background diversity within project teams and refers to this construct as functional background social identity. As social identity is a person's knowledge that he or she belongs to a social category or group (Hogg et al., 2004), this makes him or her more attractive as a member of that group (Luhtanen and Crocker, 1992). When an individual strongly socially identifies with his or her functional background, he or she will engage in behaviours to enhance the attractiveness of that background to gain more self-esteem by distinguishing their functional background from others (Randel and Jaussi, 2003). Project teams are diverse in nature to different skills or backgrounds of employees who work together (Schwalbe, 2014). Employees who collectively have stronger functional background social identity in a project team are more likely to be cooperative by distinguishing their functional background from each other and achieve higher self-esteem. This will lead to an improved in-role and/or extra-role performance of each employee within that team. Additionally, this may lead to increased levels of work engagement of project team members.

Randel and Jaussi (2003) found that functional background social identity was positively associated with individual performance in cross-functional teams. However, since the results were based on cross-sectional data it is difficult to infer causality, whereas a longitudinal design may facilitate in explaining the association of functional background social identity on individual performance over time. Moreover, the results stem from teams in different industries such as engineering, telecommunications and aerospace, and examining the impact of functional background social identity in IT project teams may offer a new finding. Furthermore, the direct effects of functional background social identity on work-related well-being such as work engagement may add a new dimension to the existing literature.

According to Bell and her colleagues, functional background diversity had a positive relationship with team performance (Bell et al., 2011). Conversely, the results were based on meta-analysis and there is a very high possibility that all the details were not encapsulated as the researcher was not actively involved at the time when it was conducted (Bell et al., 2011). This may lead to missing data and disparity, reducing its overall reliability. Moreover, team performance was measured in terms of return on the assets and there is scope to explore the impact of functional background diversity on an individual's

contribution through in-role and/or extra-role performance. Furthermore, examining functional background diversity from the lens of social identity theory may contribute to the existing field.

Ancona and Caldwell (1992) suggested that functional diversity was positively related to the team performance of technological firms. Nevertheless, the results cannot be generalised for other organisational settings such as a project team. A further drawback was that the majority of the analysis was conducted at the group level, while there is scope to explore individual-level performance within teams. Conversely, the results demonstrated the indirect effects of demography on performance; nevertheless, exploring the direct effects of diversity from the lens of social identity theory on performance may yield a new result. Team performance was measured in terms of efficiency, adherence to schedules and budgets. Alternatively, an individual's contribution to a team's task in terms of in-role and/or extra-role responsibilities of an employee may further expand the results.

Peters and Karren (2009) found a significant relationship between functional diversity and distributed team performance based on the ratings of the team members from technology firms. Although the results stem from participants working in complex project teams, due to the cross-sectional design of the study, it is difficult to establish causality. A panel design may assist in expanding the effects of functional diversity on individual performance over time. Moreover, the performance was measured based on factors such as the efficiency of team operations, the effectiveness of meeting project goals and timeliness to meet the targets swiftly. There is scope to assess performance based on the individual contribution of team members to their in-role and/or extra-role job duties. Finally, functional diversity was measured in terms of expertise in distributed teams, nonetheless exploring through the lens of the social identity of an employee towards their functional background may further add to the existing literature.

The effect of intrapersonal functional diversity was positively associated with firm performance (Cannella, Park and Lee, 2008). Intrapersonal functional diversity refers to individuals in a team who are narrow functional specialists with experience in a limited range of functions or their experience span a broad range in the functional domain (Bunderson and Sutcliffe, 2002). Conversely, there are other forms of functional diversity such as where individuals have different functional backgrounds to each other in a team and assessing its impact on performance may add to the literature on project teams. The effect of functional diversity was limited to the firm's performance and further research is required to investigate the effects of functional diversity on an individual performance involving in-role and/or extra-role responsibilities in IT project teams. Additionally, the results were derived based on the employment of pooled cross-sectional design and the findings cannot be generalised for studies focusing on panel data.

According to Bunderson and Sutcliff (2002), functional diversity had a positive influence on the performance of consumer product companies. Nevertheless, examining the effects of functional diversity in other settings such as project teams of the IT sector may add to the body of knowledge. Furthermore, longitudinal analysis can be considered to determine the causal inference of performance over time, as a cross-sectional design was employed for deriving the results. Performance measured was restricted only in terms of business profitability and targets of a team, and this can be further extended to understand the impact of functional diversity on in-role and/or extra-role performance of employees. Additionally, exploring the role of functional diversity from the social identity perspective may offer new insight for the organisations using project teams to conduct business.

Horwitz and Horwitz (2007) established that there was a positive relationship between task-related diversity and team performance through a meta-analytic technique. Conversely, investigating other forms of diversity such as intrinsic team members attributes on performance may expand the existing knowledge. Quality team performance was measured in terms of decision making, problem-solving, creativity and innovation, and there is scope to measure through other parameters such as an individual performance (in-role and/or extra-role duties) of an employee. Examining the role of functional background diversity from the lens of social identity theory in influencing an employee's in-role and/or extra-role performance through a multilevel and longitudinal analysis may further offer a new finding.

Jehn, Northcraft and Neale (1999) found that functionally diverse teams with different knowledge, skills and abilities bring a positive effect to the team performance. The results came from supervisory ratings in teams who rated the workgroup efficiency. Nevertheless, other ways of measuring group efficiencies such as an individual's contribution to their in-role and/or extra-role job responsibilities may broaden the existing knowledge. Moreover, the context was restricted to work teams from a multinational firm rather than other types of teams such as IT projects. Another limitation was the fact that the result only provided a snapshot due to the employment of a cross-sectional design and the situation may produce different results over another time through a panel data.

Karanika-Murray and her colleagues found that employees who socially identify with their organisations had a positive association with work engagement (Karanika-Murray et al., 2015). However, investigating the social identity perspective from the functional background of an employee may offer an insight into the social identity of individuals within teams. The data stems from organisations and extending the role of social identity theory in IT project teams requires attention. The results were derived through a cross-sectional design which fails to test any causal inferences and employment of a longitudinal design will give more clarity to the effect of social identity on work engagement over time.

Based on the above review, the following hypotheses are suggested for functional background social identity –

Hypothesis 2a: Stronger team-level functional background social identity in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time.

Hypothesis 2b: Stronger team-level functional background social identity in project teams has a positive association with a change in the work engagement of individual team members over time.

3.2.3 Avoidant Attachment Style

Prior research has shown that successful workplace functioning requires a balance of qualitatively different emotional, and psychological attributes and behaviours, whereas unsuccessful functioning is characterised by behavioural imbalance (Morrison, 2015; Hackman and Wageman, 2007). Attachment theory provides a sound psychologically-based methodology for understanding how people connect with others depending on their internal working models (Bresnahan and Mitroff, 2007; Gillath, Karantzas and Fraley, 2016). Attachment theory suggests that all individuals are born with a natural desire to seek proximity with others to protect against psychological and physical threats or in times of distress (Bowlby, 1969: 1982; Mikulincer and Shaver, 2007). The theory is concerned with the cognitive-affective processes of attachment, which is defined as the human propensity to seek and develop affectional bonds with others (Bowlby, 1969).

An individual's social behaviour is shaped by the psychological attachment in infancy (Main, Kaplan and Cassidy, 1985). This psychological attachment refers to the attachment style that simultaneously reflects two distinct working models; one which is related to the self and another which is related to others (Yip et al., 2018). A self-working model is represented by a person's belief of self-worth in receiving support and a working model of others is represented by a person's belief regarding the availability and accessibility of others in time of need (Mikulincer and Shaver, 2007). These models together predict the feelings and behaviours that individuals adopt towards work and employment relationships, and the degree to which individuals cope with stress in a working environment (Richards and Schat, 2011; Johnstone and Feeney, 2015). The formation of an attachment style occurs based on early caregiving relationships and they are defined as the cognitive-affective representations of the self and others in relationships (Bowlby, 1960; 1973). An attachment style is considered an important part of social relationships at work (Collins and Read, 1990) and therefore, has relevance to working relationships (Leiter, Day and Price, 2015). An

individual attachment style is conceptualised into a three-dimensional approach, consisting of secure attachment, attachment anxiety and attachment avoidance (Ainsworth et al., 1978) –

- Secure attachment – Secure individuals find it easier to form closeness with others and are comfortable with depending on one another. Moreover, secure individuals do not have any insecurity with other individuals abandoning them or an individual getting too close to them (Mikulincer and Shaver, 2007).
- Anxious attachment – Anxious individuals are reluctant to form closeness to others and possess a negative view of the self, leading to actions such as being heavily dependent on other individuals (Mikulincer and Shaver, 2007) and being extra cautious to any emotional and social cues from others (Fraley et al., 2006).
- Avoidant attachment – Avoidant individuals find it relatively difficult to form closeness to others and find it difficult to depend on others or trust them completely. They perceive others as unresponsive, unavailable or punishing (Bowlby, 1982; Mikulincer and Shaver, 2007).

However, Kim Bartholomew identified two separate forms of avoidant attachment: dismissing and fearful and further classified attachment styles into secure, insecure/preoccupied (anxious), insecure/dismissing (avoidant) and insecure/fearful (avoidant) categories (Bartholomew, 1990). Table 3.1 below summarises the attachment styles into a four-category model (Bartholomew and Horowitz, 1991; Bartholomew and Shaver, 1998).

Table 3. 1 Attachment Styles

Style	Description
Securely attached individuals	Such individuals have a high sense of self-worth. They find it easier to trust and cooperate with others and do not fear intimacy in close relationships.
Insecure dismissing individuals (avoidant)	Such individuals hold a high sense of self-worth by dismissing the need to get close to others, to expect a favourable response.
Insecure fearful individuals (avoidant)	Such individuals constantly rely on others attention for self-validation. They find it hard to trust others and avoid intimacy in close relationships in fear of rejection.
Insecure preoccupied (anxious)	Such individuals have low self-worth and are

constantly seeking to get favourable responses from others to gain security.

Notes: Based on Bartholomew (1990)

Some researchers later argued that an individual falls somewhere between the two dimensions of the attachment style: avoidant and anxious. In other words, individuals who are low in avoidance and/or anxiety are referred to as securely attached individuals, whereas, individuals who are high on avoidance and/or anxiety are classified as insecurely attached individuals. Insecurely attached individuals suffer from insecurity and tend to rely on strategies in an effort to cope with threats (Cassidy and Kobak, 1988). Moreover, the two-dimensional scores mattered only and the types of categories are unreal (Brennan, Clark and Shaver, 1998).

There are different foci of attachment and there exists a debate on a general or global model of attachment, or whether it is specific and context/person dependent (Davis, Morris and Kraus, 1998; Cozzarelli, Hoekstra and Bylsma, 2000). Attachment 'default mode' exists at the top of the hierarchical system, which corresponds to the general representations held by an individual about themselves and others. Lower down the hierarchy, more relationship-specific models exist that correspond to specific contexts such as teams or partner relationships. The present study measures global attachment of an employee's relationship that is focused on the individual with significant others, since a team member may be part of multiple project teams (Griffin and Bartholomew, 1994). Hence, a global dimension is more valid, as it may assist in understanding their previous interactions in relationships with any significant others.

In the context of the present study, employee attachment is measured in terms of avoidant attachment style by the definition of Bartholomew (1990), individuals high on avoidance attachment manifest more negative and less positive or instrumental content about teams (Rom, 2008), which can be more harmful to groups that require high interdependence among tasks to achieve the overall goals. In fact, avoidantly attached individuals tend to seek distance and self-reliance in groups and hold negative appraisals of others (Rom and Mikulincer, 2003). Furthermore, since individuals who are high on avoidance perceive others as unreliable, unresponsive or punishing (Mikulincer and Shaver, 2007), in the context of a team they will view themselves as independent and disengaged from the team. In other words, they will perceive closeness to a team as unnecessary and will avoid interdependence with teams (Keating et al., 2014). Therefore, the role of attachment avoidance on employee's performance and work-related well-being in the context of IT project teams requires closer inspection.

Individuals high on avoidant attachment find it difficult to trust others when they need them (Miller, 2007) and keep a safe distance from others due to this distrust (Collins and Read, 1990). This lack of emotional connection with other employees would deprive individuals with avoidant attachment to fully engage with their team (Bartholomew, 1990; Leiter, Day and Price, 2015). These individuals display poor behaviours that contribute negatively to relationships with others (Lavy, Littman-Ovadia and Bareli, 2014; Lavy, Bareli and Ein-Dor, 2015; Rom and Mikulincer, 2003), which can influence the functioning of work by an individual in a team (Mikulincer and Shaver, 2007). As tasks in the project teams are complex and interdependent in nature (Anantatmula, 2016), individuals who are high on attachment avoidance will have difficulty in functioning in such teams, leading to poor contribution to their formal or informal job responsibilities. This will affect the completion of the overall goals of the project. Due to these traits, a project team that is high on avoidance attachment is more likely to negatively affect the in-role and/or extra-role performance of individual team members and have an adverse effect on the levels of work engagement over time.

Hazan and Shaver (1990) found that individuals with avoidant attachment tend to avoid other people, which was costly in terms of overall well-being. Two separate questionnaires aimed at individuals focusing on job security, satisfaction with the pay and opportunities for challenges with overlapping subject samples were used to derive the results. Nevertheless, the data were based on individuals rather than teams in specific organisations and therefore examining the effect of attachment avoidance on well-being in project teams may add to the body of knowledge. The construct well-being was measured by a scale which was previously used in a national study of loneliness. However, there are other components of well-being that need further investigation such as work engagement. Moreover, it is difficult to infer causality due to the use of only two time points to draw results and a panel study with three-waves can assist in understanding the effects of attachment avoidance on employee's well-being over time.

According to Little and her colleagues, individuals who exhibit high scores on avoidant attachment had a negative relationship with the extra-role performance at the workplace and were less likely to engage in volunteer activities (Little et al., 2011). Nevertheless, findings were based on a cross-sectional design but a longitudinal approach may assist in exploring the impact of attachment avoidance on extra-role performance over time. Additionally, one of the major limitations was that the data stems from repair generalists of a single organisation and it is difficult to interpret the results for other occupational sectors such as project teams in the IT sector. Furthermore, examining other behavioural outcomes such as the impact of attachment avoidance on in-role performance may offer a broader explanation of the impact of avoidantly attached individuals on their overall contribution to the task.

Byrne, Albert, Manning and Desir (2017) suggested that avoidant attachment was associated with lower levels of work engagement. Conversely, it is difficult to infer causality since the data were collected at a single time point and a panel design could help in understanding the impact of attachment avoidance on work engagement over time. Moreover, the findings cannot be generalised to other contexts such as IT project teams since the results stem from a healthcare organisation. Lastly, the scale of avoidant attachment was modified based on Richard and Schat's measure (Richards and Schat, 2011) and assessing attachment avoidance on a short workplace measure (Leiter, Day and Price, 2015) may provide useful insight in the project work environment.

Geller and Bamberger (2009) advocated that avoidant attachment was associated with less extra-role performance in terms of helping co-workers at the workplace. The data were drawn from individuals working in call centres in a demanding environment through longitudinal analysis at two time points. Conversely, analysing the role of avoidant attachment on extra-role performance in the context of project teams may add to the knowledge. Additionally, due to the omission of any contextual factors, knowledge of the barriers that hindered individuals to render help to other co-workers is further limited. Furthermore, since the longitudinal analysis was conducted at two time points, one at the beginning of employees first month on the job and the second at the end of the research period; there is a high possibility that the behaviour of employees with avoidant attachment was influenced by factors such as little time to offer help as they were learning the work activities. A three-wave design may assist in understanding the effect of attachment avoidance on extra-role performance over time.

Schusterschitz, Stummer and Geser (2014) found that avoidantly attached individuals were unlikely to engage in extra-role behaviours directed at other employees attending a course for professional development at a management centre. However, assessing the relationship of avoidant attachment style on outcomes within IT project teams may further expand the knowledge. Furthermore, due to the employment of a cross-sectional design in deriving results, it is difficult to establish causality and a panel design may benefit the results in assessing the effects of attachment avoidance on extra-role performance over time. The scale for prosocial behaviour was measured from a German-speaking organisational citizenship behaviours (OCB) questionnaire, which consisted of a broad variety of items such as altruism, conscientiousness, sportsmanship and virtue from existing studies. Nonetheless, focusing on the impact of avoidance attachment specifically on the extra-role performance of employees may provide a better insight into the existing relationship.

Avoidance attachment had a negative association with work engagement (Littman-Ovadia, Oren and Lavy, 2013). Conversely, the results stem from employees functioning in varied occupations and

industries, and extending the effects of attachment avoidance on work engagement in project teams of the IT sector may add to the existing knowledge. Furthermore, the results were derived from a cross-sectional design and to infer causality, longitudinal data may benefit the results. Additionally, the scale of work engagement was combined into a single composite measure rather than three subscale scores including vigour, absorption and dedication (Schaufeli et al., 2002). This may have resulted in misinterpretation by the participants, affecting the validity of the findings. Employment of work engagement measure consisting of the three subscales may draw a more accurate conclusion.

Based on the above review, the following hypotheses are suggested for the avoidant attachment –

Hypothesis 3a: High team-level avoidant attachment in project teams has a negative association with a change in the in-role and/or extra-role performance of individual team members over time.

Hypothesis 3b: High team-level avoidant attachment in project teams has a negative association with a change in the work engagement of individual team members over time.

3.3 Concluding Remarks

Through the review of the existing studies and related theories, specific project team characteristics involving information system self-efficacy, functional background social identity and avoidant attachment have been examined, and their influence on outcomes including in-role and/or extra-role performance and work engagement was highlighted. This has helped in the formulation of hypotheses based on the direct effects that will enable to answer the first two research questions of the present study (as outlined in section 1.8). In the next chapter, the role of collaborative job crafting is explored in the light of COR theory to formulate the indirect hypotheses that will assist in answering the remaining questions.

Chapter 4 Indirect Effects through Collaborative Job Crafting

The following chapter focuses on the impact of the team process between group characteristics of a project and the outcomes of the present study. Building from IPO approach and COR theory, the chapter formulates the hypotheses based on the indirect effect of input (specific project team characteristics) on the output (in-role and/or extra-role performance and work engagement) through process (collaborative job crafting) variable. Relevant studies based on collaborative job crafting and their impact on outcomes is reviewed. The chapter concludes with the proposed conceptual model.

4.1 Team Process

The success of a team is dependent on the interdependent actions of the members which convert inputs to outputs through cognitive, behavioural and verbal activities, in an effort to organise tasks for achieving collective goals (Marks, Mathieu and Zaccaro, 2001). Specific characteristics of an employee have an impact on different team processes. Firstly, the skills of team members have a direct influence on the ability to carry out the tasks or different team processes (Guzzo and Dickson, 1996; Cohen, 1994). These may include information system skills which are required to use the technology in hand to collaborate with other team members and also execute group tasks to achieve greater performance in IT project teams (Liberatore and Pollack-Johnson, 2003).

Secondly, diversity among individual members also has a direct influence on team processes. Research on functional diversity in management teams has followed the basic input-process-output model of group effectiveness (Hackman and Morris, 1975; Guzzo and Shea, 1992). Group characteristics and other contextual factors (e.g. functional diversity, nature of the task) have an influence on patterns of behaviour and interactions within the group (such as communication and cohesion), which in turn affects the outcomes achieved by the group such as performance (Bunderson and Sutcliffe, 2002).

