The influence of team trust, potency and leadership on the intent to share knowledge and team creativity

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The Influence of Team Trust, Potency and Leadership on the Intent to Share Knowledge and Team Creativity

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A research thesis submitted to the Graduate College of Management, Southern Cross University, Australia, in partial fulfillment of the requirements for the degree of Doctor of Business Administration

29 March 2012
Statement of Original Authorship

I certify that the substance of this thesis has not been submitted for any degree and is not currently being submitted for any other degree.

I also certify that to the best of my knowledge any assistance received in preparing this thesis and all sources used have been acknowledged and referenced in this thesis.

Signed ……………………………………………………………

LAM Tak Ming

Date: 29 March 2012
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Abstract

Although several studies have investigated the factors that make for effective teams, few have investigated what factors increase team creativity. Therefore, the objective of this study is to investigate the relationship between team behavior, intent to share knowledge, and team creativity. Creativity becomes more important to organizations as they look beyond short-term profits by developing innovative products that enable them to survive in the long run (Elsbach & Hargadon, 2006; Oldham & Cummings, 1996). But the type of creativity that is helpful to organizations rarely occurs in isolation. It is usually a result of an interaction of leaders, individuals, teams, and their knowledge (Csikszentmihalyi, 1996). So organizations are focusing on teamwork to boost creativity. Based on a literature review of team creativity, this paper establishes a theoretical framework that identifies two important factors: the team members’ intent to share knowledge and team potency. But the intent to share knowledge and team potency is also influenced by team trust and team leadership. Team potency has a positive impact on team members’ intent to share knowledge.

This study uses quantitative surveys to explore team creativity. All participants were employees from large organizations across different industries and locations in Hong Kong and Mainland China. The 486 qualifying participants, in which 65 from Hong Kong and the remaining 421 from other Mainland China cities, had all worked on a project team within the past 2 years. The members of the teams had met face to face or in virtual space on a regular basis more than one year. It was assumed that people who worked in a team environment were knowledgeable about working in a team. All collected information was strictly confidential. Descriptive data such as means and standard deviations were calculated.
Reliability coefficients were calculated for each measure. Data was analyzed using the Statistical Package for the Social Sciences (SPSS) and SmartPLS.

The results indicated that a higher level of team trust was strongly associated with intent to share knowledge within the team. Teams with higher trust also had greater team potency within the team. Team leadership affected the intent to share knowledge and team potency. Furthermore, teams with higher potency beliefs had stronger intent to share knowledge. Team creativity also increased intent to share knowledge. Finally, teams with stronger potency beliefs also had greater team creativity. Results also indicated that team creativity had a positive impact on team potency and that team leadership positively influenced team creativity through the mediating effect of team potency.

The findings from this research can help organizations understand more about the relationship between team behavior, the intent to share knowledge, and team creativity. Team members in the companies will also be able to gain insight into how teamwork can increase their team creativity. The research intends to grant these team members greater knowledge and understanding of the importance of leadership in order to enhance team creativity. Improving team creativity may improve the products and services of organizations. The newly developed products and services can satisfy more people’s needs and wants, which can improve quality of life. In turn, this may benefit the community in general.

Key words: team creativity, intent to share knowledge, team potency, team trust, and team leadership
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<td>Analysis of Variance</td>
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<tr>
<td>HREC</td>
<td>Human Research Ethics Committee</td>
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<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>SmartPLS</td>
<td>Smart Partial Least Square</td>
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<tr>
<td>KM</td>
<td>Knowledge Management</td>
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<tr>
<td>SAS</td>
<td>Statistical Analysis Software</td>
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<tr>
<td>STATPAK</td>
<td>Statistical Software Package</td>
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<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
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<td>TP</td>
<td>Team Potency</td>
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<td>ISK</td>
<td>Intent to Share Knowledge</td>
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<td>SEM</td>
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<td>PCA</td>
<td>Principal Component Analysis</td>
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<td>Abbreviation</td>
<td>Explanation</td>
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<td>KMO</td>
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Chapter 1 INTRODUCTION

1.1 Introduction

Because companies are having to compete in the global marketplace increasingly, it is becoming more important for them to sustain competitive advantage and core competencies. In such an environment, creativity becomes more important because it will help them develop innovative products that will enable them to survive in the long run (Elsbach & Hargadon, 2006; Oldham & Cummings, 1996).

The type of creativity that is useful to organizations rarely occurs in isolation. It is usually a result of the interaction of leaders, people, team members, and their knowledge (Csikszentmihalyi, 1996). So to boost creativity, organizations are focusing on teamwork. They are doing this to (1) boost effectiveness and empowerment (Milliken & Martins, 1996) and (2) realize the potential benefits of diversity (Williams & O’Reilly, 1998). Therefore, the purpose of this study is to investigate the relationships between team leadership, team trust, the intent to share knowledge, team potency, and team creativity. Creativity that is useful to organizations rarely occurs in isolation. It is usually a result of interaction amongst leaders, people, team members and their knowledge (Csikszentmihalyi, 1996).

1.1.1 Objectives

The objective of this chapter is to present the background to this research, explaining why team creativity is important to organizations. A preliminary literature review determined the
research focus and identified the gaps in the research so far: the relationships between team behavior, team potency, the intent to share knowledge, and team creativity.

This chapter goes on to lay out a theoretical framework, research questions, and hypotheses. The remainder of this chapter explains the research methodology, including the contributions and limitations of this research.

1.1.2 Structure

This chapter consists of 10 sections. The structure of this chapter is outlined in Section 1.1. Figure 1.1 (below) details that structure. Section 1.2 reviews prior research on the impact of team trust, potency, and leadership on the intent to share knowledge and team creativity. Section 1.3 identifies the research objectives, theoretical framework, and hypotheses. Section 1.4 proposes the research design, sampling, data collection, data analysis, and ethical considerations. Section 1.5 presents definitions of terms used in this research. Section 1.6 explains why research is needed on this topic. Section 1.7 discusses the contributions of the research. Section 1.8 identifies the limitations of the research. Section 1.9 presents an overview of the structure of the thesis, and Section 1.10 concludes the chapter.
Figure 1.1 Structure of Chapter 1

1.1 Introduction

1.2 Research background and the research problem

1.3 Research issues

1.4 Research methodology

1.5 Definition of key terms

1.6 Justification for the research

1.7 Contributions of the research

1.8 Structure of the thesis

1.9 Conclusion
1.2 Research background and the research problem

This section provides an overview of the research background and the research problem.

1.2.1 Research background

In considering the strong competition and uncertainty in the global market for the organizations operating in Hong Kong, China and overseas cities, it is becoming more important than ever for organizations to sustain their competitive advantages. In connecting the stakeholders in the global environment, one possibility in meeting this challenge is to increase the use of work teams to improve an organization’s effectiveness (Neuman & Wright, 1999). Work teams are defined as “interdependent individuals who share responsibility for specific outcomes of the organization” (Sundstorm, 1999). With technological advancement and increasing global competition, more organizations are using teamwork to get cost-effective, higher quality products and services (Parker, 1990). Companies also commonly use work teams to increase efficiency and employee satisfaction.

Approximately 20 years ago, Hong Kong started seeing a decline in manufacturing and an increase in the services industry. At the same time, Mainland China became the world’s factory, producing a large number of products for the globe. Because this study takes place in Hong Kong and Mainland China, it looks at teamwork effectiveness in both the service and manufacturing sectors.

According to Sundstorm, DeMeuse, and Futrell (1990), team effectiveness is more a process than an end-state. Organizational elements and characteristics of the team contribute to this process, and the process winds up influencing the organization’s effectiveness and viability
(Gladstein, 1984). Guzzo and Dickson (1996) emphasize the mutual influence between group performance and organization performance. In her review, Dyer (1984) discussed several critical issues: team formation theories, team structures, task performance, and team measurement. She found that research had explored team performance, but there was still a need to better understand how teams work. Bass (1982, p. 227) reached a similar conclusion, saying the most obvious long-term research need is to learn more about the interaction between the contents of the team and the conditions imposed on them. Bass also identified a need to research the types of interaction processes that are likely to improve team productivity for members with certain capabilities.

Many researchers have explored team processes and identified several important elements: performance measurement, leadership behavior, team coordination, and team member communication (Salas, Sims, & Burke, 2005). Recently, changes to the business environment—technology, globalization, and the increasing complexity of work—have led organizations to better understand team effectiveness. These kinds of studies can be seen in the military, private business, and the public sector. This has stimulated a large number of studies on team effectiveness, particularly teams working in complex, dynamic, and non-structured organizations (e.g., Cannon-Bowers & Salas, 2001; Cohen & Bailey, 1997; Edmondson, 1999; Kozlowski & Ilgen, 2006).

One way of defining teamwork is the dynamic, simultaneous, and recursive enactment of process mechanisms that inhibit or contribute to team performance and performance outcomes (Salas, Stagl, Burke, & Goodwin, 2007, p. 190). Teamwork and taskwork can be distinguished by the competencies within a team (Morgan, Glickman, Woodard, Blaiwes, & Salas, 1986). In general, taskwork competencies are the knowledge, skills, attitudes, and other characteristics (KSAOs) used to achieve individual task performance. However, the
application of these skills does not need interdependent interaction inside a team. Similarly, teamwork competencies are the KSAOs necessary for members to function within an interdependent team. By this principle, team members must have both individual-level expertise and expertise in the social dynamics of teamwork (Salas et al., 2006).

Hackman (1987) argued that we cannot understand team effectiveness by merely looking at productivity or task output. Team effectiveness should be measured by task outcomes and team outcomes, as well as social and personal criteria. Additional criteria include how well the initial conditions were dealt with, how well the processes were carried out, and how well the team adjusted its processes and learned from its progress.

The input-process-output (IPO) framework is one fully developed model of teamwork (Hackman, 1983). Salas, Dickinson, Converse, and Tannenbaum (1992) proposed a normative model of team effectiveness by focusing on the basic structure of IPO. Team effectiveness depends on the level of effort contributed by team members, the knowledge and skills that can be used to perform the task, and the selection of the most appropriate task strategies. Furthermore, Salas and colleagues (1992) suggested that the resources distributed to the team can influence effectiveness. Rewards are another important variable. Individual rewards may bring out competition, but team rewards may bring out cooperation (Steiner, 1972). Tannenbaum and colleagues (1992) suggested that feedback on team performance affect team processes. Klimoski and Jones (1995) identified several determining factors for team effectiveness: team members’ mixture of knowledge, skills, and attitudes (KSAs), as well as leadership. They emphasized that team effectiveness does not come from individual effort alone. The interpersonal dynamics of the team, trust, and compatibility among team members can all influence the effectiveness of a team.
Brainstorming tends to help teams generate more ideas and better ideas compared to individuals (Mullen, Johnson, & Salas, 1991). Other scholars have also highlighted the positive potential for social and group factors in creativity (Nystrom, 1979; West, 1990), and there has been a general increase in interest in teamwork and its potential for enhancing productivity and innovation (Paulus, Brown, & Ortega, 1999).

Much research has focused on factors that enhance team innovation, such as organizational support, autonomy, and inter-team communication (Amabile, Conti, Coon, Lazenby, & Herron, 1996; West, 2003). Researchers have also found many important variables for teams—information exchange, social influence, conflict, and negotiation—and these processes can also be critical for team innovation (Drach-Zahavy & Somech, 2001).

Inter-team comparisons appear to be helpful, particularly when a team is given feedback that it performed worse than other teams (Coskun, 2000). The diversity of team members is also important. There is some evidence that some degree of ethnic diversity enhances the performance of brainstorming teams (McCleod, Lobel, & Cox, 1996). Teams composed of individuals who have a preference for working in teams tend to perform better (Larey & Paulus, 1999). Although team brainstorming may not be more effective than individual brainstorming, being part of a team may be motivating, and ideas that come from team interaction may have more support than ideas that come from individuals (Furnham, 2000). The teamwork literature also makes it clear that effective teamwork is strongly related to goal setting, a supportive environment, psychological safety, norms, team member characteristics, diversity, training, and the use of trained facilitations (Bradley et al., 2003; West, 2003).
Leadership is key for team creativity (Mumford et al., 2002). Contemporary research provides evidence that transformational leadership increases team outputs (Bass & Avolio, 1990) because it elevates team identification and motivation by increasing the intrinsic valence of team goal accomplishment, communicating visions, and emphasizing collective outcomes (Shamir, House, & Arthur, 1993). A lot of research looks at individual predictors of creativity, such as personality traits (Feist, 1998). In contrast, the processes of creativity have seldom been studied (Shalley & Gilson, 2004). Paulus, PB, Larey, TS & Dzindolet, MT (2000) have developed a cognitive theory of group creativity with the idea of cognitive stimulation. They argue that sharing ideas in groups should stimulate additional ideas. An alternative perspective is that people may not have sufficient opportunity to demonstrate the stimulation value of this information during the sharing session (Paulus, PB, Larey, TS & Dzindolet, MT 2000).

As Chapter 2 will show, there has not been any research yet on the relationship between team members’ intent to share knowledge, team potency, and team creativity. A dedicated study into this area is needed. The overall purpose of this study, therefore, is to fill this gap and extend research on team creativity into Hong Kong and other Mainland China cities. Hence, it is important to discuss what factors might improve team performance and improve creativity for the industries in Hong Kong and other Mainland China cities. Team trust and team leadership are thought to be the main factors influencing team potency and team members’ intent to share knowledge. These concepts are outlined in detail in Chapter 2, the literature review. It is important to investigate how these factors contribute to team creativity because there has not been any prior research in this area.
1.2.2 Research problems and questions

Using teamwork to enhance innovation and creativity is very important to organizational performance. Most organizations attempt to develop innovative and marketable products and services which will enable them to survive in the long term (Elsbach & Hargadon, 2006; Oldham & Cummings, 1996; Van de Ven, 1986). Organizations are increasingly using teams to generate creativity. Organizations like to use teams because they assume that they boost productivity and innovation (Devine, Clayton, Philips, Dunford, & Melner, 1999). They may inspire innovation because they can take advantage of diverse skills and information in developing new ideas and initiatives (Drach-Zahavy & Somech, 2001). Teams may also be a source of motivation, especially when they have a lot of autonomy (Cohen & Bailey, 1997).

Although it might be indisputable that diversity of knowledge or expertise in a team will enhance its creativity, thus far the evidence is not very convincing (Brown & Paulus, 2002). One possible explanation is that being in a team pushes people to focus on shared rather than unique information (Stasser & Birchmeier, 2003), which hamstrings the benefits of knowledge diversity.

A review of the existing literature indicates that there has not been any research on whether intent to share knowledge and team potency affects team creativity. However, some research has been conducted into the effects of team trust and team leadership on overall team performance. Hence, this study asks what factors influence team creativity, focusing on two key factors: (1) team members’ intent to share knowledge in formal or informal knowledge management organizations and (2) team potency. This research also explores the effects of team trust and team leadership.
The central question of this research is to identify the underlying determinants of team creativity. Five key questions are proposed:

1. What factors affect team creativity?

2. What is the impact of team trust on team members’ intent to share knowledge and team potency?

3. What is the impact of team leadership on team members’ intent to share knowledge and team potency?

4. What is the impact of team potency on team members’ intent to share knowledge?

5. What are the impacts of team members’ intent to share knowledge and team potency on team creativity?

1.3 Research issues

This section provides an overview of the research objectives, theoretical framework and research hypotheses in this research.

1.3.1 Research objectives

The key elements which will be explored in this study include the linkages amongst team trust, team leadership, and team members’ intent to share knowledge, team potency and quality of team creativity. This study used interviews and questionnaires to understand the
experience of team members working in various industries and organizations in Hong Kong and Mainland China.

1.3.2 Theoretical framework

This research adapts models from many authors:

1. Team potency (de Jong, de Ruyter & Wetzels, 2005)

2. Intent to share knowledge (Ajzen, 1991)

3. Team trust (Sarker, Valacich, & Sarker, 2003)

4. Team leadership (Sivaubramaniam, Murry, Avolio, & Jung, 2002)

5. Team creativity (Thacker, 1997)

Figure 2.2 shows the conceptual framework of team creativity. Team creativity was rated according to two measures: the team members’ intent to share knowledge and team potency. Intent to share knowledge and team potency can also be influenced by team trust and team leadership. This theoretical framework organizes the research hypotheses presented in next section.

1.4 Research methodology

This section provides an overview of the research methods used to collect and analyze the data presented in Chapter Three.
1.4.1 Research design

The research begins in Chapter Two with a review of the literature on team creativity. The seven hypotheses above emerged from this review. Quantitative research was judged to be suitable for testing the hypotheses. Essentially, this research focuses more on testing theory rather than on building theory, so positivism is a suitable paradigm (Perry, Riegs, & Brown 1999).

Of the three types of quantitative research designs, descriptive and causal research were chosen for the following reasons:

(a) Descriptive research is ideal for describing the characteristics of team creativity process in an organizational setting;

(b) Team members’ intent to share knowledge within organizations is best measured quantitatively;

(c) An overview of all aspects of the team members’ intent to share knowledge is necessary for team members to understand the complexity of interrelated variables;

(d) The objective of the research is to establish cause-and-effect relationships between influencing factors of team trust, team leadership, team potency, intent to share knowledge, and team creativity;

(e) Since this research does not involve new concepts or ideas, exploratory research methods are not appropriate.
Qualitative research can be used to develop a theory that builds an explanation (Denzin & Lincoln, 1994; Gummesson, 1991) of how the independent variables affect team creativity and the intent to share knowledge. In contrast, quantitative research typically examines preset variables. Those variables are usually derived from theory, prior research, or deduced from statistics (Gill & Johnson, 1991). The literature review for this research indicated that these four independent variables are likely to be related to team creativity. By quantifying these variables in questionnaires, this study can deduce the relationship between them.

A comparison between the two approaches suggests that qualitative research is best for gathering a large amount of information about a small number of people where the information is not reducible to numbers. Conversely, a quantitative approach uses statistical analysis and brings forth numerical evidence to draw conclusions or test hypotheses (Bakken, 1996). For reliability, the sample size used in quantitative research needs to be large. Quantitative research is also expected to be replicable (Kim, Lim, & Bhargava 1998; Ticehurst & Veal 2000).

Quantitative research is suitable for this study because it aims to gather data from a large number of subjects. Furthermore, given the fact that this research investigates the influence of certain variables on other outcome variables, a quantitative approach is appropriate. Furthermore, the current study does not aim to develop theory, but rather to test the application of existing theory in a specific context.

Quantitative research enables this study to approach the analysis process by using statistics, tables, and charts. It also measures the relationships among variables (Creswell 2003; Neuman 2003). This study aims to predict dependent variables—the intent to share
knowledge, team potency, and team creativity—depending on the independent variables of team trust and team leadership. It also aims to test the significance of its hypotheses. Thus, data collection of this study will use a survey questionnaire to gather data from a large number of respondents.

1.4.2 Sampling and data collection

After considering three research techniques—experiment, observation, and questionnaire surveys—and their implications, surveys were chosen for the following reasons:

1. Primary data needs to be collected from a representative sample of a population in order to make generalizations about the factors that influence team creativity;

2. Surveys are most suitable to study attitudes and behaviors;

3. Surveys allow for standardization and uniformity so that the researcher can compare and contrast answers;

4. Survey results are fairly reliable and accurate;

5. Surveys are efficient and inexpensive, suitable for the time and financial resources of this project.

For this study, a quantitative, survey based approach was adopted to explore the team creativity. All data collected were in the form of primary data. The questionnaire design took into consideration all relevant factors generated from the literature review. Five-point
Likert scales were used for questions about the influencing factors, as this is the most commonly used questionnaire style for attitudes and opinions.

All participants were staff members from large organizations in different industries and locations in Hong Kong and other Mainland China cities. The 486 qualifying participants, in which 65 from Hong Kong and the remaining 421 from other Mainland China cities, had all worked on a project team within the past few years. It was assumed that people who worked in a team environment were most knowledgeable about working in a team. This sample size met the statistical requirements of the survey. This study draws conclusions about team members’ creativity through the relationship with intent to share knowledge, team trust, team leadership, and team potency.

1.4.3 Data analysis

After data collection, the process of analysis began with a variety of techniques to obtain results for testing the hypotheses. The first step of analysis was preparing the data, which required editing, coding, categorizing, and entering data in a software program. The next step was to get a feel for the data through descriptive statistics, such as means, standard deviations, correlations, and frequency distributions. The data was then analyzed with reliability tests and validity determination. Interpretation of the results was the last step (Sekaran, 2003).

Most survey-based business research accumulates a large amount of data, which is more efficiently processed by computer programs. Data preparation involves data editing, data coding, data categorization and entering data into the computer program. Data editing is the
process of checking for incompleteness and inconsistencies of respondents. Blank responses must be handled by a pre-set procedure depending on variable scales and the question structure. Data coding is the process of identifying each answer with a numerical score or character. Data categorizing is the process of classifying variables into groups of concepts and constructs. Raw data are then entered into the computer program either manually or by using scanner sheets (Sekaran, 2003).

There are many software programs for data analysis, including SPSS, SmartPLS, SAS, STATPAK, SYSTAT, and Excel. SPSS and SmartPLS were selected because of the simplicity and completeness of their design (Sekaran, 2003).

1.4.4 Ethical considerations

Ethical research must protect the rights of participants. Ethics are an important aspect of the planning, design, and conduct of research projects (Bryman & Bell, 2003). The ethics involved may be described as the behavioral standards that guide moral choices about behavior with others, which are guided by societal norms that suggest codes of conduct that are appropriate in given circumstances (Cooper & Emory, 1995; Zikmund 1997, 2000).

Ethical research needs to balance the rights of others with the value of advancing knowledge. The ethical treatment of respondents requires that participation is voluntary and informed and that they have the right to withdraw, obtain results, and confidentiality. Researchers must make respondents aware of the purpose, procedures, risks, and benefits of their research, as well as the procedures to protect confidentiality (Neuman, 2000). Additionally, the researcher must maintain a research standard to ensure that the results are accurate and
objective (Zikmund, 2003). Therefore, ethical research can reduce harm to respondents and their organization and improve the quality of research results (Ticehurst & Veal, 2000).

Researchers must be concerned about any potential unethical behaviour that could be involved in their research. This study therefore addressed the ethical issues concerning the researcher, the questionnaire, and the respondents.

This research project meets all ethical standards and principles established by the NHMRC (The National Health and Medical Research Council), the University, and the research community. It was concluded that the research posed no possibility of harm to any participants or businesses. In addition, the ethics application for the research was approved on May 19, 2009 (Approval number ECN-09-046) by the Human Research Ethics Committee (HREC) of Southern Cross University.

1.5 Definition of key terms

Definitions of various terms used in this research are as follows:

**Team:** A team is a group of people linked by a common purpose. Teams are especially appropriate for conducting tasks that are complex and have many interdependent subtasks. Not all groups are teams. There is evidence that this leads to better performance (Hackman, 1987; Cannon-Bowers & Salas, 1998). Teams normally have members with complementary skills and can generate synergy through a coordinated effort that allows each member to maximize his or her strengths and minimize his or her weaknesses (Salas et al., 2006).
**Teamwork:** Teamwork is the dynamic, simultaneous, and recursive enactment of process mechanisms that affect team performance (Salas, Stagl, Burke, & Goodwin, 2007, p. 190). Teamwork consists of a variety of behavioral patterns that collectively enhance the effective functioning of an interdependent work team (Dickinson & McIntyre, 1997). Consistent with current theorizing (e.g., Cannon-Bowers, Tannenbaum, Salas, & Mathieu, 1995; Dickinson & McIntyre, 1997; McIntyre & Salas, 1995), teamwork was conceptualized as a global unitary construct consisting of different facets or clusters of behaviors such as communication, coordination, performance monitoring, and team building.

**Team Potency:** Team potency is the collective belief within a group that it can be effective (Guzzo, Yost, Campbell, & Shea, 1993). Guzzo et al. (1993) describe potency as both an antecedent and outcome of team effectiveness, i.e. they proposed that the constructs are reciprocally and longitudinally related. Potency is the influence that a team, action, or idea has on people's lives, feelings, or beliefs (de Jong et al., 2005). Potency and collective efficacy are highly related concepts—both are concerned with the measurement of confidence at the group level of analysis (Shamir, 1990).

**Knowledge Sharing:** The exchange of knowledge among people, friends, or members of a family, community, or organization. Knowledge sharing constitutes a major challenge in the field of knowledge management because some employees tend to resist sharing their knowledge with the rest of the organization (Ajzen, 1991).

**Trust:** Trust appears related to individual attributions about other people’s intentions and motives underlying their behavior (Smith and Barclay, 1997). A trusted party is presumed to seek to fulfill policies, ethical codes, laws, and promises. Trust does not need to involve belief in the good character or morals of the other party (Saonee Sarker et al., 2003).
McKnight et al. (1998) refer to trust as the belief and the willingness to depend on another party. Jones and George (1998) associate the willingness to become vulnerable to a set of behavioural expectations that allows individuals to manage the uncertainty or risk associated with their actions. Risk appears central in many definitions of trust and consists of the perceived probability of loss as perceived by the trusting person(s) (Mayer et al., 1995).

**Leadership:** Leadership is ultimately about creating a way for people to contribute to making something extraordinary happen. Put even more simply, the leader is the inspiration and director of the action. He or she is the person in the group that possesses the combination of personality and skills that makes others want to follow his or her direction. McGee-Cooper and Trammell (1995) proposed that leaders should engage in deep and respectful listening in order to fully understand the followers’ ideas and thoughts. Deming (1986) added to this by implying that leaders should listen to followers without judging the quality or intent of the message until hearing the full message.

**Creativity:** Creativity is a useful and effective response to evolutionary changes (Runco, 2004 p. 658). Creativity is a response to the continual innovation and resourcefulness that have become necessary for economic survival (Craft, 2003). Creativity is considered important for our society to maintain its current economic status. According to Cropley and Cropley (2000), many corporations have rediscovered the value of creativity because the cost of a product is determined by its design; creative designs can lead to cost savings.

### 1.6 Justification for the research
The most important consideration in initiating this research project was the gap in the literature on the factors influencing team creativity in Hong Kong and Mainland Chinese organizations. In addition, the growing importance of team creativity in the face of global competition justifies the research in terms of timing, significance, and potential beneficiaries.

