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ENGINEERING PROJECT MANAGEMENT IN THE INTERNATIONAL CONTEXT: A CHINESE CULTURE-BASED EXPLORATORY AND COMPARATIVE EVALUATION

by

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Declaration

I declare that the thesis, which I hereby submit for the degree Philosophiae Doctor (Project Management) at the University of Pretoria, is my own work and has not been previously submitted by me for a degree at another University.

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Dongdong Jiang

Summary

ENGINEERING PROJECT MANAGEMENT IN THE INTERNATIONAL CONTEXT: A CHINESE CULTURE-BASED EXPLORATORY AND COMPARATIVE EVALUATION

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Much of the research in project management focuses on developing better scheduling techniques in order to generate successful engineering and construction projects. However, with the advent of globalisation, project management is not only a domestic endeavour. Better scheduling techniques are not necessarily sufficient to ensure the successful completion of projects. Working with people with different cultural backgrounds and managing in foreign cultural areas is very common today. Cultural differences can actually affect project success and specifically the success of projects of a technological nature.

Five typical Chinese cultural behaviours are identified and discussed in terms of philosophy of life, the "face" issue, personal relationships, communication and conflict solving. The

effects of these cultural behaviours on communication, negotiation, conflict resolution, contract process and project team-building are researched through a designed survey questionnaire. Although the questionnaire is designed based on the Chinese culture, South African project managers have also been asked to participate in order to illustrate the cultural differences, where applicable. Researchers and practitioners still find it difficult to define what constitutes cultural differences and how to mitigate the influence of cultural differences on engineering projects. Data analysis and survey results for cultural effects on international engineering team performance are presented in this thesis and a method to mitigate the effect of cultural difference is conceptualised. This thesis contributes to the knowledge of managing engineering and construction projects in multicultural environments specifically in the international context. Moreover, a conceptual model has been developed and evaluated to indicate and explore the relationships between cultural differences, Chinese behaviours, project activities, project management processes and mitigation methods, from the South African and Chinese perspectives.

Keywords

International project management; cultural difference; Chinese behaviours, project activities.

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Table of Contents

List of Tables

List of Figures

List of Acronyms

AEC: Architecture, Engineering and Construction

AHP: Analytical Hierarch Process

BOOT: build-own-operate-transfer

BOT: build-operate-transfer

DB: design-build

DBB: design-bid-build

DBIO: design-build-improve-operate

DBO: design-build-operate

DBOM: design-build-operate-maintain

DBOT: design-build-operate-transfer

EIA: Environment Impact Assessment

ICB: IPMA Competence Baseline

ICT: Information and Communication Technology

IPM: International Project Management

IPT: International Project Team

KPIs: Key Performance Indicators

NPEC: Net Project Execution Cost

NPOV: Net Project Operation Value

PM: Project Management

PMBOK: the Project Management Body of Knowledge

PMS: Proposed Mitigating Solutions

PPP: public-private partnerships

Super-TKY: super-turnkey

TKY: turnkey

PART 1:

BACKGROUND AND CONTEXT

Chapter 1:

Problems in managing international projects – contextualising the research

1.1 Rationale for the research

With the advent of globalisation, project management is no longer a local issue, but an international affair that is risky in nature. “Project management is now well developed and well accepted as domain for the exercise of professional expertise and as an area for academic research and discourse. However, project management remains a highly problematical endeavour” (White & Fortune, 2002).

Changes in the global environment are presenting organisations with both opportunities and challenges (Yong & Javalgi, 2007). International contractors continue to attempt to function in the international construction industry. These international contractors should push themselves to meet international project management standards, and therefore improve their competitiveness (Ofori, 2000).