Thirdly, an individual's emotion regulation strategies have consequences for interpersonal interactions and relationships (Mikulincer, Shaver and Pereg, 2003; Diamond and Aspinwall, 2003), and guide an individual's interactions with others (Harms, 2011). Individuals differing in their attachment styles also differ in their goals they pursue in social interactions (Collins and Read, 1994). Avoidantly attached individuals tend to organise their goals based on self-reliance and maintenance of emotional distance (Rom and Mikulincer, 2003). Decisions, experiences or interactions between individuals within a work setting is inclined and understood by such relationships (Lanciano and Zammuner, 2014). As a result of this, it is important to examine how relational functioning of individuals is predictive of work-related

behaviours and attitudes (Hazan and Shaver, 1990; Richards and Schat, 2011; Bowen, Siehl and Schneider, 1989; Harms, 2011; Kark, 2011; Malach-Pines, 2005; Popper, 2004).

Based on the above justifications, characteristics on skills, diversity and interpersonal relationships can help to explain the organisational outcomes through employee interactions and experiences. The influence of team characteristics on work engagement and performance (Bakker and Demerouti, 2008) through a team process will make a valuable contribution to the existing body of knowledge in project teamwork. Resting on the taxonomy of teamwork processes, action processes should be considered when predicting team effectiveness in terms of performance quality, as these processes have a greater impact on the rate and ability of the task (Marks, Mathieu and Zaccaro, 2001). In terms of action processes, communication, coordination, collaboration and knowledge sharing have received the most attention in complex project teams (Gilson et al., 2015; Martin and Schilpzand, 2011). However, there are other action processes which require further examination such as job crafting.

The present study measures effectiveness in terms of employee's in-role and/or extra-role performance and therefore, proactive behaviour such as job crafting representing actions that initiate and create change (Wrzesniewski and Dutton, 2001; Griffin, Neal and Parker, 2007) is a crucial team process that may facilitate the performance of each employee. Job crafting reflects an action-focused approach, whereby employees purposefully shape their work (Morrison and Phelps, 1999) to make it more meaningful and engaging (Demerouti, 2014). As IT projects have high failure rates (Love et al., 2005; Lubbe and Dan, 1999), through the proactive work behaviour of job crafting, employees can engage to adjust their jobs in response to their needs, skills or preferences (Tims et al., 2013). The present study conceptualises job crafting (i.e., process variable) as a positive intervention between project team characteristics and outcomes. The following section explains the job crafting process from the perspective of JD-R theory and the type of job crafting employed by individuals within work environments.

4.2 Job Crafting from the Perspective of JD-R theory

JD-R theory assumes that every job is characterised by a set of job demands and (personal or job) resources, which are associated with job stress (Bakker et al., 2003a; Bakker et al., 2003b; Demerouti et al., 2001a; Demerouti et al., 2001b; Wingerden, Bakker and Derks, 2016). Job demands refer to the social, physical and organisational aspects of the job which require sustained efforts at the physical and cognitive levels. Job resources include different aspects of a job that may be helpful to reduce those demands and stimulate personal growth or learning (Bakker and Demerouti, 2007). According to the JD-R theory, both job demands and resources initiate two different simultaneous processes. High job

demands lead to strain and health problems, whereas job resources lead to positive organisational outcomes (Demerouti et al., 2001a). The balance between job demands and resources can be optimised by employees through job crafting, which is an important precondition for work engagement and in turn performance (Bakker and Demerouti, 2014; Wingerden, Bakker and Derks, 2016).

There are two types of job crafting: one that is crafted by the individuals to meet their needs (Wrzesniewski and Dutton, 2001) and the other form of job crafting exists at the team-level (Orr, 1996; Orlikowski, 1996, Brown and Duguid, 1991).

4.2.1 Individual Job Crafting

Individual job crafting is the process of creating or initiating change to the job (Grant and Ashford, 2008; Griffin, Neal and Parker, 2007), whereby employees typically and proactively change the boundaries that involve their jobs. These boundaries are defined as “mental fences” (Zerubavel, 1991), in the form of “physical, temporal, emotional and/or cognitive” entities, to which employees define the limits around (Lamont and Molnar, 2002; Ashforth, Kreiner and Fugate, 2000).

Shaping the boundaries through job crafting can be achieved in three ways (Wrzesniewski et al., 2013):

- Changing the physical or temporal boundaries called task crafting, which consists of adding or dropping tasks, redesigning aspects of tasks and adjusting time and effort spent on multiple tasks.
- Changing the relational boundaries called relational crafting, which consists of creating and sustaining the relationship with others at work, spending more time with preferred individuals and completely avoiding contact with others.
- Reframing the cognitive boundaries called cognitive crafting, which consists of efforts made by the employees to interpret and perceive their tasks, relationships or job as a whole, which significantly changes their work.

The present study focuses on task crafting within a project team, as by adding or removing tasks and redesigning aspects of work can offer greater flexibility that may make an employee’s job more engaging and meaningful (Demerouti, 2014), and ensure its successful completion. Employees engage in job crafting behaviour to enhance their identity and meaning, which are important aspects of well-being (Wrzesniewski and Dutton, 2001; Wrzesniewski et al., 2013). On the other hand, Tims and Bakker (2010) defined individual job crafting as a process of increasing or decreasing one’s demand and resources. They conceptualised job crafting behaviour within the JD-R model, by categorising it into four types of

behaviour such as increasing the following: social resources, structural resources, challenging job demands and decreasing hindering job demands (Tims, Bakker and Derks, 2012) –

- Social resources – Reaching out for feedback or guidance from other employees or supervisor. This will help to reduce feelings of uncertainty by providing a social support network to employees and by acquiring the necessary information to perform tasks more adequately (Robinson and Griffiths, 2005).
- Structural resources – Acquiring a new skill at the workplace to gain resources such as a feeling of mastery within the job context. This delegates employees to achieve high efficiency and performance (Laschinger et al., 2001).
- Challenging job demands – Taking up additional workload or responsibility for potential growth and development. This leads to outstanding job performance by employees (Zacher et al., 2010).
- Hindering job demands – Measures to decrease the physical, cognitive and emotional intensity of work to reduce exhaustion and professional efficacy (Maslach, Schaufeli and Leiter, 2001).

According to Sakuraya and his colleagues, job crafting behaviour in terms of increasing structural job resources was associated with higher work engagement (Sakuraya et al., 2017). Nevertheless, due to the employment of a cross-sectional design, it is difficult to establish causality between job crafting and work engagement over time. Moreover, the results were derived from employees of a single Japanese manufacturing company and the findings will be difficult to establish for project teams of the IT organisations from India. The focus of job crafting was further restricted at the individual-level and there is scope to understand the role of job crafting at the team-level.

Tims, Bakker and Derks (2013) found that job crafting was positively related to employee well-being through an increase in work engagement. However, despite deriving the results through longitudinal analysis, the main drawback stems from the fact that it is difficult to infer causality, as the participants received standardised feedback on how to proactively craft their jobs and this could have triggered the job crafting behaviour. Moreover, the intervention between each phase of the longitudinal design was one month, nonetheless, extending this time lag a bit more may help to detect any association between job crafting behaviour and work engagement. Furthermore, the results were derived from individual employees rather than teams and extending this to project teams may add to the existing knowledge.

Harju, Hakanen and Schaufeli (2016) asserted that job crafting behaviour in terms of seeking challenges positively predicted the work engagement of Finnish employees through a three-year cross-lagged panel design. Nevertheless, the findings demonstrated the weak effects of job crafting behaviour on work engagement and generalising the results in other occupational sectors such as project teams of the IT

sector requires attention. Moreover, the time lag of three years for assessing the effects of job crafting on employee well-being might be too long to detect any association. In fact, shorter time lags are considered optimal (Dormann and Griffin, 2015) and a time lag of three months might help in explaining the association between job crafting behaviour and work engagement over time.

Wingerden and Poell (2017) stated that job crafting behaviour was positively related to an employee's work engagement of Dutch employees. Conversely, the findings were based on a cross-sectional design which limits to test for causality and a longitudinal design may assist in examining the effects of job crafting behaviour on work engagement over time. Moreover, the results were drawn from Dutch employees and there is a potential gap to understand the impact of job crafting behaviour in other contexts such as IT project teams from organisations in India. Furthermore, examining the role of collaborative job crafting and its influence on employee's work engagement in project teams may add to the existing knowledge.

According to Demerouti, Bakker and Gevers (2015), job crafting behaviour by individuals had a positive indirect relationship with the extra-role performance of employees who are fully engaged. Nevertheless, the findings were drawn from individual students rather than teams and hence, it may be difficult to establish similar results for employees working within project teams in the IT sector. Additionally, since the data were analysed using a cross-sectional design that limits to test for causality, a longitudinal analysis may offer a better perspective on the cause and effect of job crafting activities on employee's extra-role performance over time.

4.2.2 Collaborative Job Crafting

In current organisations, individuals share ideas and knowledge when making crucial decisions on accomplishing various tasks (LePine et al., 1997). One can argue that individual task performance is dependent on the task performance of other team members, hence individual job crafting behaviour of changing one's job or social environment may directly influence other team members (Wrzesniewski and Dutton, 2001). As a result of working in a team and due to a high interdependence by the individual actions, another type of job crafting is employed, which is initiated at the team-level rather than the individual-level. This form of job crafting is referred to as collaborative job crafting, which is the process of groups of employees collectively altering their work to meet the shared goals (Leana, Appelbaum and Shevchuk, 2009). Job crafting at the team-level refers to the process of collective decision making by the team on the allocation of job resources for the accomplishment of the tasks and mobilisation of these resources (Tims et al., 2013). Moreover, team crafting does not mean that each individual within a team

has to craft same job resources and demands, but collectively making a decision on allocation of these resources and how to achieve these is the function of the team (Tims et al., 2013). The present study focuses on collaborative or team-level job crafting rather than individual job crafting, as they can be an important criterion for effective performance and employee engagement (Tims, Bakker and Derks, 2012), and in comparison to individual job crafting the studies on collaborative job crafting are much more scarce.

Understanding the motivations of employees to craft their job in relation to their characteristics and personal resources will offer more insight into factors that may facilitate or act as a barrier to project team outcomes. Personal resources refer to an individual's sense of capability to successfully control their work environment (Hobfoll et al., 2003). Research has demonstrated that job crafting has positive effects for individuals and organisations by improving the work engagement of employees (Petrou et al., 2012; Tims et al., 2013) and increasing performance (Bakker, Tims and Derks, 2012; Leana, Appelbaum and Shevchuk, 2009; Tims, Bakker and Derks, 2012). However, its antecedents are not well understood (Lyons, 2008; Bakker, Tims and Derks, 2012). Characteristics of individual and job are considered as primary antecedents of job crafting behaviour (Tims and Bakker, 2010; Wang, Demerouti and Bakker, 2016). Nevertheless, for identifying the facilitators of collaborative job crafting behaviour, this individual-oriented perspective needs to be broadened further and the specific characteristics of the team need to be considered (Mäkikangas, Bakker and Schaufeli, 2017). Collaborative job crafting has positive effects on the performance of a team (Mäkikangas et al., 2016) and the present study aims to explore some of the antecedents of collaborative job crafting and their possible effects on outcomes in the light of IT project teams. The impact of specific project team characteristics on outcomes through team-level job crafting may throw more light on the factors that may facilitate or act as a barrier to individual team members' in-role and/or extra-role performance and well-being.

Leana, Applebaum and Shevchuk (2009) established that collaborative job crafting had a positive relationship to the job performance of teachers in childcare centres. However, due to the employment of a cross-sectional design in obtaining results, any causal effects are difficult to establish and a longitudinal design may assist in examining the effect of team-level job crafting on performance over time. Conversely, the findings focused on preschool teachers and aides, and whether the same effects can be detected for project teams in the IT sector is questionable. Moreover, the results depicted job performance in terms of the warmth of interaction between the teacher and the child, and other factors such as in-role and/or extra-role performance of the participants remains an avenue to be explored.

According to McClelland and his colleagues, collaborative job crafting had positive indirect effects on team member's work engagement and independent ratings of team performance (McClelland et al., 2014). Nevertheless, the findings were drawn from the UK organisations operating call centres and replicating the effects of collaborative job crafting in IT project teams may add to the existing knowledge. Furthermore, the employment of a cross-sectional design in obtaining the results had further limited to establish any causal inferences between the variables involved and a longitudinal design may benefit in understanding the effects of team-level job crafting on work engagement or performance over time. Moreover, the findings demonstrated that collaborative job crafting had indirect effects on team member's work engagement and performance, and examining the mediating role of team-level job crafting on outcomes may add to the literature.

Lin, Law and Zhou (2017) asserted that collaborative job crafting was positively associated with employee's extra-role performance of teachers in Chinese high schools. Conversely, due to the employment of a time-lagged design, it is difficult to establish causal inferences unequivocally and a panel design may benefit the association of team-level job crafting on extra-role performance over time. The findings stem from educational institutions and examining the role of collaborative job crafting in project teams of the IT sector may further expand the knowledge. Moreover, exploring the involved variables in a different setting such as multinational organisations in India may provide a different perspective.

Tims and her colleagues found that job crafting was positively related to job performance through work engagement at both the individual and the team-level (Tims et al., 2013). However, one of the limitations was that the collaborative job crafting scale was measured from Tims, Bakker and Derks (2012) and adopting a revised team-level job crafting scale from studies such as Leana, Appelbaum and Shevchuk, (2009) may benefit the results. Additionally, it is difficult to establish any causal inferences since the results were derived from a cross-sectional design and a panel design may help in understanding the impact of collaborative job crafting on performance over time. Job performance was measured in terms of in-role performance of employees and examining the effect of collaborative job crafting on extra-role performance may further add to the knowledge. The findings stem from a large occupational health service company and cannot be generalised to other organisational settings such as project teams functioning in the IT sector.

4.3 Conservation of Resources Theory

The COR theory is of particular interest to the present study, which elaborates on resources that are crucial to an individual's survival and well-being, and links to the process of creating and maintaining these key resources. The COR theory proposes that individuals acquire and retain resources to resist stress (Hobfoll, 1989; Hobfoll and Shirom, 2000). The theory primarily suggests that stress is a reaction to an environment where there is a threat to loss of resources, an actual loss of resources or lack of an expected gain in resources.

Resources include objects, conditions, personal characteristics and energies which play a key role in survival or serve as a means of achieving these resources (Hobfoll, 1989). Acquiring from the COR theory, the present study suggests that resources such as conditions relating to mental health, personal resources in the form of skills or self-efficacy and energies such as knowledge or functional background are crucial resources for project teams to achieve better performance and improved well-being to overcome stress among employees.

The two corollaries on gain and loss spirals are highly relevant to the present study. The gain spiral corollary states that when individuals gain resources, they are in a better position to gain and invest in additional resources, leading to a gain spiral. Loss spiral corollary states that when individuals have fewer resources, investment in other resources becomes more difficult (Hobfoll, 1988; Halbesleben et al., 2014).

4.4 Relevance of COR theory

When an individual is expected to perform tasks that threaten to exceed their skills or resources to meet the demands of the work environment, they experience stress resulting from an environmental situation (McGrath, 1976). Stress has a range of effects on emotions, moods or behaviours when individuals are unable to cope with the demands of the external situation (Montgomery and Rupp, 2005). IT project teams are challenging in nature as human dynamics such as poor motivation, human relations, lack of employee commitment and delayed problem-solving contribute to extreme stress among team members (Kerzner, 2009; Whitneya and Daniels, 2013). This may make the final results of a project relatively disappointing, leading to group challenges, process complications and project setbacks.

Work engagement is one of the outcome variables in the present study, where engagement is characterised by energy (or vigour), involvement (or absorption) and commitment (or dedication) (Maslach and Leiter, 1997). However, due to job stress, each of the three elements comprising of energy,

involvement and commitment may get affected leading to poor mental health (Maslach and Leiter, 1997, Bakker et al., 2008). Employees who experience stress will not only perform lower in their job performance, but higher levels of stress will also reduce their willingness to engage in extra-role performance (Cheung and Cheung, 2013). This will negatively impact the individual-level performance of employees.

The COR theory is relevant to the present study as variables such as work engagement and extra-role performance can enable employees to gain additional resources to resist stress (Hobfoll, 1989). Employees working in complex project teams need to acquire and invest in resources to meet the goals of the business. Individuals who have increased work engagement contribute to resource investment (Salanova et al., 2010; Bakker, 2009) and perform behaviours whether task-related or contextual in a manner to maximise their resource pool (Meyer and Allen, 1997; Borman and Motowidlo, 1997).

One of the crucial predictors of work engagement is job resources (Schaufeli and Bakker, 2004) and having a rich resource pool can relate to resource gains by the individuals (Hobfoll, 2001). There is empirical evidence to suggest that job resources such as social support, supervisory coaching, autonomy and opportunities relating to professional development are valuable for employee engagement as they inflate self-esteem, optimism and self-efficacy of team members (Xanthopoulou et al., 2007). Engaged employees are more likely to spend their excess resources on job performance by contributing to their in-role and/or extra-role responsibilities (Macey and Schneider, 2008; Halbesleben, Harvey and Bolino, 2009).

In conjunction with COR principles, employees who are willing to spend an extra effort can either boost or threaten their energy resources. When the energy levels are low, an employee would want to conserve their health by only fulfilling what is necessary to accomplish in the form of job duties (Hobfoll and Shirom, 2000). On the other hand, when the energy levels are high, an employee would want to engage in proactive behaviours by taking a risk with their energy resources to improve the job or acquire new resources (Hobfoll and Shirom, 2000). In fact, employees who contribute outside their work, gain additional resources (Hobfoll, 2001) such as skills or knowledge through which they can perform complicated tasks at reduced efforts (Griffin, Neal and Neale, 2000).

Therefore, it is important for employees working in IT project teams to invest in additional resources to improve their well-being and performance to meet their targets. The present study emphasises the importance of outcome variables such as work engagement or extra-role performance as key contributors to resource gain in the light of COR theory.

4.5 Indirect Hypotheses

Collaborative job crafting is one of the variables that might facilitate the functioning of a project team and aid in understanding the influence on the in-role and/or extra-role performance and work engagement of employees. Team-level job crafting is valued in its own right, which may act as a way in achievement or protection of other valued resources that may help in overcoming stress among individuals in complex organisational settings (Hobfoll, 2001; Diener and Fujita, 1995).

The process of job crafting provides employees with more satisfaction, identification and fulfilment with their respective jobs (Lyons, 2008). From a COR perspective (Hobfoll, 1989; 2001), in order to align the preferences and abilities with the environment, individuals engage in some type of resource investment such as crafting behaviour in the hope for a better alignment to resist stress (Tims and Bakker, 2010; Edwards, 2008). By changing the task boundaries, employees result in smoother functioning, better communication and more efficient collaboration in a work unit. These changes can have a positive effect on the group and organisational performance (Leana, Appelbaum and Shevchuk, 2009). In a project team environment, team-level job crafting can be beneficial as it may allow for greater flexibility, more understanding of the work environment and clarity in job processes performed by different individuals. In the present study, team-level job crafting is measured through Leana, Appelbaum and Shevchuk (2009) concept.

The following section discusses the role of collaborative job crafting between specific project team characteristics and outcomes in the light of COR theory, which will assist in answering the research questions 3 and 4 of the present study as outlined in section 1.8.