1.6.1 Gaps in the literature

The literature review process undertaken for this research ascertained that there has been limited research that has identified and quantified the factors influencing team creativity in organizations. The gap in knowledge on this subject is significant, especially considering the growing importance of creativity and teamwork. This research attempts to fill that gap.

1.6.2 Importance of team creativity

Creativity becomes more important to organizations as they attempt to look past short-term profits by developing innovative products that enable them to survive in the long run (Elsbach & Hargadon, 2006; Oldham & Cummings, 1996; Van de Ven, 1986). This research can therefore benefit organizations with insight into how to improve team performance by improving team creativity.

1.6.3 Importance to the community
Improving team creativity may improve the products and services of organizations. The newly developed products and services can satisfy more people’s needs and wants, which can improve quality of life. This may benefit the community in general.

1.7 Contributions of the research

Since this study is the first attempt to quantify the factors that influence team creativity in organizations in Hong Kong and Mainland China, its contribution to the body of knowledge is significant. The results also provide practical information for various groups:

a. Participants will be able to come to a greater understanding about the relationship between team behavior, the intent to share knowledge, and creativity. Team members will be able to gain insight into how to boost creativity through teamwork. The research intends to give these team members greater understanding of the importance of leadership in order to enhance team creativity.

b. As stated, boosting creativity may improve the products and services of organizations. The new developed products and services can satisfy more people’s needs and wants.

c. The literature review indicates that there is a gap in research on the relationship between team behavior, the intent to share knowledge, and team creativity. The findings of this research can help to bridge this knowledge gap.
1.8 Structure of the thesis

This research thesis consists of six chapters outlined as follows:

Chapter 1: Introduction

Chapter 2: Literature Review

Chapter 3: Research Methodology

Chapter 4: Data Collection and Analysis

Chapter 5: Conclusion and Implication

Chapter 1 presented a background to the research, followed by an introduction of the research problems, aims, objectives, and hypotheses. It has also provided an overview of the research methodology, definition of variables, limitations, and an outline of the thesis structure.

Chapter 2 provides a comprehensive review of the literature on team creativity and its influencing factors. This chapter also provides details on two major influencing factors: team members’ intent to share knowledge and team potency. The chapter concludes with the development of a theoretical framework and research hypotheses.

Chapter 3 presents the research methodology and includes information about the sampling methods, data collection, research design, and questionnaire development. This chapter also considers the important issues of data reliability and validity, along with the ethical considerations and the limitations of the research.
Chapter 4 presents the results of data analysis. It begins with an explanation of the data screening procedures used to check for missing data, outliers, and normal distributions. Second, it presents the results of statistical analysis. Hypotheses are tested and a model of predicted online repurchase behavior is constructed using independent t-tests, discriminate analysis, and multiple linear regressions.

Chapter 5 summarizes the research results with conclusions and implications. The contributions and limitations of the research are discussed.

1.9 Conclusion

This chapter has outlined the background to this research project in order to introduce the key research problems. It has also explained the research aims, objectives, questions, and hypotheses. Key definitions of terms have been presented, and the research methodology has been explained. Finally, the limitations of this research were briefly discussed, and an outline of each chapter was presented. In order to further understand the background of the topic and highlight the need for the proposed research, the next chapter reviews the existing literature on team creativity.
Chapter 2 LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to review the literature on team performance and team creativity. Based on this review, this chapter proposes a conceptual model aimed at investigating the factors that influence team creativity. The three primary literature areas used to develop this chapter are the nature of teamwork, the relationship between team effectiveness and team performance, and team creativity.

This chapter is divided into eight sections, as shown in Figure 2.1. Section 2.1 introduces the topic. Section 2.2 explains the nature of teamwork, including an explanation of the definition of teamwork, a model of teamwork, teamwork coordination mechanisms, and teamwork behaviors. Section 2.3 discusses team effectiveness, team performance, and team development. Section 2.4 focuses specifically on team creativity. In particular, it considers the important relationships between team creativity and team performance. Section 2.5 discusses the antecedents of team creativity. The theoretical framework and overall hypotheses are presented in Section 2.6. This is followed by the conclusions to this chapter, summarized in Section 2.7.
Figure 2.1 Structure of Chapter 2

2.1 Introduction

2.2 Focus one: The nature of teamwork

2.3 Focus two: The relationship between team effectiveness and team performance

2.4 Focus three: Team creativity

2.5 Antecedents of quality team creativity

2.6 The theoretical framework and overall hypotheses

2.7 Conclusion
2.2 Focus one: The nature of teamwork

Dyer (1984) presented a review of teamwork based on several critical issues in team formation theories, team structures, task performance, and team measurement. Dyer concluded that prior research had examined the factors influencing team performance, but there were still gaps in the understanding of teams. In organizational team research, Bass (1982, p. 227) reached a similar conclusion, stating that “the most obvious long term research need is to learn much more about exactly what interaction processes result from properties of the team and the conditions, imposed on it, and what types of interaction processes are likely to be conducive to team productivity for members with certain capabilities.”

The next section introduces some key issues related to teamwork in general, including definitions of teamwork, teamwork models, and team behaviors.

2.2.1 The definition of teamwork

Teamwork is the dynamic, simultaneous, and recursive enactment of process mechanisms that inhibit or contribute to team performance and performance outcomes (Salas, Stagl, Burke, & Goodwin, 2007, p. 190). The terms “teamwork” and “taskwork” can be distinguished according to the competencies within a team (McIntyre & Salas, 1995; Morgan, Glickman, Woodard, Blaiwes, & Salas, 1986).

In general, taskwork competencies are the knowledge, skills, attitudes, and other characteristics (KSAOs) use to achieve “individual” task performance. These skills do not depend on interacting with other team members. Teamwork competencies are the
applications of KSAOs necessary for members to function within an interdependent team. By this principle, team members must process not only individual-level expertise relevant to the technical performance of their own individual tasks, but also expertise in the social dynamics of teamwork (Salas et al., 2006).

2.2.2 A model of teamwork

Salas and colleagues (2005) proposed five core components to teamwork: (1) team leadership; (2) team orientation; (3) mutual performance monitoring; (4) backup behavior; and (5) adaptability. Different types of teamwork have their own contexts, and these may have different requirements for each of the five teamwork components. Team leadership significantly contributes to the effectiveness of teams and organizations at large. In general, leaders solve social problems through four types of actions: (1) the search for and structuring of information; (2) the use of information in problem solving; (3) the management of personnel resources; and (4) the management of material resources. Researchers have concluded that the functional approach to leadership is an important perspective (e.g., Fleishman et al., 1991; Hackman, 2002; Zaccaro, Rittman, & Marks, 2001).

The concept of shared leadership has been developed to cope with fast-changing working environments. Shared leadership is the “transference of the leadership function among team members to take advantage of member strengths (e.g., knowledge, skills, attitudes, perspectives, contacts, and time available) as dictated by either environmental demands or the development stage of the team” (Burke, Fiore, & Salas, 2004, p. 105). Having flexible leaders allows the team to adapt better to changing working environments and helps
optimally leverage individual-level expertise. Some research shows that shared leadership is more effective than traditional leadership (Pearce & Sims, 2002).

Adaptability is an important component of teamwork, especially for teams working under dynamic conditions. There has only been a small amount of research dealing with all aspects of team performance and processes (Dyer, 1984). Researchers have pointed out this gap in the research (e.g., Gersick, 1988; Morgan, Salas, & Glickman, 2001). Teams can achieve adaptive performance when they go through four different phases. First there is the situation assessment, where team members find patterns in the environment and build a good understanding of their present situation. The second phase is plan formulation, where the team builds a series of actions to deal with their current situation. The third phase is plan execution, which is achieved by team coordination. The fourth phase is team learning, where they evaluate team performance. Adaptability has been framed in different ways, such as the self-regulation of processes related to individual and team goals (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004) and temporal entrainment (Harrison, Mohammed, Mcgrath, Florey, & Vanderstoep, 2003).

The objective of mutual performance monitoring is for an individual to “keep track of fellow team member’s work while carrying out their own…to ensure that everything is running as expected and…to ensure that they are following procedures correctly” (McIntyre & Salas, 1995, p. 23). This is an important element of teamwork, but it has a negative side effect because it depends on the team members’ perceptions. However, if team members use mutual performance monitoring to avoid personal responsibility for mistakes, it will bring more negative effects than benefits.
Successful teams should frame performance monitoring as a way of improving performance. Mutual performance monitoring is a necessary prerequisite for backup behavior, and backup is necessary to turn mutual performance monitoring into performance gains. Backup behavior is physical and verbal assistance. Supporting behavior is “the discretionary provision of resources and task related effort to another…when there is recognition by potential backup providers that there is a workload distribution problem in their team” (Porter et al., 2003, pp. 391-392). Team members can correct the errors of other team members. This reduces the number of mistakes in the team’s performance, and the feedback helps team members develop their skills.

Team orientation is the aptitude to coordinate, evaluate, and use the input of teammates (Driskell & Salas, 1992). It is more than an individual’s preference for working in a team versus in isolation. Team orientation is important for effective teamwork. For example, research studies show that when teams experience increasing levels of stress, team members can respond by narrowing their attention. They shift their focus away from the team and focus on their individual work (Driskell & Salas, 1991; Kleinman & Serfaty, 1989). When team members are stressed, they are less likely to consider new ideas, input, or feedback from other team members. This can cause poor team performance (Driskell, Salas, & Johnston, 1999).

2.2.3 Teamwork coordinating mechanisms

The five core components of teamwork in the model above can be constructed by three major coordination mechanisms: (1) shared mental models, (2) closed-loop communication, (3) and mutual trust. Shared mental models are organized knowledge structures that
facilitate the execution of interdependent team processes (Klimoski & Mohammed, 1994).

An individual-level mental model is a knowledge structure involved in the process of integrating information and comprehending a phenomenon of interest (Johnson-Laird, 1983). At the team level, a mental model is a shared knowledge structure or mental representation that is partially shared and partially distributed throughout a team. The sharing or distribution helps all of the team members understand the incoming information in an agreeable manner that can create effective coordination. Shared mental models can create more effective and adaptive team performance and higher-quality decision-making (Cannon-Bowers et al., 1993; Stout, Cannon-Bowers, & Salas, 1996; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). However, the accuracy of shared mental models is more important to team performance than sharing (Edwards, Day, Arthur, & Bell, 2006). Accuracy can be set as a prerequisite to obtain benefits from shared mental models, as there may be little value in sharing inaccurate mental models.

Closed-loop communication is a pattern of communication that enables effective teamwork. The three elements of closed-loop communication are: (1) a message initiated by the sender; (2) the message being received, interpreted, and acknowledged by the receiver; and (3) a follow-up by the sender ensuring that the message was received and appropriately interpreted (McIntyre & Salas, 1995). This pattern of communication helps us confirm that all team members are operating under the same goals, plans, and understanding of the situation (Orasanu, 1990, 1994). Communication helps teams convert individual-level understanding into the team-level representations that guide coordinated action (Cooke, Salas, Kiekel, & Bell, 2004). Effective teams are able to shift between implicit and explicit communication in response to changing environmental demands and task constraints (Entin & Serfaty, 1999; Espinosa, Lerch, & Kraut, 2004).
Webber defined mutual trust as “the shared perception…that individuals in the team will perform particular actions important to its members and…will recognize and protect the rights and interests of all the team members engaged in their joint endeavor” (Webber, 2002, p. 205). Mutual trust is important for effective teamwork because it supports mutual performance monitoring and backup behavior. If there is no mutual trust, team members will waste time by unnecessarily checking up on other team members to ensure that they are performing adequately (Cooper & Sawaf, 1996). Mutual trust can improve contributions, participation, outcome quality, and retention (Bandow, 2001; Jones & George, 1998).

### 2.2.4 Teamwork behaviors

In the framework of action regulation theory, Rousseau and colleagues (2006) construct the concept of teamwork behavior via two categories: (1) regulation of team performance and (2) team maintenance. There are two types of teamwork that contribute to team maintenance: (1) psychological support and (2) integrative conflict management. There are four types of team maintenance: (1) preparation of work accomplishment (e.g., team mission analysis, goal specification, and planning); (2) work-assessment behaviors (e.g., performance monitoring and systems monitoring); (3) task-related collaborative behaviors (e.g., coordination, cooperation, and information exchange); and (4) team-adjustment behaviors (e.g., backing up, intra-team coaching, collaborative problem solving, and team-practice innovation). By organizing teamwork behaviors within a framework of regulation processes, Rousseau and colleagues introduce the time element into their conceptual structure of teamwork behaviors. Different teamwork behaviors are more likely to occur during different stages. For example,
mission analysis will likely occur in a team’s preparation phase. This organization parallels the temporal framework of team processes (Marks et al., 2001).

2.3 Focus two: The relationship between team effectiveness and team performance

The more the business environment shifts with changes in technology and globalization, the more complex work becomes. Complex work has led more organizations to understand the importance of team effectiveness. This environment has stimulated a large number of explorations into team effectiveness, particularly teams working in complex, dynamic, and non-structured organizational environments (e.g., Cannon-Bowers & Salas, 1995, Edmondson, 1999; Kozlowski & Ilgen, 2006).

The following section introduces some key issues related to team development, team effectiveness, and team performance. The relationship between team effectiveness and team performance is reviewed.

2.3.1 Team development

To understand team development, Gersick (1988) observed eight teams over their entire team-development lifespan. Based on his findings, Gersick developed a model of team effectiveness. This model recommended that teams determine an initial method of performance when they first come together and that they stick to this method until midway through the target objective. Upon reaching this middle section, the team members become aware of the time left to completion, review their previous efforts, and modify their strategy.
accordingly for the second half of the performance cycle. This theory of team development has made a significant impact on team effectiveness research by demonstrating the interactive nature of team performance and the ability of teams to adapt their strategies over time.

Based on this model, Waller, Zellmer Bruhn, and Giambatista (2002) clarified the connection between time and team development. Even though teams focus on different factors depending on the type of deadline imposed, the project midpoint remains a transition opportunity regardless of the stability of the team’s deadline. Other researchers have argued that time and team developments are important in team leadership. Kozlowski, Gully, Nason, and Smith (1999) argue for the changing role of the leader over different stages. Similarly, Hackman and Wageman (2005) believe that the focus of leading will differ depending on the team development stages.

The most popular and widely used model of team development (Tuckman, 1965) recommends five stages: forming, storming, norming, performing, and adjourning.

1. Forming: team members ask questions to test concerns about their roles in a team, particularly leadership responsibilities and about the resource allocation within the team. Individual team members often find out information about other team members, particularly their experience with the type of work that the team will undertake. They are likely to be anxious about the expectations outside the team and request guidance that will affect the team’s working methods. The most important task at this stage is to ensure that team objectives are clearly stated and agreed upon by team members
2. Storming: conflict may arise between team members. The selection, responsibility, and capability of the leaders are challenged, and individuals have to deal with any resistance by the leader, who controls team processes. This stage reveals the honesty and openness within the team as they work through the conflicts. The team leader must try to gain shared commitment to the team objectives, build trust, form team roles, and set up conflict-resolution policies.

3. Norming: conflicts are minimized, and the team begins to work on the task with good cooperation at this stage. Plans are developed and working standards are formed. Team members more readily express their views and opinions, and networks for mutual support are developed. The team leader should allow the team to take responsibility for its own planning and team processes at this stage; this allows team members to make mistakes and encourages the team to reflect upon them.

4. Performing: at this stage, team members settle into an effective team-working structure, within which individual members feel comfortable and begin to work together more effectively. The team leader does not need to keep monitoring the day-to-day operations—a change that is usually acknowledged and welcomed by team members. At this stage, regular review should be established to ensure the team works effectively.

5. Adjourning: not all teams go through this stage, but at various times of its life key members will leave or major projects will be completed. It is important that the team members be informed about the effects of such changes on the life of the team. Teams may revert to earlier stages of development depending on their levels of maturity, their stability, and the scale of the change.
It is a popular team development model and will be adopted in this research as a good reference. However, this is not to say that all teams naturally will go through all stages of Tuckman’s sequence. It is very common that a team might jump back and forth between different stages to deal with problems gradually at different levels. Team members can ensure their team development is effective by ensuring that the team task is clear, team conflicts are processed with satisfactory consequences, team members’ roles are clear, positive norms are established, and the team performs well in a timely fashion when its task is completed.

2.3.2 Team effectiveness

Teams are often evaluated in terms of their effectiveness—but with little explanation as to what is meant by either of these terms. Hackman (1987) suggests that merely looking at productivity or task output is not sufficient; social and personal criteria should also be included. Team effectiveness criteria should cover task- and team-related outcomes. Additional criteria can include how well the initial conditions were dealt with, how well the processes were carried out, and how well the team adjusted its processes and learned from its experiences.

The IPO framework is one fully developed model of teamwork (Driskell, Salas, & Hogan, 1987; Hackman, 1983). The input factors reflect the team’s potential for productivity. However, potential for productivity does not equal effectiveness. Instead, the difference between potential and actual effectiveness is a function of team processes. Driskell and colleagues (1987) believe that the interaction of the group input factors and group processes
lead either to process gain or process loss. Furthermore, this model suggests that some input conditions can promote process gain (Collins & Guetzkow, 1964).

Hackman (1983) suggests that for a team to be successful it must have a clear direction, performance-enabling situations, good team design with clear task structure, core team norms, supportive organizational context, and expert coaching and process assistance. Salas, Dickinson, Converse, and Tannenbaum (1992) propose a normative model of team effectiveness based on IPO. They argue that organizational context and group design affect the member-interaction process, which in turn affects team performance. Team effectiveness depends on the effort of team members, the knowledge and skills they can use for the task, and the right task-performance strategies. Furthermore, Salas and colleagues (1992) point out that the resources distributed to the team can influence effectiveness.

Tannenbaum and colleagues (1992) define the team’s context with an emphasis on organizational characteristics and structures. Individual rewards may incite competition, whereas team rewards may bring about cooperation, which influences team effectiveness (Hackman, 1983; Steiner, 1972). Tannenbaum and colleagues (1992) also incorporate team interventions into the process (such as team training and team building). These are included as moderating techniques to improve goal setting and enhance team characteristics and interpersonal relationships, thus improving team processes and team performance. Tannenbaum and colleagues (1992) also suggest that feedback on team performance affects team processes.

Klimoski and Jones (1995) incorporate team members’ mixture of KSAs, as well as leadership into the scope of input components. They emphasize that team effectiveness does not come from individual effort alone. The interpersonal dynamics in the team, trust, and
compatibility among team members are all components that can shape the effectiveness of a team. Shanahan (2001) also identifies leadership as an important component of team effectiveness.

Rasker, van Vliet, van den Broek, and Essens (2001) provide a comprehensive model of team effectiveness from their studies based on five categories of factors: situational, organizational, team, individual, and task. Team and individual factors make up the human elements of the model. Continuous assessment and adjustment with appropriate feedback within a team is critical to its effectiveness throughout the process, at intermediate review, and after the mission.

Recently Ilgen, Hollenbeck, Johnson, and Jundt (2005) propose an input-mediated-output-input (IMOI) framework, in which the processes are replaced by mediation variables to reflect the wider scope of factors for team effectiveness. They also propose different stages of team effectiveness to capture development of the team: the forming stage (IM), the functioning stage (MO), and the finishing stage (OI). In the forming stage, affective variables (e.g., trust and psychological safety) and task-related variables (e.g., planning and shared mental models) are used. In the functioning phase, bonding, adapting to novel and dynamic situations, and learning each other’s standpoints and behaviors are used. In the finishing phase, team members discover factors that influenced team performance based on having worked in the team. The finishing phase has received little attention in the literature so far.

Also, the IPO framework has provided the groundwork for the development of models of team effectiveness. IPO theory speculates that input factors have indirect effects on outputs
like team performance. Many of the most influential and well-known models of team effectiveness follow this pattern (e.g., Nieva, Fleishman, & Reick, 1978; Hackman, 1983).

Gladstein (1984) develops a model of team effectiveness that suggests that individual-level input factors—such as group composition and group structure—can influence group effectiveness through group processes. Campion and colleagues (1993) present a meta-model of 19 input variables thought to influence team effectiveness. These variables can be categorized into five groups: interdependence, composition, context, job design, and process. Hackman (1987) suggests that input factors—including organizational context and group design—are connected to a set of team processes, which are related to team effectiveness.

Technically, only job design, interdependence, composition, and context are considered input variables. The input factors are based on the theory of motivational job design. These factors include self-management, participation, task variety, task significance, and task identity. Interdependence includes goal interdependence, task interdependence, and interdependent feedback and rewards. Campion and colleagues suggested that interdependence characteristics may increase the motivational properties of work and thus may be related to effectiveness. The composition theme is included based on its circulation in other models of team effectiveness (e.g., Guzzo & Shea, 1992; Hackman, 1987) and includes heterogeneity, flexibility, relative size, and preference for group work.

Tannenbaum, Beard, and Salas (1992) suggest a relatively comprehensive model of team effectiveness with the integration of a list of six team processes: coordination, communication, conflict resolution, decision making, problem solving, and boundary spanning. Salas and colleagues (2001) define a set of teamwork skill dimensions, including adaptability, shared situational awareness, performance monitoring and feedback, leadership
and team management, interpersonal relations, coordination, communication, and decision making. McIntyre and Salas (1995) propose several principles describing essential teamwork behaviors: performance monitoring, feedback, closed-loop communication, and backup behavior. Dickinson and McIntyre (1997) integrate team-attitude competencies and team-skill competencies into a model composed of team processes that interact in a complex network: communication, team orientation, team leadership, monitoring, feedback, backup behavior, and coordination. Finally, Marks and colleagues (2001) propose a teamwork process by outlining 10 critical components that can be found in IPO loops: mission analysis, goal specification, strategy formulation and planning, monitoring progress towards goals, systems monitoring, team monitoring and backup, coordination, conflict management, motivating and confidence building, and affect management.

In general, team effectiveness relies on the team process, the team member activities, team members’ individual level expectations and team members’ behaviors. The team leaders can make the significant contributions to build team members’ believe they can make it. Will team effectiveness affected by culture, social environment and company styles? Those are the areas we want to have the answers in this research.

### 2.3.3 Team performance

The effectiveness of employees working in teams is an important characteristic that organizations look for in their staff (Bradley, White, & Mennecke, 2003). Team members also appear to have positive feelings for teams with good performance (Cotton, 1993). Productivity is only one common criterion for evaluating the usefulness of different kinds of group work (e.g., Furnham, 2000). Some other criteria include: enhanced group morale and
motivation, opportunities to develop social and intellectual skills, commitment to decisions that come out of group processes, and opportunities to learn to work with diverse group members. Participants in face-to-face idea generation groups appear to rate their performance more favorably than people in electronic brainstorming groups, but people in electronic brainstorming groups tend to rate their performance more favorably than people in face-to-face groups (Pinsonneault, Barki, Gallupe, & Hoppen, 1999). Participants are not good at accurately judging their performance (Connolly, Jessup, & Valacich, 1990).

Individuals tend to compare themselves with others similar to themselves (Festinger, 1954; Goethals & Darley, 1987), so coworkers are a natural basis for comparison. Individuals in groups can use other group members as a reference point for assessing their own performance. Comparisons may influence both perceptions and motivation. If someone discovers their performance level is below that of coworkers, this person should negatively evaluate their performance and be motivated to increase their effort. Conversely, if they are doing better than coworkers, they should evaluate their performance favorably and have a reduced motivation for performance. This perspective suggests a tendency for performance of individual group members to flow toward a group norm.

The performance-evaluation process is affected by the personal motivations of the individuals and the social context. If individuals are achievement-oriented, they should be particularly interested in social comparison with other group members and be motivated to exceed the group norm. Others may be more concerned with just getting by (Schwartz et al., 2002) and may be happy as long as their performance is in the general range of the group norm. This individual tendency is likely to be influenced by cultural mores, as exemplified by cultural differences in social loafing (Karau & Williams, 1993). An emphasis on competition and individual achievement should lead to a tendency toward upward
comparison in which individuals are more concerned with showing off their abilities than in matching the group norm (Paulus, Dugosh, Dzindolet, Coskun, & Putman, 2002; Sutton & Hargadon, 1996).

Beliefs about group efficacy can also be affected by prescriptive ideals in the organizational or broader culture. When team members or outside evaluators are asked to evaluate the effectiveness of a particular team, one would expect that evaluations based on organizational support, psychological safety, and external demands would have a positive influence on evaluations of team performance (West, 2003).

In general, whether teams can perform better than an individual depends on the structure of the team. Is the leader leading the team well? Is knowledge good enough to flow internally and be shared with all members of the team? Do the team members have a strong enough belief such that they can implement objectives? Those are the important factors to increase the team performance. Recently, people have more interest of the performance of creativity in organizations. In China, there are a number of organizations that want to transform their businesses from manufacturing to innovative operations. They believe that teamwork can help them to speed up their transformations.

2.4 Focus three: Team creativity

Prior research emphasizes that personal characteristics and experiences are related to creativity (Paulus, Brown, & Ortega, 1999). There is much evidence that eminently creative individuals have remarkably high levels of motivation. Studies of groups generally find that they have little basis for creative potential (Paulus, Brown, & Ortega, 1999). But brainstorming research has found that teams tend to generate more ideas and more high-
quality ideas compared to individuals (Mullen, Johnson, & Salas, 1991). Amabile (1983) published her study on social context factors in creativity and emphasized that certain controlling factors—such as evaluation and the use of reward—prevent intrinsic motivation, including the motivation to be creative. However, she also emphasizes how modeling and factors that enhance intrinsic motivation can enhance creativity. Other scholars also highlight the positive potential for social and group factors in creativity (Nystrom, 1979; West, 1990), and there has been a recent increase in interest in teamwork and its potential for enhancing productivity and innovation (Paulus, Brown, & Ortega, 1999).

Organizations commonly use work teams because of the assumption that teams improve productivity and innovation (Devine, Clayton, Philips, Dunford, & Melner, 1999). Teams may be a source of motivation, especially when they have a lot of autonomy (Cohen & Bailey, 1997). They may also be sources of innovation because they can take advantage of the diverse skills and information of the group to develop new ideas (Drach-Zahavy & Somech, 2001). Much of the research on teamwork has focused on the team characteristics and contextual factors that influence team effectiveness.

Although the research on team productivity is mixed (Naquin & Tynan, 2003; Paulus, 2000), much research has focused on factors that enhance team innovation, such as organizational support, autonomy, and inter-team communication (Amabile, Conti, Coon, Lazenby, & Herron, 1996; West, 2003). A lot of the information exchange, social influence, conflict, and negotiation take place in team meetings. These processes can be critical for team innovation (Drach-Zahavy & Somech, 2001).