4.5.1 Information System Self-Efficacy and Outcomes

Based on COR theory, psychological resources such as self-efficacy are crucial to overall resource management and maintenance, as individuals tend to acquire such resources instinctively (Hobfoll, 2001). Information system skills relate to personal characteristics in the form of primary job skills, which can help to resist stress in complex working environments (Hobfoll, 1985; Cohen and Edwards, 1989). Skills are an important input variable which aids in stress resistance (Hobfoll, 1985) and has a strong influence on team functioning (Cannon-Bowers et al., 1995). According to Hobfoll (1985), resources such as job-related skills and self-efficacy are crucial for survival and resiliency by representing personal resources. Information system skills are critical in project teams as they enable individual team members to use the

software tools in place for interactions (Duarte and Snyder, 2001; Anantatmula, 2008) and influences the work behaviour of an employee (Mtsweni, Horne and Poll, 2016).

Employees who are highly self-efficacious are better positioned to gain new resources, whereas individuals with low self-efficacy deplete their existing pool of resources as they dwell on their failures and deficiencies (Demerouti, Bakker and Butlers, 2004; Xanthopoulou et al., 2009; Hobfoll, 2001). Employees who have high self-efficacy in their information system skills will be able to buffer their levels of stress, as their initial resources will help them to perform tasks to further boost their pool of resources in project teams. A team consisting of employees with high information system self-efficacy will have more capabilities in selecting, altering and implementing their other resources to meet stressful demands (Chen, Westman and Hobfoll, 2015; Hobfoll, 2002; Gorgievski, Halbesleben and Bakker, 2011). For example, a project team with high information system self-efficacy will not perceive the system as a demanding threat (job demand) when collaborating with other team members. Having initial resources such as collective high information system self-efficacy may predispose individuals to look for new resources through processes such as team-level job crafting. By engaging in collaborative job crafting, project team members may gain new resources such as explicitly agreeing who will complete particular aspects of the tasks (Leana, Appelbaum and Shevchuk, 2009). This will enable each team member to get a clear understanding of the roles or responsibilities that an employee may perform in a project team. Once the individual team members have acquired these new resources through collaborative job crafting, their work-related well-being may increase over time (e.g., work engagement) as having an optimal level of job demands and job resources is an important precondition for work engagement (Wingerden, Bakker and Derks, 2016). This may also improve the in-role and/or extra-role performance of each employee. Based on this argument, the following hypotheses are suggested for information system self-efficacy –

Hypothesis 4a: Higher team-level information system self-efficacy in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time, through its positive effect on collaborative job crafting.

Hypothesis 4b: Higher team-level information system self-efficacy in project teams has a positive association with a change in the work engagement of individual team members over time, through its positive effect on collaborative job crafting.

4.5.2 Functional Background Social Identity and Outcomes

Teams consisting of individuals from different functional backgrounds bring different perceptions and experiences to a team (Sutcliffe, 1994). Project teams typically consist of members from different functional expertise and backgrounds to accomplish complex, novel and non-routine tasks (Edmondson and Nembhard, 2009; Denison, Hart and Kahn, 1996, McDonough, 2000). Diversity creates a situational environment that fosters engagement among team members through the challenge of coordinating conflicting ideas and varied skills (Gorgievski and Hobfoll, 2008). Hence, a team requires more efforts to perform tasks, leading to better communication and engagement between employees (Glick, Miller and Huber, 1993). Additionally, individuals can become more committed to their job as they thrive on fulfilment (Hackman and Oldham, 1980). This may create a resourceful work environment where individuals can acquire resources such as efficacy, optimism and resiliency development, which may lead to an increase in the overall performance (Luthans et al., 2006).

The term diversity refers to a mixture of individuals representing different group identities within the same social system (Nkomo and Cox, 1996). Individuals who have strong social identity derive his or her knowledge of membership from a social group together with the value and emotional significance attached to that membership (Tajfel, 1978). When a project team consists of employees with stronger functional background social identity, they may engage in behaviours to improve the attractiveness of that background to gain more self-esteem by distinguishing their backgrounds from other team members (Tajfel and Turner, 1986; Randel and Jaussi, 2003). This may enable them to increase their personal resources through better cooperation (Hobfoll, 1989). Through these new resources, investment in additional resources such as collaborative job crafting may become easier. This may result in an acquisition of new resources such as informally discussing work practices (Leana, Appelbaum and Shevchuk, 2009). This informal discussion of work practices may enable the project team to gain collective resources such as a cohesive working environment, leading to an increase in work-related well-being in terms of work engagement (Wingerden, Bakker and Derks, 2016) and positively influencing each employee's in-role and/or extra-role performance over time. Based on the argument above, the following hypotheses are suggested for functional background social identity –

Hypothesis 5a: Stronger team-level functional background social identity in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time, through its positive effect on collaborative job crafting.

Hypothesis 5b: Stronger team-level functional background social identity in project teams has a positive association with a change in the work engagement of individual team members over time, through its positive effect on collaborative job crafting.

4.5.3 Avoidant Attachment and Outcomes

Tasks in project teams are interdependent and interrelated to meet a specific purpose (Anantamula, 2016) and therefore, require team members to develop effective working relationships to accomplish the overall goals. From a COR perspective, individuals who exhibit high levels of attachment avoidance view themselves as independent of the team (Keating et al., 2014) as they are motivated to conserve resources and direct little energy towards behaviours that will consume their remaining resources (Hobfoll, 1989; Halbesleben and Bowler, 2007). This will result in further loss of resources such as social support, feedback and professional opportunities (Xanthopoulou et al., 2007). Additionally, such individuals are more concerned with fulfilling the interests of themselves rather than the team since they display lack of trust, lower levels of commitment and group identification (Korsgaard, Brodt and Sapienza, 2003).

A project team consisting of individuals with high avoidant attachment is more likely to have unfavourable attitudes towards group members as they pursue their own self-interests and this self-reliance may account for poor contribution to both socio-emotional and instrumental functioning during group tasks (Rom and Mikulincer, 2003). According to the COR theory, when individuals are low in personal resources, investment in additional resources becomes difficult (Hobfoll, 1988). As a result of this, individuals may direct fewer or no resources towards collaborative job crafting activities such as discussing the frequency of project meetings (Leana, Appelbaum and Shevchuk, 2009), resulting in further depletion of resources due to inadequate work-related information between team members. This may directly affect the levels of work engagement due to loss spirals, leading to a negative effect on the in-role and/or extra-role performance of individual team members over time. Based on this argument, the following hypotheses are suggested for avoidant attachment –

Hypothesis 6a: High team-level avoidant attachment in project teams has a negative association with a change in the in-role and/or extra-role performance of individual team members over time, through its negative effect on collaborative job crafting.

Hypothesis 6b: High team-level avoidant attachment in project teams has a negative association with a change in the work engagement of individual team members over time, through its negative effect on collaborative job crafting.

Below is the proposed conceptual model (Figure 4.1) for the present study –

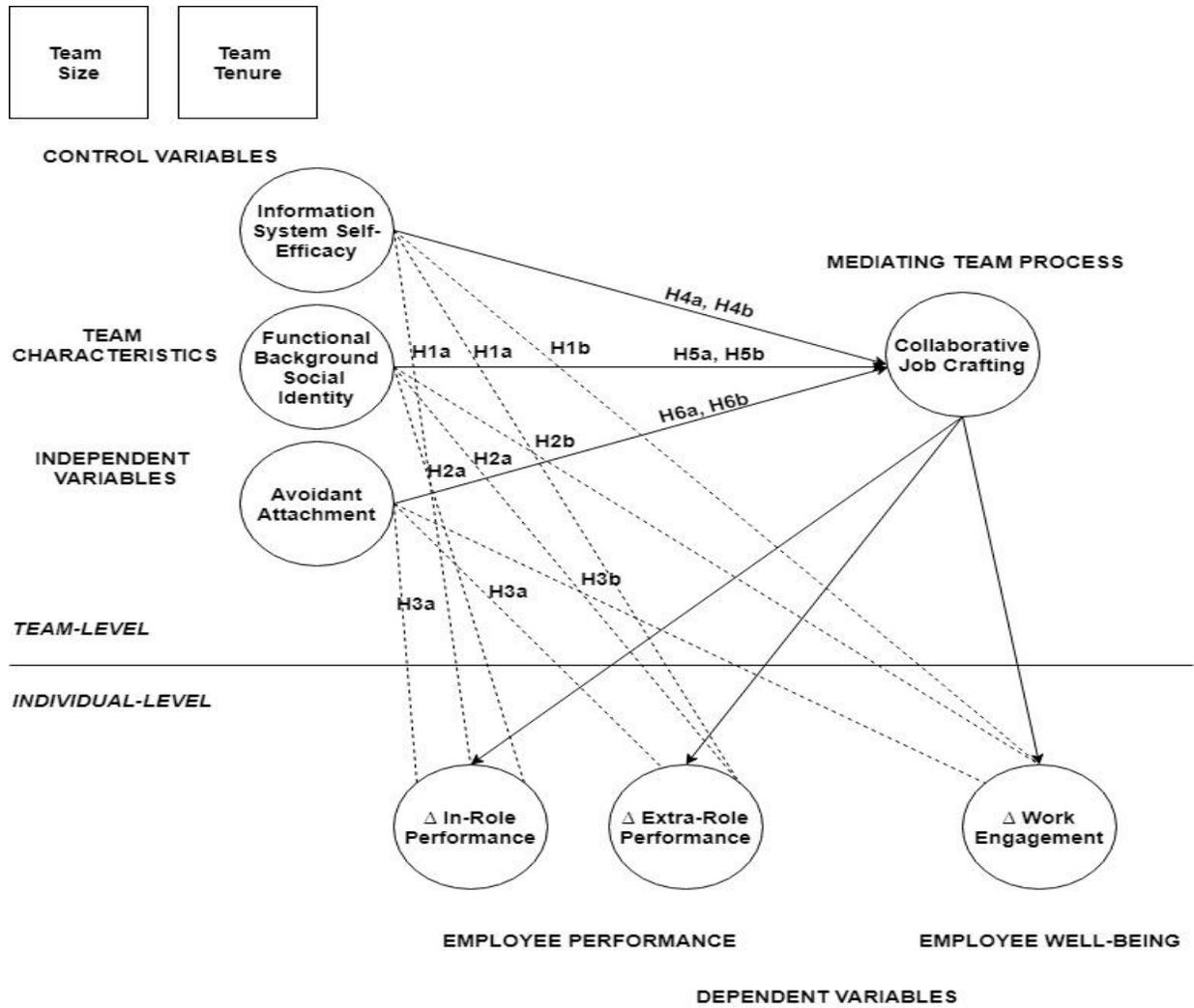


Figure 4. 1. Conceptual model

4.6 Concluding Remarks

From the review of the literature above, the chapter has focused on the relevance of team process involving collaborative job crafting. The studies on collaborative job crafting were much more limited in comparison to individual job crafting and there was scope to examine its role in the context of IT project teams. The framework of COR was used predominantly in the present study to formulate the hypotheses based on indirect effects. The proposed conceptual model (displayed in figure 4.1) exhibited both the direct and indirect effects between the specific project team characteristics and outcomes through team-level job crafting. By doing so, the present study aims to test the hypotheses framed in both chapters 3 and 4 through the methodology discussed in the next chapter.

Chapter 5 Methodology

The chapter outlines the methods applied in the thesis by focusing on the elements such as the research design, involved participants and procedure, the analytical approach and the aggregation techniques employed in the data collected. The main aim of the chapter is to indicate clear reasons and justifications on the choice of the research design and analytical strategy to help in answering the research questions of the present study. Furthermore, the chapter concludes with the measures of each variable involved and the studies from where they are derived.

5.1 Research Design

A positivist paradigm was adopted, whereby social reality is represented by an objective ontological structure and individuals are the responding agents to this objective environment (Morgan and Smircich, 1980). In the present study, a project team environment represented the ontological structure and employees including the team leaders and members were the responding agents to this environment.

The research questions of the present study pointed to the use of quantitative research, as the primary goal was to investigate factors that may hinder or boost the performance and well-being of project team members over time. The main purpose of a quantitative paradigm is that through a clear prediction of cause and effect, objective truth can be measured in a way that is generalisable and valid (Cassell and Symon, 1994). This suggests the use of non-experimental quantitative approach, as the variables were not manipulated in any way but were studied as they exist such as information system self-efficacy and avoidant attachment, and its impact on individual performance and well-being.

The present study employed multilevel analysis, as the data originates from employees nested within project teams. Multilevel models can take into account both the individual-level characteristics as well as the entire context where these characteristics influence the actions and behaviour of an employee (Hrițcu, 2015). It also takes into account the dependence between the members of the team and the teams from the same organisation. Based on the proposed conceptual model, the present study focused on a multilevel mediation model, whereby a higher-level variable (such as collective functional background social identity or avoidant attachment) has an effect on lower-level variable (such as in-role and/or extra-role performance) through its influence on some intermediate variable (such as team-level job crafting).

Indirect hypotheses are preferably tested through longitudinal design, as the causal relationships implied by the paths take time to unfold (Selig and Preacher, 2009). Additionally, using other methods such as

cross-sectional design can leave out several key predictors, making the model over or underestimated relative to their true values. Finally, since the effects unfold over time, a longitudinal design will enable to enhance causal inference between variables (Gollob and Reichardt, 1987; Selig and Preacher, 2009). Cross-sectional research will fail to establish how variable changes over time, which may lead to inaccurate conclusions (Maxwell and Cole, 2007; Ployhart and Vandenberg, 2010). Additionally, research on organisational stress should rely on longitudinal design to alleviate issues presented by the cross-sectional data (Zapf, Dormann and Frese, 1996; Taris and Kompier, 2003).

One of the biggest advantages of employing longitudinal design was the use of time as an independent variable (Wright, 2007). The data from longitudinal design can address the research questions of the present study by providing the within-person variance which depicts any change in individuals over time with regards to their well-being (in terms of work engagement) and individual contribution (in-role and/or extra-role performance) to the team (Avey, Luthans and Mhatre, 2008). A longitudinal design will offer insight into which factors play a strong basis for concluding cause and effect (Wildemuth, 2016). For example, does collective higher information system self-efficacy influence individual team members' performance through team-level job crafting or does aggregated high attachment avoidance impact individual team members' well-being through collaborative job crafting. The before and after effects of team-level job crafting on outcomes will add valuable information through a longitudinal design. The research design consisted of three phases during data collection, since that is a minimum number of repeated measures for any longitudinal study (Chan, 1998) and anything less than three makes it impossible to determine the form of change over time (Rogosa, 1995; Singer and Willett, 2003).

The first phase of data collection was from January 2017 and involved two separate questionnaires for project team leaders and members. Leaders were requested to fill in their demographics and information relating to team size and team tenure. Team members were requested to fill in their demographics, characteristics (information system self-efficacy, functional background social identity and avoidant attachment style), performance (in-role and/or extra-role job duties) and well-being (work engagement) aspects. The purpose of the first phase of data collection was to measure the initial in-role and/or extra-role performance and work engagement from individual team members' point of view to get a more accurate and truthful response.

The second phase was conducted after a 12-week interval starting from April 2017 and comprised of a questionnaire directed towards the individual team members to measure the team process called collaborative job crafting. The purpose of the second phase was to collect responses from individual team members to examine the role of team-level job crafting. Since project team members would be involved

in collaborative job crafting activity, their responses provided more accurate results. During the second phase, employee's in-role and/or extra-role performance and work engagement were not measured, since the present study was interested in the pre and post effects of collaborative job crafting on the outcomes. Furthermore, measuring the outcomes at phase 2 when collaborative job crafting is taking place may not contribute to any change in the in-role and/or extra-role performance and work engagement of employees. Hence, the outcomes were not assessed in the second phase of the data collection.

The final phase of the longitudinal design was conducted after a further 12-week period starting from July 2017 and was aimed at measuring the aspects of individual team members' performance and well-being a second time. The team members were requested to fill in their performance (in-role and/or extra-role job duties) and well-being (work engagement) again. The purpose of the final phase was to measure both performance and well-being aspects again, since individual team members may have either improved or reduced their outcomes after the process of team-level job crafting. Table 5.1 below depicted the research design and the allocated time intervals between each phase of the data collection.

Table 5. 1 Research Design

Phase	Team Leaders	Team Members
Phase 1	Demographics including covariates such as team size and team tenure	Demographics, employee performance (IRP and ERP), well-being (WE) and team characteristics (ISSE, FBSI, AA)
Phase 2 <i>(After 12 weeks interval)</i>		Team process (CJC)
Phase 3 <i>(After a further 12 weeks interval)</i>		Employee performance (IRP and ERP) and well-being (WE)

Notes: IRP = In-Role Performance, ERP = Extra-Role Performance, WE = Work Engagement, CJC = Collaborative Job Crafting, ISSE = Information System Self-Efficacy, FBSI = Functional Background Social Identity, AA = Avoidant Attachment

Longitudinal studies of occupational stress utilised time lags which varied from one month to 15 years, with 58% using time lags of up to one year (Zapf, Dormann and Frese, 1996). According to De Lange et al. (2003), time lags varied between 28 days to 14 years in the 45 longitudinal studies. The present study employed 12 weeks (84 days) interval between each of the three-time periods in the longitudinal design. This gives a total period of 6 months (or 24 weeks) between phase 1 and phase 3, whereby individual team members' performance and well-being were estimated twice. Any significant changes in the performance and well-being over 6 months were likely to be detected by using the specified time lag. In fact, many substantive changes in the cause and effect relationships between work attitudes or experience

might not take long to be expressed and shorter time lags are recommended as work-related phenomena are much more dynamic (Dormann and Griffin, 2015).

Previous longitudinal studies detected significant changes in in-role performance (Ashforth and Saks, 1996) and extra-role performance (Donaldson, Ensher and Grant-Vallone, 2000) over a 6-month time lag. Other longitudinal studies on employee well-being have used 6-month time lags to detect changes in well-being (Boswell et al., 2009; Kiely, 1986; Leung, Ip and Leung, 2010; Liu et al., 2012) including work engagement (Luyckx et al., 2010). Additionally, based on practical considerations, a longer time lag between each phase could not be employed due to the length of the research period.

An important consideration was the sample size of the individual and the group level in a multilevel design. According to the rule of thumb, individuals nested within groups call for a minimum of 30 units at each level of analysis (Hox, 1998; Maas and Hox, 2004). With multilevel structural equation modelling, a minimum of 100 clusters is required for good performance of Muthen's maximum likelihood estimator (Hox and Maas, 2001). Based on the complexity of the proposed model, the present study aimed to achieve a minimum of 100 project teams from prospective organisations.

5.2 Participants

A total of seven organisations functioning in the IT sector in India were contacted and five organisations agreed to participate in the present study. Online questionnaires were distributed by the human resources (HR) team within each organisation. The first phase of the data collection involved distributing the questionnaires to 150 project teams, out of which 130 project teams responded with completed surveys, leading to an initial response rate of 86%. The second phase involved distributing questionnaires to 130 project teams, out of which 127 project teams responded. The third phase of the data collection involved distributing questionnaires to 127 project teams and 125 project teams responded with completed surveys, as the remaining teams were dropped due to the termination of the project. Thus, the final sample size was 678 team members and 125 team leaders from 125 project teams, leading to an overall response rate of 83%.

The sample size of the present study included a total of 803 participants comprising both the team members and leaders. Team sizes ranged from 6 to 12 participants, with a mean size of 6.4. The sample consisted of 55% of the male population. The ratio of males to females in the total population was 11:9. The mean age of the participants was 38 years, with the mean age of team members at 38 years and mean age of team leaders at 43 years. The mean number of hours worked by the subjects was 36.91 per week, whereby team members' mean number of hours worked was 36.38 per week and team leaders' mean

hours worked was 39.7 per week. The mean qualification of both the team members and leaders was a bachelor's degree. The overall job experience of the participants was 3.76 years; with the mean job experience of a team member at 3.69 years and team leaders at 4.11 years. The mean team tenure was 11.67 months. Participants had varied roles in a project team, including programmer (15%), information technology (19%), finance (13%), marketing (10%), business analyst (5%), database developer (4%), software engineer (4%) and business and management (3%).

5.3 Procedure

The research targeted multinational IT companies functioning in India and these organisations were contacted based on employing teams for specific projects that were currently running for six months or longer to account for repeated measures (in-role performance, extra-role performance and work engagement). Based on the contextual factors and the dynamic nature of teamwork in today's modern-day organisations (Mathieu et al., 2008), individuals working actively in a project team environment were accounted for in the study rather than those working largely on their own. If an individual was working on simultaneous projects and had been actively involved with one or more teams, then they were accounted for all of those teams as an individual team member. Moreover, the study assumed that the entity of a leader was separate from that of a team member and entailed the role of supervising the team rather than actively participating in the day-to-day functioning of the project. The teams were selected based on the following characteristics; employees were working on a specific project in the multinational organisations of the IT sector. Furthermore, the projects were actively running and the members of the team were working full-time. At least 50% or more members from each team were expected to respond to the questionnaires.

A formal letter of participation (in appendix 10.1) was used to explain the purpose of the research and how the research will be conducted to gain a strong motivation and support from the target audience. HR assisted in distributing the questionnaires to the relevant participants working in project teams and was contacted through a reference from a currently employed participant(s) and direct contact on their websites. The organisations agreed to participate in the study because they were interested to understand the factors that may facilitate or act as a barrier in accelerating the success of an IT project team.

Online questionnaires were generated in survey monkey software. Each variable with the definite items was listed and the appropriate instructions on how to answer a question were specified to the participants in the online survey. The questionnaires were directly forwarded to the HR teams of each organisation through email, who in turn were requested to forward the online questionnaires to the respective team

leaders and members. Furthermore, the links of the online questionnaires were emailed to the HR teams during each of the three phases.

5.4 Ethics

The questionnaires were sent to both the team leaders and members who were part of a project team in the targeted IT companies. Collecting sensitive data from the participants can be threatening, embarrassing or incriminating to employees, as each participant may find topics that they are unwilling to discuss (Jehn and Jonsen, 2010). Hence, ensuring the saliency of the topic and privacy was highly important (Kvale and Brinkmann, 2009; Saunders, Thornhill and Lewis, 2009). Confidentiality of participant's responses was guaranteed and also their individual identities and the organisations they worked for were kept completely anonymous based on the ethical considerations by the University of East Anglia (UEA). The participation of each individual was voluntary and they had the right to decline to answer any specific question in the survey or withdraw to participate at any stage. The consent for the participation of each employee was taken at the start of the data collection phase.

In order to identify the participants during each phase of the questionnaire, an identification code was used consisting of the first letter of the participant's mother's first name, followed by the first letter of the participant's father's first name that was followed by the first letter of the participant's surname and the month of their date of birth. The primary purpose of using the identification code was to estimate participant attrition rates in the study (Donnellan and Conger, 2007). Related articles and newsletters were emailed to HR teams, which were requested to be forwarded to the study participants from time to time during the data collection period to keep everyone connected to the project and reduce attrition rates (Stouthamer-Loeber, Van Kammen and Loeber, 1992; Donnellan and Conger, 2007). This process has greatly enabled to reduce the attrition rates from the sample.

5.5 Analytical Approach

The variables of interest from the conceptual model cannot be measured perfectly as they represented a hypothetical construct, which was a reflection of a set of items using different instruments (Rabe-Hesketh, Skrondal and Zheng, 2007), such as functional background social identity, avoidant attachment, extra-role performance and collaborative job crafting. Structural equation modelling (SEM) is used when constructs are represented by the latent factors or unobserved variables (Hox and Bechger, 1998).

Some of the strengths of SEM include the adoption of covariance matrices as input data rather than correlations (Kenny, 1975), permitting endogenous variables for the simultaneous analysis of two variables at two time points in a single model and its ability to compare model fits (Hays et al., 1994). Additionally, SEM enables the inclusion of control variables to avoid causal contagion from third variables and therefore any estimated correlations are unique effects beyond the control variables (Anderson and Kida, 1982). While other designs such as cross-lagged assume that all variables are measured without measurement error, leading to an estimation bias, SEM can incorporate measurement errors in its structural models (Bentler and Speckart, 1981). Furthermore, SEM enables comparing the structural coefficients by analysing different variables in different time points in the same model (Burkholder and Harlow, 2003). Finally, SEM approach can decompose total effects into direct, indirect and specific indirect effects, allowing the testing of within and across levels (Bollen, 1987; Curran, 2003).

The data for the present study stems from individuals nested within teams and teams nested within organisations; hence it represented a hierarchical or clustered data requiring multilevel modelling (Hox, 1998). Multilevel mediation model enables to test the indirect effects in nested datasets and can accommodate the initial and mediator variables measured either at the individual or the group level (Krull and Mackinnon, 2001). This requires the use of multilevel structural equation modelling (MSEM), which is a synthesis of multilevel and structural equation modelling to help deal with clustered and multivariate data (Mehta and Neale, 2005). MSEM has the advantages of accommodating random slopes of longitudinal multilevel data (Preacher, 2011), and has the power to handle missing data and unbalanced clusters (Ansari, Jedidi and Dube, 2002; Chou, Bentler and Pentz, 2000; Muthén and Asparouhov, 2008; Raudenbush and Sampson, 1999; Rabe-Hesketh, Skrondal and Pickles, 2004).

The outcomes of the present study (individual team members' performance and well-being) were measured twice and any changes in these were of key interest. Difference scores were used to study change, time-sequential associations within constructs and time-sequential associations across individuals (McArdle, 2001; McArdle and Hamagami, 2001). The longitudinal data enabled to differentiate between the differences between individuals and changes within an individual (McArdle, 2009). Difference scores parameterise change (using latent difference scores) as a function of proportional growth from one-time point to the next depending on the level at an earlier time point (Keller and El-Sheikh, 2011). To estimate the direct or indirect effects that were based on the difference scores between two measurement occasions (Ferrer and McArdle, 2003; McArdle, 2001), difference scores were applied to the outcome variables.

Latent change score modelling represents a relatively new and underutilised statistical technique for examining dynamic relations in one or more variables over time. It has been applied to various areas of

research including behavioural (e.g., Kim and Deater-Deckard, 2011), neurological (e.g., Grimm et al., 2012) and cognitive (e.g., Ferrer and McArdle, 2003) outcomes. Though other models that examine change relations exist, such as cross-lagged regression models, latent trajectory models and latent differential models, however, latent change score modelling is unique in that it is flexible enough to model multivariate time-sequential changes and dynamic relations.

The main focus of latent change scores is to identify dynamics among constructs, such that the current level of one variable predicting future change in another are not easily tested through standard methods. Multivariate growth curves could only explain that the changes are related, but not which is leading and which is lagging. Cross-lagged models could explain the effects of variables over time, but without capturing the model of growth and decline (Ferrer and McArdle, 2003; McArdle, 2001).

5.6 Justification for Aggregation

Project team characteristics of employees based on collective higher information system self-efficacy, stronger functional background social identity, high avoidant attachment styles and processes such as collaborative job crafting were measured at the team-level. The outcome variables such as in-role performance, extra-role performance and work engagement were measured at the individual-level, since the success of a project is dependent on the contribution of each individual employee (Gorden and Curlee, 2011; Ludden and Ledwith, 2014).

Team composition comprising of an aggregated employees' skill efficacy, social identity and attachment style represented higher-level constructs (Chan, 1998). The degree of an employee's information system self-efficacy, functional background social identity and avoidant attachment represented the inputs in the form of team member attributes or individual-level factors that combine to influence group processes and in turn team outcomes (Gladstein, 1984; Hackman, 1987). Attributes such as skill, ability and demographic characteristics combine to form a higher-level unit (Milliken and Martins, 1996; Moreland and Levine, 1992). Characteristics of a team constitute inimitable human capital resource which can exist at the group, department or a firm level of analysis by a simple aggregation of individual-level knowledge, skills, abilities and other characteristics measured at the level that is empirically relevant (Ployhart, Weekley and Baughman, 2006; Ployhart and Moliterno, 2011). This approach assumes that the amount of characteristic exhibited by each individual within a team will add to the collective pool of that characteristic (Williams and Sternberg, 1988). Hence, these were measured at the team-level.

In-role and extra-role performance of employees represented lower-level phenomena and these were conceptualised at the individual-level to avoid the fallacy of the wrong level (Klein, Dansereau and Hall,

1994). Since project teams are composed of “available individuals” rather than handpicked individuals (Berger, 2010), an individual is responsible for overall performance. Team characteristics, values, attitudes and factors motivate employees and play an important role in determining their behaviour in the workplace (Morrison, 1994; Penner, Midili and Kegelmeyer, 1997). This may affect the roles pursued by each employee within their teams. An employee may contribute more towards their in-role duties rather than extra-role responsibilities and this contribution may differ from one employee to another in a project team. Since the success of a project is dependent on each employee’s contribution to the accomplishment of a specific task (Barry and Stewart, 1997; Gordon and Curlee, 2011), it is important to understand how factors such as the characteristics of a team may have an influence on individual team members’ performance in relation to their in-role and/or extra-role responsibilities. Therefore, the present study had conceptualised in-role and/or extra-role performance as individual-level constructs (Klein and Kozlowski, 2000a; Chan, 1998).

Work engagement constituted towards the well-being of individual team members in the present study and occurs at the individual-level. According to Britt (2003), work engagement refers to feeling personally responsible for and committed to job performance, so that job performance ‘matters’ to an individual when they are engaged in work. There is a general belief that employee engagement has positive consequences for organisations in terms of business results (Harter, Schmidt and Hayes, 2002). However, engagement is an individual-level construct and to produce business results, it must first impact individual-level outcomes. Therefore, it is expected that the engagement of employees is related to an individual’s intentions, attitudes and behaviours (Saks, 2006). The present study focuses on the individual team members’ engagement as it may play a key role in understanding the consequences of external forces that might affect the work engagement of employees in project teams. Hence, the construct of work engagement was measured at the individual-level.

There are certain higher-level constructs which are directly shaped by lower-level dynamics and cannot be reduced to their lower-level units or individual perceptions (Dansereau, Alutto and Yammerino, 1984). An example of such a construct was collaborative job crafting (Costa et al., 2013) that represented shared team properties, which refer to the experiences, values or behaviours that were held in common by the individual team members (Molleman, 2005; Klein and Kozlowski, 2000a). For such type of constructs, team members need to be in consensus to share the property and these were measured at the individual-level, but the construct refers to the higher-level order (Chan, 1998). In the present study, collaborative job crafting results in indirect effects of project team characteristics on outcomes. Collaborative job crafting refers to the process of collectively redesigning of a job by team members (Leana, Appelbaum and Shevchuk, 2009). This requires common behaviour and understanding between individual team

members to achieve team functions. Hence, collaborative job crafting was measured as a shared unit-level construct.

Team size and team tenure were controlled for in the present study and represented global constructs, as they are descriptive in nature and are easily observable characteristics of the whole team (Klein and Kozlowski, 2000a; Schmidt, 2016).

5.7 Methods for Aggregation

A primary method was used for representing an individual's perception of some higher-level structure through referent-shift model. The referent-shift model refers to the process whereby individuals rate team behaviour rather than themselves (Chan, 1998; DeShon et al., 2004).

In the present study, collaborative job crafting was measured through referent-shift consensus model. An alternative method of direct consensus would result in a poor measure of a group's behaviour (Han and Williams, 2008), as it employs individual self-referenced items such as reporting the frequency of experiencing a specific phenomenon (Chan, 1998). Nevertheless, asking individuals to assess their team behaviour through referent-shift, shared perception of the group behaviour can be obtained (Chan, 1998). Hence, it is argued that a referent-shift model was employed for assessing the process of team-level job crafting (Marques-Quintero et al., 2015; Chan, 1998).

Finally, variables such as information system self-efficacy, functional background social identity and avoidant attachment of individual team members were conceptualised as an additive team-level construct. The additive model states that a higher-level construct is a summation or the average of the lower-level units' scores (Chan, 1998). Table 5.2 below summarises the different levels and variables per level of the proposed conceptual model.

Table 5. 2 Different Levels

Variables		Justification for Aggregation	Method of Aggregation	Levels
Project characteristics involving collective information system functional background social identity and attachment avoidance	team	Characteristics of a project team represented a valuable human capital resource, whereby each individual may contribute in terms of specific knowledge, skills or abilities to the resource pool of the whole team (Barney and Wright, 1998; Williams and Sternberg, 1998; Hobfoll, 1988).	Additive composition model	Represented team-level variables
Collaborative Crafting	Job	Individual team members need to be in consensus in order to collectively perform behaviour through mutual decision making and these are measured at the individual-level, but the construct refers to the higher-level order (Chan, 1998).	Referent-shift model	Represented team-level variable

In-role and/or Extra-role performance and Work Engagement	Each individual in a team contributes to the success of a project (Gordon and Curlee, 2011) and both performances in terms of in-role and/or extra-role duties and well-being with regards to work engagement must impact individual-level outcomes to produce overall business results (Saks, 2006; Bakker, Emmerik and Riet, 2008).	No aggregation	Represented individual-level variables
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Notes: Summary of the variables per level

5.8 Measures

5.8.1 Project Team Characteristics

Information system self-efficacy scale was created specifically for the context of IT project teams through a focus group (please refer to 10.3 appendix for the thematic map), for item development and to further support the phrasing of the items (O'Brien, 1993). An efficacy belief system is not a global trait but a differentiated set of self-beliefs linked to different realms of functioning and as a result, there is no all-purpose measure of perceived self-efficacy (Bandura, 2005). A total of nine participants formed part of the focus group for the generation of the items. They were chosen from a multinational company, functioning in the IT sector, working in project teams to help provide relevant information (Morgan, 1988). The group included five male and four female participants, ensuring a good mix with regards to gender. Open questions (such as 'why do you think it is necessary to have confidence in your information system skills during project meets?') were generated to motivate participants to talk about their self-confidence in using information system skills when working in a project team environment. Based on the thematic analysis of the focus group responses, four items were developed. The items included questions

such as “I can use technology to attend/conduct project meetings using my technical skills”. Responses from the participants were measured on a five-point Likert scale ranging from “strongly disagree” to “strongly agree”. After conducting the exploratory factor analysis (please refer to section 6.1 of chapter 6), the Cronbach’s alpha for information system self-efficacy measured at time 1 of the present study was 0.88.

Functional background social identity scale was taken from the study of Randel and Jausi (2003), who captured the social identity theory based on an individual’s identification with the successes or failures of a particular group or subgroup (Ashforth and Mael, 1989). The scale consisted of three items, including questions such as “I share in the successes of others with similar functional background”. A five-point Likert scale was used to assess the responses from the participants ranging from “strongly disagree” to “strongly agree”. The Cronbach’s alpha for the scale was 0.79 (Randel and Jausi, 2003). In the present study, the Cronbach’s alpha for functional background social identity measured at time 1 was 0.94.

Avoidant attachment was measured through a five-item scale from the brief attachment questionnaire, which consisted of a subscale – involving five items of avoidant attachment (Leiter, Price and Day, 2013; Leiter, Day and Price, 2015). A five-point Likert scale ranging from “not at all like me” to “very much like me” was used to measure the responses from the participants, making specific reference to relationships at work. The scale included questions such as “I don’t need close friendships at work” and “I like to have close personal relationships with people at work”. The Cronbach’s alpha for the avoidant attachment scale was 0.78 (Leiter, Day and Price, 2015). The computed Cronbach alpha for this scale was 0.54 and one of the items (‘I work hard at developing close working relationships’) was dropped as it reduced the reliability of the measure. After dropping the least reliable item, the Cronbach’s alpha for the avoidant attachment scale measured at time 1 was 0.97.

5.8.2 Team Process

Collaborative job crafting scale was derived from Leana, Appelbaum and Shevchuk (2009), who have used a five-item scale for measuring the team-level job crafting behaviour through changing tasks by teachers in childcare centres. These items were slightly modified in light of the present study. A five-point Likert scale was used to measure the collaborative job crafting behaviour within the team, ranging from “never” to “always”. It included questions such as “does your team engage in working together to introduce new approaches to improve tasks”. The two items in the scale that were modified included “does the team decide with other members to coordinate schedules” and “does the team decide with other members to plan and attend meetings” (Berg, Dutton and Wrzesniewski, 2013). The Cronbach’s alpha for

the scale was 0.89 (Leana, Appelbaum and Shevchuk, 2009). In the present study, the Cronbach's alpha for the collaborative job crafting scale measured at time 2 was 0.95.

5.8.3 Employee Performance and Well-being

The present study had adopted the scales of in-role and/or extra-role performance from Huang and You (2011), who have derived the scales from previous research in their study (Smith, Organ and Near, 1983; Williams and Anderson, 1991; Podsakoff et al., 1990). The scales from Huang and You (2011) measured the individual perceptions of in-role and/or extra-role performance and the subject of their study involved nurses in hospitals in Taiwan. Nevertheless, the items were very relevant for a project team environment, due to the contribution made by employees to their job (Gordon and Curlee, 2011). A five-point Likert scale ranging from "strongly disagree" to "strongly agree" was used to measure the responses for both in-role and/or extra-role performance. Moreover, the outcomes such as in-role and/or extra-role performance were measured at both time 1 and time 3 and these represented the difference scores (denoted by Δ), which estimated the change in the performance of employees over time. In-role and/or extra-role performance were calculated by the difference scores of each item (time 3 – time 1) and were then loaded onto the difference score factors (McArdle, 2001).

In-role performance included four items, which measured the formal responsibilities undertaken by the employees (Williams and Anderson, 1991; Huang and You, 2011) and consisted of items such as "I adequately complete assigned duties" and "I fulfil responsibilities specified in the job description". The Cronbach's alpha for the in-role performance scale was 0.76 (Huang and You, 2011). In the present study, the Cronbach's alpha for Δ in-role performance was 0.93.

Extra-role performance included three items, which measured the contributions made by employees that benefited specific individuals and indirectly contributed to the team or the organisation (Williams and Anderson, 1991; Huang and You, 2011). The construct included specific questions for employees such as "I go out of the way to help new employees" and "I help others who have heavy workloads". The Cronbach's alpha for the extra-role performance scale was 0.76 (Huang and You, 2011). In the present study, the Cronbach's alpha for Δ extra-role performance was 0.94.