A variety of other social factors influence idea generation. Providing teams or individuals with challenging goals or high norms can also increase idea generation (Larey & Paulus,
Simply having the opportunity to compare one’s performance with other group members enhances the number of ideas generated (Paulus, Larey, Putman, Leggett, & Roland, 1996; Roy, Guavin, & Limayem, 1996). Inter-team comparisons appear to have positive benefits, particularly when a team is given feedback that it has performed worse than other teams (Coskun, 2000).

The mix of team members is also important. There is evidence that some degree of ethnic diversity enhances performance in brainstorming teams (McLeod, Lobel, & Cox, 1996). The effect of diversity is complicated by negative social or affective reaction to a number of dimensions of diversity (Milliken, Bartel, & Kurtzberg, 2003).

Team composition based on differences in personality or attitudes can also affect the performance of teams, particularly if these traits are relevant to idea generation. Teams composed of members who are high in social anxiety tend to perform poorly compared to teams low in social anxiety (Camacho & Paulus, 1995). This is consistent with the idea that evaluation apprehension inhibits brainstorming. Teams composed of individuals who have a preference for working in teams tend to perform better (Larey & Paulus, 1999).

Although social factors and team member characteristics tend to influence team creativity, features of the task appear to be even more important. Allowing team members to exchange ideas by writing or typing avoids production blocking and improves performance (Dennis & Williams, 2003; Paulus et al., 2002). These benefits of team interaction are evident both during team brainstorming (Dugosh et al., 2000).

Task decomposition seems to be beneficial for creativity as well. Presenting the problem one component at a time—rather than all at once—seems to enhance the number of ideas generated (Coskun, Paulus, Brown, & Sherwood, 2000). Stimulating individuals with more
ideas during the idea-generation process appears to increase the overall number of ideas generated. Contrary to what one might expect, common ideas tend to have more stimulation value than unique ones, but presenting unique categories is more stimulating than presenting more common categories (Dugosh & Paulus, 2005).

Although team brainstorming may not be more effective than individual brainstorming, teams may be motivating, and ideas that come from team interaction may have more support than ideas that come from individuals (Furnham, 2000). Osborn (1957, 1963) proposes that some alternation between team and individual brainstorming might be optimal. In meetings, knowledge and ideas are exchanged and usually evaluated. Afterward, individuals may reflect on the exchanged information and related evaluations. In a subsequent team meeting, second thoughts can be shared and a final decision made (Janis & Mann, 1977).

Some research has found that the benefits of team idea exchange may be most evident after a subsequent period of individual incubation or reflection (Dugosh et al., 2000; Paulus & Yang, 2000). Therefore, the best sequence may be to have team brainstorming followed by individual brainstorming (Brown & Paulus, 2002). However, there may also be benefits from generating ideas individually before team brainstorming (Paulus et al., 1995). This allows people to more easily access a large number of ideas during the subsequent team-sharing session, and this could help minimize the impact of negative factors in team brainstorming. It also makes it more likely that team members will respond positively to ideas that they did not think of in the prior session (Putman & Paulus, 2002).

Creativity is defined as the generation of novel and appropriate ideas, products, processes, or solutions that are useful or appropriate to the situation (Amabile, 1983; Oldham & Cummings, 1996; Shalley, 1995). Creativity becomes more important to organizations as
they attempt to not only earn short-term profits but also develop new and interesting products and services that enable them to survive over the long term (Elsbach & Hargadon, 2006; Oldham & Cummings, 1996; Van de Ven, 1986). To generate creativity effectively, organizations are increasing the use of teams in an attempt to facilitate effectiveness and empowerment (Milliken & Martins, 1996) and to realize the potential benefits of diversity (Williams & O’Reilly, 1998). The type of creativity that is helpful to organizations rarely happens in isolation; it is usually a result of the interaction between people or teams (West, 1990). However, some individuals are better able to bring together pieces from different places and combine them into something useful for an organization (Amabile, 1988).

With more heterogeneity in the specializations of team members, teams have a wider range of views; so one may expect that more heterogeneity always leads to greater creativity (Bantel & Jackson, 1989; Pelled, Eisenhardt, & Xin, 1999). Also, information and decision-making theories suggest that heterogeneity leads to increased cognitive processing and better use of information (e.g., Watson, Kumar, & Michaelsen, 1993). But cumulative research results have shown that heterogeneity does not always lead to desirable team outcomes like creativity (for reviews, see Jackson et al., 2003; Williams & O’Reilly, 1998).

Leadership is a key aspect of the context that affects team creativity (Mumford et al., 2002). In contemporary research, transformational leadership is thought to increase team outputs (Bass & Avolio, 1990) because it elevates team identification and motivation by increasing the value of team goal accomplishment, communicating visions, and instilling collective outcomes (Bass, 1985; Shamir, House, & Arthur, 1993). Also, transformational leadership encourages team members to view problems from new perspectives and provides individual opinions (Bass, 1985). Thus, transformational leadership appears to be most suitable in managing R&D teams to leverage diversity and develop creativity.
Conceptual models of team effectiveness have regularly included team resources as enablers, whether more passively received from the organization (Gladstein, 1984; Hackman, 1987) or more actively sought and acquired by the team (Ancona, 1990; Ancona & Caldwell, 1992). In fact, the new product development literature has shown that resource-constrained projects can lead to products that are judged highly innovative and that are very successful in the marketplace (Goldenberg et al., 2001; Moreau & Dahl, 2005). Whether the format involves face-to-face or computer interactions, effective decisions and creative solutions require a full exchange of ideas by all group members (Janis & Mann, 1977).

Paulus and his colleagues (Brown, Tumeo, Larey, & Paulus, 1998; Paulus, Larey, & Dzindolet, 2000) have developed a cognitive theory of group creativity that applies the idea of cognitive stimulation to groups. They suggest that sharing ideas in groups should stimulate additional ideas. In groups, people are exposed to more ideas than solitary people. Thus, there is much potential for cognitive stimulation in groups, as long as group members attend carefully to the shared ideas.

Diehl and Stroebe (1987) find that hearing others generate ideas does not improve individual brainstorming. The lack of cognitive stimulation effects in brainstorming studies is inconsistent with an information-processing perspective, which presumes that group members can attend, encode, store, and retrieve information that is encountered in group interaction (Hinsz, Tindle, & Vollrath, 1997; Nagasundaram & Dennis, 1993). An alternative perspective is that individuals do carefully process the shared information, but may lack the right opportunity to demonstrate the stimulation value of this information during the sharing session (Paulus et al., 2000).
In general, many studies find that team creativity can have a better result than individual creativity. However, a number of team factors such as team potency and knowledge sharing can make the impacts on the team creativity performance.

2.5 Antecedents of quality team creativity

Researchers have looked at several concepts as antecedent factors in team development, team performance, and team creativity. Many factors can influence team creativity. Significant factors that are likely to influence team creativity are now considered in detail.

2.5.1 Team potency and team creativity

Team potency is a group’s belief about its general effectiveness (Guzzo & Shea, 1992). This concept is rooted in self-efficacy and refers to an individual’s belief about his or her effectiveness at a given task (Bandura, 1977, 1982). Some scholars have argued that collective efficacy is basically an individual perception rather than a group attribute (Gibson, Randel, & Earley, 2000). However, empirical research indicates that collective efficacy is often a shared perception that predicts relevant team outcomes (Gully et al., 2002).

Gully and colleagues (2002) show that team potency is positively related to group performance and team effectiveness. Additionally, research indicates that group potency is positively related to other areas of group effectiveness, such as member effort and member satisfaction (Lester et al., 2002). Specifically, high levels of initial group potency can lead to
comparatively better initial performance, which can lead to further improvement in potency and performance through a variety of group activities (Lindsley, Brass, & Thomas, 1995).

Potency beliefs are based on perceptions that a team has sufficient knowledge, skills, and strategies to perform effectively. Specifically, Campion and Higgs (1993) have found significant positive associations between productivity, employee satisfaction, and managerial ratings of performance. Earley (1989) and Gibson (2000) find similar positive associations between group efficacy beliefs and team effectiveness. Guzzo and colleagues (1993) argue that this motivational belief is important because it significantly predicts group effectiveness in customer service and other domains: higher belief in efficacy is related to higher levels of effectiveness.

Given that several existing research studies have demonstrated that team potency is likely a critical factor for team performance and team creativity, it is highly relevant to the current research. As such, the following hypothesis is proposed:

\[ H5: \text{ The greater the potency belief of the team, the greater the team creativity } \]

2.5.2 Team potency and team leadership

Campion and colleagues (1993) have found that group potency is a significant predictor not only of productivity, but also of the satisfaction of team members and management assessments of its performance. Team leadership is a key factor that influences the development and evolution of team potency beliefs (Kozolowski, Gully, Nason, & Smith, 1996). Leaders can directly influence potency beliefs by boosting the confidence of their followers in their capacity to perform required tasks (Watson & Tellegen, 1993).
Effective leaders have been found to contribute to the team by enhancing positive team affect (Watson & Tellgen, 1993). The more positive a member feels about the group, the more motivated the person is to promote in-group solidarity, cooperation, and support (Hopkins, 1997). Furthermore, as Gibson (1995) indicates, the high status and power of transformational and transactional leaders within a group of followers can increase potency beliefs. But contrary to Gibson’s expectations, large status differences between team members are positively related to the level of group-efficacy held by the group.

Houghton and colleagues (2003, p. 131) state that, through the use of self-leadership strategies, “team members can effectively increase their self-efficacy beliefs for undertaking various leadership roles and responsibilities within the team.” Therefore, increasing perceptions of the team’s potency are likely to inspire team members with the confidence that they have the necessary skills to engage in shared leadership. This is in line with Pearce and Sims’ (2000) assertion that shared leadership is more likely when team members are highly skilled in their assigned tasks; however, they assert that team members must also have the confidence that these skills are present and likely to be effective in order to develop shared leadership in the best sustainable direction. If team members are low in the collective sense of team potency in sharing leadership responsibilities, they are likely to be unwilling and perhaps even unable to undertake leadership activities within the team. Therefore, shared leadership is more likely to be developed if team members have both the skills and the desire to engage in common influence (Perry et al., 1999).

Consequently this study will explore the role of team leadership as an important variable with the potential to influence future team creativity and team potency. Will team leadership significantly different in Chinese Mainland with other cities? This led to the following research hypothesis:
2.5.3 Team leadership and knowledge management

Leadership is regarded as a very important factor in the success or failure of organizations (Bass, 1990). Leadership researchers have taken different approaches to the aspects of the leader or the leader’s actions within various situational contexts. Leaders have been found to influence followers in many ways, including coordinating, communicating, motivating, sharing information, and rewarding (Yukl, 1989). Most of the theorists have investigated three core factors of leadership: (1) the characteristics and traits of the leader, (2) the leader’s behaviors, and (3) the situation in which leaders ask to lead. However, most of the research reveals that these aspects of leadership cannot adequately explain leader effectiveness. Current contingency and transformational theories of leadership examine the combined effects and interactions of the three factors mentioned above and the impact on follower performance.

In general, leaders are the role models for their colleagues in organizations, and they have a direct impact on the organization’s culture, the approach toward knowledge, and the management of knowledge. Therefore, organizational leadership is critical to the overall success of any knowledge management (KM) program. A finding from a study of US and European organizations confirms that more than 67 percent admitted that their top barrier to KM is organizational leadership, including the culture, trust, cooperative involvement, and incentives (Ruggles, 1998). KM practices must be fully supported and implemented by the organization’s leaders. It is unlikely that KM programs will ever catch on or be effective if KM does not penetrate all levels of an organization. As supported by the leaders, managers
also set the standards for conducting at every level throughout the organization. Without managers stressing the importance of KM programs, employees will assume that KM is not something that needs to be taken seriously.

The organization leader can be anyone from the chairman, board of directors, CEO, down to the unofficial supervisors who work on the front line. Kluge, Stein, and Licht (2001) point out that leaders across all levels of an organization have unique and important roles to play in managing knowledge, and it is particularly important for the top management to be involved in setting up policies of knowledge creation and sharing processes. This involvement is critical because the top management sets the tone and establishes the rules for an organization.

Takeuchi (2001) suggests three ways in which leaders can provide direction for KM. First of all, leaders must articulate a grand theory of what the company as a whole ought to be. Second, top management must incorporate its vision for KM into the company’s corporate objectives or policy statement. Third, leaders must decide which KM efforts to support and develop, and then they must follow that strategy. To implement those suggestions with a higher level of performance, Takeuchi (2001) says an organization’s leadership must not only link together the many disparate activities of the organization into a coherent whole, but should also establish clear and visible standards and objectives for the rest of the company to follow.

Well-trained middle managers also have an important role to play in bridging the gap between the top managers and all the frontline staff. Takeuchi (2001) also gives important insight into how middle managers can mediate between the “what ought to be” mindset of the top and the “what is” mindset of the frontline staff. To do this, middle managers have to
create a vision, and the grand theory created by top management must be understandable and executable for frontline staff. They must also synthesize the knowledge generated by both the top management, as well as frontline staff, converting the knowledge into usable technologies, products, or systems (Takeuchi, 2001).

Beckman (1999) expands management’s responsibilities in the KM process to include motivating employees, providing equal opportunities and development, and measuring and rewarding the performance, behaviors, and attitudes that are required for effective KM. Brelade and Harman (2000) further point out the need for organizations’ leaders to help their staff avoid conflicts of interest with KM practices and find solutions where conflict exists.

Stewart (1997) states that even companies with promising cultures and highly effective reward programs will not succeed without dedicated and responsible leaders. However, many researchers and professionals are now realizing that if organizations wish to have leaders who are dedicated to achieving KM goals and who are prepared to do what is necessary to achieve those goals, the organizations must be willing to deliberately develop these leaders and provide them with on-going training, visions, and rewards. Although developing leadership committed to KM will require investments of both time and resources from organizations, research is beginning to show that the investment is justified, since the benefits that come from doing so more than make up for the costs associated with such efforts (Ichijo, von Krogh, & Nonaka, 1998).

Given that several studies have demonstrated that team leadership is likely a critical factor in the intent to share knowledge, it is highly relevant to the context of the current research. However, we have the interest to know more about the impact of stated owned enterprise
leaders in China to the knowledge sharing. Will Chinese leaders want to keep knowledge to reduce the risk in sharing? As such, the following hypothesis is proposed:

\[ H2a: \quad \text{Effective team leadership increases the intent to share knowledge} \]

### 2.5.4 Team trust, knowledge management and team potency

Some researchers argue that trust is a multi-faceted concept. A model of organizational trust posited by Mayer, Davis, and Schoorman (1995) reflects the context of cross-functional and geographically distributed work. There is also a distinction between calculative and non-calculative trust. Calculative trust is based on the balance of the costs and benefits of certain actions and on a view of man as a rational actor. Non-calculative trust, in turn, is based on values and norms (Lane, 1998).

An individual-level factor that enhances knowledge sharing is the interpersonal trust between colleagues in the workplace (Abrams et al., 2003; Levin et al., 2006; Mayer et al., 1995). The conceptualization and labeling of propensity to trust is consistent with Mayer and colleague’s (1995) proposal that propensity to trust is a stable within-person factor.

Interpersonal trust in the workplace has been shown to have a strong positive influence on a variety of organizational phenomena, including job satisfaction, stress, organizational commitment, productivity, and (most relevant to the current research) knowledge sharing (Kramer, 1999). Overall, trust leads to increased knowledge sharing and makes knowledge sharing less costly. It also increases the likelihood that knowledge acquired from a colleague is sufficiently understood such that a person can put it to use (Levin & Cross, 2004).
Precursors of interpersonal trust include contextual factors and malleable relational features, such as shared language and shared vision (Abrams et al., 2003). Most of the researchers have focused on environmental and contextual influences on interpersonal trust in the workplace, mirroring much of the research on knowledge sharing (Kramer, 1999).


We can see that when trust and distrust are put in various political, economic, and cultural contexts, it is a highly complex societal phenomenon. Trust has never been a topic of mainstream sociology (Luhmann, 1988). Luhmann remarked that “neither classical authors nor modern sociologists used the term in a theoretical context” and that empirical research relied on unspecified ideas confusing trust with other notions. Since then, a number of scholars have attempted to clarify the concept (e.g., Seligman, 1997) by trying to distinguishing trust from other notions—for example, familiarity (Luhmann, 1988), confidence (Giddens, 1990; Luhmann, 1988; Seligman, 1997), and faith (Seligman, 1997).

Trust is as central to the healthy psychological development of individuals as it is to the consolidation of social bonds and the construction of community. Developmental psychologists have shown that trusting relationships are essential if an infant is to realize its biological potential and develop into a fully functioning adult. From Piaget (1967) and Piaget & Inhelder (1969), to the more recent experimental studies of Trevarthen (1979), the psychology of ontogenesis has consistently shown that both the cognitive and emotional life
of the developing child emerge out of the basic trusting bonds an infant is able to sustain with significant others.

For communities, trust is equally fundamental and is the basis of social cohesion, a central concept in sociological and social psychological traditions dealing with the origin and consolidation of social orders (Eisenstadt, 1995; Luhman, 1979; Moscovici, 1993). Indeed, studying the structure of trust in different societies has allowed sociologists and historians to identify different social formations (Eisenstadt, 2003; Eisenstadt & Roniger, 1984) and understand how they develop. Different practices of trust across societies and historical periods show clearly that trust is not just a psychological phenomenon; it is also a social and cultural phenomenon.

Given that several existing research studies have demonstrated that team trust is a critical factor for team potency and the intent to share knowledge, will the team trust level different from China to the other cities in the world that make the direct impact to knowledge sharing and team potency? This study proposes the following hypotheses:

**H1a:** The higher the team trust, the greater the intent to share knowledge

**H1b:** The higher the team trust, the greater the team potency

**H3:** The greater the potency belief of the team, the greater the intent to share knowledge

### 2.5.5 Intent to share knowledge and team creativity

Knowledge sharing is defined as the provision or receipt of task information, know-how, and feedback regarding a product or procedure (Cummings, 2004). It has been connected to
a variety of expected outcomes, including productivity, task deadline, organizational learning, and creativity (Argote et al., 2000; Cummings, 2004).

There are a number of factors that may influence knowledge sharing, including the components of the knowledge itself, such as its degree of articulation and degree of aggregation (Nonaka & Takeuchi, 1995; Spender, 1996). The major elements of management attempts to increase effective knowledge sharing include actions such as coordination mechanisms, rewards, incentives, and managerial interventions (Cabrera & Cabrera, 2002; Tsai, 2002).

Elements of the environment—such as national culture, technology, and organization culture—have a great impact on knowledge sharing (Wasko & Faraj, 2005). Important for the development of an organization are the micro-level environmental factors of interpersonal relationships: such as shared language, shared vision, and strength of the interpersonal ties between two parties. This emphasizes the local character of knowledge flowing in social networks (Brown & Duguid, 2002; Gherardi et al., 1998).

For business, knowledge can be counted as a resource for competitive advantage, and it plays a more important role than traditional resources in organizations (Nonaka & Takeuchi, 1995; Martensson, 2000). Managers often try to find out how to motivate employees to share their knowledge so they can boost overall performance and build competitive advantage in the market (Chow et al., 2000; Taylor & Wright, 2004).

Interpersonal trust and the intent to share knowledge are important issues in human resource-oriented KM (Abrams et al., 2003; Ellingsen, 2003; Politis, 2003). Preliminary findings on the topic show that trust is important for KM, particularly for the intent to share knowledge (Holste, 2003). In team meetings, representatives from different locations or
functional departments may wish to share knowledge and perspectives in order to develop new products, visions, or solutions (Dunbar, 1995; Sutton & Hargadon, 1996).

However, no research to date has explored the relationship between intent to share knowledge and team creativity. Therefore, there is a need to explore whether or not intent to share knowledge is also a significant factor for teams. The following hypothesis is therefore proposed:

*H4: More intent to share knowledge increases team creativity*

### 2.6 The theoretical framework and overall hypotheses

As research methodology will be outlined in detail in Chapter 3, this research adapts models from many authors’ published papers:

1. Team potency (de Jong, de Ruyter & Wetzels, 2005)
2. Intent to share knowledge (Ajzen, 1991)
3. Team trust (Sarker, Valacich, & Sarker, 2003)
4. Team leadership (Sivaubramaniam, Murry, Avolio, & Jung, 2002)
5. Team creativity (Thacker, 1997)

Figure 2.2 shows a model of the conceptual framework of team creativity. Team creativity is rated according to two measures: team members’ intent to share knowledge and team
potency. However, team members’ intent to share knowledge and team potency can be influenced by the team trust and team leadership. This theoretical framework will be used to test the research hypotheses, which are presented in next section.

Based on the literature review of team creativity, a theoretical framework has been established that proposes that team creativity is influenced by the team members’ intent to share knowledge and team potency. Furthermore, both the team members’ intent to share knowledge and team potency are influenced by team trust and team leadership. Team potency has a positive impact on team members’ intent to share knowledge. More specifically, this study explores the following hypotheses:

H1a:  The higher the team trust, the greater the intent to share knowledge

H1b:  The higher the team trust, the greater the team potency

H2a:  Effective team leadership increases the intent to share knowledge

H2b:  Effective team leadership increases team potency

H3:  The greater the potency belief of the team, the greater the intent to share knowledge

H4:  More intent to share knowledge increases team creativity

H5:  The greater the potency belief of the team, the greater the team creativity

2.7 Conclusion
This chapter outlines a literature review that gives a context for understanding the background of teamwork and many factors that influence team creativity. The literature review revealed that team trust, team leadership, knowledge sharing, and team potency all influence team creativity. The findings from this study will provide a good theoretical foundation for further studies of team performance.

To date, limited study has focused on the factors influencing team creativity. As such, the results of this literature review are used as a basis to develop a preliminary model of team performance and team creativity in organizations.

Additionally, Chapter Two presents the theoretical framework that serves as a basis for the research model. Adapted from previous research, the team creativity model is first discussed in general terms and then presented in Figure 2.2. The relationships between the variables considered in the hypotheses are presented in Section 2.6.

Chapter Three will review the theoretical framework intended to provide a foundation for the methodology. This chapter will outline the survey methodology, quantitative techniques, sampling procedures, data collection, questionnaire development, operational of variables, and data analysis in detail.
Figure 2.2: The influence of team trust, potency and leadership on the intent to share knowledge and team creativity
CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology. After choosing a topic, the researcher must choose appropriate methods to conduct the research, including the research procedures, setting up the research questions and the research guidance. Methods may be the most important part of the design because even the best research question cannot be answered with poor techniques. Therefore, these questions form the core of a research project’s design.

Research designs can be divided into fixed and flexible (Robson, 1993). Another similar distinction is between quantitative and qualitative research. In fixed designs, the design of the study is fixed before data collection takes place. Fixed designs are normally theory-driven; without some amount of prior theory, it is impossible to know in advance which variables need to be controlled and measured. Fixed designs usually use quantitative measures (Robson, 1993).

Flexible designs allow for more freedom during data collection. One reason researchers might want to use a flexible research design is that the variable of interest may not be quantitatively measurable. In other cases, a researcher may be exploring a new question, so there may not even be prior theory.

The research methodology is outlined in this chapter. There are fourteen sections, as shown in Figure 3.1., below.
Figure 3.1: Structure of Chapter 3

3.1 Introduction

3.2 Overview of theoretical framework

3.3 Research paradigms

3.4 Type of research method

3.5 Research methodology

3.6 Data collection method

3.7 Questionnaire design

3.8 Sampling

3.9 Pilot testing

3.10 Data analysis

3.11 Ethical considerations

3.12 Conclusion
3.2 Overview of theoretical framework

Based on the literature review in Chapter 2, this study pursues the following hypotheses on the influence of team trust, potency, and leadership on the intent to share knowledge and team creativity:

- \( H1a: \text{The higher the team trust, the greater the intent to share knowledge} \)
- \( H1b: \text{The higher the team trust, the greater the team potency} \)
- \( H2a: \text{Effective team leadership increases the intention to share knowledge} \)
- \( H2b: \text{Effective team leadership increases team potency} \)
- \( H3: \text{The greater the potency belief of the team, the greater the intent to share knowledge} \)
- \( H4: \text{More intent to share knowledge increases team creativity} \)
- \( H5: \text{The greater the potency belief of the team, the greater the team creativity} \)

3.3 Research paradigms

A research paradigm refers to the philosophies and beliefs that provide a road map of how the research is to be implemented (Ticehurst & Veal, 2000). It can be stated as a group of assumptions that the investigation starts with (Deshpande, 1983). It represents a group of people’s opinions that defines the original thoughts about how the phenomenon works.

Paradigms reflect what practitioners think is important, legitimate, and reasonable, and they
generate a set of standards to guide what should be done (Patton, 1990). Therefore, paradigms determine both what problems are worthy of study and what methods are applied to find the answer (Deshpande, 1983).

There are three major reasons why understanding these sorts of philosophical issues is very important. First, it can help us better understand research designs. This not only involves decisions about what kind of evidence is needed and how it is to be interpreted, but also how this will provide adequate answers to the list of questions being studied. Second, the related knowledge can help the researcher to understand which design is the best. It should enable the researcher to avoid common problems. Third, it can help the researcher develop a design that may go above and beyond his or her previous experience.

There are different kinds of paradigms to guide the development of research. For example, Bonoma (1985) divides inquiries into qualitative and quantitative paradigms, while Guba and Lincoln (1994) divide the different types of paradigms suggested by other authors into four groups: positivism, realism, critical theory, and constructivism. Table 3.1 describes each paradigm; the reader is expected to come away with the conclusion that positivism is the most suitable paradigm for this research.