Work engagement scale was adapted from Schaufeli, Bakker and Salanova (2006), which comprised of a nine-item scale that can be used in organisational behaviour, consisting of three items each to measure the subscales such as vigour, dedication and absorption. The questions measured the individual perceptions of their work engagement. The scale included questions for each measure such as "at my work, I feel bursting with energy" for vigour, "I am enthusiastic about my job" for dedication and "I am immersed in

my work” for absorption. Respondents were asked to rate these items on a seven-point Likert scale from “never” to “always”. The Cronbach’s alpha for the nine-item work engagement scale varied between 0.85 and 0.92 (Schaufeli, Bakker and Salanova, 2006). Work engagement was measured at both time 1 and time 3 and was calculated by the difference scores (denoted by Δ) of each item (time 3 – time 1), which was then loaded onto the difference score factors (McArdle, 2001). In the present study, the Cronbach’s alpha for Δ work engagement was 0.98.

Team tenure acts as a control variable in the present study. The team leaders reported the tenure of the team as they had the key information regarding the length of the project.

Team size was controlled for in the present study and the team leaders reported the number of individuals involved in completing the project on time.

5.9 Concluding Remarks

The chapter highlighted the importance of employing a longitudinal and multilevel design in answering the research questions of the present study. The longitudinal data will enable to assess the change in performance and wellbeing of individual team members over time while a multilevel design will capture the effects of higher-level variables such as project team characteristics and processes on outcomes. The data consisted of two levels involving characteristics (information system self-efficacy, functional background social identity and avoidant attachment) and process (collaborative job crafting) measured at the team-level, while the outcomes (in-role performance, extra-role performance and work engagement) were examined at the individual-level. The Cronbach’s alpha of each variable demonstrated good reliability and consistency of the constructs being measured. The results of the preliminary analysis and multilevel structural equation modelling are displayed in the next chapter.

Chapter 6 Findings

The primary aim of the chapter is to present the results of the preliminary findings including the goodness of fit indices, factor loadings of each item of different variables, the data aggregation results and the correlation matrix. The preliminary finding also includes the assessment of the underlying structure of the new measure called information system self-efficacy through exploratory factor analysis. Additionally, the results of the multilevel structural equation modelling are displayed for the direct and indirect hypotheses of the present study. The main aim of the chapter is to provide an overview of the findings.

6.1 Exploratory Factor Analysis

Information system self-efficacy – To determine the underlying factors of information system self-efficacy scale, principal axis factoring was conducted (as shown in Table 6.1). Principal axis factoring does not require meeting specific assumptions regarding the items or data such as multivariate normal distribution (Fabrigar et al., 1999). The scale was developed using the findings from the focus group and demonstrated that all the four items loaded highly onto the factor between the values of 0.76 to 0.85.

Table 6. 1 Principal Axis Factoring

Items	Value
Item1	.811
Item2	.849
Item3	.787
Item4	.761

Notes: Results of Principal Axis Factoring of Information System Self-Efficacy scale

Additionally, a principal component analysis was also conducted due to the Likert-type rating scale and showed the loadings between the values of 0.88 and 0.91.

6.2 Multilevel Confirmatory Factor Analysis and Measurement Invariance

The following section displays the fit indices of the measurement models to determine an acceptable model fit relative to a saturated model (Crowley and Fan, 1997). Goodness of fit was assessed using indices such as chi-square (χ^2), degrees of freedom (df), probability value, comparative fit index (CFI), the Tucker-Lewis Index (TLI), the root mean square error of approximation (RMSEA) and the

standardised root mean square residuals (SRMR) (Kline, 2005). A value of 0.95 or above for the CFI and TLI indicate a good fit, while values close to 0.06 for the RMSEA and values up to 0.08 for SRMR are deemed acceptable (Hu and Bentler, 1999).

A one-factor model was tested, whereby all the items of the independent variables (information system self-efficacy, functional background social identity, avoidant attachment), mediating variable (collaborative job crafting) and dependent variables (difference scores of in-role performance, extra-role performance and work engagement) loaded on to a single factor. The model showed no convergence.

A two-factor model was tested, whereby all the items of independent variables (information system self-efficacy, functional background social identity, avoidant attachment) and mediating variable (collaborative job crafting) collapsed into a single factor and items of the dependent variables loaded on to another factor. The model showed a poor fit: $\chi^2 = 6228.24$, $df = 582$, $p < .001$, CFI = 0.68, TLI = 0.66, RMSEA = 0.08, SRMR (within) = 0.17, SRMR (between) = 0.33.

A three-factor model was assessed, whereby all the items of independent variables (information system self-efficacy, functional background social identity, avoidant attachment) collapsed into one factor, items of mediating variable on to a single factor and items of the dependent variables loaded on to another factor. The fit indices shown by the model were poor: $\chi^2 = 5832.06$, $df = 587$, $p < .001$, CFI = 0.70, TLI = 0.69, RMSEA = 0.08, SRMR (within) = 0.17, SRMR (between) = 0.32.

A four-factor model was assessed, whereby all the items of independent variables (information system self-efficacy, functional background social identity, avoidant attachment) loaded onto a single factor, items of mediating variable loaded onto a second factor, items of employee performance (in-role and/or extra-role) loaded onto a third factor and items of employee well-being (work engagement) was collapsed onto a fourth factor. The fit indices shown by the model were poor again: $\chi^2 = 1433.43$, $df = 621$, $p < .001$, CFI = 0.56, TLI = 0.56, RMSEA = 0.28, SRMR (within) = 0.43, SRMR (between) = 0.38.

The hypothesised model consisted of seven factors and gave an excellent fit compared to other models: $\chi^2 = 1149.16$, $df = 615$, $p < .001$, CFI = 0.97, TLI = 0.97, RMSEA = 0.02, SRMR (within) = 0.04, SRMR (between) = 0.04. Measurement invariance was also conducted on the hypothesised model to determine if the model holds across time with pre and post-test for the repeated outcome variables (Meredith and Horn, 2001). The hypothesised model consisted of repeated variables (such as in-role performance, extra-role performance and work engagement) that were measured at two different time points to account for difference scores (McArdle, 2001; 2009). The results showed measurement invariance of $\Delta\chi^2/df =$

22.43(16), $p = 0.220$, using chi-square test (Sörbom, 2011; Horn, McArdle and Mason, 1983; Meredith, 1993), demonstrating weak measurement with the factor loadings relatively equal across time.

The fit indices of the alternative models and the hypothesised model are displayed in Table 6.2 below. As can be seen, the hypothesised model was significantly superior as compared to other alternative models.

Table 6. 2 Goodness of Fit Indices

Factor Model	χ^2 (df)	CFI	TLI	RMSEA	SRMR (within)	SRMR (between)
One-factor model	No convergence					
Two-factor model	6228.24 (582)	0.68	0.66	0.08	0.17	0.33
Three-factor model	5832.06 (587)	0.70	0.69	0.08	0.17	0.32
Four-factor model	1433.43 (621)	0.56	0.56	0.28	0.43	0.38
Hypothesised Model	1146.06 (615)	0.97	0.97	0.03	0.04	0.04

Notes: N = 803 participants (including 678 team members)

Figure 6.1 and 6.2 below displays the path diagram of the constructs at the between and the within-level. The proposed conceptual model depicted between-level constructs that represented the aggregated characteristics of individuals within clusters such as information system self-efficacy, functional background social identity and avoidant attachment, therefore, the same factor structure has to apply to both levels and factor loadings should be equal across levels (Stapleton, Yang and Hancock, 2016). This equality of factor loadings across levels is called isomorphism (Tay, Woo and Vermunt, 2014) and depicts a cross-level invariance that ensures that the factor at different levels can be interpreted as the within and between-level components of the same latent variable (Vijver and Poortinga, 2002). As a result of this, the factor loadings of each item were constrained to be equal for both within and between levels. Table 6.3 below shows the factor loadings of the items which were all high ranging from 0.70 to 1.0 with the lowest factor loading of 0.63 for in-role performance (difference score) item. A factor loading of an item over 0.6 is considered high (Kline, 2005) and exhibits better psychometric properties (Bagozzi and Yi, 1988; Kline, 2011).

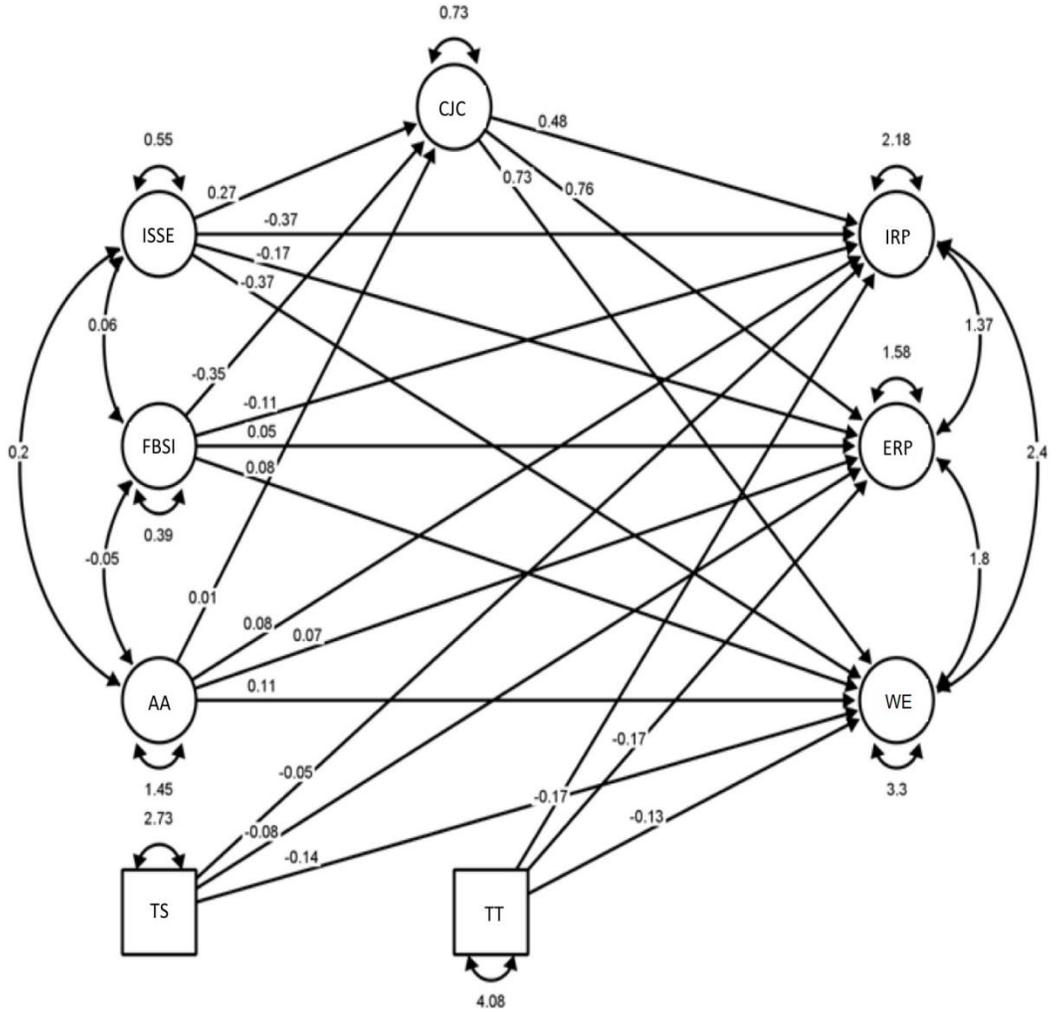


Figure 6. 1. Path diagram of the between-level constructs

Notes: ISSE = Information System Self-Efficacy, FBSI = Functional Background Social Identity, AA = Avoidant Attachment, CJC = Collaborative Job Crafting, IRP = In-Role Performance, ERP = Extra-Role Performance, WE = Work Engagement, TS = Team Size, TT = Team Tenure

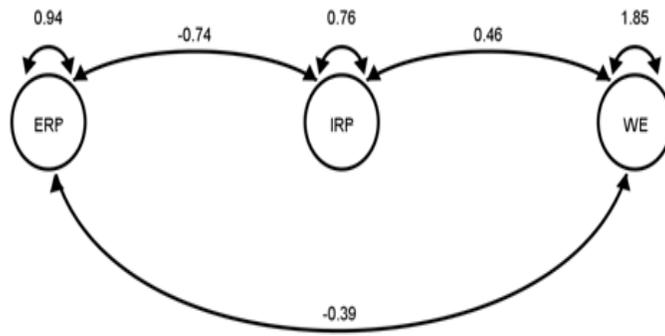


Figure 6. 2. Path diagram of the within-level constructs
Notes: IRP = In-Role Performance, ERP = Extra-Role Performance, WE = Work Engagement

Table 6. 3 Standardised Factor Loadings

Variable	ISSE	FBSI	AA	CJC	IRP	ERP	WE	Error Variance
Information System Self-Efficacy	0.94							0.07
Information System Self-Efficacy	0.97							0.05
Information System Self-Efficacy	0.88							0.19
Information System Self-Efficacy	0.87							0.16
Functional Background Social Identity		0.96						0.04
Functional Background Social Identity		0.98						0.02
Functional Background Social Identity		0.95						0.05
Avoidant Attachment			0.98					0.07
Avoidant Attachment			0.98					0.04
Avoidant Attachment			0.85					0.26
Avoidant Attachment			0.98					0.04
Collaborative Job Crafting				0.96				0.07
Collaborative Job Crafting				0.97				0.06
Collaborative Job Crafting				0.95				0.11
Collaborative Job Crafting				0.95				0.08
Collaborative Job Crafting				0.94				0.09
ΔIn-Role Performance					0.76			0.16
ΔIn-Role Performance					0.71			0.03
ΔIn-Role Performance					0.66			0.23
ΔIn-Role Performance					0.63			0.24
ΔExtra-Role Performance						0.78		0.08
ΔExtra-Role Performance						0.80		0.06
ΔExtra-Role Performance						0.78		0.06
ΔWork Engagement							0.90	0.09
ΔWork Engagement							0.90	0.07
ΔWork Engagement							0.85	0.11
ΔWork Engagement							0.85	0.05
ΔWork Engagement							0.86	0.06
ΔWork Engagement							0.86	0.15
ΔWork Engagement							0.86	0.07
ΔWork Engagement							0.87	0.05
ΔWork Engagement							0.90	0.05

Notes: Standardised through Bayesian Estimator, ISSE = Information System Self-Efficacy, FBSI = Functional Background Social Identity, AA = Avoidant Attachment, CJC = Collaborative Job Crafting, IRP = In-Role Performance, ERP = Extra-Role Performance, WE = Work Engagement

6.3 Data Aggregation

The data were aggregated to team-level for characteristics including information system self-efficacy, functional background social identity, avoidant attachment and team process called collaborative job crafting in the proposed model.

Employee agreement was calculated for team-level job crafting as it was based on referent-shift model (Chan, 1998). Since the specified construct reflected group behaviour, a high consensus was required for aggregating the data. The within-group agreement reflects the degree to which the raters provide the same ratings (Tinsley and Weiss, 1975; Kozlowski and Hattrup, 1992). Rwg(j) is the most frequently used

measure in the organisational literature and is used to calculate the within-group agreement for multi-item scales, whereby J represents a number of items in the measure (James, Demaree and Wolf, 1984, 1993; Bliese, 2000; Biemann, Cole and Voelpel, 2012). Agreement among members of the team was calculated using $rwg(j)$ statistic in the present study (George and James, 1993). Collaborative job crafting construct showed a high agreement among its members with a mean $rwg(j)$ value of 0.82. The value of 0.82 is greater than the generally accepted 0.70, although the debate exists regarding the proper cut-off value for $rwg(j)$ (Lance, Butts and Michels, 2006; LeBreton and Senter, 2008).

$Rwg(j)$ values were not computed for project team characteristics involving information system self-efficacy, functional background social identity and avoidant attachment. $Rwg(j)$ indices are more useful for either a direct consensus or referent-shift consensus composition model, whereby each group share a common perception concerning a target construct and a high interrater agreement is a necessary prerequisite (Biemann, Cole and Voelpel, 2012). The primary reason for not computing $rwg(j)$ values for these constructs was that the present study does not assume members of a team to have a high consensus based on their skill efficacy, social identity or attachment style, rather it simply averages the scores of each group to represent the team characteristics based on additive model (Chan, 1998).

Intraclass correlations (ICC) were also calculated to determine the reliability of the constructs. ICC(1) states how strongly clustered individuals are within units, whereas ICC(2) represents the reliability of the unit-level mean (Bliese, 2000, 2002; James, 1982; Bartko, 1976; Shrout and Fleiss, 1979). Any small within unit-level differences which are evidenced by ICC(1) values can lead to reliable mean group differences (Dixon and Cunningham, 2006). ICC(1) values as low as 0.05 suggest meaningful variation at the group level and calls for multilevel modelling (LeBreton and Senter, 2008). A value of 0.70 and higher are acceptable for ICC(2) based on common practice (Klein et al., 2000; LeBreton and Senter, 2008). The ICC(1) values for information system self-efficacy was 0.62, $p < .001$, functional background social identity was 0.45, $p < .001$, avoidant attachment was 0.40, $p < .001$ and collaborative job crafting was 0.63, $p < .001$. The ICC(1) values were considerably higher and this may be due to the homogeneous representation of the sample consisting of project team members functioning in multinational organisations of the IT sector. Whereas, the ICC(2) values for information system self-efficacy was 0.89, $p < .001$, functional background social identity was 0.81, $p < .001$, avoidance attachment was 0.78, $p < .001$ and collaborative job crafting was 0.90, $p < .001$.

The design effect was also computed and provides an estimate of the multiplier that needs to be applied to standard errors to correct for the negative bias resulting from nested data (Peugh, 2010). Design effect = $1 + (\text{average number of individuals in each group} - 1) \times \text{Intraclass correlation}$ (Snijders and Bosker, 1999).

A design effect of greater than 2.0 indicates the need for multilevel modelling (Muthén, 1991, 1994; Muthén and Satorra, 1989, 1995). Based on these results, project team characteristics and collaborative job crafting were aggregated at the team-level and the results are outlined in Table 6.4 below.

Table 6. 4 Aggregation Results

Constructs	ICC(1)	ICC(2)	Design Effect
Information System Self-Efficacy	0.62	0.89	3.73
Functional Background Social Identity	0.45	0.81	3.00
Avoidant Attachment	0.40	0.78	2.76
Collaborative Job Crafting	0.63	0.90	3.81

Notes: ICC = Intraclass Correlation

6.4 Outliers

Both univariate and multivariate outliers have been identified in the present study using SPSS version 19.0. An outlier is an observation that deviates from other observations leading to suspicion that it might be generated by a different mechanism (Hawkins, 1980).

A univariate outlier is an observation that lies outside the 1.5 * interquartile range (IQR) within a single variable. IQR is the difference between 75th and 25th quartiles. Two univariate mild outliers were identified in the dataset: one from a number of hours worked by a team member that had a low value of 9 and the other was the team tenure of a leader which had a high value of 17. The former was adjusted to a whisker of distribution (25th percentile – 1.5 * IQR; 30 – 1.5 * 10), resulting in 15 (Branstetter, Furman and Cottrell, 2009) and the latter was adjusted to 15.94 through Gaussian distribution (Goerg, 2011).

A multivariate outlier occurs within the joint combination of two or more variables. A total of 42 cases of multivariate outliers were identified from the dataset of team members by computing the Mahalanobis distance (MD) for each variable. Mahalanobis distance refers to the distance of a case from the centroid of the remaining cases, whereby the centroid is the intersection of the means of all variables (Fidell and Tabachnick, 2003). Linear regression was used to compute the squared MD for each case and these were evaluated for statistical significance against the appropriate chi-square distribution using an alpha level of 0.001 (Kline, 2011). The cases where the squared MD exceeded the critical chi-square value were considered as multivariate outliers (Meyers, Gamst and Guarino, 2013).

The data were tested with and without the identified multivariate outliers and there was no difference observed in the findings. As a result, multivariate outliers formed part of the original dataset when running the multilevel structural equation modelling.

6.5 Correlation Matrix and Construct Validity

Table 6.5 below displays the correlations between the constructs of the present study. As observed from the correlation matrix, information system self-efficacy had a positive correlation with collaborative job crafting ($r = 0.19$, $p < .01$), indicating that project team members with information system self-efficacy have a stronger contribution to collaborative job crafting activity. A positive correlation was found between collaborative job crafting and in-role ($r = 0.25$, $p < .01$), extra-role ($r = 0.44$, $p < .001$) and work engagement ($r = 0.32$, $p < .001$), indicating greater involvement in collaborative job crafting leads to improved in-role and/or extra-role performance, and work engagement of project workers.

The negative correlation between functional background social identity and collaborative job crafting ($r = -0.21$, $p < .01$) indicated that project team members with functional background social identity contributed poorly to collaborative job crafting activities. Furthermore, avoidant attachment was not correlated to the team-level job crafting ($r = 0.08$, $p > .05$).

The mean tenure of a team was 11.66 with a standard deviation of 4.38. Team tenure had a negative correlation with work engagement ($r = -0.15$, $p < .05$) indicating that the length of time a project team had been together reduced the levels of work engagement among employees. The mean size of a team was 6.42 with a standard deviation of 1.31. The size of a project team had negative impact on the performance levels of employees, as team size was negatively correlated to both in-role ($r = -0.12$, $p < .05$) and extra-role ($r = -0.16$, $p < .05$) variables.

The convergent validity was evaluated for the latent constructs through average variance extraction and the values were higher than 0.50, which were within an acceptable range (Fornell and Larcker, 1981; Bagozzi, 1981). The composite reliability of all latent constructs was higher than the cut off value of 0.70 (Fornell and Larcker, 1981; Bagozzi and Burnkrant, 1985). Hence, the measure adequately assessed the constructs it purports to assess. To determine the discriminant validity, both maximum shared variance (MSV) and average shared variance (ASV) were computed. The between-level MSV was 0.80 and between-level ASV was 0.07, which were lower than the average variance extracted values of the between-level constructs involving information system self-efficacy (0.85), functional background social identity (0.92), avoidant attachment (0.91) and collaborative job crafting (0.92). The within-level MSV was 0.56 and within-level ASV was 0.33, which were lower than the average variance extracted values of

the within-level constructs including in-role performance (0.78), extra-role performance (0.86) and work engagement (0.79) (Fornell and Larcker, 1981). Therefore, the variables were unrelated to each other.

Table 6. 5 Correlation Matrix

Variable	Mean	Variance	AVE	CR	1	2	3	4	5	6	7	8	9
Information System Self-Efficacy	4.03	0.55	0.85	0.96	1								
Functional Background Social Identity	3.98	0.39	0.92	0.97	0.14	1							
Avoidant Attachment	3.16	1.45	0.91	0.98	0.22	-0.07	1						
Collaborative Job Crafting	3.49	0.8	0.92	0.98	0.19**	-0.21**	0.08	1					
ΔIn-Role Performance	0.29	2.46	0.78	0.89	-0.13*	0.11	0.03	0.25**	1				
ΔExtra-Role Performance	0.21	2.07	0.86	0.92	0.01	0.06	0.04	0.44***	0.75	1			
ΔWork Engagement	0.54	3.88	0.79	0.84	-0.06	-0.04	0.04	0.32***	0.59	0.51	1		
Team Tenure	11.66	4.38			0.04	-0.18	0.14	0.03	-0.07	-0.12	-0.15*	1	
Team Size	6.42	1.31			0.06	-0.11	0.08	0.06	-0.12*	-0.16*	-0.07	0.09	1

Notes: *p < .05, **p < .01, ***p < .001, N = 803 participants (including 678 team members), 125 project teams, AVE = Average Variance Extracted, CR = Composite Reliability

6.6 Analysis Strategy

The analysis was performed using Mplus 8.0 version and the parameters of the model were estimated using maximum likelihood estimation with robust standard errors (Muthén and Muthén, 1998-2017). Full information maximum likelihood (FIML) and expectation maximization (EM) was used, which permitted the use of all observations in the dataset to estimate the parameters without the need to impute the data (Enders and Bandalos, 2001; Enders and Peugh, 2004). All hypotheses were examined simultaneously.

6.7 Results

The results of the multilevel structural equation modelling are displayed in Table 6.6 below.

Table 6. 6 Results of MSEM

Effects	Direct Effects	Indirect Effect through Collaborative Crafting	Total Effects
Information system self-efficacy → In-role performance	$\beta = -0.353, p = 0.017^*$	$\alpha = 0.126, p = 0.047^*$	$\gamma = -0.227, p = 0.108$
Information system self-efficacy → Extra-role performance	$\beta = -0.157, p = 0.164$	$\alpha = 0.205, p = 0.008^{**}$	$\gamma = 0.048, p = 0.727$
Information system self-efficacy → Work engagement	$\beta = -0.343, p = 0.053$	$\alpha = 0.204; p = 0.022^*$	$\gamma = -0.139, p = 0.465$
Functional background social identity → In-role performance	$\beta = -0.145, p = 0.548$	$\alpha = -0.162, p = 0.034^*$	$\gamma = -0.306, p = 0.219$
Functional background social identity → Extra-role performance	$\beta = 0.035, p = 0.889$	$\alpha = -0.263, p = 0.006^{**}$	$\gamma = -0.229, p = 0.371$
Functional background social identity → Work engagement	$\beta = 0.038, p = 0.912$	$\alpha = -0.262, p = 0.015^*$	$\gamma = -0.225, p = 0.526$
Avoidant attachment → In-role performance	$\beta = 0.076, p = 0.408$	$\alpha = 0.002, p = 0.918$	$\gamma = 0.078, p = 0.362$
Avoidant attachment → Extra-role performance	$\beta = 0.066, p = 0.442$	$\alpha = 0.004, p = 0.918$	$\gamma = 0.070, p = 0.425$

Avoidant attachment →

Work engagement $\beta = 0.114, p = 0.323$ $\alpha = 0.004, p = 0.918$ $\gamma = 0.118, p = 0.278$

Team tenure → In-role performance $\beta = -0.057, p = 0.274$

Team tenure → Extra-role performance $\beta = -0.084, p = 0.057$

Team tenure → Work engagement $\beta = -0.147, p = 0.028^*$

Team size → In-role performance $\beta = -0.164, p = 0.030^*$

Team size → Extra-role performance $\beta = -0.162, p = 0.017^*$

Team size → Work Engagement $\beta = -0.122, p = 0.207$

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$, β = direct effects, α = indirect effects, γ = total effects, $N = 803$ participants (including 678 team members) and 125 project teams, MSEM = Multilevel Structural Equation Modelling

6.7.1 Direct Effects of Information System Self-Efficacy

Hypotheses 1a to 1b predicted that higher team-level information system self-efficacy in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time (Hypothesis 1a) and higher team-level information system self-efficacy in project teams has a positive association with a change in the work engagement of individual team members over time (Hypothesis 1b). However, a collective higher information system self-efficacy had a significant negative effect with a decrease in the in-role performance ($\beta = -0.353, p = 0.017$) over time, while non-significant effects were found with a decrease in the extra-role performance ($\beta = -0.157, p = 0.164$) and work engagement ($\beta = -0.343, p = 0.053$) over time. Therefore, hypotheses 1a and 1b were not supported.

6.7.2 Direct Effects of Functional Background Social Identity

Hypotheses 2a to 2b predicted that stronger team-level functional background social identity in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time (Hypothesis 2a) and stronger team-level functional background social identity in project teams has a positive association with a change in the work engagement of individual team members over time (Hypothesis 2b).

Based on the results, an aggregated stronger functional background social identity showed a non-significant effect with a decrease in the in-role ($\beta = -0.145, p = 0.548$) and an increase in the extra-role ($\beta = 0.035, p = 0.889$) performance over time. Additionally, a stronger team-level functional background social identity had no significant effect with an increase in the work engagement ($\beta = 0.038, p = 0.912$) of employees over time. Therefore, hypotheses 2a and 2b were unsupported.

6.7.3 Direct Effects of Avoidant Attachment

Hypotheses 3a to 3b predicted that high team-level avoidant attachment in project teams has a negative association with a change in the in-role and/or extra-role performance of individual team members over time (Hypothesis 3a) and high team-level avoidant attachment in project teams has a negative association with a change in the work engagement of individual team members over time (Hypothesis 3b).

A collective high avoidant attachment had no significant effects with the in-role ($\beta = 0.076, p = 0.408$) and/or extra-role ($\beta = 0.066, p = 0.442$) performance over time. Therefore, hypothesis 3a was not supported. Additionally, no significant effect was found between high team-level avoidant attachment and work engagement ($\beta = 0.114, p = 0.323$) of employees over time. Hence, hypothesis 3b was not supported.

6.7.4 Indirect Effects of Information System Self-Efficacy

Hypotheses 4a to 4b predicted that higher team-level information system self-efficacy in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time, through its positive effect on collaborative job crafting (Hypothesis 4a) and higher team-level information system self-efficacy in project teams has a positive association with a change in the work engagement of individual team members over time, through its positive effect on collaborative job crafting (Hypotheses 4b).

Positive indirect effects of higher team-level information system self-efficacy with an increase in in-role performance ($\alpha = 0.126, p = 0.047$), extra-role performance ($\alpha = 0.205, p = 0.008$) and work engagement ($\alpha = 0.204; p = 0.022$) over time through collaborative job crafting were all significant. Based on the results, a partial mediation was found between information system self-efficacy and in-role performance, as there was a significant direct effect ($\beta = -0.353, p = 0.017$) and indirect effect through collaborative job crafting ($\alpha = 0.126, p = 0.047$), with the Bayesian 95% confidence intervals of [0.01, 0.29]. As the confidence intervals excluded zeros, the indirect effects were all statistically significant. This was a case of competitive partial mediation due to the opposing signs of the direct and indirect effects (Zhao, Lynch and Chen, 2010), whereby collective information system self-efficacy still explained a portion of the in-role performance that is independent of collaborative job crafting (Nitzl, Roldan and Cepeda-Carrion, 2016).

A collective higher information system self-efficacy was positively associated with team-level job crafting ($\alpha = 0.278, p = 0.003$) and team-level job crafting was positively associated with an increase in the in-role ($\alpha = 0.453, p = 0.006$) and/or extra-role ($\alpha = 0.739, p < 0.001$) performance over time. Moreover, an aggregated higher information system self-efficacy was positively associated with team-level job crafting ($\alpha = 0.278, p = 0.003$) and team-level job crafting was positively associated with an increase in the work engagement ($\alpha = 0.736, p < 0.001$) over time. The results fully supported hypotheses 4a and 4b.

6.7.5 Indirect Effects of Functional Background Social Identity

Hypotheses 5a to 5b predicted that stronger team-level functional background social identity in project teams has a positive association with a change in the in-role and/or extra-role performance of individual team members over time, through its positive effect on collaborative job crafting (Hypothesis 5a) and stronger team-level functional background social identity in project teams has a positive association with a change in the work engagement of individual team members over time, through its positive effect on collaborative job crafting (Hypotheses 5b).

An aggregated stronger functional background social identity had significant indirect effects with a decrease in the in-role performance ($\alpha = -0.162, p = 0.034$), extra-role performance ($\alpha = -0.263, p = 0.006$) and work engagement ($\alpha = -0.262, p = 0.015$) through collaborative job crafting. As collective stronger functional background social identity led to a decrease in the in-role and/or extra-role performance over time through team-level job crafting, hypothesis 5a was not supported. Similarly,

hypothesis 5b was not supported as collective stronger functional background social identity led to a decrease in the work engagement of project workers over time through team-level job crafting.

6.7.6 Indirect Effects of Avoidant Attachment

Hypotheses 6a to 6b predicted that high team-level avoidant attachment in project teams has a negative association with a change in the in-role and/or extra-role performance of individual team members over time, through its negative effect on collaborative job crafting (Hypothesis 6a) and high team-level avoidant attachment in project teams has a negative association with a change in the work engagement of individual team members over time, through its negative effect on collaborative job crafting (Hypotheses 6b).

A collective high avoidant attachment had no indirect effects on the in-role performance ($\alpha = 0.002, p = 0.918$), extra-role performance ($\alpha = 0.004, p = 0.918$) or work engagement ($\alpha = 0.004, p = 0.918$) over time through team-level job crafting. Based on the results, hypotheses 6a and 6b were not supported.

Figure 6.3 below displays the conceptual model with the coefficients. The symbol α symbolises the indirect effects of project team characteristics on outcomes through collaborative job crafting, whereby α_1 represented the effects of information system self-efficacy, α_2 represented the effects of functional background social identity and α_3 represented the effects of avoidant attachment on collaborative job crafting. The effects of collaborative job crafting on in-role performance were represented by α_4 , extra-role performance by α_5 and work engagement by α_6 respectively. The symbol β symbolises the direct effects and was categorised into β_1 for information system self-efficacy, β_2 for functional background social identity and β_3 for avoidant attachment on each of the outcomes.

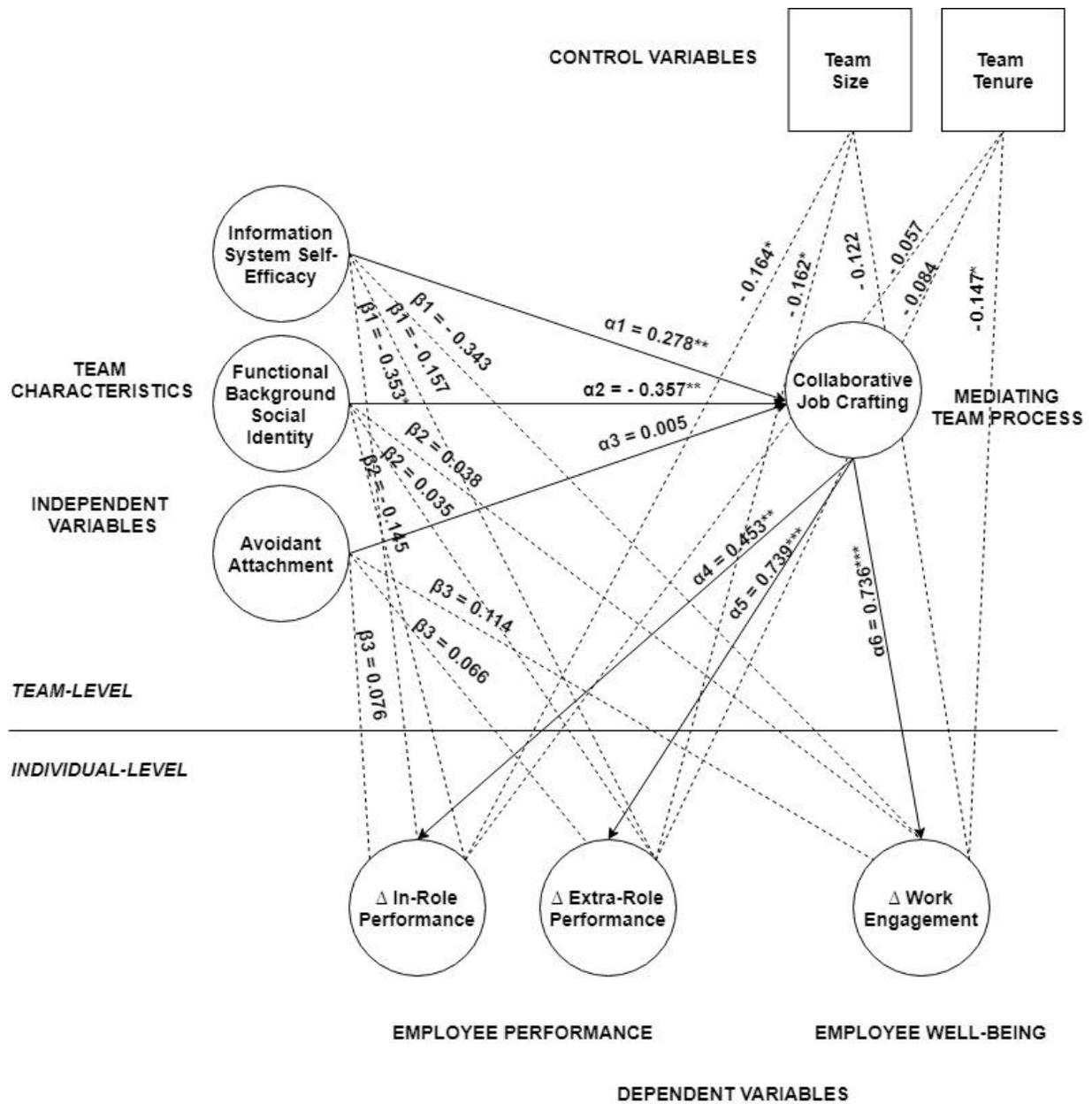


Figure 6. 3. Conceptual model with the estimates

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$

6.8 Concluding Remarks

The chapter presented the preliminary findings of the present study including the demonstration of the items of information system self-efficacy through principal axis factoring that loaded well onto the variable. Furthermore, the results of the data aggregation indicated the need for multilevel modelling, since project team characteristics involving information system self-efficacy, functional background social identity and avoidant attachment, and processes including collaborative job crafting had high ICC values. The results of the multilevel structural equation modelling revealed that teams with higher information system self-efficacy had significant positive effects with an increase in project outcomes through collaborative job crafting, while functional background social identity had significant negative effects with a decrease in project outcomes through team-level job crafting. The above findings are discussed in detail and the theoretical contributions of the present study are highlighted in the next chapter.

Chapter 7 Discussion

The following chapter focuses on the results that are discussed and some possible explanations for the observed effects (including both the direct and indirect effects) are clarified in terms of why these occurred in the view of current research and theories. The contributions and the practical implications of the study are highlighted at the end of the chapter.

7.1 Discussion

The main aim of the present study was to investigate the impact of specific project team characteristics on individual team members' performance and well-being. Moreover, the indirect effects through collaborative job crafting were explored in the above relationships through COR theory. The emphasis was to contribute to existing knowledge by determining specific project team characteristics (input) and collaborative job crafting (process) that may be considered as valuable team resources in facilitating the individual-level in-role and/or extra-role performance and work engagement (output) of project workers.