Table 3.1: Research paradigms

<table>
<thead>
<tr>
<th>Paradigm Element</th>
<th>Positivism</th>
<th>Constructivism</th>
<th>Critical Theory</th>
<th>Realism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology</td>
<td>“Real reality” but apprehensive</td>
<td>Relativism – local and specific constructed realities</td>
<td>Historic realism – virtual reality shaped by social, political, cultural, economic, ethnic, &amp; gender values;</td>
<td>Critical realism – “real” reality but only imperfectly and probabilistically</td>
</tr>
<tr>
<td>Epistemology</td>
<td>Dualist/objectivist; findings true</td>
<td>Transactional/subjectivist; created findings</td>
<td>Transactional/subjectivist; value-mediated findings</td>
<td>Modified dualist/objectivist; critical tradition/community findings probably true</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Common Methodology</td>
<td>Hermeneutical/dialectical; “passionate participant”; consensus/dialogue</td>
<td>Dialogic/dialectical; “transformative intellectual”; action research/focus groups</td>
<td>Experiment/manipulation; critical multiplism; hypothesis falsification; qualitative methods; case studies/convergent interviewing</td>
<td></td>
</tr>
</tbody>
</table>


### 3.3.1 The positivist paradigm

The positivist paradigm is based on the approach used in the natural and social sciences (Hussey & Hussey, 1997). Positivists explore the world from a unidirectional viewpoint (Guba & Lincoln, 1994); positivists deny that their presence affects the phenomenon. All in all, the positivist paradigm is based on the assumption that the world is an observable reality—and that theoretical propositions about this reality can be developed and tested. Therefore, logical questioning is applied to the research so that accuracy, objectivity, and
rigor replace experience and initiation as the methods of investigating research problems (Hussey & Hussey, 1997). The hypotheses are deduced from accepted principles to be statistically tested. After that, human behavior is explored by data collection only (Perry, Riege, & Brown, 1999). The epistemology of the positivist paradigm focuses on existing theories to find truth rather than on building new theory (Perry, Riege, & Brown, 1999). Experiments and questionnaires are the most common positivist methods (Hussey & Hussey, 1997).

### 3.3.2 Critical theory paradigm

The critical theory paradigm is based on the analysis of common historical events from the viewpoint of political, economic, social, cultural, gender, and ethical values (Perry, Riege, & Brown, 1999). The basic criterion of critical theory is that the researcher understands the events and create a logical discussion of ideas and opinions (Guba & Lincoln, 1994). The critical theory paradigm has been used most often to directly compare different qualitative research findings.

### 3.3.3 The constructivist paradigm

The constructivist paradigm argues that truth is subjective and based on people’s perceptions of reality, which results in multiple realities (Guba & Lincoln, 1994; Perry, Riege, & Brown, 1999). This can lead to some problematic philosophical outcomes, and researchers may find it difficult to explain the reality of a research topic (Guba & Lincoln, 1994). Constructivism spends more time describing the phenomenon rather than measuring it. In some cases,
constructivist researchers may be passionate participants in the interview process (Guba & Lincoln, 1994).

3.3.4 The realist paradigm

The realist paradigm is based on the idea that there is an external reality. It uses triangulation of research methods to generate knowledge. It considers research findings to be relatively true, rather than absolutely true, as positivism would have it (Guba & Lincoln, 1994; Perry, Riege, & Brown, 1999). From the theory of knowledge, the researcher finds the values of the objective while being of the opinion that the study of multiple outcomes in relation to teams and incentives does heavily contribute to the subjective. Realist researchers try to use both qualitative and quantitative designs (Perry, Riege, & Brown, 1999). This can include case studies and convergent interviews (Guba & Lincoln, 1994; Healy & Perry, 2000).

3.3.5 Justification for current research paradigm

Based on this review, this study undertakes a positivist paradigm as the most suitable for investigating team creativity. Positivism is appropriate in part because this project applies existing theories to team creativity, rather than developing a new theory (Guba & Lincoln, 1994). This study seeks to investigate the interplay between team trust, team leadership, the intent to share knowledge, team potency, and team creativity. To get at these questions, this study uses quantitative data collected through surveys.

This process involves quantitative methods and statistical tests based on deduction (Hussey
& Hussey, 1997; Perry, Riege, & Brown, 1999). The sample surveys will be used by the researcher to verify whether the research hypotheses are correct or not (Guba & Lincoln 1994). The positivist paradigm is suitable for this study as a quantitative method that involves finding a population, surveying a sample of that population, and statistically analyzing the relationships between the variables (Perry, Riege, & Brown, 1999).

3.4 Type of research method

Churchill (1999) categorizes business studies into exploratory, descriptive, and causal. Gay and Diehl (1992) extended the classification to include historical and associative research. In choosing a design, this study took into account the availability of data, the time available for the study, and the budget allocated. Therefore, the research methodology is based on the whole research structure and context. Every research design can be applied in different research conditions and circumstances (Sarantakos 2005; Zikmund 2003). The following classification has been selected because it is popularly used, and is related to the objectives of this study.

3.4.1 Descriptive research

The major objective of descriptive research is to describe the nature and composition of a population or a situation. The research process tries to find answers to questions of who, what, where, when, and how. The outcome is an organized, well-prepared description suitable for statistical calculations (Zikmund, 2003).
Data collected and analyzed from descriptive research can help people understand the characteristics of a group. It can offer a full picture of all aspects of the study areas and build new ideas (Sekaran, 2003).

The objective of descriptive research is to draw a picture or to describe certain areas of the phenomena of interest from an individual, organizational, or industry perspective (Sekaran, 2003). This type of research design is commonly used to evaluate the dimensions of a population with common interests and understand the relationship between the different elements in the research (Emory & Cooper, 1991). And also, descriptive research find out the answers to questions with when, who, where, what and how (Zikmund 2003). The most commonly used research techniques for descriptive research are open-ended and fill-in-the-blank surveys (Davis, 2004). Descriptive research requires formal and structured interviews based on some previous understanding and assumption of the existing nature of the research problems (Ghauri, Gronhaug, & Kristianslund, 1995).

**3.4.2 Causal research**

The purpose of causal research is to find out the variables that might establish the cause-and-effect relationships between the variables causing particular actions and responses (Hussey & Hussey 1997). Most causal research relies on designed experimentation and simulation programs (Cooper & Schindler, 1998). To prove causality, one variable is kept constant, and another variable is altered. However, many researchers find that causal research is not feasible, especially when dealing with human behavior.
In other situations, causal research is possible, but it is quite complicated and involved. Causal research can take place in the laboratory or in the real world as a part of a field experiment. In a laboratory, the researcher develops a situation similar to the situation in the real world. Causal research is developed in order to recognize the cause-and-effect relationships for the selected research variables based on the research issues defined beforehand (Zikmund, 2003). Once the relationship has been identified, the established causality can be used to project the result of the examined problem.

3.4.3 Exploratory research

Researchers commonly use exploratory research to explain an ambiguous problem or to argue that a problem does not exist (Gay & Diehl, 1992). It is also used when the researchers do not have a clear picture of the problem and hope that exploratory research will generate a clearer picture and a starting point for new research. For example, exploratory research can help the organizations test the market acceptance of new products or services.

Common methods of exploratory business research include focus groups, pilot studies, case studies, in-depth interviews, and projective studies (Ticehurst & Veal, 2000). For example, the exploratory research can help the organizations to test the market acceptance of new products or services.

If not much is known about the situation or not sufficient information is available on similar research issues have been solved in the past, exploratory research is a good solution. The methods of exploratory research are based on the qualitative studies through data collection from surveys, interviews, focus groups or observations (Sekaran 2003).
Therefore, exploratory researches are helpful to better understand the nature of an issue that happened in the past but not addressing well. The exploratory research can help researchers to have a better understanding of the issues and to find out valuable insights from the research topics.

Zikmund (2003) describes exploratory research as the initial stage for research projects that plan to explore the nature of a problem before proceeding to the next step of research. Exploratory research is also commonly used to divide a big problem into a number of smaller and more precise sub-problems before making more detailed investigations (Wong, 1999).

Table 3.2: An overview of the different research design characteristics

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Exploratory</th>
<th>Descriptive</th>
<th>Causal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>Discovery of ideas and insights (ambiguous problem)</td>
<td>Describe characteristics and functions (aware of partially defined problem)</td>
<td>Determine cause-and-effect relationships (clearly defined problem)</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Flexible, versatile: often the front end of total research design</td>
<td>Prior formulation of hypotheses and research problems; pre-planned and structured design</td>
<td>Manipulation of one or more independent variables; control of other variables</td>
</tr>
<tr>
<td>Methods</td>
<td>Expert surveys, pilot survey, secondary data analysis, qualitative research</td>
<td>Secondary data, surveys, panels, and observational data</td>
<td>Experiments</td>
</tr>
</tbody>
</table>

Source: Zikmund, 2003, p. 58
3.4.4 Justification for the selection of research method

In considering the analysis of the three functional research designs of the quantitative method above and its implications in the research area, descriptive and causal research have been selected for the following reasons:

(a) Since this research does not involve new concepts or ideas, exploratory research is not a suitable design.

(b) Descriptive research should be used to express the characteristics of the team creativity process in an organization setting.

(c) The intent to share knowledge is best measured quantitatively.

(d) The objective of the research is to suggest cause-and-effect relationships between team trust, team leadership, team potency, the intent to share knowledge, and team creativity.

3.5 Research methodology

After selecting a research paradigm, the next step is to choose a methodology. Although new developed technological capabilities have been increased to handle the complex analysis, the major skills used in social science concentrate on three methodologies: qualitative, quantitative, and combined methods (Creswell, 2003). Quantitative and qualitative researches differ in the following three aspects:

- Qualitative results are often reported using verbal descriptions; quantitative results are described in numbers (Creswell, 2003).
- Qualitative research is often deeper but with less structure, so it is useful in exploratory research (Jarratt, 1996).

- Qualitative research relies on observation and insight based on the ability of the researcher; quantitative research is based on formalized statistical structures and formulas (Cooper & Emory, 1995).

3.5.1 Qualitative methodology

Qualitative involves expressing, describing, analyzing, interpreting, and explaining the meaning of a phenomenon (Van Maanen, 1983). However, researchers are not restricted by any particular methodology but rather use various instruments and methods according to the requirement of problem resolution (Denzin & Lincoln, 1994).

Commonly used qualitative research methods include grounded theory, case studies, phenomenological research, narrative research, ethnographies, and critical theory (Creswell, 2003). The downside of qualitative research is that it is more subjective than quantitative research.

In interviews and focus groups—two common qualitative methods—participants answer set-up questions, and the interviewer explores their responses to identify and explain their perceptions, ideas, and feelings about the research topic (Neuman, 2003). The quality of the findings from qualitative research depends on the techniques, skills, experience, and sensitivity of the interviewer (Bryman, 2004; Neuman, 2003). This type of research is often cheaper than questionnaire research.
Qualitative research is an exploration of what is assumed to be a dynamic reality. Qualitative research measures static reality in the hope of uncovering universal laws or theories (Sarantakos, 2005).

### 3.5.2. Quantitative methodology

Ticehurst and Veal (2000) define quantitative research as the quantification of relationships between variables like height, age, and work performance. These relationships are explained by the use of statistical analyses, such as linear correlations, frequency distributions, or mean variance. Quantitative methods often involve complex experiments with multiple variables and elaborate structural equations (Creswell, 2003).

Most quantitative research tends to be sequential because of the nature of data collection (Ticehurst & Veal, 2000). Quantitative research is suitable for variables that can be quantified and measured where hypotheses can be established by statistical testing and when generalizations can be drawn from samples of a population (Gay & Diehl, 1992).

Experiments, observations, and surveys are common quantitative methods (Cooper & Schindler, 1998). Experiments can be true experiments set up with random assignment or quasi-experiments that use non-randomized sampling designs (Keppel, 1991). Surveys can be given to a sample of a population with a cross-sectional or longitudinal design (Babbie, 1990).

Statistical power calculations can help determine the sample size a researcher will need in order to test a hypothesis (Neuman, 2003). In general, researchers choose sample sizes that
will leave them at a 95% confidence level about the differences they are looking at (Neuman, 2003; Zikmund, 2003).

3.5.3 Combined methodology

Campbell and Fiske (1959) have discussed the merits of the combined method. Creswell (2003) finds that the biases in any one method can be neutralized or compensated for by the other method. In general, it is good to use both quantitative and qualitative methods.

Creswell (2003) identifies three procedures commonly used by combined methodologies:

- Concurrent procedures: researchers combine quantitative and qualitative data to integrate into a comprehensive analysis.

- Sequential procedures: researchers use one method to confirm the findings of the other method.

- Transformative procedures: a theoretical check provides a research design structure with both methods used to collect and analyze data.

3.5.4 Justification for the selection of research methodology

For the current project, quantitative methods are appropriate to test the theory of creativity and the conclusions of the literature review (Gill & Johnson, 1991). Qualitative research can be used to develop a theory that will formulate an explanation (Denzin & Lincoln, 1994;
Janssen, 2001) of the relationship between team creativity, the intent to share knowledge, team potency, team trust, and team leadership.

The literature review indicated that team potency, team trust, team leadership, and the intent to share knowledge are likely related to team creativity. Statistical modeling of quantitative survey questionnaires can help analyze these relationships.

Table 3.3: A comparison of quantitative and qualitative research methods

<table>
<thead>
<tr>
<th>Quantitative research focuses on:</th>
<th>Qualitative research focuses on:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deduction</td>
<td>1. Induction</td>
</tr>
<tr>
<td>2. Explanation via analysis of causal relationships and explanation by previously formulated research problem</td>
<td>2. Explanation of subjective meaning systems and explanation by understanding a prior set of concerns</td>
</tr>
<tr>
<td>4. Use of various controls—physical or statistical—to testing hypotheses</td>
<td>4. Commitment to research in everyday settings; minimizes reactivity among participants</td>
</tr>
</tbody>
</table>

Source: Malhotra, (2002) and Miles & Huberman (1994)

Quantitative research is suitable for this study because it aims to gather data from a large number of samples in order to measure, analyze, and validate the model of team creativity that has been established from past research. Therefore, this research is very useful for understanding the relationships of variables of team trust, team leadership, team potency, intent to share knowledge and the team creativity which are identified in the model presented in Chapter 2 literature review. It is also appropriate because the research focuses
on the relationship between variables (Creswell, 2003; Neuman, 2003). Because the literature has established a number of factors that are likely to influence team creativity, a quantitative approach is more appropriate. This study does not develop new theory; it tests the existing theory in a specific culture.

This objective of this study was to predict the response of a dependent variable of intent to share knowledge, team potency and the team creativity and depending on the impact of independent variables of team trust, team leadership. It also targeted to verify the significance of its hypotheses. Based on it, a survey questionnaire was used to gather data from an appropriate sample size of respondents.

3.6 Data collection method

3.6.1 Type of research technique

The methods suitable for these research questions include experimentation, observation, and questionnaires. These research techniques were evaluated before the selection of the technique for this research. A research design was planned to investigate and gain answers from the research question and problems (Bryman & Bell 2003; Kumar 2005).

3.6.1.1 Experiments

In experimentation, the researcher operates and controls an independent variable to determine its effect on dependent variables, as discussed above.
Experimentation techniques aim to manipulate at least one independent variable and establish the cause and effect relationships in the research study (Spector 1990; Zikmund 2003). Experiments can be conducted in the natural environment setting or laboratories equipments to test hypotheses about cause and effect relationships between variables in the study construct (Aldridge & Levine 2001; Bordens & Abbott 2005).

In the research study, the researchers control the independent variables to determine what kinds of impacts can be identified on those dependent variables (Aldridge & Levine 2001). Researchers also control one or more variables and observe the related changes in the other variables to find out cause effect relationships (Montgomery & Duck 1991).

3.6.1.2 Observations

Observational techniques can be used in both quantitative and qualitative research (Sekaran, 2003). People can directly observe the behavior, or the behavior can be recorded and analyzed later (Zikmund, 2003). One of the advantages of observation is that participants can act naturally, rather than reacting to questions (Ticehurst & Veal, 2000).

In general, observation takes place in a natural environment (Spector, 1990). This kind of research technique can generate a detailed record of people or events in the connections between the variables in the study (Zikmund, 2003). Observational research is very useful because it is flexible and less formal (Montgomery & Duck, 1991).

3.6.1.3 Questionnaires
Questionnaires are a common method of collecting primary data. Questionnaires use carefully designed questions (Kumar, 2005). Information obtained from questionnaires can be attitudinal, behavioral, motivational, or perceptual (Gay & Diehl, 1992). In general, surveys are a tool for gathering data from a large sample of a population, rather than focusing on an individual.

Questionnaires are particularly suitable for asking sensitive questions (Butler & Howell, 1980) because the researcher can send the questionnaires to respondents asking them to answer anonymously (Montgomery & Duck, 1991; Sarantakos, 2005; Zikmund, 2003).

The questions from the survey must be simple, self-explanatory, clearly structured, and easy to understand, since nobody will be available to explain the questions to them (Kumar, 2005). Surveys often get low response rates because participants may not be interested in them or because the questionnaire may be too long (Aldridge & Levine, 2001; Kumar, 2005; Veal, 2005; Zikmund, 2003).

When questionnaires are returned, they need to be coded, analyzed using statistical tools, and interpreted (Kumar, 2005; Zikmund, 2003). If a research survey is well designed—based on an appropriate literature review and statistical assumptions—the outcome may be generalized to the larger population (Butler & Howell, 1980). Questionnaire data can be collected in many different ways, including direct mailing, email, face-to-face interviews, drop-off and pick-up, and telephone interviews (Bordens & Abbott, 2005; Ticehurst & Veal, 2000).

### 3.6.2 Justification for questionnaires
Based on the discussion above, the questionnaire method was chosen for the following reasons:

a. Questionnaires allow the standardization of the findings so that the researcher can compare the answers.

b. Questionnaires are most suitable for the study of attitudes and behaviors.

c. Questionnaires are efficient and low cost—suitable for the time and budget restraints of this study.

d. Survey results for well-designed questionnaires are relatively reliable and accurate.

e. Primary data and a sizeable sample are required to make generalizations about the factors that influence team creativity.

For this study, the researcher collected data from a large number of team members in organizations. By using questionnaires, it was possible to gather data in a short period of time. Another advantage is that the survey can be sent quickly to different kinds of respondents in a population and all selected samples will have a fair opportunity to respond (Barribeau et al., 2005).

3.6.3 Types of survey administration

A questionnaire survey can be managed in some major administration methods including direct mailing, telephone interview, face to face interviews, and electronic interviews (Malhotra 2004; Burns & Bush 2003; Sekaran 2003). The choice of an appropriate
administration method depends on a balance of factors, such as the available budget, time, information accuracy, research environment, research objective, the characteristics of respondents, the sensitivity of the research topic, sampling, and questionnaire structure (Ranchohod & Zhou, 2001; Sekaran, 2003; Skjak & Harkness, 2003).

Direct-mail surveys are a relatively inexpensive method. Respondents can fill in the questionnaires anytime and anywhere. Commonly, respondents receive the questionnaires directly, and they return them in the mail. However, the response rate is usually low (Bordens & Abbott, 2005; Ticehurst & Veal, 2000).

Group-administered surveys are arranged when a large number of respondents are available over a short period. However, participants may not feel as comfortable for worry that their identity might be disclosed in the close-contact environment (Bordens & Abbott, 2005). A group-administered questionnaire is not suitable for this study because it requires administration at a specific time and specific place, which is not easy to coordinate with busy working people.

Internet surveys are an increasingly popular method. The survey can be distributed to respondents by e-mail or through a link on questionnaire web pages. One problem with Internet surveys is that the respondents may not be representative of the target population. It seems that Internet surveys are easy to handle and capable of reaching a large number of respondents; however, they are most suitable for relatively simple uncomplicated surveys (Bordens & Abbott, 2005).

Questionnaires can also be conducted by telephone or by interactive voice response system. However, telephone surveys risk a high failure rate because people may not like to respond to unwanted incoming calls. Telephone surveys are convenient, efficient, low cost, and good
for studies that need to ask only a few questions. This study is relatively long, so a telephone survey is not suitable.

Face-to-face surveys allow the researcher to ask questions to the respondents directly. In general, face-to-face surveys get relatively high response rates. However, a common downside is that the interviewers may influence the respondents. And respondents may be biased against the interviewers’ appearance or body gestures (Bordens & Abbott, 2005). Therefore, the interviewers should be well trained with techniques that can minimize their influence over respondents. Well-qualified interviewers will help to solve this problem, but they may be expensive.

Self-completion or household drop-off questionnaires have advantages over both mail and group-administered questionnaires. In this approach, researchers go to households or organizations and ask them to complete the survey and send it back later by mail. In other cases, research collectors return to collect the surveys. The respondents can fill in questionnaires anytime, anywhere. They can contact the researcher or questionnaire collectors if they have any problems or questions. In general, response rates are lower than with face-to-face interviews, but they may still be acceptable (Bordens & Abbott, 2005).

3.6.4 Justification for data collection method

Face-to-face survey and self-completion were the two most appropriate survey methods for this study. However, this project used self-completed questionnaires because they demand less time and money. And because the respondents were business professionals, it would
probably be difficult to make greater demands on their time. By using paper questionnaires, the respondents have time to read and complete the questionnaire at their own convenience.

Table 3.4: Advantages and disadvantages of administration methods

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Face-to-Face Interview</th>
<th>Self-Completion/Household Drop-off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Flexible</td>
<td>1. Flexible</td>
</tr>
<tr>
<td></td>
<td>2. Inexpensive</td>
<td>2. Wide-reaching</td>
</tr>
<tr>
<td></td>
<td>3. More complex questions can be asked</td>
<td>3. Less time pressure on respondents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Less social desirability bias since no direct presentation to interviewer</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>1. Requires data entry</td>
<td>1. Requires high-quality production</td>
</tr>
<tr>
<td></td>
<td>2. Limited routing</td>
<td>2. No spontaneous measures</td>
</tr>
<tr>
<td></td>
<td>3. Self-presentation bias</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Selection bias</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Third-party bias</td>
<td></td>
</tr>
</tbody>
</table>


Self-administered surveys have the following advantages (Zikmund, 1997, p. 244):

- Geographical flexibility, since data can be collected from respondents in different locations at the same time;

- Relatively fast and low cost;

- The quality of data collected depends on the content and quality of the questions rather than the techniques of the interviewer;

In this study, respondents had 24 hours to complete the questionnaires. Respondents returned the completed questionnaires to the researcher the next day. This process took place
3.7 Questionnaire design

Most researchers agree that questionnaire design is an important element in the research process and that it can influence the data (Burns & Bush, 2003). The respondents read the written questions and then write down their answers on the questionnaire (Kumar 2005; Zikmund 2003). In a questionnaire, every question should be linked to the research questions and hypotheses (Burns & Bush, 2000; Kumar, 2005; Ticehurst & Veal, 2000). However, there is no commonly accepted principle of questionnaire design. Churchill (1999) believes that questionnaire design is a science and that it requires experience and knowledge (Malhotra, 2004). Some marketing research publications suggest a general set of policies to govern every step of the design process (e.g., Frazer & Lawley, 2000; Zikmund, 2003). The process involves (a) specifying the survey method, (b) knowing what particular data is needed and having operational definitions, (c) drafting the questionnaire, (d) pre-testing and revising, (e) assessing reliability and validity, and (f) administration.

Commonly, respondents need to answer the questions by themselves; researchers are not able to explain the meaning of the questions to respondents, so the wordings in the questionnaire should be clear, simple, and easy to understand (Kumar, 2005). Simplicity and clarity should raise the response rate (Kumar, 2005; Veal, 2005; Zikmund, 2003). Respondents will be frustrated if they are asked to read relatively long questions. Sometimes, they may decide to ignore and skip those questions (Buckingham & Saunders, 2004). Also, jargon and unclear sentences should be avoided (Veal, 2005).
Most of general quantitative techniques by statistics can be applied through the process of data collection from questionnaires (Easterby-Smith, Thorper and Lowe 1991). However, questionnaires should include enough questions to deal with the research topic in enough detail (Gill & Johnson, 1991). Usually there should be at least two questions per variable.

As mentioned, it is necessary to pre-test the questionnaire with people representative of the ultimate sample to ensure that the questionnaire is appropriate, understandable, and answerable (Madanoglu, Moreo, & Leong, 2003).

For the current project, a pre-test questionnaire was sent to the selected participants (Etzion, Eden, & Lapidot, 1998). After collecting the feedback, slight changes in wording were made to ensure that all participants responded in consistent ways, maximizing reliability (Jackson, Schwab, & Schuler, 1986).

This study followed the above suggestions for questionnaire design to develop an English questionnaire. The survey then had to be translated so that it could be used in China. To avoid any mistranslations, the researcher used the recognized back-translation procedure (Hambleton, 2004). This involves first translating the questionnaire and then having several people fluent in both Chinese and English back-translate it. The translation team then resolved any discrepancies in the translations. Copies of both the English and Chinese versions of the questionnaires are attached in Appendices B and C.

3.7.1 Scale design

Commonly, this kind of research project uses Likert scales because they are easy to use and understand (Kumar, 2005; Zikmund, 2003). Likert scales are used to indicate respondents’
opinions by measuring their agreement / disagreement levels for each question (Veal 2005; Kumar 2005). In some occasions, the respondents need to select an appropriate answer from a list of specific answers or multiple choices in the closed-ended questions (Zikmund 2003). In general, Likert scales have three, five, seven, or ten points depending on how fine researchers want to measure the intensity of people’s opinions (Kumar, 2005).

Although larger Likert scales make it possible to discriminate opinions more finely, they can also confuse the respondents (Bass, Cascio, & O'Connor, 1974). In general, seven-point scales are found to reduce inaccuracy, whereas five-point scales restrict choice too much (Burns & Bush, 2000). Therefore, seven-point scales were used in this study. This provides more alternatives for respondents, and it provides a less skewed distribution for statistical analysis (Burns & Bush, 2000).

3.7.2 Design of study measuring

It is important for researchers to know the process of setting up the questionnaire when designing the questionnaire (Zikmund 2003). Commonly, for convenience, time efficiency and economy, the researcher needs to create the questionnaire by themselves.

A self-administered survey questionnaire is a pre-written set of questions for respondents to put down their answers within the closely selected alternatives (Sekaran 1999). And also, it is efficiency and easy data collection tools for general research with the following advantages (Zikmund 1997, p. 244):

- It offers geographical flexibility as data can be collected from respondents in different locations at the same time;
• Comparing with other survey methods, it is relatively low cost and fast to use.

• The quality of data collected depends on the contents of questions rather than the techniques of the interviewer;

• It allows the data collection can be completed in a shorter time;

In this research study, the questionnaires could be completed by respondents within 24 hours of the questionnaires being dropped off. Respondents then returned the completed questionnaires to the researcher the next day. The time for data collection was around one-and-a-half-month period.

3.8 Sampling

Sampling uses parts of the population to draw conclusions about the whole population. Sampling involves identifying survey targets. In general, large samples are more accurate than small samples, but, with proper sampling methods, a small proportion of the total population can still provide a reliable estimation of the whole. For example, cluster sampling can help reduce operation costs and increase efficiency (Zikmund, 2000, p. 64 & p. 339).

3.8.1 Sample size

There are general statistical guidelines to help with decisions of sample size (Cavana, Delahaye, & Sekaran, 2001, p. 278). Cavana, Delahaye, and Sekaran (2001) suggest that sample sizes for most research should be larger than 30 and smaller than 500. They argue
that samples over 500 are much more prone to type-II errors. Judgment sampling needs the choice of subjects who are in the best position to provide the information required (Sekaran 2000, p.278). Based on a study conducted by the researcher, there are many organizations in Hong Kong and China the senior executives had good exposures in team work. The target sample size for this study was 480 participants or greater.

### 3.8.2 Sample selection

Sample selection is a procedure of selecting a sample from the target population (Aldridge & Levine, 2001). In general, there are two methods of sample selection: probability sampling and nonprobability sampling (Aaker, Kumar, & Day, 1998; Krueger, 1988).

Most quantitative researchers use probability sampling (Buckingham & Saunders, 2004; Zikmund, 2003). If the objective of the research is to estimate the population as a whole, probability sampling is the most appropriate method (Babbie, 1992). The benefit of probability sampling is that every member of the population has an equal chance of selection, which minimizes selection bias and improves accuracy (Zikmund, 2003). There are many types of probability sampling: simple random sampling, systematic sampling, stratified sampling, cluster sampling, and multistage sampling:

a. **Simple random**: Researchers allocate each member of the population a number and then select sample units randomly. Samples are based on equal chance.

b. **Systematic**: Researchers use the natural order of sampling frame, select a random starting point, and then select items at a pre-selected interval.
c. **Stratified:** Researchers divide the population into groups and randomly select subsamples from each group. Variations include proportional, disproportional, and optimal allocation of subsample sizes.

d. **Cluster:** Researchers select sampling units randomly and survey all members in the group.

e. **Multistage:** Researchers select smaller areas in each stage and integrate the first four techniques above (adapted from Kumar, 2005; Zikmund, 2003).

In nonprobability sampling, the chance of any particular member of the population being chosen is not known in advance (Kumar, 2005; Sekaran, 2003; Zikmund, 2003). The selection of sampling members in nonprobability sampling is not organized; the researchers use personal experience to make their decisions (Zikmund, 2003). Nonprobability sampling includes convenience sampling, judgmental sampling, quota sampling, and snowball sampling.

a. **Convenience:** Researchers just use the most economical or convenient samples.

b. **Judgment:** Researchers select samples based on their experience to achieve a task such that they make sure all members have similar characteristics.

c. **Quota:** Researchers restrict the sample in each category and select the appropriate respondents.

d. **Snowball:** Initial respondents are selected randomly, and these respondents refer additional respondents (adapted from Buckingham & Saunders, 2004; Zikmund, 2003).
3.8.3 Justification for chosen sampling method

This study collected data from a sample chosen using statistical analysis to be representative of the whole population. For reasons of accuracy, time, and convenience, the researcher decided to combine methods of probability and nonprobability sampling.

When probability sampling is used, each member in the population has a probability to be selected (Buckingham & Saunders 2004; Kumar 2005). Therefore, based on the sources of data, this research study used a combination of two methods in probability sampling: simple random sampling and cluster sampling. Simple random sampling was used because it is the easiest way to minimize bias (Kumar, 2005). For populations that are not highly differentiated, simple random sampling is a suitable technique (Bryman, 2004; Zikmund, 2003). In this study, the target population is senior executives who are known to fit the typical profile of team work. They also do a high percentage of the team work in organizations. However, since the portion of Chinese workers that do team work is very large, simple random sampling alone would be expensive, difficult to implement, and lengthy (Zikmund, 2003).

Therefore, to save time and money, this study added cluster sampling. Cluster sampling divides the target population into a number of small groups based on categories such as cities or universities (Kumar, 2005). Each small group is selected using simple random sampling (Kumar, 2005; Zikmund, 2003). In this study, the researcher initially specified the locations and senior executives in cities in Mainland China and Hong Kong. A prior study conducted by the researcher revealed that many organizations in Hong Kong and Mainland China have senior executives with wide exposure to team work. However, since cluster
sampling cannot be used for the very large populations in China and Hong Kong, the researcher then used self-administration with nonprobability sampling to further reduce the costs (Kumar, 2005; Zikmund, 2003).

Nonprobability sampling is not a good method to draw broad conclusions if it is used alone (Sekaran, 2003; Zikmund, 2003). In this study, quota and convenience sampling from nonprobability sampling were used in the combination with the multistage probability sampling discussed above. In brief, this study integrated simple random sampling and cluster sampling, which are parts of probability sampling. To save further time and cost, it also mixed quota and convenience sampling, which are tools of nonprobability sampling.

3.9 Pilot testing

A pilot test is a formal testing of the questionnaire with a small number of respondents (Malhotra, 1999; Zikmund, 2003). Pilot testing helps the researcher make modifications to minimize any unforeseen issues (Zikmund, 2003). A pilot test was conducted to test the feasibility of this study before launching a full-scale operation.

Pilot testing was arranged for this study for the following reasons:

- to establish correct sampling and research techniques;

- to ensure appropriate questionnaire design;

- to assess the research methodology;
- to gain professional advice on the research questions and hypotheses (Zikmund, 2003).

Pilot testing is used to evaluate the effectiveness of questionnaires and to make sure that the meaning of each question is clear to the pilot respondents (Neuman, 2003; Zikmund, 2003). In this pilot test, the questionnaires were submitted to 80 highly regarded professionals in organizations that use team work. All feedback was considered in the hopes of improving the survey.

3.10 Data analysis

After data collection, data analysis starts. This section summarizes this step—the last step in the study—and discusses the justification for the chosen techniques.

The first step in data analysis is to edit, code, categorize, and enter the data. The next step is to get an overall picture of the data by looking at descriptive statistics, such as means, standard deviations, correlations, and frequency distributions. After that, the data are tested for quality using tests of reliability and validity. Interpretation is the final step in data analysis (Sekaran, 2003).

3.10.1 Data preparation

Most quantitative surveys in business research collect a large amount of data which is processed most efficiently using data analysis programs. Data editing involves checking for incomplete and inconsistent data. Data coding involves identifying each data point with a
numerical score or character. Data categorizing is the procedure of classifying variables into groups of constructs based on the research design. Finally, data are entered into the data analysis program (Sekaran, 2003).

3.10.2 Selection of SPSS and SmartPLS software program

There are many software programs used to process data analysis including SPSS, SmartPLS, SAS, STATPAK or Excel. The most popular program is SPSS (Statistical Package for the Social Sciences). In this study, SPSS and SmartPLS were chosen for their simplicity and completeness (Sekaran, 2003).

3.10.3 Reliability and validity

Data is deemed acceptable based on reliability and validity (Ticehurst & Veal, 2000). Basically, a data set is reliable when it is error-free and consistent across (1) time and (2) the items in the analysis. Reliability can be used to test for the stability and internal consistency of measures. In general, the test-retest reliability or parallel-form reliability are used to measure stability. Similarly, internal consistency is measured with interitem consistency or split-half reliability.

Table 3.5: Tests of reliability

<table>
<thead>
<tr>
<th>Reliability Test</th>
<th>Description</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test-retest reliability</td>
<td>Reliability coefficient obtained on second test (retest) is similar</td>
<td>Stability</td>
</tr>
</tbody>
</table>
Parallel-form reliability | Two comparable sets of construct are highly correlated | Stability
Inter-item consistency | Independent measures of same concept are highly correlated | Consistency
Split-half reliability | Two halves of instrument are highly correlated | Consistency

Based on Sekaran, 2003

Internal validity ensures the causal relationships between variables. External validity ensures that the causal relationships hold in new settings with other subjects (Lincoln & Guba, 1985). Sekaran (2003) classified eight types of validity measurements: content, face, criterion-related, concurrent, predictive, construct, convergent, and discriminant validity.

Table 3.6: Types of validity

<table>
<thead>
<tr>
<th>Type of Validity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Does it adequately measure the concept?</td>
</tr>
<tr>
<td>Face</td>
<td>Does it measure what its name suggests?</td>
</tr>
<tr>
<td>Criterion</td>
<td>Does it predict a criterion variable?</td>
</tr>
<tr>
<td>Concurrent</td>
<td>Does it predict something that co-occurs with the criterion?</td>
</tr>
<tr>
<td>Predictive</td>
<td>Does it predict a future criterion?</td>
</tr>
<tr>
<td>Construct</td>
<td>Does it tap the concept as theorized?</td>
</tr>
<tr>
<td>Convergent</td>
<td>Do two instruments measuring the concept correlate highly?</td>
</tr>
<tr>
<td>Discriminant</td>
<td>Does it correlate with an unrelated variable?</td>
</tr>
</tbody>
</table>

Based on Sekaran, 2003
3.10.4 Descriptive and inferential statistics

Descriptive statistics are used to summarize data. The major descriptive statistics are the mean, median, range, mode, variance, and standard deviation (Tabachnick & Fidell, 2001).

In general, mean is the total amount scores in a data distribution divided by the number of scores. Median is the middle point in a data distribution. Range is the different between the highest to lowest scores in a data distribution. Mode is the highest frequent score in a data distribution. Variance is the mean of the squared deviation scores for the mean of a data distribution. Standard deviation is the square root of the variance (Ticehurst & Veal 2000).

The most frequently used measurement for inferential statistics is the Pearson correlation coefficient. Inferential statistics are used to make judgments about a population on the basis of samples (Sekaran, 2003).

3.10.5 Statistical tests

Statistical tests are used to make comparisons between variables and relationships between variables. Tests are chosen based on the format of the data, the measurement level, or the number of variables.

Table 3.7: Types of statistical tests

<table>
<thead>
<tr>
<th>Task</th>
<th>Data format</th>
<th>No. of Variables</th>
<th>Types of Variables</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship between two variables</td>
<td>Cross tabulation of frequencies</td>
<td>2</td>
<td>Nominal</td>
<td>Chi-square</td>
</tr>
<tr>
<td>Difference between two paired means</td>
<td>Means of whole sample</td>
<td>2</td>
<td>Ratio or ordinal</td>
<td>Paired t-test</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------------</td>
<td>---</td>
<td>----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Difference between two means taken from independent samples</td>
<td>Means from 2 subgroups</td>
<td>2</td>
<td>1 ratio or ordinal, 2 nominal</td>
<td>Independent-samples t-test</td>
</tr>
<tr>
<td>Relationship between two variables</td>
<td>Means from 3 or more subgroups</td>
<td>2</td>
<td>1 ratio or ordinal, 2 nominal</td>
<td>One-way analysis of variance</td>
</tr>
<tr>
<td>Relationship between three or more variables</td>
<td>Cross-tabulated means</td>
<td>3+</td>
<td>1 ratio or ordinal, 2 or more nominal</td>
<td>Factorial analysis of variance</td>
</tr>
<tr>
<td>Relationship between two variables</td>
<td>Individual measures</td>
<td>2</td>
<td>Ratio or ordinal</td>
<td>Correlation</td>
</tr>
<tr>
<td>Linear relationship between two variables</td>
<td>Individual measures</td>
<td>2</td>
<td>Ratio or ordinal</td>
<td>Linear regression</td>
</tr>
<tr>
<td>Linear relationship between two or more variables</td>
<td>Individual measures</td>
<td>3+</td>
<td>Ratio or ordinal</td>
<td>Multiple regression</td>
</tr>
<tr>
<td>Relationship between large number of variables</td>
<td>Individual measures</td>
<td>Many</td>
<td>Ratio or ordinal</td>
<td>Factor analysis; cluster analysis</td>
</tr>
</tbody>
</table>

Based on Ticehurst & Veal, 2000

Manning and Munro (2006) suggest a five-step procedure for selecting statistical tests:

1. Understand the objective of the study, such as determining a correlation between variables, testing hypotheses, or testing differences in variables.

2. Identify the variables involved and the exact nature of the expected relationship.
3. Identify the scale of measurements for each variable.

4. Ensure the variables meet the assumptions of the test.

5. Select the acceptable tests based on above considerations.

The major purpose of this study is to test hypotheses based on two independent composite variables (team trust and team leadership) and three dependent variables (intention to share knowledge, team potency, and team creativity). The overall study construct and the tests to be used (t-tests, correction tests, multiple regression, and factor analysis) will be discussed in detail in Chapter 4.

3.11 Ethical considerations

Ethical considerations are in use to protect the rights of participants. Ethics should be an important concern in planning of research (Bryman & Bell, 2003). Ethical considerations are behavioral standards that guide our moral choices. They are guided by the norms accepted by society and a list of agreeable codes of conduct applicable to the social environment (Cooper & Emory, 1995; Zikmund, 1997, 2000).

Research should balance the rights of people and the value of knowledge creation. Participation is voluntary. Participants have the right to quit and access the research findings, to keep their results secret, and to give informed consent. The researchers must explain the objective, process, risks, benefits, and privacy concerns to participants (Neuman, 2000). And also, the researcher must maintain a research quality to make sure the research findings are
correct and objective (Zikmund 2003). Therefore, ethical considerations minimize the
negative impact on participants (Ticehurst & Veal, 2000).

Therefore, this study addresses the ethical issues surrounding respondents, the questionnaire,
and the researcher. The National Health and Medical Research Council (NHMRC) of
Australia (1999) established three basic principles for ethical conduct by researchers: (a)
integrity, respect for persons, beneficence, and justice; (b) consent; and (c) research merit
and safety. Bouma (2000) expanded these principles further with his five rules:

a. Researchers must treat participants with dignity and respect.

b. The potential benefit of the project must substantially out weigh potential
   harm.

c. Participants must be able to give voluntary and informed consent.

d. Researchers must be supervised by qualified persons to ensure the safety of
   participants.

e. The research must be open and accountable to the community and
   participants.

In consideration of these principles and the guidelines established by the Graduate Research
College of Southern Cross University, this study handled the ethical issues in the following
manner:

- Voluntary participation and informed consent: The cover letter of the questionnaire
  package sent to participants stressed the fact (1) that the respondent was free to not
answer any question and suspend participation at any time and (2) that, by responding, participants expressed explicit consent to the research publication.

- **Privacy:** Respondents could reply to the questions in their own time, in their own location, in complete privacy without any interference from the researcher.

- **Deception:** The cover letter gave full disclosure to participants about the objectives, topic, and process of the research project.

- **Confidentiality and anonymity:** The mail questionnaire was a standard business survey providing complete anonymity because respondents were not allowed to write their name on the response page.

- **Feedback:** The cover letter also informed participants that either partial or complete findings of the research would be available through various industry publications or by personal request.

In view of the above factors, this research project met all the ethical standards and principles established by the NHMRC, the university, and the research community. There was no foreseeable harm or damage to any participants or their business. In addition, the ethics application for this research was approved on 19 May 2009 (Approval number ECN-09-046) by the Human Research Ethics Committee (HREC) of Southern Cross University.

### 3.12 Conclusion

Chapter 3 has presented the methodology that was used to test the proposed team creativity model. Issues have included the sampling method, data collection, and questionnaire
development. Probability and nonprobability sampling were combined in this study. The questionnaires were translated into Chinese and a seven-point scale was used to measure team creativity.

Additionally, reliability and validity were assessed. Exploratory factor analysis—using principal component factor analysis—was used to analyze the scale items. The internal reliability of each factor was assessed using Cronbach’s alpha coefficient. SPSS and SmartPLS were used to test the relationships between variables.

Chapter 4 presents the results statistical analysis.
Chapter 4 DATA COLLECTION AND ANALYSIS

4.1 Introduction

Chapter 3 described the methodology used in the second stage of this research. This chapter will discuss the data analysis strategy. The chapter begins with a brief introduction and an examination of the returned questionnaires (Section 4.1 & 4.2). Section 4.3 profiles the respondents. Data analysis begins with a preliminary analysis and an exploratory factor analysis (Section 4.4 & 4.5). Section 4.6 evaluates the measurement models, and Section 4.7 provides structural models. Section 4.8 gives a summary and conclusion.
The questionnaire was constructed and modified based on the existing literatures from the following authors: 1. Team potency (de Jong, de Ruyter & Wetzels, 2005), 2. Intent to share knowledge (Ajzen, 1991), 3. Team trust (Sarker, Valacich, & Sarker, 2003), 4. Team leadership (Sivaubramaniam, Murry, Avolio, & Jung, 2002) and 5. Team creativity (Thacker, 1997).

After the English language questionnaire was created, it was reviewed for content validity by more than 30 university research students and academics staff. Because the questionnaire
was administered in Chinese, we translated the English questionnaire into Chinese and then back into English to ensure translation equivalence (Brislin, Walter & Robert, 1973). A professional translator and two research assistants independently translated the original items from English into Chinese. They analyzed the independently translated Chinese versions and came to an agreement on the final version for the questionnaire. The questionnaire was then translated back into English by another professional translator to confirm translation equivalence. The questionnaire was pilot tested on 80 highly-regarded professionals in the team work organizations for completion. The people were not included in the main survey, but the organizations that they were from may have been in the main survey. Preliminary evidence showed that the scales were reliable and valid.

4.2 Examination of returned questionnaires

Respondents returned 499 (85.45%) of the 584 surveys, which were distributed in May 2009 and Jan 2010. The high response rate was likely due to the fact that surveys were delivered and picked up in by research assistant the next date in person, rather than by mail or e-mail. Another reason for the high response rate was that respondents had plenty of time in one to two days to complete their questionnaires. Participants received reminders to complete the questionnaire; furthermore, second and third pick-up times were offered when necessary. Where respondents had either skipped or misunderstood questions, the researcher returned to ensure they completed the questionnaire.

4.2.1 Questionnaire editing
Raw data was examined for completeness, consistency, respondent eligibility, and accuracy (Churchill, 1999; Sekaran, 2003; Zikmund, 2003). In this research, all the questionnaires were numbered in the sequence of their return. The researcher then checked for the completeness of the questionnaires and eligibility of the respondents. Thirteen questionnaires were considered unusable. Of these, 4 questionnaires had missing pages, 1 questionnaire had multiple answers for 4 items, and 9 questionnaires were missing answers to 25 percent of the questions. That left a final total of 486 questionnaires for further analysis.

4.2.2 Data coding

For coding, Churchill (1999) suggests two steps. First, the categories or classes are specified based on the research problem. This research included five constructs, and items in Section A of the questionnaire were organized based on these five constructs. Second, code numbers are assigned—usually numeric codes (Churchill, 1999). Responses were then pre-coded (Malhotra, 2004) according to codes that were designed before data collection. Table 4.1 summarizes the scale items and their codes. After these two steps, the data was transferred into computer files using SPSS and SmartPLS.

Table 4.1 Scale items and codes

<table>
<thead>
<tr>
<th>Latent Constructs</th>
<th>Scale Items</th>
<th>Item Codes</th>
<th>Sources for the Adapted Measurement Items:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Potency</td>
<td>Our team has confidence in performing the job requirements.</td>
<td>TP01</td>
<td>de Jong, A., de Ruyter, K. &amp; Wetzels, M. 2005,</td>
</tr>
<tr>
<td>Intent to Share Knowledge</td>
<td>Our team believes it can become unusually good at self-management.</td>
<td>TP02</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our team expects to become known as a high-performing team.</td>
<td>TP03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our team feels it can solve any problem it encounters.</td>
<td>TP04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No task is too tough for our team.</td>
<td>TP05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our team can get a lot done when it works hard.</td>
<td>TP06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I will share my work reports and official documents with members of my organization more frequently in the future.</td>
<td>ISK01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I will always provide my manuals, methodologies and models for team members, in order to complete the group work of my organization.</td>
<td>ISK02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I intend to share my knowledge or experience from work with other organizational members more frequently in the future.</td>
<td>ISK03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I always provide my knowledge or experience at the request of other organizational members.</td>
<td>ISK04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I try to share my expertise or knowledge from my education or training with other organizational members in a more effective way.</td>
<td>ISK05</td>
<td></td>
</tr>
<tr>
<td>Team Trust</td>
<td>Team members tell the truth about the limits of their knowledge.</td>
<td>TT01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team members can be counted on to do what they say they will do.</td>
<td>TT02</td>
<td></td>
</tr>
</tbody>
</table>


Sarker, S, Valacich, JS & Sarker, S 2003, ‘Virtual team trust: Instrument development and validation in an IS
| Team Leadership | Members of my team talk about how trusting each other can help overcome difficulties. | TL01 | Sivasubramaniam, N., Murry, WD, Avolio, BJ, & Jung, DI 2002, ‘A longitudinal model of the effects of team leadership and group potency on group performance’, |
| Members of my team envision exciting new possibilities. | TL02 |
| Members of my team emphasize the importance of being committed to our beliefs. | TL03 |

| Team members are honest in describing their experience and abilities. | TT03 |
| Team members have advanced skills/abilities. | TT04 |
| Team members put in their best effort when it comes to team projects. | TT05 |
| My team members do their share of the work because we have always been told that in a group project, members should divide and share the work. | TT06 |
| My team members submit the required materials or information on time. | TT07 |
| My team members all do their best. | TT08 |
| I can depend on my team members because they are my cohorts, and my cohorts are always dependable. | TT09 |
| My team members do their best because this project is for them to learn and gain experience about real problems that organizations face. | TT10 |
| I can depend on my team members because they do their best to uphold the reputation of the team/organization. | TT11 |

Team members have advanced skills/abilities.

My team members do their share of the work because we have always been told that in a group project, members should divide and share the work.

My team members submit the required materials or information on time.

My team members all do their best.

I can depend on my team members because they are my cohorts, and my cohorts are always dependable.

My team members do their best because this project is for them to learn and gain experience about real problems that organizations face.

I can depend on my team members because they do their best to uphold the reputation of the team/organization.

4.3 Profile of respondents

After the useable questionnaires were identified and the data was entered, data analysis began. This section describes the demographic characteristics of the respondents.

All participants were employees from large organizations across different industries and locations in Hong Kong and Mainland China. The 486 qualifying participants had all worked on a project team within the past 2 years. The members of the teams had met face to face or in virtual space on a regular basis for more than one year. It was assumed that people who worked in a team environment were knowledgeable about working in a team. All collected information was strictly confidential. At this individual level of analysis, expectations for teamwork refer to how strongly an individual endorses the importance of behaviors associated with teamwork. Similar to previous research (e.g., Kraiger, Ford &
Salas, 1993), as individuals’ expectations for teamwork become stronger, they more closely approximate an expert’s expectations for teamwork.

First of all, frequency distributions were formed for all the respondents. The distributions contained data about tenure with current organization, age, position, gender, and company size. Table 4.2 summarizes the basic demographic information. The collected data illustrates that the majority of respondents (69%) were male. Almost half of the respondents were 30-39 years old (48%). Most came from middle management (61%). Most had fewer than 10 years of work experience (42%). Many came from companies with 200 or more employees (47%).

Table 4.2 Demographic profile of respondents

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure with current organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10 years</td>
<td>202</td>
<td>41.6</td>
</tr>
<tr>
<td>10 to 19 years</td>
<td>198</td>
<td>40.7</td>
</tr>
<tr>
<td>20 years or more</td>
<td>86</td>
<td>17.7</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 30</td>
<td>126</td>
<td>25.9</td>
</tr>
<tr>
<td>30 to 39</td>
<td>232</td>
<td>47.7</td>
</tr>
<tr>
<td>40 to 49</td>
<td>118</td>
<td>24.3</td>
</tr>
<tr>
<td>50 or above</td>
<td>10</td>
<td>2.1</td>
</tr>
<tr>
<td>Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO or senior management</td>
<td>94</td>
<td>19.3</td>
</tr>
<tr>
<td>Middle management</td>
<td>298</td>
<td>61.3</td>
</tr>
<tr>
<td>Gender</td>
<td>General staff</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>---------------</td>
<td>---</td>
</tr>
<tr>
<td>Male</td>
<td>334</td>
<td>68.7</td>
</tr>
<tr>
<td>Female</td>
<td>152</td>
<td>31.3</td>
</tr>
<tr>
<td>Company size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fewer than 50 employees</td>
<td>76</td>
<td>15.6</td>
</tr>
<tr>
<td>50-99 employees</td>
<td>94</td>
<td>19.3</td>
</tr>
<tr>
<td>100-199 employees</td>
<td>86</td>
<td>17.7</td>
</tr>
<tr>
<td>200 or more employees</td>
<td>230</td>
<td>47.3</td>
</tr>
</tbody>
</table>

Figure 4.2 Bar Chart for Respondents’ Tenure with Current Organization

Figure 4.3 Bar Chart for Respondents’ Age
Figure 4.4 Bar Chart for Respondents’ Position

Figure 4.5 Bar Chart for Respondents’ Gender

Figure 4.6 Bar Chart for Respondents’ Company Size
4.4 Preliminary analysis

Preliminary analysis was carried out to ensure that the data was translated into a form that was suitable for analysis and capable of being interpreted into meaningful results (Sekaran, 2003). Major difficulties with preliminary analysis are the accuracy of data input, missing observations, outliers, and distribution-related issues (e.g., normality; Hair et al., 1998). Each of these issues is discussed in the following section.

4.4.1 Data cleaning and screening

Data cleaning and screening involved (1) checking whether the data had been entered accurately and (2) identifying inconsistent responses and missing data (Malhotra, 2004). This project used two methods to clean and screen the data. First, descriptive statistics and frequency distributions were screened thoroughly. This identified a few minor data entry errors, which were immediately checked with the original questionnaires. Second, every tenth data set was manually checked against the original questionnaire. This check found no entry errors.

4.4.2 Treatment of missing values

Next, missing data was identified. Missing data can come from errors external to the respondent (e.g., data entry errors) or from respondent mistakes (e.g., failure to answer a question; Hair et al., 1998). In the present analysis, initial data screening identified missing
data due to data entry errors. Therefore, in this step, the major focus was to find items that respondents failed to answer. Only two out of 486 surveys had missing data. This showed that missing data was not a serious problem. Instead of deleting data and losing valuable information, missing values were replaced with an estimated score (the mean), as some researchers suggest (e.g., Hair et al., 1998). This led to a more complete data set for further analysis.