7.1.1 Direct Effects of Information System Self-Efficacy

Some researchers have found a strong positive relationship between self-efficacy and performance of a specific task (Kappagoda, 2018; Carter et al., 2016; Iroegbu, 2015; Lai and Chen, 2012; Jawahar et al., 2008; Judge et al., 2007; Randhawa, 2004), while others have reported a negative correlation between self-efficacy and performance (Vancouver and Kendall, 2006; Vancouver et al., 2002; Vancouver, Thompson and Williams, 2001). The results of the present study showed that higher team-level information system self-efficacy had a significant effect with a decrease in the in-role performance of individual team members over time. A possible explanation could be that teams with collective higher self-efficacy beliefs may bias the perception of their goal state leading them to believe that they have reached the goal more readily than those who have lower self-efficacy (Vancouver, Thompson and Williams, 2001; Vancouver et al., 2002). This could result in reduced efforts in terms of goal pursuit (Powers, 1973; Vancouver and Kendall, 2006). For example, project teams with aggregated high information system self-efficacy may have overconfidence in their levels of skills making them believe that they have achieved the project goals more easily, leading to reduced efforts by individual team members. This may negatively affect their performance levels.

A higher team-level information system self-efficacy had no significant effect on extra-role performance over time. This may be because self-efficacy is closely related to goal-setting theory. The theory on goal-

setting emphasises on the motivational effect of specific and challenging set goals of the organisation (Locke, 1968), and a person with high self-efficacy beliefs sets arduous goals and maintains a commitment to them (Bandura, 1997). To satisfy the condition of goal-setting theory, an individual must be committed to the goal and self-efficacy is one of the primary factors that enhance the goal commitment (Locke and Latham, 2002). Therefore, any contributions outside the job specification and towards extra-role performance are completely voluntary and are vague without any formal requirements. Hence, a team with collective higher information system self-efficacy may stick to their formal job responsibilities to achieve the project goals rather than engaging in extra-role responsibilities such as sharing the workload. Furthermore, higher team-level information system self-efficacy had no significant effect on work engagement over time. This finding is inconsistent with previous research (Xanthopoulou et al., 2007; Bakker et al., 2008). A possible justification for it could be the working environment which may have constrained the effects of aggregated higher information system self-efficacy on work engagement. Project teams in the IT sector are less organised as individuals work with people of different work styles, languages, cultures and generations (Snedkar, 2005) and hence, have less ability to influence the behaviour of other individual team members. Therefore, this may have restricted their communication, leading to no significant effect on the levels of work engagement.

7.1.2 Direct Effects of Functional Background Social Identity

A stronger team-level functional background social identity had no significant effects on outcomes such as in-role and/or extra-role performance and work engagement over time. Randel and Jaussi (2003) found that functional background social identity was positively associated with individual performance in a cross-functional team. However, in project teams, employees with collective stronger social identity towards their functional background had no effect on their in-role and/or extra-role performance and work engagement over time. Project members come from different functional backgrounds and departments of an organisation (Pearce, Powers and Kozlowski, 2015), which may increase the physical proximity between the team members involved. Therefore, a possible explanation could stem from construal-level theory, whereby employees create a more abstract and less accurate perception of individuals when there is a perceived distance between them (Fujita et al., 2006; Pinto, Pinto and Prescott, 1993), resulting in less cooperation and more deception (Bradner and Mark, 2002). This may not affect the levels of work engagement of an employee, further restricting their contribution to work responsibilities.

7.1.3 Direct Effects of Avoidant Attachment

A high team-level avoidant attachment had no effects on in-role and/or extra-role performance and work engagement of individual team members over time in the present study. Previous research on attachment theory at the workplace have found a significant relationship between avoidant attachment and extra-role performance (Erez et al., 2008; Geller and Bamberger, 2009; Rom and Mikulincer, 2003; Syna, Sabag and Ashton, 2006; Little et al., 2011). However, there are studies which have failed to find any significant association between attachment styles and supervisory-rated performance (Ronen and Zuroff, 2010) as well as leader/follower attachment style and performance (Daus and Joplin, 1999). In the context of a project team, the present study did not find any significant relationship between collective high attachment avoidance of employees and its impact on individual team members' in-role and/or extra-role performance and well-being. One possible reason for this could be the use of global attachment scale to assess the project worker's avoidant attachment style with significant others. The use of the global attachment scale may have been too generic for the current context, resulting in no significant association with the project team outcomes. As global and relationship-specific models may predict different outcomes (Klohn et al., 2005), it could be that use of relationship-specific models such as attachment to the team or attachment to the leader might offer better insight.

7.1.4 Indirect Effects of Information System Self-Efficacy

The main findings showed that a higher team-level information system self-efficacy was positively associated with an increase in the in-role and/or extra-role performance of individual team members through collaborative job crafting. The result suggested that employees who collectively have higher levels of information system self-efficacy acquire team resources such as job-related technical skills and confidence to put those skills into practice, leading to a high optimism (Hobfoll, 2001). This may result in a project team to invest their resources to gain new ones (Hobfoll, 1989) through collaborative job crafting activity. In fact, the result of collective redesigning of the job is more likely to enable each project employee to improve their in-role and/or extra-role performance. For example, project teams with high confidence in their information system skills are likely to use the technology at ease and engage in activities such as collaborative job crafting, whereby employees may collectively redesign their work by discussing the frequency of meetings that may benefit each individual team member. This may improve the performance of each employee within that team through increased communication. Previous studies have demonstrated that educators who engage in collaborative job crafting performed better (Leana, Appelbaum and Shevchuk, 2009) and had a positive association with extra-role performance (Lin, Law

and Zhou, 2017). Additionally, team-level job crafting was also positively associated with job performance in the travel industry (Cheng et al., 2016).

The results also revealed that higher team-level information system self-efficacy was positively associated with an increase in the work engagement of individual team members through its positive effect on team-level job crafting. According to COR theory, having a sense of self-efficacy is linked with social support and such employees are in a better position to invest their resources to acquire new resources (Hobfoll, 2001). A project team who has high job-related self-efficacy can invest resources in collaborative job crafting and collectively gain new resources from it. As a result of this, each project worker may benefit from having an improved work-related state of mind. For example, a project team with high information system self-efficacy is likely to be more confident in their everyday tasks performed through the use of technology. This confidence will enable it to engage in collaborative job crafting activities, whereby individual team members may learn about their peer's roles and responsibilities through informal discussion, resulting in decreased levels of stress and improved well-being. A recent study has echoed on collaborative job crafting indirectly strengthening work engagement of employees in the hospitality industry (Chen, Yen and Tsai, 2014). Moreover, collaborative job crafting was indirectly positively related to team member's work engagement in call centre teams (McClelland et al., 2014). The results of the present study further supported the case in IT project teams.

7.1.5 Indirect Effects of Functional Background Social Identity

The results showed that a stronger team-level functional background social identity was negatively associated with a decrease in the in-role and/or extra-role performance and work engagement of individual team members through its negative effect on collaborative job crafting. Research on social identity theory posits social identification as a change from feeling and thinking as a distinct individual, to feeling and thinking as a representative of a social group (Tajfel and Turner, 1986). This transition enables individuals to derive self-esteem from socially identifying with groups and to be motivated to maximise this potential for self-esteem (Tajfel and Turner, 1986). Social identification was found to be positively associated with performance in cross-functional teams (Randel and Jaussi, 2003). However, in the context of project teams, a possible explanation could be the physical distance between employees which may lead to an abstract conceptualisation of other members (Fujita et al., 2006; Pinto, Pinto and Prescott, 1993), making employees less cooperative with each other (Bradner and Mark, 2002). Proximity can be an effective tool in creating supporting group relationships and increased communication flows (Pinto, Pinto and Prescott, 1993). Project teams typically involve members from different functional backgrounds (Edmondson and Nembhard, 2009), who could be located in different

units or departments of the organisation leading to increased physical proximity. This may have a negative effect on team-level job crafting behaviours, resulting in depletion of resources (Hobfoll, 1988), leading to a poor contribution to job performance and a decline in work engagement among individual team members. For example, project teams with stronger functional background social identity may less likely cooperate with other team members due to any physical distance and this may limit their contribution to collaborative job crafting activities such as formal or informal discussions relating to the redesigning of the work.

7.1.6 Indirect Effects of Avoidant Attachment

The results found no significant association between high team-level avoidant attachment and outcomes such as individual team members' performance (in-role and/or extra-role responsibilities) and well-being (work engagement) through collaborative job crafting. Past research has shown a negative association of avoidant attachment and group processes (Rom and Mikulincer, 2003; Smith, Murphy and Coats, 1999) as well as on outcomes such as work engagement (Little et al., 2011; Littman-Ovadia, Oren and Lavy, 2013) and performance including extra-role duties (Rom and Mikulincer, 2003; Geller and Bamberger, 2009; Schusterschitz, Stummer and Geser, 2014) in different work settings. However, in a project environment, employees who were collectively high on avoidant attachment in a team had no effect on individual performance (in-role and/or extra-role) or work engagement through collaborative job crafting. This further implies that collaborative job crafting is not a key factor in explaining the indirect effect between the aggregated level of attachment avoidance of a team and outcomes in project teams. In fact, other team processes such as group cohesion could be used as a mediator between attachment avoidance and project team outcomes. Group cohesion has demonstrated the indirect effects of avoidant attachment on work outcomes in previous research (Mikulincer and Shaver, 2016).

7.2 Theoretical Contributions

Self-efficacy theory is a reasonable predictor of job performance, as highly self-efficacious individuals activate sufficient effort that if well executed produces successful outcomes, whereas those who are low in self-efficacy are likely to cease efforts prematurely and fail their task (Bandura, 1997). The present study was the first to create a measure of information system self-efficacy through a focus group in the context of IT project teams. The results revealed that a higher team-level information system self-efficacy makes a negative contribution with a decrease in the in-role performance of employees over time. This finding is inconsistent with the theory of self-efficacy and demonstrated that employees had a negative effect on their formal job performance despite having collective high self-efficacy in information system

skills in project teams. Therefore, when self-efficacy theory was applied to the context of a project team, the present study adds to the knowledge by demonstrating the negative effects of perceived self-efficacy on in-role performance. In IT project teams, the presence of interpersonal conflicts between the stakeholders such as hostility and poor communication (Robey, Smith and Vijayasathy, 1993), frustration and low morale (Barki and Hartwick, 2001), software redo (Sherif, Zmud and Browne, 2006) and decrease in team decision making (Pelled, Eisenhardt and Xin, 1999) can create conflicts (Liu et al., 2011) that may sometimes diminish the perceived discrepancy between the current state and goals, leading to negative effects on formal job performance.

The present study expanded COR theory by emphasising that specific characteristic such as aggregated higher information system self-efficacy of a group and processes such as collaborative job crafting were key team resources that enable individual team members to improve their performance and well-being in project teams. Perceived self-efficacy enhances performance through its effect on cognitive, affective or motivational intervening processes (Bandura, 1989). The finding suggested that higher information system self-efficacy was a key team resource for project workers that enable them to invest their resources into collaborative job crafting activities, resulting in a gain spiral (Hobfoll, 1988). Project teams with higher information system self-efficacy may select challenging settings, explore their environments or create new situations through a sense of competence (Bandura, 1992). Collaborative job crafting was a valuable team resource that will further increase the resources of project team members, leading them to perform better in their in-role and/or extra-role responsibilities and also improve their levels of work engagement. In fact, collaborative job crafting can stimulate employees to work together to change work practices and processes, resulting in the further acquisition of new resources (Leana, Appelbaum and Shevchuk, 2009).

Previous research has found that self-efficacy for teamwork was positively associated with team-level job crafting (McClelland et al., 2014; Mäkikangas, Bakker and Schaufeli, 2017). The present study established that higher self-efficacy in information system skills was a reasonable predictor of collaborative job crafting behaviour. This demonstrated that to facilitate team-level job crafting, a group's willingness and enthusiasm in their levels of technical skills to use software tools was a crucial contributor to increase a project team's job resource. Apart from self-efficacy, other antecedents such as team members' positive affect, connecting leadership and team climate were identified as key antecedents of team-level job crafting (Mäkikangas, Bakker and Schaufeli, 2017). The present study also asserted that a stronger functional background social identity of a team was associated with collaborative job crafting.

A stronger team-level functional background social identity had a negative effect with a decrease in the in-role and/or extra-role performance and work engagement of individual team members through collaborative job crafting. Based on social identity theory, an individual's self-identity and social identity influences his or her self-concept in a team and affects his or her attitudes and behaviours (Hogg and Terry, 2000). Employees who collectively identify with their functional background in a project team are more likely to perform cooperatively by distinguishing their functional background from each other to gain more self-esteem. From a COR perspective, employees with initial resources are in a better position to gain and invest in additional resources (Hobfoll, 1988; Halbesleben et al., 2014). However, the results are inconsistent with the gain spiral phenomena in project teams. The result adds to the COR theory by underlying certain team resources such as an employees' aggregated stronger social identity with their functional background were likely to have a negative effect on specific group behaviours such as team-level job crafting, leading to loss of resources for project workers. The finding is indicative of loss spiral corollary, whereby employees who lack resources are more vulnerable to resource loss and initial loss begets future loss (Hobfoll, 1988; 1998), leading to a decline in project team outcomes.

7.3 Practical Implications

The study draws important implications for the organisations employing project teams in the IT sector. Skills are crucial to functioning in any job and the same applies to project teams. Based on the results, higher information system self-efficacy is a key team resource for individual team members to perform better in their in-role and/or extra-role job performance and also enables them to improve their levels of work engagement. Project team leaders and human resource managers should focus on technical abilities in using software applications when hiring employees to work in IT project teams. Technological skills must be taken into consideration in project team settings (White and Leifer, 1986; Mtsweni, Horne and Poll, 2016) and further training should be given to employees who struggle with technology or have poor technical skills to boost their self-confidence. This highlights the importance of training for individual team members and also emphasises the need to keep everyone in a project team updated with the software development from time to time. By doing so, employees will become more proficient and confident with the updated software that could potentially help them to achieve collective goals.

Furthermore, some level of flexibility should be given to project team members to achieve collective results. Project team leaders should assist employees within their teams to jointly craft their job in such a way that it aligns with their organisational goals (Leana, Appelbaum and Shevchuk, 2009). Providing objectives and communication in a clear manner, managers should be able to guide team-level job crafting towards positive and organisational outcomes which can lead to higher levels of work

engagement and in turn positively affect the in-role and/or extra-role performance of each employee (Gruman and Saks, 2011). In fact, one way to achieve this is to integrate collaborative job crafting in formal job descriptions of a project worker, whereby employees and leaders engage in regular development discussions and seek agreement on what belongs within the domain of an employee's work and how work should be understood (Kira, Eijnatten and Balkin, 2010). This may result in each manager and employee taking time off from their usual work to discuss crafting opportunities and enable joint considerations of the task boundaries (Kira, Eijnatten and Balkin, 2010). By doing so, they will encourage a project team to gain more resources that will be beneficial for it to invest in additional complex tasks.

A team with stronger functional background social identity had a negative impact on collaborative job crafting in project teams. A project team comprises of individuals from different functional backgrounds who bring different assumptions, behaviours and routines at work (Edmondson and Nembhard, 2009; Denison, Hart and Kahn, 1996). When employees in a team socially identify with their functional background, this leads to a team comprising of different identities. For such a team to work collectively on group tasks, it is important for project team leaders to break the ice between members of different functional backgrounds from the start of the project, and open opportunities for reciprocation and feedback in the discussion (Wise, 2016; Tseng and Ku, 2011). This will enable employees to understand each other better and avoid any conflicts which can arise due to possible physical distance. One of the solutions can be through defining a vision for the team, generating a passion for the project, finding common ground and visualising the 'big picture' for the project to encourage better cohesion (Staples, Wong and Cameron, 2004). Moreover, the use of free tools such as Google groups can be employed for online collaboration outside work to create more transparency and shared meaning in team settings (Bjorn and Ngwenyama, 2009).

7.4 Concluding Remarks

The chapter elaborated on the explanation for the direct and indirect effect hypotheses of the present study. As highlighted, collective higher information system self-efficacy in a project team has a negative effect on the in-role performance of individual team members, which can be due to overconfidence in the levels of perceived skills. Furthermore, a project team with a collective higher information system self-efficacy have a positive effect on in-role and/or extra-role performance and work engagement of individual team members through its positive effect on collaborative job crafting. This suggested that information system self-efficacy and collaborative job crafting were key team resources for employees to boost their outcomes in a project team environment. An aggregated stronger functional background social

identity was negatively associated with the project team outcomes through collaborative job crafting and this may be due to any physical distance involved between individual team members. Practically, project team leaders should focus on team member's training in software tools and flexibility in the form of collaborative job crafting for improved outcomes. The present study discusses the limitations and areas of future research for these key findings in the next chapter.

Chapter 8 Conclusion

This final chapter brings the conclusion from the preceding chapters, which are examined in the light of the project teams. The present study has examined the relationship between input (project team characteristics) and process (collaborative job crafting) variables on output involving in-role and/or extra-role performance and work engagement of employees. The limitations of the work in this thesis are outlined and directions for future research are proposed followed by the conclusion.

8.1 Limitations and Recommendations

Despite the interesting findings, the present study has a few limitations. Firstly, the measures used in the study were all self-reported, which raises the possibility of common method bias and increases the additional concern that the relationships may be inflated. However, since the outcomes were repeated over time, this may have diminished the possibility of common method bias (Doty and Glick, 1998). Moreover, previous research suggests that self-reported data are not as limited as commonly expected (Spector, 1992). The respondent's answers were kept completely anonymous and different scale anchors were used when assessing team-level constructs and individual-level data (Podsakoff et al., 2003). Additionally, the items were clear, simple and specific to avoid any ambiguity (Podsakoff, MacKenzie and Podsakoff, 2012).

A second limitation was the use of subjective measures of performance by the team members. Subjective measures provided important perceptions of employees involved in project teams. The present study aimed to measure project team members' in-role and/or extra-role performance, as the success of a project is dependent on each individual contributing to the team's task (Gordon and Curlee, 2011; Barry and Stewart, 1997). In fact, anonymous self-evaluations of job performance by team members is better than the performance rated by team leaders, as the identities of the leaders are known to the employees they evaluate (Kock, 2017). Moreover, project team leaders were not directly involved in the project and it was difficult to report the in-role and/or extra-role duties performed by each individual within their teams. Therefore, collecting responses from individual team members was considered appropriate to assess the overall impact to project team success. However, subjective measures may be less accurate than objective data and future analysis may include the objective measures of performance from the team leaders.

A third limitation was based on the time lag between the repeated measures. The outcomes were measured in phase 1 and phase 3 and therefore the time lag between the two phases was 6 months. Future research may want to employ additional time points to measure the outcomes to test any significant

incremental or decremental changes from one-time lag to another. Measuring with more time points may capture the rate of change over time in employee performance (in-role and/or extra-role) and well-being (work engagement) by offering greater insight.

A fourth limitation was the test of reciprocal causality among the constructs of the present study. The current design was structured in such a way that it examines the impact of project team characteristics on team processes and their influence on outcomes. Reverse causation is expected equally likely between work engagement and job crafting (Bakker, Tims and Derks, 2012). Similarly, employee's in-role and/or extra-role performance may predict job crafting activities. Future research may employ cross-lagged design to examine the reciprocal effects of outcomes on team processes such as collaborative job crafting.

The fifth limitation was related to the project team characteristics. The responses were aggregated at the team-level by a simple average of the individual responses of team characteristics including information system self-efficacy, functional background social identity and avoidant attachment style. As the study was not expecting a consensus among the participants based on their characteristics and examined the homogenous attributes within a team, averaging the responses was considered appropriate. However, averaging the responses may have resulted in biased parameter estimates of the predictors (underestimation or overestimation), that could have masked important information of individual team member's skill efficacy, social identity or attachment level (Williams and Sternberg, 1988).