4.4.3 Tests for outliers

Outliers are observations with a unique combination of characteristics distinct from other observations (Hair et al., 1998). They are cases that have values that differ from the majority of cases in the data set. It is important to identify outliers because they may unduly impact the results. There are beneficial outliers and problematic outliers. Beneficial outliers are indicative of characteristics in the population, and problematic outliers are not representative of the population, which means they are counter to the objectives of the analysis (Hair et al., 1998). Thus, the decision to include or exclude outliers depends on why the case is an outlier and the purpose of the analysis.

Two methods were used to detect outliers: univariate and multivariate. Univariate detection involves examining the distribution of observations of each variable individually and selecting values that fall at the outer ranges of the distribution (Hair et al., 1998). This was done by converting the data values into standardized \( z \) scores. The general rule of thumb is to flag scores 3 or 4 \( z \) units from the mean (Hair et al., 1998). This study used the commonly used cutoff of \( \pm 3.29 \) (Tabachnick & Fidell, 2001). This identified 6 cases in the construct of team potency (ID: XA68, FZB50, U26, UC88, UC97, and HK31); 7 cases in intention to
share knowledge (ID: XA59, XA68, XA73, FZB1, UC97, HK05, and HK42); 6 cases in team trust (ID: XA59, XA68, FZB50, U26, UC88, and UC97); 2 cases in team leadership (ID: XA68 and UC04); and 4 cases in team creativity (ID: FZA17, UC97, HK36, and XA68). Fourteen cases were deleted because they had outliers in more than one construct.

Next, multivariate assessment was performed because some values that are not outliers in themselves may become multivariate outliers when several variables are combined (Hair et al., 1998; Tabachnick & Fidell, 2001). Multivariate outliers are cases that have an extreme combination of values on different variables. In this analysis, Mahalanobis distance was calculated. Mahalanobis distance is a measure of the distance in multidimensional space of each observation from the mean center of the observations (Hair et al., 1998). Multivariate outliers were examined with SPSS, and the Mahalanobis distance was then interpreted as a \( \chi^2 \) statistic with degrees of freedom equal to the number of composite variables. A case is a multivariate outlier if the probability associated with its \( d^2 \) is 0.001 or less (Tabachnick & Fidell, 2001). Using this criterion, 3 cases were identified as multivariate outliers and were not included in subsequent analysis.

Table 4.3 Mahalanobis distance of outliers

<table>
<thead>
<tr>
<th>Construct</th>
<th>Case Number</th>
<th>Mahalanobis Distance (d^2)</th>
<th>DF</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to Share Knowledge</td>
<td>FZB2</td>
<td>20.603</td>
<td>3</td>
<td>16.27</td>
</tr>
<tr>
<td></td>
<td>UC47</td>
<td>17.872</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Potency</td>
<td>FZB2</td>
<td>17.412</td>
<td>2</td>
<td>13.82</td>
</tr>
<tr>
<td></td>
<td>UC47</td>
<td>17.724</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Creativity</td>
<td>FZB68</td>
<td>17.113</td>
<td>2</td>
<td>13.82</td>
</tr>
</tbody>
</table>
In brief, 8 more cases were identified as multivariate outliers. Therefore, a total of 23 outliers were deleted, leaving 464 cases for further data analysis.

### 4.4.4 Test of normality

Normality is tested to deal with distribution-related problems. This is important for structural equation modeling (SEM) because its first assumption is a multivariate normal distribution (Hair et al., 1998). Multivariate normality concerns not only the distribution of individual items, but also the distribution of variable combinations (Hooley et al., 1999). The normality assumption is central for significance testing with \( t \)-tests and \( F \) statistics, as well as model estimation and testing (Schumacker & Lomax, 1996; Tabachnick & Fidell, 2001). In this study, normality was examined based on skewness and kurtosis.

Skewness is a measure of the symmetry of a distribution; kurtosis is a measure of the flatness of a distribution compared to a normal distribution (Hair et al., 1998). The general guideline is that variables violate normality if they have values greater than ±2.58 (Hair et al., 1998). In this study, cases causing violations of normality were identified and removed. Of the 30 observed variables, skewness values ranged from -1.344 to -0.618, and kurtosis
values ranged from 0.100 to -2.360 (see Table 4.2). Specifically, the 6 items of team potency ranged from -1.092 to -0.776 for skewness and 0.343 to 1.552 for kurtosis. The 5 items for the intent to share knowledge ranged from -1.344 to -0.783 for skewness and 0.100 to 2.360 for kurtosis. The 11 items for the team trust ranged from -1.072 to -0.676 for skewness and 0.262 to 1.758 for kurtosis. The 4 items for the construct of team leadership ranged from -0.973 to -0.618 for skewness and 0.132 to 2.099 for kurtosis. The 4 items for team creativity ranged from -0.946 to -0.731 for skewness and 0.327 to 0.652 for kurtosis. None of the 30 items exceeded ±2.58.

In summary, the data set did not have serious departures from normality, and the possibility of abnormal distribution was not significant. Therefore, the data set was considered appropriate for further analysis.

Table 4.4 Test of normality and descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Variance</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP01</td>
<td>464</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>5.89</td>
<td>1.042</td>
<td>1.086</td>
<td>-0.805</td>
<td>0.343</td>
</tr>
<tr>
<td>TP02</td>
<td>464</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>5.70</td>
<td>1.152</td>
<td>1.328</td>
<td>-1.067</td>
<td>1.483</td>
</tr>
<tr>
<td>TP03</td>
<td>464</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>6.16</td>
<td>0.874</td>
<td>0.764</td>
<td>-1.013</td>
<td>1.140</td>
</tr>
<tr>
<td>TP04</td>
<td>464</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>5.51</td>
<td>1.102</td>
<td>1.214</td>
<td>-0.776</td>
<td>0.842</td>
</tr>
<tr>
<td>TP05</td>
<td>464</td>
<td>6</td>
<td>1</td>
<td>7</td>
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<td>1.284</td>
<td>1.649</td>
<td>-0.870</td>
<td>0.786</td>
</tr>
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<td>TP06</td>
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<td>5</td>
<td>2</td>
<td>7</td>
<td>6.24</td>
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<td>0.700</td>
<td>-1.092</td>
<td>1.552</td>
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<td>2</td>
<td>7</td>
<td>6.16</td>
<td>0.922</td>
<td>0.850</td>
<td>-1.344</td>
<td>2.360</td>
</tr>
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<td>2</td>
<td>7</td>
<td>6.15</td>
<td>0.907</td>
<td>0.822</td>
<td>-1.031</td>
<td>1.093</td>
</tr>
<tr>
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<td>-----</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>ISK03</td>
<td>464</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>6.23</td>
<td>0.798</td>
<td>0.637</td>
<td>-0.801</td>
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</tr>
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<td>ISK04</td>
<td>464</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>6.19</td>
<td>0.840</td>
<td>0.706</td>
<td>-0.783</td>
<td>0.100</td>
</tr>
<tr>
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<td>4</td>
<td>3</td>
<td>7</td>
<td>6.18</td>
<td>0.846</td>
<td>0.716</td>
<td>-0.839</td>
<td>0.485</td>
</tr>
<tr>
<td>TT01</td>
<td>464</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>5.51</td>
<td>1.127</td>
<td>1.270</td>
<td>-1.027</td>
<td>1.526</td>
</tr>
<tr>
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<td>464</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>5.54</td>
<td>1.055</td>
<td>1.113</td>
<td>-0.746</td>
<td>0.779</td>
</tr>
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<td>2</td>
<td>7</td>
<td>5.71</td>
<td>1.007</td>
<td>1.015</td>
<td>-0.780</td>
<td>0.644</td>
</tr>
<tr>
<td>TT04</td>
<td>464</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>5.75</td>
<td>0.991</td>
<td>0.983</td>
<td>-0.805</td>
<td>0.755</td>
</tr>
<tr>
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<td>1</td>
<td>7</td>
<td>5.86</td>
<td>0.958</td>
<td>0.918</td>
<td>-0.845</td>
<td>1.288</td>
</tr>
<tr>
<td>TT06</td>
<td>464</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>5.85</td>
<td>0.960</td>
<td>0.922</td>
<td>-0.787</td>
<td>0.806</td>
</tr>
<tr>
<td>TT07</td>
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<td>1</td>
<td>7</td>
<td>5.49</td>
<td>1.110</td>
<td>1.231</td>
<td>-0.841</td>
<td>1.025</td>
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<tr>
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<td>2</td>
<td>7</td>
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<td>0.972</td>
<td>-1.031</td>
<td>1.135</td>
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<tr>
<td>TT09</td>
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<td>5</td>
<td>2</td>
<td>7</td>
<td>5.97</td>
<td>0.946</td>
<td>0.895</td>
<td>-1.072</td>
<td>1.758</td>
</tr>
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<td>TT10</td>
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<td>1</td>
<td>7</td>
<td>5.95</td>
<td>0.962</td>
<td>0.925</td>
<td>-1.022</td>
<td>1.742</td>
</tr>
<tr>
<td>TT11</td>
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<td>3</td>
<td>7</td>
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<td>0.929</td>
<td>0.863</td>
<td>-0.676</td>
<td>0.262</td>
</tr>
<tr>
<td>TL01</td>
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<td>4</td>
<td>3</td>
<td>7</td>
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<td>0.944</td>
<td>0.892</td>
<td>-0.646</td>
<td>0.132</td>
</tr>
<tr>
<td>TL02</td>
<td>464</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>5.77</td>
<td>0.883</td>
<td>0.780</td>
<td>-0.618</td>
<td>0.471</td>
</tr>
<tr>
<td>TL03</td>
<td>464</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>5.81</td>
<td>0.967</td>
<td>0.934</td>
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<td>2.099</td>
</tr>
<tr>
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<td>1</td>
<td>7</td>
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<td>1.016</td>
<td>1.032</td>
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<td>1.470</td>
</tr>
<tr>
<td>TC01</td>
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<td>3</td>
<td>7</td>
<td>5.95</td>
<td>0.990</td>
<td>0.980</td>
<td>-0.946</td>
<td>0.652</td>
</tr>
<tr>
<td>TC02</td>
<td>464</td>
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<td>2</td>
<td>7</td>
<td>5.78</td>
<td>0.979</td>
<td>0.958</td>
<td>-0.769</td>
<td>0.461</td>
</tr>
<tr>
<td>TC03</td>
<td>464</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>5.84</td>
<td>0.944</td>
<td>0.890</td>
<td>-0.731</td>
<td>0.327</td>
</tr>
</tbody>
</table>
4.5 Exploratory factor analysis

In this section, there are two major parts. The first discusses descriptive analysis and gives general information about the scores of the samples. The second part covers the factor structure of the constructs in order to obtain a clear picture of relationships between variables. The discussion of each part is given in the following.

4.5.1 Descriptive analysis

Descriptive analysis refers to the transformation of raw data into a form that makes them easier to understand and interpret (Sekaran, 2003; Zikmund, 2003). Descriptive statistics are summarized in Table 4.4. Most of the items did not have a mean close to the right end of the scale (i.e., close to 7). Instead, items had a mean just in the range of 5.35 to 6.24.

Most items had variance statistics near or above 1. All items had ranges of 4 or greater—evidence that the data had a wide range. Although range is often inferior to other measures of variation, such as standard deviation and variance, it does give basic information about the spread of the data.

4.5.2 Extraction of components via factor analysis
Factor analysis is used to condense a large number of variables into a smaller number of components factors (Hair, Black et al., 2006; Manning & Munro, 2006; Zikmund, 2003). It is also used to untangle the linear relationships between variables into their separate, simpler patterns, which are displayed in a correlation matrix (Manning & Munro, 2006; Zikmund, 2003). Hence, factor analysis is an appropriate technique for data analysis using principal component analysis (PCA), a variable reduction technique (Pallant, 2005). PCA is also useful as a method to test theories in a way that is uncontaminated by unique error variability (Tabachnick & Fidell, 2001).

PCA uses varimax rotation to determine a number of components factors (Manning & Munro, 2006). Varimax rotation is an appropriate method because it provides a simple structure in the results to extract components in the first stage, which makes the results easier to interpret (Manning & Munro, 2006; Pallant, 2005; Tabachnick & Fidell, 2001).

Factor analysis may also identify factor loading, which presents the correlation of each variable with the factor (Hair et al., 1998; Malhotra et al., 2006). Factor loading is suitable for differing sample sizes that should be large enough to enable the correlations to be reliably estimated (Manning & Munro, 2006). Pallant (2005) suggests that a larger sample size is preferable to a small sample size for factor analysis methods. Hair and colleagues (1998) and Tabachnick and Fidell (2001) suggest that the sample size should be at least 300, with a factor loading of 0.3, which is considered significant and is appropriate for PCA.

To conduct a factor analysis, a matrix of correlation between the variables is analyzed using Kaiser-Meyer-Olkin (KMO) and Bartlett's testing. KMO is a measure of sampling adequacy; it tests for small partial correlations among items (Malhotra et al., 2006). Brace, Kemp, and Snelgar (2006) suggest that KMO values of 0.5 or lower are poor, and 0.6 is acceptable. If
the value of the KMO exceeds 0.5 or is close to 1, factor analysis is considered an
appropriate technique for analyzing the correlation matrix (Hair et al., 1998; Malhotra et al.,
2006).

Bartlett's test of sphericity also tests whether the correlation matrix is an identity matrix,
which would indicate that the factor model is inappropriate (Malhotra et al., 2006; Pallant,
2005). If the Bartlett value is significant ($p < .05$), it is considered appropriate to apply PCA.
Otherwise, the data is probably not factorable.

The number of factors that exist in a dataset is determined by its eigenvalues and percentage
of variance (Malhotra et al., 2006). Eigenvalues indicate the number of factors to be
extracted for which the sum of eigenvalues is equal to the number of variables (Brace, Kemp
et al., 2006; Malhotra, Hall et al., 2006; Zikmund, 2003). Many researchers (Hair et al.,
1998; Malhotra et al., 2006) suggest that if the eigenvalue of factors exceeds 1, they should
be classified as significant and useful as unique to factors; otherwise they should not be
further analyzed. If only one component has an eigenvalue greater than 1, then all items are
thought to measure a single underlying construct (Hair et al., 2006; Manning & Munro,
2006).

The percentage of variance can also help determine how many factors exist. Percentage of
variance is calculated by dividing the associated eigenvalue by the total number of factors or
variables and multiplying by 100 (Malhotra et al., 2006).

In this research, 464 cases and 5 composite variables (team trust, team potency, team
leadership, team creativity, and intent to share knowledge) were entered into the PCA using
varimax rotation. The next section presents the results of the PCA analysis.
4.5.2.1 Team potency

The KMO value for team potency was 0.649, showing that Bartlett's testing was significant: $2(15, 464) = 1296.889, p < .001$ (see Table 4.5). Hence, in this case it was appropriate to apply PCA on the data for team potency.

Table 4.5 Factor analysis of team potency

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues and Extraction Sums of Squared Loadings</th>
<th>KMO and Bartlett’s test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% Variance</td>
</tr>
<tr>
<td>1</td>
<td>3.292</td>
<td>54.865</td>
</tr>
<tr>
<td>2</td>
<td>1.088</td>
<td>18.134</td>
</tr>
<tr>
<td>3</td>
<td>0.587</td>
<td>9.779</td>
</tr>
<tr>
<td>4</td>
<td>0.546</td>
<td>9.101</td>
</tr>
<tr>
<td>5</td>
<td>0.329</td>
<td>5.488</td>
</tr>
<tr>
<td>6</td>
<td>0.158</td>
<td>2.634</td>
</tr>
</tbody>
</table>

Table 4.5 shows the number of components to be extracted. Only two components had an eigenvalue greater than 1 (3.292 and 1.088), which means the PCA extracted two components. These components explained 73.00% (54.87% and 18.13%) of the total variance.
As shown in Table 4.6, the communalities results indicate how much variance exists in each variable for the component extracted. All 6 items had high communalities—greater than .5. The highest communality was .829 for item TP03. No item had communality lower than .5. Brace, Kemp, and Snelgar (2006) suggest that if a variable has a low communality (lower than .3), it should be dropped from the analysis. For team potency, no item fell near that threshold, so all items were retained.

Table 4.6 Communalities and component matrix of team potency

<table>
<thead>
<tr>
<th>Composite variables and item labels</th>
<th>Communalities</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>TP01</td>
<td>.637</td>
<td>.781</td>
</tr>
<tr>
<td>TP02</td>
<td>.707</td>
<td>.802</td>
</tr>
<tr>
<td>TP03</td>
<td>.829</td>
<td>.641</td>
</tr>
<tr>
<td>TP04</td>
<td>.684</td>
<td>.787</td>
</tr>
<tr>
<td>TP05</td>
<td>.719</td>
<td>.760</td>
</tr>
<tr>
<td>TP06</td>
<td>.806</td>
<td>.657</td>
</tr>
</tbody>
</table>

All 6 items loaded on the same component of the team potency (Table 4.6). The highest loading on this component was .802, for item TP02, and the lowest loading on this component was .641 (item TP03).

4.5.2.2 Intent to share knowledge
For the intention to share knowledge, the KMO value was .844, showing that Bartlett's testing was significant: $2(10, 464) = 1096.796, p < .001$. Hence, it was appropriate to apply PCA to the measure of intention to share knowledge.

Table 4.7 Factor analysis of intent to share knowledge

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues and Extraction Sums of Squared Loadings</th>
<th>KMO and Bartlett’s test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% Variance</td>
</tr>
<tr>
<td>1</td>
<td>3.275</td>
<td>65.495</td>
</tr>
<tr>
<td>2</td>
<td>0.652</td>
<td>13.032</td>
</tr>
<tr>
<td>3</td>
<td>0.446</td>
<td>8.913</td>
</tr>
<tr>
<td>4</td>
<td>0.352</td>
<td>7.038</td>
</tr>
<tr>
<td>5</td>
<td>0.276</td>
<td>5.522</td>
</tr>
</tbody>
</table>

Table 4.7 shows the number of components to be extracted. Only one component had an eigenvalue greater than 1 (3.275), which means the PCA extracted one component. This component explained 65.50% of the total variance.

The communalities results (Table 4.8) indicate how much variance exists in each variable for the extracted component. All 5 items had communalities greater than .5, so all items were retained in the measure. The highest communality was .695 (item ISK04). Brace, Kemp and Snelga (2006) suggest that if the variable has a low communality (lower than 0.3)
then this variable should be dropped from the analysis. In this study, all the communalities were large and none were lower than 0.3, so they were all retained in the measure.

Table 4.8 Communalities and component matrix of team potency

<table>
<thead>
<tr>
<th>Composite variables and item labels</th>
<th>Communalities</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISK01</td>
<td>.506</td>
<td>.712</td>
</tr>
<tr>
<td>ISK02</td>
<td>.680</td>
<td>.824</td>
</tr>
<tr>
<td>ISK03</td>
<td>.755</td>
<td>.869</td>
</tr>
<tr>
<td>ISK04</td>
<td>.695</td>
<td>.834</td>
</tr>
<tr>
<td>ISK05</td>
<td>.638</td>
<td>.799</td>
</tr>
</tbody>
</table>

All 5 items loaded on the same component of team potency (Table 4.8). The highest loading on this component was .869 (item ISK03), and the lowest loading was .712 (item ISK01).

4.5.2.3 Team trust

The KMO value for team trust was 0.919 (Table 4.9), showing that Bartlett's testing was significant: \(2(55, 464) = 2507.712, p < .001\). Hence, it was appropriate to apply PCA to team trust.

Table 4.9 Factor analysis of team trust
<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues and Extraction Sums of Squared Loadings</th>
<th>KMO and Bartlett’s test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% Variance</td>
</tr>
<tr>
<td>1</td>
<td>5.604</td>
<td>50.944</td>
</tr>
<tr>
<td>2</td>
<td>1.239</td>
<td>11.264</td>
</tr>
<tr>
<td>3</td>
<td>0.764</td>
<td>6.943</td>
</tr>
<tr>
<td>4</td>
<td>0.654</td>
<td>5.946</td>
</tr>
<tr>
<td>5</td>
<td>0.530</td>
<td>4.818</td>
</tr>
<tr>
<td>6</td>
<td>0.476</td>
<td>4.328</td>
</tr>
<tr>
<td>7</td>
<td>0.421</td>
<td>3.832</td>
</tr>
<tr>
<td>8</td>
<td>0.362</td>
<td>3.287</td>
</tr>
<tr>
<td>9</td>
<td>0.343</td>
<td>3.117</td>
</tr>
<tr>
<td>10</td>
<td>0.311</td>
<td>2.831</td>
</tr>
<tr>
<td>11</td>
<td>0.296</td>
<td>2.690</td>
</tr>
</tbody>
</table>

Only two components had eigenvalues greater than 1 (5.604 and 1.239), which means the PCA extracted two components (Table 4.9). These components explained 62.21% (50.94% and 11.26%) of the total variance.

Ten items had communalities greater than .5. The highest communality was .767 (item TT09). Item TT07 had the lowest communality value: .416. All of the items surpassed the .3 threshold, so all were retained. Brace, Kemp and Snelga (2006) suggest that if the variable
has a low communality (lower than 0.3) then this variable should be dropped from the analysis. In this study, all the communalities were large and none were lower than 0.3, so they were all retained in the measure.

Table 4.10 Communalities and component matrix of team potency

<table>
<thead>
<tr>
<th>Composite variables and item labels</th>
<th>Communalities</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>TT01</td>
<td>.541</td>
<td>.664</td>
</tr>
<tr>
<td>TT02</td>
<td>.667</td>
<td>.730</td>
</tr>
<tr>
<td>TT03</td>
<td>.742</td>
<td>.767</td>
</tr>
<tr>
<td>TT04</td>
<td>.637</td>
<td>.744</td>
</tr>
<tr>
<td>TT05</td>
<td>.612</td>
<td>.776</td>
</tr>
<tr>
<td>TT06</td>
<td>.559</td>
<td>.747</td>
</tr>
<tr>
<td>TT07</td>
<td>.416</td>
<td>.613</td>
</tr>
<tr>
<td>TT08</td>
<td>.666</td>
<td>.747</td>
</tr>
<tr>
<td>TT09</td>
<td>.767</td>
<td>.679</td>
</tr>
<tr>
<td>TT10</td>
<td>.680</td>
<td>.616</td>
</tr>
<tr>
<td>TT11</td>
<td>.555</td>
<td>.744</td>
</tr>
</tbody>
</table>

All 11 items loaded on the same component of the team potency (Table 4.10). The highest loading on this component was .776 (item TT05), and the lowest loading was .613 (item TT07).
4.5.2.4 Team leadership

The KMO value for team leadership was 0.794, showing that Bartlett's testing was significant: $2(6, 464) = 712.984, p < .001$ (Table 4.11). Hence, it was appropriate to apply PCA to team leadership.

Table 4.11 Factor analysis of team leadership

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues and Extraction Sums of Squared Loadings</th>
<th>KMO and Bartlett’s test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% Variance</td>
</tr>
<tr>
<td>1</td>
<td>2.663</td>
<td>66.566</td>
</tr>
<tr>
<td>2</td>
<td>0.614</td>
<td>15.347</td>
</tr>
<tr>
<td>3</td>
<td>0.387</td>
<td>9.672</td>
</tr>
<tr>
<td>4</td>
<td>0.337</td>
<td>8.415</td>
</tr>
</tbody>
</table>

Only one component for team leadership had an eigenvalue greater than 1 (2.663), which meant the PCA extracted one component (Table 4.11). This component explained 66.57% of the total variance.

All 4 items had communalities greater than .5 (Table 4.12), so all items were retained. The highest communality was .733 (item TL04). No item had a communality lower than 0.5. Brace, Kemp and Snelga (2006) suggest that if the variable has a low communality (lower
than 0.3) then this variable should be dropped from the analysis. In this study, all the communalities were large and none were lower than 0.3, so they were all retained in the measure.

Table 4.12 Communalities and component matrix of team potency

<table>
<thead>
<tr>
<th>Composite variables and item labels</th>
<th>Communalities</th>
<th>Component 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL01</td>
<td>.517</td>
<td>.719</td>
</tr>
<tr>
<td>TL02</td>
<td>.698</td>
<td>.835</td>
</tr>
<tr>
<td>TL03</td>
<td>.715</td>
<td>.845</td>
</tr>
<tr>
<td>TL04</td>
<td>.733</td>
<td>.856</td>
</tr>
</tbody>
</table>

All 4 items loaded on the same component of the team leadership (Table 4.12). The highest loading on this component was .856 (item TL04), and the lowest loading on this component was .719 (item TL01).

4.5.2.5 Team creativity

For team creativity, the KMO value was 0.814, showing that Bartlett's testing was significant: $2(6, 464) = 931.925, p < .001$ (Table 4.13). Hence, it was appropriate to apply PCA to team creativity.

Table 4.13 Factor analysis of team creativity
Only one component of team creativity had an eigenvalue greater than 1 (2.884), which means the PCA extracted one component (Table 4.13). This component explained 72.09% of the total variance.

All 4 items had communalities greater than .5 (Table 4.14). The highest communality was .818 (item TC03). No item had a communality value lower than .5, so all items were retained. Brace, Kemp and Snelga (2006) suggest that if the variable has a low communality (lower than 0.3) then this variable should be dropped from the analysis. In this study, all the communalities were large and none were lower than 0.3, so they were all retained in the measure.

Table 4.14 Communalities and component matrix of team potency
All four items loaded on the same component of the team potency. The highest loading on this component was .904 (item TC03), and the lowest loading on this component was .803 (item TC04).

4.5.3 **Factor structure of the constructs**

Before model testing, two steps are necessary. First is to perform an initial examination with factor analysis, and second is to assess the reliability of the indicators for each latent construct.

To start, the KMO test and Bartlett’s test of sphericity were performed for the whole construct. These are tests of multivariate normality and sampling adequacy used to decide whether it is appropriate to conduct factor analysis (George & Mallery, 2001). The KMO test had a value of 0.910, which meets the 0.7 cutoff point. Bartlett’s test had a value of (435)7893.439 $p < .01$, which meets the $\alpha = .05$ guideline. These illustrated that the data set in this research was adequate for factor analysis (George & Mallery, 2001; Hair et al., 1998).

For reliability, an item-total correlation or interitem correlation is calculated for each item. Rules of thumb suggest that the item-total correlations should exceed .5, and the interitem
correlations should exceed .3 (Hair et al., 1998). The Cronbach’s alpha coefficient is the most widely used measure for testing the internal consistency of the scales (Churchill, 1999; Hair et al., 1998). The generally agreed-upon guideline for acceptable reliability for Cronbach’s alpha is .7 (Hair et al., 1998).

Table 4.15 summarizes the item-total correlations and Cronbach’s alphas for the survey items. Item-total correlations for the 30 items ranged from .518 (TP03) to .809 (TC03). All of the items surpassed the .5 guideline. Similarly, the Cronbach’s alphas ranged from .830 to .901, with all items surpassing the .7 cutoff.

In summary, the 6 items measuring team potency had item-total correlations from .518 to .693, and an alpha of .833. The 5 items measuring the intention to share knowledge had item-total correlations from .577 to .768 and an alpha of .864. The 11 items measuring team trust had item-total correlations from .535 to .705 and an alpha of .901. The 4 items measuring team leadership had item-total correlations from .545 to .715 and an alpha of .830. The 4 items measuring team creativity had item-total correlations from .660 to .809 and a coefficient alpha of .869.

Table 4.15 Reliability statistics of the measurement items

<table>
<thead>
<tr>
<th>Item Codes</th>
<th>Scale Items</th>
<th>Item-total Correlation</th>
<th>Coefficient Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP01</td>
<td>Our team has confidence in performing the job requirements.</td>
<td>.653</td>
<td>.833</td>
</tr>
<tr>
<td>TP02</td>
<td>Our team believes it can become unusually good at self-management.</td>
<td>.693</td>
<td></td>
</tr>
<tr>
<td>TP03</td>
<td>Our team expects to become known as a high-</td>
<td>.518</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>TP04</td>
<td>Our team feels it can solve any problem it encounters.</td>
<td>.672</td>
<td></td>
</tr>
<tr>
<td>TP05</td>
<td>No task is too tough for our team.</td>
<td>.638</td>
<td></td>
</tr>
<tr>
<td>TP06</td>
<td>Our team can get a lot done when it works hard.</td>
<td>.512</td>
<td></td>
</tr>
<tr>
<td>ISK01</td>
<td>I will share my work reports and official documents with members of my organization more frequently in the future.</td>
<td>.577 .864</td>
<td></td>
</tr>
<tr>
<td>ISK02</td>
<td>I will always provide my manuals, methodologies and models for team members, in order to complete the group work of my organization.</td>
<td>.712</td>
<td></td>
</tr>
<tr>
<td>ISK03</td>
<td>I intend to share my knowledge or experience from work with other organizational members more frequently in the future.</td>
<td>.768</td>
<td></td>
</tr>
<tr>
<td>ISK04</td>
<td>I always provide my knowledge or experience at the request of other organizational members.</td>
<td>.717</td>
<td></td>
</tr>
<tr>
<td>ISK05</td>
<td>I try to share my expertise or knowledge from my education or training with other organizational members in a more effective way.</td>
<td>.668</td>
<td></td>
</tr>
<tr>
<td>TT01</td>
<td>Team members tell the truth about the limits of their knowledge.</td>
<td>.587 .901</td>
<td></td>
</tr>
<tr>
<td>TT02</td>
<td>Team members can be counted on to do what they say they will do.</td>
<td>.659</td>
<td></td>
</tr>
<tr>
<td>TT03</td>
<td>Team members are honest in describing their experience and abilities.</td>
<td>.700</td>
<td></td>
</tr>
<tr>
<td>TT04</td>
<td>Team members have advanced skills/abilities.</td>
<td>.670</td>
<td></td>
</tr>
<tr>
<td>TT05</td>
<td>Team members put in their best effort when it comes</td>
<td>.705</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TT06</td>
<td>My team members do their share of the work because we have always been told that in a group project, members should divide and share the work.</td>
<td>.673</td>
<td></td>
</tr>
<tr>
<td>TT07</td>
<td>My team members submit the required materials or information on time.</td>
<td>.535</td>
<td></td>
</tr>
<tr>
<td>TT08</td>
<td>My team members all do their best.</td>
<td>.677</td>
<td></td>
</tr>
<tr>
<td>TT09</td>
<td>I can depend on my team members because they are my cohorts, and my cohorts are always dependable.</td>
<td>.609</td>
<td></td>
</tr>
<tr>
<td>TT10</td>
<td>My team members do their best because this project is for them to learn and gain experience about real problems that organizations face.</td>
<td>.542</td>
<td></td>
</tr>
<tr>
<td>TT11</td>
<td>I can depend on my team members because they do their best to uphold the reputation of the team/organization.</td>
<td>.675</td>
<td></td>
</tr>
<tr>
<td>TL01</td>
<td>Members of my team talk about how trusting each other can help overcome difficulties.</td>
<td>.545</td>
<td>.830</td>
</tr>
<tr>
<td>TL02</td>
<td>Members of my team envision exciting new possibilities.</td>
<td>.683</td>
<td></td>
</tr>
<tr>
<td>TL03</td>
<td>Members of my team emphasize the importance of being committed to our beliefs.</td>
<td>.699</td>
<td></td>
</tr>
<tr>
<td>TL04</td>
<td>Members of my team work out agreements about what is expected from each other.</td>
<td>.715</td>
<td></td>
</tr>
<tr>
<td>TC01</td>
<td>My team leader tries to create a team atmosphere, encouraging us to work together.</td>
<td>.733</td>
<td>.869</td>
</tr>
<tr>
<td>TC02</td>
<td>My team leader is interested in our ideas about how to solve problems.</td>
<td>.688</td>
<td></td>
</tr>
</tbody>
</table>
My team leader tries to dictate how we are to proceed whenever a problem arises.  

My team leader often emphasizes the rules and procedures when we are trying to solve problems.

| TC03 | My team leader tries to dictate how we are to proceed whenever a problem arises. | .809 |
| TC04 | My team leader often emphasizes the rules and procedures when we are trying to solve problems. | .660 |

In brief, all the items had appropriate item-total correlations and coefficient alpha values. This showed that the data set lies within an acceptable level of reliability and is suitable for model testing.

### 4.6 Measurement models evaluation

This section describes first the exploratory factor analysis (EFA) and then a confirmatory factor analysis (CFA), which uses multivariate techniques to test specified relationships between variables (Hair et al., 1998). This study adopted the two-step modeling procedures suggested by Anderson and Gerbing (1988). The measurement models are first estimated to assess the quality of the measurement items, and then a structural model is used to estimate the prescribed relationships between the fixed measurement models (Anderson & Gerbing, 1988; Hair et al., 1998). This section describes the measurement models, and the next section describes the structural model.

Partial least squares (PLS) were used to test the model because there were a lot of interaction terms, and PLS is capable of testing these effects (Chin, Marcolin, & Newsted, 2003). Using Smart-PLS, the study first examined the measurement model to assess reliability and validity before testing the various structural models.
Measurement models are used to (1) specify how the latent variables or hypothetical constructs are measured in terms of the observed (measured) variables and (2) describe their reliability and validity (Schumacker & Lomax, 1996). CFA is a way to test measurement models in which observed variables define constructs or latent variables (Schumacker & Lomax, 1996). Therefore, three steps are involved: (1) comparing different measurement models in order to illustrate the relationships between latent and observed variables, (2) putting the chosen measurement model into the CFA, and (3) assessing its reliability and validity.

Reliability and validity assessment ensures that the multiple indications of each latent variable in the measurement model converge to measure a single construct (Anderson & Gerbing, 1988). Reliability is a measure of the internal consistency of the construct indicators, depicting the degree to which they reflect the same latent variable (Hair et al., 1998). Reliability makes researchers more confident that the individual indicators are all consistent in their measurements (Hair et al., 1998). The commonly accepted measure of reliability is Cronbach’s alpha (as mentioned in Table 4.16), but Cronbach’s alpha has an important drawback: Simply increasing the number of items in the scale—even if they have the same degree of intercorrelation—will increase the reliability value (Hair et al., 1998). In addition, Cronbach’s alpha is based on the restrictive assumption that all indicators are equally important (Hair et al., 1998).

Therefore, more reliable measures provide the researcher with greater confidence that the individual indicators are all consistent in their measurements (Hair et al., 1998). Composite reliability in CFA is assessed by construct reliability and average variance extracted (AVE). Table 4.16 lists construct reliability and AVE statistics for each construct. The recommended cutoff point is .70 for construct reliability and .50 for AVE (Fornell &
Larcker, 1981; Hair et al., 1998). All latent variables in the survey had high construct reliability, ranging between .878 and .919. The column of Cronbach’s alphas was added for reference; these values were roughly the same as construct reliability. Similarly, all of the constructs had AVE values higher than .50, ranging from .509 to .721. Therefore, these measures indicate that the measurement model is reliable.

Table 4.16 Construct reliability and average variance extracted of latent variables

<table>
<thead>
<tr>
<th>Latent variable</th>
<th>Construct Reliability</th>
<th>Average Variance Extracted (AVE)</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Potency</td>
<td>.878</td>
<td>.547</td>
<td>.833</td>
</tr>
<tr>
<td>Intention to Share</td>
<td>.904</td>
<td>.654</td>
<td>.864</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Trust</td>
<td>.919</td>
<td>.509</td>
<td>.901</td>
</tr>
<tr>
<td>Team Leadership</td>
<td>.888</td>
<td>.665</td>
<td>.830</td>
</tr>
<tr>
<td>Team Creativity</td>
<td>.911</td>
<td>.721</td>
<td>.869</td>
</tr>
</tbody>
</table>

Moreover, discriminant validity was assessed to determine the external consistency of the measurement model. The AVE value for each construct was then compared with the square of the correlation between the two constructs (Brady & Robertson, 2001; Fornell & Larcker, 1981; Spreng & Mackoy, 1996). In summary, the AVE for different constructs are: team potency (.547), intention to share knowledge (.654), team trust (.509), team leadership (.665), and team creativity (.721; Table 4.16). Table 4.17 lists the correlations and the squared correlations with latent constructs. The largest value was .416. Therefore, the AVE values of all the latent variables were greater than the square of their correlations. Hence, discriminant validity was achieved.
Table 4.17 Corrections of latent constructs in the measurement model

<table>
<thead>
<tr>
<th></th>
<th>TP</th>
<th>ISK</th>
<th>TT</th>
<th>TL</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISK</td>
<td>.599 (.359)*</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TT</td>
<td>.541 (.293)</td>
<td>.517 (.267)</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL</td>
<td>.326 (.106)</td>
<td>.286 (.082)</td>
<td>.352 (.124)</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td>.457 (.209)</td>
<td>.447 (.200)</td>
<td>.645 (.416)</td>
<td>.316 (.100)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Note: The square of the correlation coefficient of each latent construct is presented inside parentheses.

TP: team potency; ISK: intention to share knowledge; TT: team trust; TL: team leadership; TC: team creativity

In summary, two measurement models were compared. After one measurement model was selected based on a chi-square test, the CFA was performed on the chosen model. All the observed variables had high estimated loadings on the corresponding latent variables. Then, different indices were used to assess the overall model fit. The results provided satisfactory evidence of model fit. The construct reliability and AVE values both supported the reliability of the model. The critical ratio and standard error were used to assess convergent validity, and their values for each underlying construct indicated that the model had
acceptable convergent validity. Finally, discriminant validity was examined using AVE and the squared correlations among the latent variables. The results also showed that the model had acceptable discriminant validity. The next section investigates the structural model.

4.7 Structural models evaluation

Structural models describe dependence relationships in the hypothesized model (Hair et al., 1998). The major aim is then to test the proposed structural model and the hypothesized relationships between constructs. This section discusses the two steps of structural equation modeling: (1) preparing and comparing competing models and (2) evaluating the chosen structural model.

The second assumption of regression and correlation is that the independent variables are not highly correlated with each other. Multicollinearity becomes a problem when correlations between independent variables are very high—above .90 (Tabachnick & Fidell 1996). Multicollinearity may pose difficulties in testing and interpreting regression coefficients. As Berry points out (1993), if independent variables correlate at .9, the standard errors of the regression coefficients are in doubt. And when multicollinearity is present, none of the regression coefficients may be significant because of the large standard error.

Table 4.17 shows the correlations ranging from .286 to .599. All variables have significant correlations at the $\alpha = .01$ level, except for centralization, which does correlate significantly with market orientation as a construct or with intelligence generation and responsiveness as individual variables. However, centralization correlates significantly ($p < .01$) with intelligence dissemination. In addition, centralization correlates significantly ($p < .05$) with
top management emphasis, internal communication, and functional coordination. Because no correlation surpassed .90, it can be concluded that multicollinearity was not a problem, according to Tabachnick and Fidell (1996).

After assessing the research model, the hypotheses developed in Chapter 2 are to be examined. There were seven hypotheses to be tested in this study. The first two tested the relationships of team trust to the constructs of intention to share knowledge and team potency. The third and the fourth tested the relationships of team leadership to the constructs of the intention to share knowledge and team potency. The fifth hypothesis tested the relationship between team potency and the intention to share knowledge. The sixth and seventh tested the relationships of the intention to share knowledge and team potency to the construct of team creativity.

Table 4.18 Estimated path coefficients

<table>
<thead>
<tr>
<th></th>
<th>Hypothesis</th>
<th>Standardized Estimate</th>
<th>Standard Error</th>
<th>Critical Ratio</th>
<th>p Value</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>TT → ISK</td>
<td>0.434</td>
<td>0.066</td>
<td>3.913</td>
<td>&lt; .001</td>
<td>Yes</td>
</tr>
<tr>
<td>H1b</td>
<td>TT → TP</td>
<td>0.889</td>
<td>0.050</td>
<td>9.694</td>
<td>.001</td>
<td>Yes</td>
</tr>
<tr>
<td>H2a</td>
<td>TL → ISK</td>
<td>0.037</td>
<td>0.051</td>
<td>0.992</td>
<td>.150</td>
<td>No</td>
</tr>
<tr>
<td>H2b</td>
<td>TL → TP</td>
<td>0.123</td>
<td>0.059</td>
<td>2.639</td>
<td>&lt; .001</td>
<td>Yes</td>
</tr>
<tr>
<td>H3</td>
<td>TP → ISK</td>
<td>0.403</td>
<td>0.059</td>
<td>7.532</td>
<td>.001</td>
<td>Yes</td>
</tr>
<tr>
<td>H4</td>
<td>ISK → TC</td>
<td>0.370</td>
<td>0.071</td>
<td>3.821</td>
<td>&lt; .001</td>
<td>Yes</td>
</tr>
<tr>
<td>H5</td>
<td>TP → TC</td>
<td>0.367</td>
<td>0.072</td>
<td>4.091</td>
<td>&lt; .001</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: TP: team potency; ISK: intention to share knowledge; TT: team trust; TL: team leadership; TC: team creativity
One hypothesis out of seven was not supported ($p > .05$): the path from team leadership to the intent to share knowledge with a standardized path estimate of 0.037 and a critical ratio of 0.992.

All other hypotheses were supported. Team trust was positively related to the intention to share knowledge (H1a; $t = 3.91 \ p < .001$) and team potency (H1b; $t = 9.69 \ p = .001$). Team leadership was also positively related to team potency (H2b; $t = 2.64 \ p < .001$). Team potency was positively related to the intention to share knowledge (H3; $t = 7.53 \ p = .001$). The intention to share knowledge was positively related to team creativity (H4; $t = 3.82 \ p < .001$), and team potency was positively related to team creativity (H5; $t = 4.09 \ p < .001$).

In brief, most of the hypothesized relationships between the constructs in the model were supported. Six paths out of 7 were supported. Appendix D shows the final model and the standardized estimates. All paths are significant unless otherwise noted.

![Diagram of the Results of Hypotheses Analysis](imageURL)

Figure 4.7 The Results of Hypotheses Analysis
4.8 The mediation and moderation effects

4.8.1 The mediation effects

The mediation effects of team potency and intent to share knowledge were tested by SmartPLS. Baron and Kenny (1986) suggest three regression equations that are required in order to test the linkages in the mediation model. Refer to Appendix F, the mediator of team potency is partially significant in regard to the paths of team leadership to team potency (1.647) and team potency to intent to share knowledge (3.954). However, the mediator of intent to share knowledge is also partially significant in regard to the development of team potency and the intent to share knowledge (3.954); and also the intent to share knowledge to team creativity (3.771). It is clear that both team leadership and intent to share knowledge are related to team potency. If team potency were explored as the dependent variable, these results would suggest that both team leadership and intent to share knowledge additively contribute to team potency. However, both team potency and team creativity are related to the intent to share knowledge. If intent to share knowledge were explored as the dependent variable, these results would suggest that both team potency and team creativity also contribute to team potency.

4.8.2 The moderation effects

For the unsupported research hypothesis H2a, the path of team leadership to the intent to share knowledge, the age, gender, grade/position, company size and working experience/tenure were used to test as possible moderators. However, all of the moderator path coefficient were less than 1 (Team Leadership*Age=0.565, Team Leadership*Gender=0.316, Team Leadership*Company size=0.386, Team leadership*Grade=0.327 and Team Leadership*Working Experience=0.709), refer to
Appendix G. The differences of leadership styles and culture from organizations in China might be the main reason on the hypothesis H2a not supported by the research data. As most of the respondents come from the cities of Mainland China, the leadership styles, leader characteristics, leader’s behavior and the situation in which leaders are asked to lead may be different from the other cities in the West. Most of these leaders are appointed by the central Chinese government and their businesses are guaranteed with government’s networks. Most of these leaders try to reduce risk and it is not considered necessary to share knowledge with subordinators. Thus most organizations in China (including the Stated Owned Enterprises) do not have clear knowledge sharing policies for their staff to follow.

4.9 Conclusion

This chapter reported the second stage of the results. First, there was a basic examination of the returned questionnaires, followed by questionnaire editing, data coding, and tests of nonresponse rates. Second, the profile of respondents and their tenure with current organization were detailed. Third, the data was cleaned and screened; missing values were dealt with; and tests were completed for outliers and normality.

Fourth, the descriptive statistics—such as maximum, minimum, mean, range, standard deviation, and variance—were given before the exploratory factor analysis was completed. Afterwards, the factor structure of each construct was investigated with the reliability assessment—Cronbach’s alpha. Next, the measurement models were evaluated. The details of the estimation method and model evaluation and specification were discussed. The measurement model was established and compared with confirmatory factor analysis, reliability, and validity. Finally, hypothesis testing was performed on the research model.
The results supported six out of seven hypothesized paths. The next and final chapter will discuss the implications of the main model.
Chapter 5 CONCLUSIONS AND IMPLICATIONS

5.1 Introduction

This chapter begins with the conclusions to the hypotheses (Section 5.2) and the research problem (Section 5.3). The implications for theory (Section 5.4) and implications for practice (Section 5.5) follow. The chapter concludes with a discussion of limitations (Section 5.6), directions for future research (Section 5.7), and a conclusion (Section 5.8), as shown in Figure 5.1.
5.2 Conclusions to hypotheses

This section outlines the conclusions for each hypothesis compared with the findings detailed in Chapter 4 (Table 5.1). Supported hypotheses are presented first, followed by unsupported hypotheses.

Table 5.1: List of conclusions for research hypothesis
<table>
<thead>
<tr>
<th>Research Hypothesis</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a The higher the team trust, the greater the intent to share knowledge</td>
<td>Yes</td>
</tr>
<tr>
<td>H1b The higher the team trust, the greater the team potency</td>
<td>Yes</td>
</tr>
<tr>
<td>H2a Effective team leadership increases the intention to share knowledge</td>
<td>No</td>
</tr>
<tr>
<td>H2b Effective team leadership increases team potency</td>
<td>Yes</td>
</tr>
<tr>
<td>H3 The greater the potency belief of the team, the greater the intent to share knowledge</td>
<td>Yes</td>
</tr>
<tr>
<td>H4 More intent to share knowledge increases team creativity</td>
<td>Yes</td>
</tr>
<tr>
<td>H5 The greater the potency belief of the team, the greater the team creativity</td>
<td>Yes</td>
</tr>
</tbody>
</table>

5.2.1 Conclusions for the supported hypotheses

After the analysis, the first supported concern is the ways in which the constructs in team trust affected the intent to share knowledge and team potency, whereas the second supported concern is the relationship between the construct of team leadership and team potency. The third supported consideration regards the impact of team potency on the intent to share knowledge. The fourth supported concern is the relationship between intention to share knowledge and team creativity. The fifth and final supported concern is the relationship of intent to share knowledge to team potency and team creativity. Each is discussed in the following.
5.2.1.1 Hypothesis H1a: The higher the team trust, the greater the intent to share knowledge

The findings of this study further confirm previous research, which has shown that interpersonal trust in the workplace has a strong influence on a variety of organizational phenomena, including knowledge sharing (Kramer, 1999; Levin & Cross, 2004). The results show that team trust is positively related to the intent to share knowledge. In other words, teams with greater team trust tend to have a greater intent to share knowledge.

At the individual level, interpersonal trust in colleagues can encourage knowledge sharing (Abrams et al., 2003; Levin et al., 2006; McEvily et al., 2003). The distinction between trait and state trust—although challenging to operational behavior (Rotter, 1967)—is meaningful and central to this research. The conceptualization here of propensity to trust is consistent with Mayer and colleague’s (1995) proposal that it is a stable individual factor.

Overall, trust is related to increase knowledge sharing and makes knowledge exchanges less costly. It also increases the likelihood that knowledge acquired from a colleague will be sufficiently understood and absorbed such that the recipient can put it to use (Abrams et al., 2003; Levin & Cross, 2004). Intention to share knowledge is an important factor in making knowledge management systems successful.

Precursors of interpersonal trust include environmental and contextual factors and malleable relational features, such as shared language and shared vision (Abrams et al., 2003). Like the research on knowledge management, most studies on the antecedents of knowledge sharing have focused on environmental or contextual influences on interpersonal trust in the workplace (Kramer, 1999). This study contributes to the field by exploring and clarifying the relationship between team trust and the intent to share knowledge.
5.2.1.2 Hypothesis H1b: The higher the team trust, the greater the team potency

Some researchers have found that trust is a multifaceted concept. McAllister (1995) draws a distinction between cognition-based and affect-based trust. Cognition-based trust is a rational view of trust and is associated with responsibility, integrity, competence, ability, reliability, and dependability. Affect-based trust is an emotional view of trust related to care, concern, benevolence, commitment, and mutual respect.

Another distinction is between calculative and non-calculative trust. Calculative trust is based on the balance between the costs and benefits of certain actions—and on a view of humans as rational actors. Non-calculative trust, in turn, is based on values and norms (Lane, 1998).

We can see that when trust and distrust are put in political, economic, and cultural contexts, they create a highly complex social phenomenon. Trusting other people is as central to healthy psychological development of individual persons as it is to the formation of social bonds and the construction of community. Developmental psychologists have shown that trusting relationships are essential if an infant is to realize its biological potential and become a healthy person. From Piaget (1967; Piaget & Inhelder, 1969), Vygotsky (1978, 1994), and Winnicott (1965), to the more recent experimental studies of Trevarthen (1978, 1979), the psychology of ontogenesis has consistently shown that both the cognitive and emotional life of developing children emerge out of the basic trusting bonds an infant is able to sustain with significant others.
Team potency is a group’s collective belief about its general effectiveness (Guzzo & Shea, 1992). This concept is rooted in self-efficacy and refers to an individual’s belief about his or her effectiveness at a given work task (Bandura, 1977). Some scholars have argued that collective efficacy is basically an individual perception rather than a group attribute, as with team potency (Gibson, Randel, & Earley, 2000; Guzzo et al., 1993). However, empirical research indicates that collective efficacy is often a shared perception that predicts team outcomes, as with team potency (Gully et al., 2002).

The results of this research show that team trust is positively related to team potency. Teams with higher trust have a greater sense of team potency. This finding expands upon the results of studies of previous researchers.

5.2.1.3 Hypothesis H2b: Effective team leadership increases team potency

Campion and colleagues (1993) have found that group potency is a significant predictor of productivity, team member satisfaction, and management assessments of team performance. Team leadership is a key factor influencing the development and evolution of team potency beliefs (Kozolowski, Gully, Nason, & Smith, 1996). Leaders can directly influence potency beliefs by boosting the confidence of their followers in their capacity to perform required tasks (Guzzo et al., 1993; Watson & Tellegen, 1993). Researchers have found that effective leaders contribute to the team by enhancing positive team affect (Watson & Tellgen, 1993). The more positive people feel about the group, the more motivated they are to promote in-group solidarity, cooperation, and support (Hopkins, 1997). Gibson (1995) argues that the high status and power of transformational and transactional leaders help boost potency
beliefs. In line with Gibson’s expectations, large status differences between team members are positively related to group efficacy.

Houghton and colleagues (2003, p. 131) state that by using self-leadership strategies, “team members can effectively increase their self-efficacy beliefs for undertaking various leadership roles and responsibilities within the team.” Therefore increasing the perceptions of the team’s potency are likely to inspire team members with the confidence that they have the necessary skills to engage in shared leadership. This is in line with Pearce and Sims’ (2000) assertion that shared leadership is more likely when team members are highly skilled in their assigned tasks; however, they add that team members must also have the confidence that they really have these skills, and they must develop shared leadership in a sustainable way. If team members have a low collective sense of team potency for sharing leadership responsibilities, they are likely to be unwilling and perhaps even unable to undertake leadership activities. Therefore, shared leadership is more likely to be developed when team members have both the skills and the desire to engage in common influence (Perry et al., 1999). Therefore, this study explored the role of team leadership as an important variable with the potential to influence team potency. The results show that team leadership is positively related to team potency.

5.2.1.4 Hypothesis H3: The greater the potency belief of the team, the greater the intent to share knowledge

Another contribution of this study is the finding that team potency is positively related to the team’s intention to share knowledge. This relationship was much stronger than the nonsignificant (albeit positive) relationship between team potency and team effectiveness.
These results are consistent with findings that efficacy beliefs correlate positively with job satisfaction (Riggs & Knight, 1994) and task performance (Prusssia & Kinicki, 1996). The results of this study suggest that if team members believe they can share knowledge, the team as a whole is more likely to want to share knowledge.

5.2.1.5 Hypothesis H4: More intent to share knowledge increases team creativity

Knowledge sharing is defined as the provision or receipt of task information, know-how, and feedback regarding a product or procedure (Cummings, 2004). Studies have connected knowledge sharing to a variety of outcomes, including productivity, meeting task deadlines, organizational learning, and creativity (Argote, 1999; Argote et al., 2000; Hansen, 2002).