The avoidant attachment scale was measured on individual team members' global model of attachment, which can be applied to a wide range of situations and relationships, and was useful in shaping general tendency of an individual's relationship-specific models (Pierce and Lydon, 2001). In fact, there is research that suggests individuals possessing both general and relationship-specific attachment models (Klohn et al., 2005; Overall, Fletcher and Friesen, 2003; Pierce and Lydon, 2001). Given that a project team member may be part of multiple teams, a global model of attachment was considered to be more valid. This approach detailed the individual's attachment with significant others and thereafter the collective attachment style of individuals within a team was computed. However, this approach may have been too generic and relationship-specific models in the context of teams may provide accurate insight.

The correlation between in-role and/or extra-role performance was slightly higher (0.75) and this represented being the same construct. Future research may examine the differential effects of the present set of predictors on in-role and/or extra-role performance separately for more accurate insight into the roles performed by the project team members.

Another limitation was the homogeneous sample that led to high alpha values of the variables, as the data were collected from multinational organisations in India and focused specifically on project workers working in the IT sector. Nevertheless, the findings based on solid theoretical frameworks can be extended to other occupational sectors to determine if the results are similar. A rapid change in technology and increasing global competition in the marketplace (Paris, Salas and Cannon-Bowers, 2000) makes the project teams relevant to other occupational sectors such as finance or marketing industry.

A final limitation was the fact that there were no leader-level variables such as the leader's perceptions of team climate. Due to the restrictions based on their availability to participate in the present study, leaders have reported the team size and team tenure only. Nevertheless, additional variables at the leader-level could be further explored.

8.2 Future Research

Organisations rely on teams to reap the positive benefits that can result from a team-based work environment such as enhanced performance, employee benefits, reduced costs and organisational enhancements (Griffin and Moorhead, 2014). In that aspect, project teams are becoming increasingly important for business in facilitating effective communication, knowledge sharing and innovative thinking (Cormican, Morley and Folan, 2014; Huang, Hsieh and He, 2014; Sethi, Smith and Park, 2001) and through the review of the literature; a number of research gaps were identified, pointing to avenues for future research. The areas of future research differ from the limitations mentioned in the previous section, as the limitations focused specifically on the methodological weaknesses of the present study, whereas the future research concentrates on possible avenues of further exploring the current findings.

The present study highlighted the importance of collective information system self-efficacy as a team resource in improving individual team members' performance in terms of in-role and/or extra-role performance and well-being in relation to work engagement through its effect on team-level job crafting. The newly developed scale of information system self-efficacy could be used in future research. The effects of information system self-efficacy on other team processes (such as team coordination) can be further explored and the way it indirectly affects the present outcomes. Researchers can also explore the role of this newly developed scale as a potential moderator. Examining the role of information system self-efficacy as a moderator might help future researchers to understand the interaction effects of technical self-efficacy with variables such as task-technology fit on present work-related outcomes.

The role of social identity in project teams is another possible avenue to be explored. The present study had found an indirect negative association of aggregated functional background social identity on project team outcomes through collaborative job crafting. Future research could examine the role of functional background social identity in terms of majority/minority aspects in IT project teams. Identification processes are elicited more strongly by dichotomous categories such as minority versus majority, leading to biases that favour 'us' over 'them' (Hartstone and Augoustinos, 1995). Employees who are high in a majority with regards to a specific functional background or those that are low in a minority in a team may influence individual team members' in-role and/or extra-role performance and work engagement. Extending this concept to an IT project team can be one of the possible avenues for future research.

The work in the area of attachment and group dynamics is promising; however, it has focused exclusively on the positive outcomes of secure attachment (Yip et al., 2018). The avoidant attachment was examined as a predictor in the present study and the results found no significant association between collective avoidant attachment and work-related outcomes in project teams. Nevertheless, there was scope to investigate the effects of anxious attachment style on work-related outcomes. As both anxious and avoidant attachment styles are different from each other (Bartholomew, 1990), exploring the differential effects of them on outcomes such as individual team members' in-role and/or extra-role performance or work engagement in project teams remain unanswered. Additionally, attachment avoidance can also be tested as a moderator to explore its interaction effects with variables such as job autonomy (Littman-Ovadia, Oren and Lavy, 2013).

Collaborative job crafting was a key team process that has shown to have positive indirect effects between teams with collective higher information system self-efficacy and individual's performance (in-role and/or extra-role performance) and well-being (work engagement). The process of job crafting reflects an action-focused approach, whereby employees purposefully shape their work (Morrison and Phelps, 1999). Based on the taxonomy of team processes (Marks, Mathieu and Zaccaro, 2001), transitional or interpersonal processes can be further examined as a mediator in project teams. Project teams carry out defined, specialised and time-limited projects that disperse upon completion (Chen, Donahue and Klimoski, 2004). Therefore, transitional processes such as planning are paramount for a project team. While research has mostly focused on action or interpersonal processes, the area of transitional processes has been largely ignored (Gilson et al., 2015). Therefore, the role of a transitional process such as team reflexivity as a mediator between the present set of predictors and outcomes could be examined in the light of project teams.

The present study measured individual performance based on an employee's contribution to their formal job (in-role) and/or outside their job responsibilities (extra-role). Employee well-being was measured in relation to an individual-level of work engagement. Future research may extend these to other work-related outcomes such as job satisfaction, turnover intentions and absenteeism in the context of project teams.

Project team characteristics in the form of collective information system self-efficacy, functional background social identity and attachment avoidance have been examined in the present study. These characteristics were examined from a broader perspective of cognitive, social and behavioural input factors. Nevertheless, there is scope to look into other project team characteristics (from the perspective of cognitive, social or behavioural factors) such as collective group beliefs in terms of norms that may represent a reflection of values of team members and any informal rules that govern the team (Steers, 1981).

Finally, the present study examined the role of IT project teams and there is a potential area to investigate other types of projects such as virtual teams. Due to the advancement in technology and increasing globalisation (Kirkman, Gibson and Shapiro, 2001), virtual team projects are becoming popular for organisations and assessing the impact of specific distributed team characteristics on employee's in-role and/or extra-role performance and work engagement (Gilson et al., 2015) may offer an insight into its potential advantages.

8.3 Conclusion

Through adopting an IPO-based approach as an overarching framework to guide the present study, cognitive input factor involving information system self-efficacy had positive direct and indirect effects on output, while behavioural input factor including functional background social identity had negative indirect effects on output through process variable (i.e., collaborative job crafting). The original contribution to the knowledge was the negative direct effect of collective higher information system self-efficacy with a decrease in the in-role performance over time and positive indirect effect with an increase in project team outcomes through collaborative job crafting. Higher information system self-efficacy and collaborative job crafting were key project team resources that were likely to enable individual team members to achieve improved outcomes. Functional background social identity led to a resource loss in project team outcomes, through its effect on collaborative job crafting. The present study revealed encouraging results and aimed to answer the research questions listed below:

1. How do project team characteristics such as information system self-efficacy, functional background social identity and avoidant attachment style influence employee's in-role and/or extra-role performance?
2. How do project team characteristics such as information system self-efficacy, functional background social identity and avoidant attachment style influence employee work engagement?
3. What is the role of collaborative job crafting in the relationship between specific characteristics of a project team and employee's in-role and/or extra-role performance?
4. What is the role of collaborative job crafting in the relationship between specific characteristics of a project team and employee work engagement?

Characteristics such as higher team-level self-efficacy in information system skills can negatively influence individual team members' in-role performance over time. The results raised an important question regarding the confidence levels of IT project workers in utilising their technical skill set to use software tools and further elaborated that sometimes over-confidence may lead to reduced efforts by employees in achieving the desired goals (Powers, 1973; Vancouver and Kendall, 2006). Although project team characteristics did not influence an employee's well-being directly, it also pointed out that having specific characteristics in a project team such as high technical self-efficacy was not enough to promote the mental health of employees.

The role of collaborative job crafting was explored in the light of COR theory. The results revealed that information system self-efficacy and collaborative job crafting were crucial team resources that could facilitate an individual team member's performance over time in project teams. High technical self-efficacy of employees when combined with collaborative job crafting activities within a project team, increases the resources of individual team members and enabled them to contribute to their prescribed duties and also go beyond their specified role requirements. Employees who are competent in their technical skill set to use software packages were likely to put in more efforts in handling day-to-day complex tasks through greater flexibility.

Additionally, aggregated higher information system self-efficacy and team-level job crafting played a key role in improving individual team members' well-being by increasing their levels of work engagement over time. Crafting jobs will further enable opportunities for interactions between project team members and provide more clarity in understanding other team members' roles and responsibilities. This process may further lead to a better understanding of the shared workload among project workers.

A stronger team-level functional background social identity resulted in depletion of resources among project team members and restricted them to engage in collaborative job crafting activities. Employees'

identification with their functional background may prove to be a barrier for them to understand the perspective of other individuals within an IT project team. Due to the complexity of a project team, whereby team members may be co-located in different units or departments leading to physical proximity (Pinto, Pinto and Prescott, 1993), individuals who may strongly associate with their functional expertise are likely to require more efforts to collaborate with other employees and engage in teamwork activities; this may negatively influence the project outcomes.

The study offers an insight into the performance and well-being of employees from the perspective of specific project team characteristics, however, the results should be treated with caution as there could be other factors such as a project team structure, complexity of a project and working conditions of employees that may restrict the findings of the present study. Despite this, collective higher information system self-efficacy and collaborative job crafting were identified as potential project team resources. Project team leaders should consider these two elements by encouraging key traits such as high confidence in technical skills in using software tools and fostering collaborative job crafting in project teams to inspire employees to achieve the overall goals.

To be successful in a project team, employees require good technical skills and knowledge of the varied software packages that could help them to collaborate with other employees to achieve the common organisational goals. Making subtle yet meaningful changes to the scope of an employee's work will enable individuals to perform better and keep them more engaged in a project team. The present study identified new additional factors that may facilitate individual performance and well-being in a project team and aimed to answer the unanswered questions in this direction. IT project teams have many benefits; however, there are also challenges associated with them (Goatham, 2009; Hartman and Ashrafi, 2002), which cannot be overlooked. Identifying the strengths and challenges of a project team will provide good opportunities for organisations in the IT sector to utilise their resources to full potential and achieve success.

Chapter 9 References

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Chapter 10 Appendices

10.1 Recruitment Letter



OPPORTUNITY FOR IT COMPANIES TO PARTICIPATE IN AN IMPORTANT RESEARCH STUDY

Background: The research study examines the factors that may facilitate or act as a barrier to the performance and employee well-being in project teams. Project teams are widely used for conducting business in the IT sector. Individual performance and employee work engagement may get affected due to high failure rates of a project team that may arise from lack of confidence in technical skills, weak team identity and poor working relationships of employees.

Purpose of the research: The main aim of the research is to assess how specific project team characteristics have an impact on the team process, performance and well-being of individuals.

Benefits to participating organisations: The companies that participate in the research project will receive feedback report which will include recommendations on how specific factors such as the characteristics of a project team may influence the in-role and/or extra-role performance and work engagement of individual members. These recommendations can be used by organisations and team leaders to improve **performance** and **employee well-being**.

What is required of the organisation: Team leaders and members who have worked in a project team will be invited to complete a short questionnaire about their experiences of the functioning of the team as well as the performance and well-being aspects.

The research is towards my doctoral degree in IT project teams, performance and well-being to the University of East Anglia. For further information, please contact **Mr Rahul Goel**, email: r.goel@uea.ac.uk.

The Research Team: Rahul Goel, Dr Annilee Game and Professor Ana Sanz Vergel (all University of East Anglia), Professor Karina Nielsen (Former Supervisor - University of Sheffield). The project also benefits from a similar study conducted in the area of occupational safety and health for distributed workers by the University of East Anglia which is running parallel to the present research. **Website:** <https://www.uea.ac.uk/norwich-business-school/re-search/iosh-project>

10.2 Survey Questions

The Impact of Project Team Characteristics on Employee Performance and Well-being in the IT Sector: The Mediating Role of Collaborative Job Crafting

Project Team Members (participation in all the three phases)

Consent to Participate in Research conducted at the University of East Anglia

You are invited to participate in the research study, entitled “The Impact of Project Team Characteristics on Employee Performance and Well-being in the IT Sector: The Mediating Role of Collaborative Job Crafting”. The study is being conducted by Rahul Goel (Email: r.goel@uea.ac.uk) and supervised by Dr Annilee Game and Professor Ana Sanz Vergel at Norwich Business School, University of East Anglia. The research has received ethical approval from the University of East Anglia.

Your participation in the study will contribute to a better understanding of the influence of specific project team characteristics on the functioning, performance and well-being of employees. You are free to contact the investigator at the above email address to discuss the study. You were selected to participate in the research based on the following characteristics: you are working in the IT sector and are currently part of a project team.

If you agree to participate:

- You will complete three surveys at different points in time, including questions based on specific project team characteristics, performance and well-being aspects.
- Each survey will take approximately 10 minutes of your time.

The risks to any participant are low. It is up to the individual whether they wish to participate and no personally identifiable information will be collected. All data collected will be considered strictly confidential.

Your participation in this study is voluntary. You may decline to answer any question and have the right

to withdraw from the participation at any time. Withdrawal will not affect your relationship with the University of East Anglia.

Please base your responses for this and subsequent surveys on your current experience within a project team.

If you have any questions about the study contact the researcher through email r.goel@uea.ac.uk.

Thank you very much.

1. I consent to take part in this survey and I am over 18 years of age

Yes

2. Are you part of a project team currently?

Yes No

3. Please generate an identification code for the survey. The code should consist of the first letter of your mother's first name, followed by the first letter of your father's first name, followed by the first letter of your surname, followed by the month of your date of birth. For example, if your name is John Smith, your mother's name is Michelle Smith, your father's name is David Smith and your date of birth is 13-05-1992, then your code is MDS05. This is a unique code that is untraceable and your identity will not be traced.

First letter of your mother's first name

First letter of your father's first name

First letter of your surname

Month of your date of birth

4. Please select your gender: Male Female

5. How many hours per week do you work:

6. Please select your age bracket: Under 25 years 26-30 years 31-35 years
 36-40 years 41-45 years 46-50 years
 51-55 years 56-60 years 61-65 years
 Over 66 years

7. Please select your overall job experience: Under 1 year 1-3 years 3-6 years
 6-9 years Over 9 years

8. Please select the highest level of education completed: High school or below Diploma
 Bachelors Degree Masters Degree
 Doctorate/PhD Degree
9. Please specify your functional background (for example, if your background is in information technology, then please specify IT. If you have more than one functional backgrounds, for example, IT and Finance, then please specify both):

In-Role Performance –

Do you agree that you -	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
Adequately complete assigned duties					
Fulfil responsibilities specified in job description					
Perform tasks that are expected of you					
Meet formal performance requirement of the job					

Extra-Role Performance –

Do you agree that you -	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
Go out of the way to help new employees					
Help other team members who have heavy workloads					
Help others who have been absent in the team					

Work Engagement –

Please score the following statements that best describes your feelings at work –	Never	Almost Never (A few times a year or less)	Rarely (Once a month or less)	Sometimes (A few times a month)	Often (Once a week)	Very Often (A few times a week)	Always (Everyday)
When I get up in the morning, I feel like going to work							
I am enthusiastic about my job							
My job inspires me							
I am proud of the work that I do							
At my work, I feel bursting with energy							
I am immersed in my work							
I get carried away when I am working							
At my job, I feel strong and vigorous							
I feel happy when I am working intensely							

Collaborative Job Crafting –

How often does your team engage in the following behaviours –	Never	Rarely	Sometimes	Often	Everyday
Works together to introduce new approaches to improve tasks					
Changes minor work procedure that our team thinks are not productive (such as lunch times or transition routines)					
Changes the way we do our job to make it easier for ourselves					
Decide with other team members to coordinate schedules					
Decide with other team members to plan and attend meetings					

Information System Self-Efficacy –

To what extent do you agree with the following statements, based on your technical skills -	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I can use technology to attend/conduct project meetings using my technical skills					
I can communicate with other team members during project meetings using my technical knowledge					
I can coordinate with other team members during project meetings using my technical knowledge					
I can collaborate with other team members during project meetings using my technical knowledge					

Functional Background Social Identity –

Thinking about your team members, to what extent do you agree -	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
When others with my functional background are successful, I feel that all of us with the same functional background have been successful					
I share in the successes of others with similar functional background					
When others with my functional background are recognised for their accomplishments, I feel like I have accomplished something too					

Avoidant Attachment –

Please rate to what extent you describe your relationships at work in general –	Not at all like me	A bit like me	Somewhat like me	Often like me	Very much like me
I like to have close personal relationships with people at work					
I work hard at developing close working relationships					
I make close friendships at work					
I don't need close friendships at work					
A close friendship is a necessary part of a good working relationship					

Project Team Leaders (Participation only in the first phase)

Consent to Participate in Research conducted at the University of East Anglia

You are invited to participate in the research study, entitled “The Impact of Project Team Characteristics on Employee Performance and Well-being in the IT Sector: The Mediating Role of Collaborative Job Crafting”. The study is being conducted by Rahul Goel (Email: r.goel@uea.ac.uk) and supervised by Dr Annilee Game and Professor Ana Sanz Vergel at Norwich Business School, University of East Anglia. The research has received ethical approval from the University of East Anglia.

Your participation in the study will contribute to a better understanding of the characteristics of a project

team that is managed. You are free to contact the investigator at the above email address to discuss the study. You were selected to participate in the research based on the following characteristics: you are working in the IT sector and are currently managing a project team.

If you agree to participate, the survey will take approximately 5 minutes of your time. The risks to any participant are low. It is up to the individual whether they wish to participate and no personally identifiable information will be collected. All data collected will be considered strictly confidential.

Your participation in this study is voluntary. You may decline to answer any question and have the right to withdraw from the participation at any time. Withdrawal will not affect your relationship with the University of East Anglia.

Please base your responses for the survey on your current experience within a project team. If you have any questions about the study contact the researcher through email r.goel@uea.ac.uk.

Thank you very much.

1. I consent to take part in this survey and I am over 18 years of age

Yes

2. Are you managing a project team currently?

Yes No

3. Please generate an identification code for the survey. The code should consist of the first letter of your mother's first name, followed by the first letter of your father's first name, followed by the first letter of your surname, followed by the month of your date of birth. For example, if your name is John Smith, your mother's name is Michelle Smith, your father's name is David Smith and your date of birth is 13-05-1992, then your code is MDS05. This is a unique code that is untraceable and your identity will not be traced.

First letter of your mother's first name

First letter of your father's first name

First letter of your surname

Month of your date of birth

4. Please select your gender: Male Female

5. How many hours per week do you work:
6. Please select your age bracket: Under 25 years 26-30 years 31-35 years
 36-40 years 41-45 years 46-50 years
 51-55 years 56-60 years 61-65 years
 Over 66 years
7. Please select your overall job experience: Under 1 year 1-3 years 3-6 years
 6-9 years Over 9 years
8. Please select the highest level of education completed: High school or below Diploma
 Bachelors Degree Masters Degree
 Doctorate/PhD Degree
9. How long (in months) is the project estimated for:
10. How many individuals (in numbers) do you have in your team (including you)

10.3 Thematic Map of Information System Self-Efficacy Scale