There are a number of factors that may influence knowledge sharing, including the components of the knowledge itself, such as its degree of articulation and degree of aggregation (Nonaka & Takeuchi, 1995). One of the main goals of management and managerial actions—such as coordination mechanisms, rewards, incentives, and managerial interventions—is to increase effective knowledge sharing (Cabrera & Cabrera, 2002).

The environment has a great impact on knowledge sharing—factors including national culture, technology, and organizational culture (Wasko & Faraj, 2005). For organizations that want to develop knowledge sharing, it is important to focus on microlevel environmental factors of interpersonal relationships, such as shared language and shared vision. It is also important to have strong interpersonal ties between two parties that emphasize the character of knowledge that flows in social networks (Brown & Duguid, 2002; Gherardi et al., 1998).
For business, knowledge can be considered a resource for competitive advantage. It plays a more important role than traditional resources in organizations (Martensson, 2000; Nonaka & Takeuchi, 1995). Managers try to find out how to motivate employees to share their knowledge so that their overall performance can be improved and so that they can gain competitive advantage in the market (Chow et al., 2000; Taylor & Wright, 2004).

However, no research to date has explored the role of the intent to share knowledge and team creativity. Therefore, there is a need to explore whether or not the intent to share knowledge is also a significant factor for teams. The results of this study suggest that the stronger the intent to share knowledge, the better the team creativity.

5.2.1.6 Hypothesis H5: The greater the potency belief of the team, the greater the team creativity

Team potency is a group’s collective belief about its general effectiveness (Guzzo & Shea, 1992). This concept is rooted in self efficacy and refers to an individual’s belief about his or her effectiveness at a given work effort (Bandura, 1977). Some scholars have argued that collective efficacy is basically an individual perception rather than a group attribute as with team potency (Gibson, Randel, & Earley, 2000).

Gully and colleagues (2002) have shown that team potency is positively related to group performance and team effectiveness. In addition, this research indicates that group potency is positively related to other areas of group effectiveness, such as team member effort and team member satisfaction (Lester et al., 2002). High levels of initial group potency can lead
to better initial performance, which can lead to further improvement in potency and performance (Lindsley, Brass, & Thomas, 1995).

Gibson (2000) has found positive associations between group efficacy beliefs and team effectiveness. Guzzo and colleagues (1993) argue that the strength of this motivational belief lies in the fact that it significantly predicts group effectiveness in customer service and other domains. This study found that teams with greater potency beliefs have higher team creativity.

5.2.2 Conclusions to unsupported hypotheses

This section discusses the one hypothesis from the research model that was found to have an inadequate fit. This hypothesis is related to the relationship between team leadership and intent to share knowledge. It is discussed in the following.

5.2.2.1 Hypothesis H2a: Effective team leadership increases the intention to share knowledge

Leadership is thought to be a very important factor in the success or failure of organizations (Bass, 1990). Leadership researchers have focused on different aspects of the leader or the leader’s actions. Leaders have been found to influence followers in many ways: by coordinating, communicating, motivating, sharing information, and rewarding (Yukl, 1989). Most theorists have investigated three core factors of leadership: (1) the characteristics and traits of the leader, (2) the leader’s behaviors, and (3) the situation in which leaders are
asked to lead. However, most of the research reveals that these aspects of leadership cannot adequately explain leader effectiveness. Current contingency and transformational theories of leadership examine the combined effects and interactions of the three factors mentioned above and their impact on follower performance.

Takeuchi (2001) suggests three ways in which leaders should provide KM direction. First of all, leaders must articulate a grand theory of what the company as a whole ought to be. Second, top management must incorporate its vision for KM into the company’s corporate objectives or policy statement. Third, leaders must decide which KM efforts to support, and then they must follow that strategy. In order to effectively implement those suggestions, Takeuchi (2001) argues that leadership has to link together the many disparate activities of the organization into a coherent whole and establish clear and visible standards and objectives for the rest of the company to follow.

Well-trained middle managers also have an important role to play in bridging the gap between the top managers and all the frontline staff. To do this, middle managers must create a common vision; and the grand theory created by top management must be understandable and executable for the frontline staff. They must also synthesize the knowledge generated by both the top management and frontline staff, converting the knowledge into usable technologies, products, or systems (Takeuchi, 2001).

Beckman (1999) expands management’s responsibilities in the KM process to include motivating employees, providing equal opportunities, and measuring and rewarding the performance, behaviors, and attitudes that are required for KM. Brelade and Harman (2000) further point out the need for organizations’ leaders to help their staff avoid conflicts of interest with KM practices and find solutions when facing conflicts.
Stewart (1997) argues that even companies with promising cultures and highly effective reward programs will not succeed without dedicated and responsible leaders. However, many researchers and professionals are realizing that if organizations want to have leaders dedicated to achieving KM goals, they must be willing to deliberately develop these leaders and provide them with ongoing training, visions, and rewards. Although developing leadership committed to KM requires time and resources, research is beginning to show that the investment is justified.

Several researchers have argued that team leadership is a critical factor for the intention to share knowledge; however, none of the results has shown a relationship. The major reason may be that surveys cannot easily measure team leadership by managers.

As most of the respondents come from the cities of Mainland China, their leadership styles and behaviors may be different from their counterparts in the West. Further, the situations in which Chinese leaders are asked to lead may also be quite unique to mainland China. There remain a number of companies known as Stated Owned Enterprises that have been funded and controlled by Chinese government. Most leaders within such organizations are appointed by the central Chinese government and their businesses are guaranteed by the Communist Party. These leaders tend to reduce risk and it is not considered acceptable to share knowledge with their subordinators. The cultures of the East and West are different. China is more conservative in respect to the expression of ideas. Thus in China most organizations - including State Owned Enterprises - may not have clear knowledge sharing policies for their staff to follow.

5.3 Conclusions to research problems
As noted above, there is a scarcity of studies into what factors influence team creativity. Therefore, this study explored this problem.

Most organizations are after short-term benefits, as well as innovative and marketable products and services that will enable them to survive over the long term (Elsbach & Hargadon, 2006; Oldham & Cummings, 1996; Van de Ven, 1986). To boost creativity, organizations are using more and more teams. The hope is that teams will increase effectiveness and empowerment (Milliken & Martins, 1996) and help companies realize the benefits of diversity (Williams & O’Reilly, 1998).

Teams may be sources of innovation because they can take advantage of diverse skills and information to develop new ideas (Drach-Zahavy & Somech, 2001). They may be a source of motivation—especially when they have a lot of autonomy (Cohen & Bailey, 1997). Organizations commonly use work teams because of presumptions about their positive impact on productivity and innovation (Devine, Clayton, Philips, Dunford, & Melner, 1999).

Although it might seem obvious that teams with more diversity of knowledge or expertise should have higher creativity, thus far the evidence for this is not very convincing (Brown & Paulus, 2002; Cady & Valentine, 1999). It is of course possible that people’s bias for sharing common rather than unique information prevents teams from benefitting from knowledge diversity (Stasser & Birchmeier, 2003).

A review of the existing literature reveals that there has not been any research conducted on the impacts of intention to share knowledge and team potency on team creativity. Therefore, this study focuses on what increases team creativity. This study considers two key factors. The first factor is the team members’ intention to share knowledge in formal or informal knowledge management organizations. The second factor is team potency. This study has
also explored the link between team trust, team leadership, the intent to share knowledge, team potency, and team creativity.

The overall goal of this study is to identify the underlying determinants of team creativity. Five key questions were proposed to test factors that might influence the quality of team creativity:

1. What factors affect team creativity?

2. What is the impact of team trust on team members’ intent to share knowledge and team potency?

3. What is the impact of team leadership on team members’ intent to share knowledge and team potency?

4. What is the impact of team potency on team members’ intent to share knowledge?

5. What is the impact of team members’ intent to share knowledge and team potency on team creativity?

The results revealed a number of factors that are directly related to creativity including the intent to share knowledge and team potency. Creativity should be affected by the source of knowledge from team members in different levels in the creative thinking process. If team members have a strong belief in their creativity abilities, then the team creativity will be stronger too. Teams with higher internal trust have a stronger intent to share knowledge. One reason is that team members are not as worried about the risk of sharing knowledge because they trust the other members. Findings indicate that team leaders can play an important role in strengthening team potency. Team leaders’ support can increase the team
members’ self believe. Furthermore, team potency can significantly increase team members’ intent to share knowledge as they believe their abilities won’t be reduced after sharing part of their knowledge with others.

5.4 Implications for theory

This research contributes to our understanding of team creativity in organizations in Hong Kong and China. Therefore, this study provides some insights into new research areas. This study also identified three major implications for further investigation: the direct relationship between team leadership effectiveness and team potency; the mediating effect of team potency on leadership effectiveness and team satisfaction; and the direct relationship between team satisfaction and team effectiveness.

5.4.1 The direct relationship between team leadership effectiveness and team potency

One of the key contributions of this study is the finding that leadership effectiveness is related to team potency. Teams that perceive their leaders as effective carry a stronger belief in their capacity to perform well. Clearly this is important: on a given shift, leaders work on the floor with the team and actively contribute to the team’s performance. However, few studies have explored the relationship between leadership effectiveness and team potency. Watson and Tellegen (1993) found that leadership effectiveness is positively related to team affect. Gibson (1995) found that having a leader—or a person with a high status difference within the team—contributes to team potency. Guzzo and colleagues (1993) found that leadership style contributes to the evolution of efficacy beliefs. This study has contributed to
the body of research by supporting the contention that teams with effective leaders are more efficacious.

5.4.2 The mediating effect of team potency on leadership effectiveness and team satisfaction

Supplemental analyses showed that team potency partially mediates the relationship between leadership effectiveness and team satisfaction. The findings of this research suggest that the impact leaders have on team satisfaction is based primarily upon leadership’s impact upon team potency. Effective leaders build team potency, as has been described previously. Teams that are confident in their capacity to perform well are most satisfied with their team members. This finding suggests that leadership effectiveness is important in as much as effective leaders increase the potency of the team. The impact of leadership effectiveness on team satisfaction is lessened in the presence of team potency. If a team believes in the collective abilities of the team, then the team is more satisfied working together.

5.4.3 The direct relationship between team satisfaction and team effectiveness

The findings on team potency, team leadership, and team creativity are important given the sparse research previously conducted on team and coworker satisfaction. Hackman (2002) proposes that team satisfaction may influence the future performance of teams. He further says that team satisfaction can be predictive of a team’s capacity to function effectively in the future.
While these findings indicate that initial effectiveness of the team may be unaffected by coworker satisfaction, any current feelings of dissatisfaction within the team may erode the team’s collective performance over time. Such dissatisfaction might lead to “process losses” (Steiner, 1972) and hurt the team in the future. However, the teams in this study had quite high levels of satisfaction, which suggests little cause for concern. Given the mediation relationship found, it is more likely that the relative level of satisfaction with the team impacts the team’s potency belief in its capacity to succeed, which ultimately influences the team’s future success. Longitudinal studies in this area are needed to help identify the evolution and causal direction of these relationships.

5.5 Implications for practice

The findings of this study have implications for organizations. The findings demonstrate the importance of team creativity in building highly effective teams. Many organizations train and promote leaders under the assumption that leadership is a key to team effectiveness. The findings of this study emphasize that organizations should direct their efforts towards activities and systems that will boost teams’ belief in their capacity to perform.

Leadership is a key mechanism that can contribute to such beliefs. Transformational leadership in particular has been shown to boost confidence in teams (Bass, 1985). However, this study supports the contention that effective leaders—leveraging both transformational and transactional styles of leadership—help build high beliefs in team potency and high levels of team satisfaction. Consequently, organizations should select, train, and reinforce leaders who demonstrate either transformational or transactional styles of leadership. It is
important to help leaders identify the appropriate situations to apply each style of leadership and understand when a combination of the distinct behaviors is most effective.

In addition to leadership, there are other means by which a team’s potency beliefs can be improved. Reward systems can be tailored to reinforce such beliefs in a team. Selection systems can be designed to hire individuals with high levels of self-efficacy, under the assumption that self-efficacious individuals help build collective efficacy beliefs in the team. As Bandura (1997) contends, personal and collective efficacy beliefs have similar sources, serve similar functions, and operate through similar processes.

Regarding training, many companies may concentrate too much on providing comprehensive training on product knowledge to the detriment of trust-building training. This study showed that the level of trust was positively related to creative outcomes. Therefore, organizations should conduct trust-building training. Product-knowledge training should focus on two key issues: how to build trust in different dimensions and how to respond appropriately when trust is declining (Halliday, 2003). For example, team leaders need to understand when they should adopt benevolence and credibility strategies to maintain a high level of trust with team members. Here is the summary of recommendations to practitioners:

1. The team creativity is based on a highly effective team.

2. The organizations should put more resource and effort to increase team’s belief in their capacity to perform that will be favorable to team creativity.

3. In team member selection, it can be designed to recruit individuals with high level of self-efficacy.
4. Organizations should conduct trust building training for individual team members that can increase the creativity performance.

5.6 Limitations

This study has five major limitations:

First, this study focused mainly on large Chinese government-operated organizations. The results of these findings may only be applicable to similar organizations. Therefore they cannot necessarily be generalized to other organizations, such as small and medium-sized enterprises.

Second, this study was conducted in only one country: China. The results may not be applicable to other countries. However, future studies in other countries may certainly test the research model proposed in this study.

Third, this study did not consider external factors, such as economic conditions, union influences, unemployment rates, company sizes, government policies, and culture. Economic development and changes in China are happening rapidly because it is transforming from a semi-socialist system to a capitalist economic system. Thus, for these reasons, future studies may generate different findings.

Fourth, this study selected a sample of respondents from a number of cities in Mainland China including Xian, Chengdu, Shenzhen, Hangzhou, Beijing, Fuzhou and Hong Kong. It does not sample people outside large cities. Thus, the results of this study may not reflect those for organizations in other regions. However, the sample selected is relatively
representative of typical major organizations in China as they had offices setting up covering most of the major cities in China.

Fifth, this study has also focused only on selected internal organizational factors. Like many other studies, limitations of time, funding, and participant time constraints made it impossible to include the full range of factors that could potentially impact organizations. High-ranking personnel in large organizations were not as responsive as their counterparts in smaller organizations. Therefore the results may not be as representative as expected. Future researchers may be interested in the many other internal and external factors not covered in this study.

Finally, only five constructs were chosen for this study. Many other relationship constructs have not been included. Therefore, the suggestions for building team creativity should not be considered comprehensive. Many studies have demonstrated various antecedents of team creativity. It is not possible to investigate all the ways to enhance team creativity in a single study. Hence, future research may find more constructs that are important to team creativity.

Because of these limitations, the results of this research may not reflect management in different kinds of organizations, such as service industries in general, banking, and insurance companies. Nevertheless, the limitations of this research can also serve as a guideline for further research, as discussed below.

5.7 Directions for future research
As explained in the previous section, five limitations have been identified in this study that could be overcome in future research and the limitations of this study have provided opportunities for further research in terms of the scope of the study.

First, this study focused on Chinese government-operated industries. Future research may consider the applicability of the findings to other industries, such as private organizations in cities in other provinces. This is important in order to get findings that represent a variety of groups of organizations and industries.

Second, this study was focused on China. Future research may apply these findings in other countries such as Japan, Korea, India, Germany, and Canada.

Third, this study was conducted only in Chinese cities. Future researchers may consider other developing countries in Asia as a focus of the study or as a comparison study. Future studies may investigate, for example, Malaysia and Singapore.

Moreover, future studies can focus on selected internal and external organizational factors. As with other studies, more resources of time and funding need to be allocated in order to develop a longer survey capable of capturing more comprehensive responses; this will help capture the full range of factors that can potentially impact organizations.

Finally, only five constructs were chosen for this study. Therefore, future studies should include more ways to enhance different dimensions of team creativity. This will be vital in enhancing the effectiveness of research constructs. Many studies have shown various antecedents that increase team creativity. Future studies can compare these different factors against each other to see if any factors are redundant and which factors are more influential.
5.8 Conclusions

This chapter has discussed the conclusions and interpretations regarding the research questions and hypotheses. Conclusions about the effect of team trust, team leadership, intent to share knowledge and team potency to the quality of team creativity have been discussed. The implications for theory and practice, along with the limitations of the research and the implications for further research have also been discussed.

The results of this research have identified four internal organizational factors that are critically important in developing team creativity: team trust, team leadership, the intent to share knowledge, and team potency. This study also found that market team intent to share knowledge and team potency is related to team creativity. These findings add to the theory of team creativity by emphasizing the role of team management in the general industries sector on team performance. However, most team managers overlook their importance in relation to internal connections. Hence, further investigations on the ways to maintain developed team linkage are required. The development of China is fast and it is a golden time to migrate the world factory to knowledge economy with innovation as a driving force to lead China’s continuous growth in the new century.
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Appendix A:

Questionnaire Survey Cover Letter
QUESTIONNAIRE ON THE QUALITY OF TEAM CREATIVITY

Dear Participant,

I am conducting a research project as part of my doctoral studies at the Southern Cross University in Australia. I would greatly appreciate it if you could fill out the following questionnaire. It will take only a few minutes of your time.

The purpose of this survey is to understand more about the quality of team creativity within organisations. All information provided will be kept strictly confidential and will be used purely for research purposes. You do not need to provide your name. Please read the instructions carefully before you answer the questions, and try to choose the answers that best reflect your present feelings, perceptions and attitudes.

If you would like a copy of the final research report, please write to me separately, so as not to violate the anonymity of the questionnaire.

Many thanks.

Yours sincerely,

Lam Tak Ming, Eric
Researcher / DBA Student
Email: mslam@polyu.edu.hk
Tel: (852) 90128008
Appendix B:

Questionnaire in English Version
QUESTIONNAIRE ON THE QUALITY OF TEAM CREATIVITY

Please answer the following questions in sequence. Anybody who is now (or was formerly) in your team may complete the questionnaire.

Do NOT skip ahead or skim through the rest of the survey. Please read each question carefully and circle the number that most closely represents your own opinion.

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<td>1.</td>
<td>Our team has confidence in performing the job requirements.</td>
<td>Strongly Agree</td>
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<td>2.</td>
<td>Our team believes it can become unusually good at self-management.</td>
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<td>3.</td>
<td>Our team expects to become known as a high-performing team.</td>
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<td>4.</td>
<td>Our team feels it can solve any problem it encounters.</td>
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<td>5.</td>
<td>No task is too tough for our team.</td>
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<td>6.</td>
<td>Our team can get a lot done when it works hard.</td>
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<td>7.</td>
<td>I will share my work reports and official documents with members of my organization more frequently in the future.</td>
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<td>8.</td>
<td>I will always provide my manuals, methodologies and models for team members, in order to complete the group work of my organization.</td>
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<td>9.</td>
<td>I intend to share my knowledge or experience from work with other organizational members more frequently in the future.</td>
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<td>10.</td>
<td>I always provide my knowledge or experience at the request of other organizational members.</td>
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<tr>
<td>11. I try to share my expertise or knowledge from my education or training with other organizational members in a more effective way.</td>
<td><strong>Strongly Agree</strong></td>
<td><strong>Strongly Disagree</strong></td>
<td>7</td>
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<td>12. Team members tell the truth about the limits of their knowledge.</td>
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<td>13. Team members can be counted on to do what they say they will do.</td>
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<td>14. Team members are honest in describing their experience and abilities.</td>
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<td>15. Team members have advanced skills/abilities.</td>
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<td>16. Team members put in their best effort when it comes to team projects.</td>
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<td>17. My team members do their share of the work because we have always been told that in a group project, members should divide and share the work.</td>
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<td>18. My team members submit the required materials or information on time.</td>
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<td>19. My team members all do their best.</td>
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<td>20. I can depend on my team members because they are my cohorts, and my cohorts are always dependable.</td>
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<td>21. My team members do their best because this project is for them to learn and gain experience about real problems that organizations face.</td>
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<td>22. I can depend on my team members because they do their best to uphold the reputation of the team/organization.</td>
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<td>23. Members of my team talk about how trusting each other can help overcome difficulties.</td>
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<td>Question</td>
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<td>24. Members of my team envision exciting new possibilities.</td>
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<td>25. Members of my team emphasize the importance of being committed to our beliefs.</td>
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<td>26. Members of my team work out agreements about what is expected from each other.</td>
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<td>27. My team leader tries to create a team atmosphere, encouraging us to work together.</td>
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<td>28. My team leader is interested in our ideas about how to solve problems.</td>
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<td>29. My team leader tries to dictate how we are to proceed whenever a problem arises.</td>
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<td>30. My team leader often emphasizes the rules and procedures when we are trying to solve problems.</td>
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PERSONAL BACKGROUND INFORMATION:

Please select the most suitable answers by putting a tick “✔” and filling in the related information according to your current situation.

| Tenure with current organization: | □ less than 10 years  
□ 10 to 19 years  
□ 20 years or above |
|----------------------------------|----------------------|
| Age:                             | □ below 30  
□ 30 to 39  
□ 40 to 49  
□ 50 or above |
| Position:                        | □ CEO or Senior Management  
□ Middle Management  
□ General Staff |
| Gender:                          | □ Male  
□ Female |
| Company size:                    | □ less than 50 employees  
□ 50 – 99 employees  
□ 100 -199 employees  
□ 200 or above employees |

END OF QUESTIONNAIRE.

THANK YOU FOR YOUR SUPPORT AND COOPERATION!
Appendix C:

Questionnaire in Chinese Version
问卷调查：影响团队创作力的因素

请试从您个人现在或过往中的一次团队合作的经验，按顺序回答以下问题。

不要跳过或掠过任何问题。请仔细阅读以下问题并按自己的观点选择最合适的答案。

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<th>完全同意</th>
<th>极不同意</th>
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<tr>
<td>1. 我们团队有信心达成工作的要求.</td>
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<td>2. 我们相信自我管理能让我们团队变得特别出色.</td>
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<td>3. 我们团队期待有出色的表现.</td>
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<td>7 6 5 4 3 2 1</td>
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<td>4. 我们团队觉得能解决任何出现的问题.</td>
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<td>7 6 5 4 3 2 1</td>
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<td>5. 没有任何任务对我们团队来说是非常艰难的.</td>
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<td>6. 只要我们团队努力工作,我们必能完成大部份任务.</td>
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<td>7. 我愿意将来有更多机会与我的同事共享我的工作报告和文件.</td>
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<td>8. 为了完成任务,我总是乐意将我的数据,工作心得和方法与我的同事共享.</td>
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<td>9. 我打算将来更密切地与我同事分享我的个人经验和工作心得.</td>
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<td>10. 我总是会应同事的要求常常提供我的知识和经验.</td>
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<td>11.</td>
<td>我会尝试将我在课堂或训练中所学到的知识与我的同事进行更有效的分享。</td>
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| 12. | 我们团队组员会如实透露他们在知识领域里不足之处。                             | 7 6 5 4 3 2 1 |

| 13. | 我们团队组员被认为是说得出来的就能办得到。                                  | 7 6 5 4 3 2 1 |

| 14. | 我们团队组员会诚实地讲述他们的工作经历和能力。                                | 7 6 5 4 3 2 1 |

| 15. | 我们团队组员有熟练的技巧或能力。                                               | 7 6 5 4 3 2 1 |

| 16. | 我们团队组员都会尽心尽力去做好团队的项目。                                      | 7 6 5 4 3 2 1 |

| 17. | 我们团队组员总是会分担大家的工作，因为我们知道团队所有项目是应该分担和分享的。 | 7 6 5 4 3 2 1 |

| 18. | 我们团队组员都会准时提交与工作相关的数据。                                     | 7 6 5 4 3 2 1 |

| 19. | 我们团队组员都能尽心尽力去做好每一件事。                                       | 7 6 5 4 3 2 1 |

| 20. | 我信赖我的团队组员，我们像战友一样互相支持和依靠。                            | 7 6 5 4 3 2 1 |

| 21. | 通过这个项目我们团队可以在解决实际问题中学到宝贵的经验，因此大家都做到最好。 | 7 6 5 4 3 2 1 |

| 22. | 我信赖我的团队组员因为他们会尽力去维护团队或公司的信誉。                      | 7 6 5 4 3 2 1 |

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| 23. 我们团队组员都相信互相信赖能帮助大家解决难题。 | 7 6 5 4 3 2 1 |
| 24. 我们团队组员都会为未来新机遇而雀跃。 | 完全同意 | 极不同意 |
| 25. 我们团队组员会强调忠于自己的信念是很重要的。 | 7 6 5 4 3 2 1 |
| 26. 我们团队组员会对于各自的期望最终能达成协议。 | 7 6 5 4 3 2 1 |
| 27. 我的团队领导尝试创造团队氛围,鼓励我们一起合作。 | 7 6 5 4 3 2 1 |
| 28. 我的团队领导有兴趣去知道组员解决问题的想法。 | 7 6 5 4 3 2 1 |
| 29. 当遇到问题时,我的团队领导会尝试指导我们如何继续下去。 | 7 6 5 4 3 2 1 |
| 30. 当我们处理问题的时候,我的团队领导时常强调我们应有的纪律和程序。 | 7 6 5 4 3 2 1 |
个人背景资料

请就您现时的情况，选出最合适的答案及在空格内填上「✓」。

| 在所属公司的年资: | □ 10 年以下       |
|                   | □ 10 至 19 年      |
|                   | □ 20 年或以上      |
| 年龄:             | □ 30 岁以下        |
|                   | □ 30 至 39 岁      |
|                   | □ 40 至 49 岁      |
|                   | □ 50 岁或以上      |
| 职级:             | □ 行政总裁或领导  |
|                   | □ 中层管理         |
|                   | □ 一般员工         |
| 性别:             | □ 男               |
|                   | □ 女               |
| 公司规模:         | □ 50 名员工以下    |
|                   | □ 50 至 99 名员工   |
|                   | □ 100 至 200 名员工|
|                   | □ 200 名或以上员工 |

问卷完成

感谢您的支持和合作！
Appendix D:

Research Model Path Coefficient
Appendix E:

Research Model Path Coefficient with Consideration of “Does team leadership lead to team trust?”
Appendix F:

Research Model Path Coefficient with Mediation Effects of Team Potency and Intent to Share Knowledge
Appendix G:

Research Model Path Coefficient with Moderation Effects of Team Leadership to Intent to Share Knowledge