Since the 1950s, much of the work in project management has focused on project scheduling problems, assuming that the development of better scheduling techniques would result in better management and thus the successful completion of projects (Bellassi & Tukel, 1996). In the past number of years, project scheduling seems still to be a popular topic in project management research (Peteghem et al., 2010; Vonder et al., 2008; Lambrechts et al., 2008;Herroelen & Leus, 2005) .However, there are many factors outside the control of management that could determine the success or failure of a project, especially when managing international development projects (Bellassi & Tukel, 1996; Kendra & Taplin, 2004). Different projects should be managed in different ways (Sadeh, Dvir & Shenhar, 2010).Wang and Liu (2007) also argue that, for a project to succeed, the people involved "should not only learn and practice its tools and techniques but also learn, internalize and practice its work-related value/beliefs". Youker (1992) states that "the literature of project management places great emphasis on planning and management tools for the project manager to use to control time, cost, resources and quality of performance. However, a review of the results of project monitoring and evaluation on World Bank projects indicates that many of the key problems of implementation lie in the general environment of the project, and are not under the direct control of the project manager". The project management (PM) environment for international development projects is also much more complicated than domestic projects in industrialised countries (Kwak, 2002).

The knowledge and expertise required for domestic construction projects are not necessarily adequate for developing a strategy for international

construction projects. Project managers should understand the social, economic, political and cultural factors that affect the project environment (Howes & Tah, 2003).

“International construction is much riskier than domestic construction. The complex international environment is affected by diverse variables that are not part of domestic markets and that create risks never encountered in domestic conditions” (Gunhan & Arditi, 2005).

Lucas (1986) argues that managing projects in foreign environments provides unusual challenges. Even at that early stage he stated that the main concerns in international project management focus on understanding cultural differences, communications avoiding local politics and supervising an international group of senior professionals. International project managers therefore also encounter unique situations over and above the challenges that domestic project managers face (Murphy, 2005).

Form abovementioned discussion, it can be said that international projects are more complicated and risky than domestic projects. Some risks encountered in international projects are not the same as those in domestic projects. The cultural differences issue has been recognized as one of the main concerns in international projects management (Murphy, 2005; Pheng and Leong 2000). Although there may be also cultural differences in a domestic project team because of the team members’ difference in origin, international project teams seem to be more easily influenced by cultural differences. Simkhovych (2009) did an empirical research to examine the relationship between intercultural effectiveness and project team performance in the international development

field. Correlation analysis confirmed the relationship between intercultural effectiveness and project team performance. Chen and Partington (2004) did a study on comparison of Chinese and Western concepts of relationships in construction project management work. They examined the extent to which Western project management ideas have been supported by the Chinese culture, and recommend that practical considerations in specific situations should be based on the knowledge that project management is not universal, but culture sensitive. Kwak (2002) states that the "culture issue is the least known but the most hazardous in the context of international development projects".

With increasing globalisation, more and more project managers will be involved in the management of projects in foreign environments. The scope of this research is international projects in general; however more focus is on construction projects. Consequently, the research topic presented in this thesis will match this trend and focus on enriching project management (PM) theories.

1.2 Some problems in managing international projects

The following provides a preliminary review of some factors creating problems in the managing of international projects with a focus on construction. A more detailed appropriate review is provided in later chapters as part of the exploratory research on cultural influences in successful project management. This section essentially leads to the high level identification of research problems for this research in section 1.3

1.2.1 Problems encountered in international project management

Many researchers and practitioners (Murphy, 2005; Lucas, 1986; Youker, 1992; Howes & Tah, 2003) are aware of the challenge of managing international projects, since international projects face uncertainties caused by host country conditions (Ozorhon, Arditi, Dikmen & Brigonul, 2007). Researchers have previously identified some key factors that constrain the success of international projects.

1.2.1.1 Cultural differences

Pheng and Leong (2000) conducted research on international construction in China, and determined that cultural differences are a critical factor that can actually affect the outcome of an international project. For an international project manager, understanding key concepts in cross-cultural management and project management is the basic requirement in the era of globalisation. Muriithi and Crawford (2003) also argue that Western management concepts may be not applicable to other cultures that are not so deeply rooted in the Western philosophy. They suggest that appropriate modifications can be made to current management theories by studying cultural differences.

Large-scale international projects are of a global nature. Therefore, a high degree of coordination and communication is needed. Communication in the international environment is complicated by different languages, cultures and etiquette (Howes & Tah, 2003). Loosemore and Muslmani (1999) state that the

internationalisation in project management creates intercultural communication problems that result in significant misunderstanding and conflict.

1.2.1.2 Political factors

Khattab, Anchor and Davies (2007) did a study to examine the vulnerability of international projects to political risks. Their study results showed that political risks are ranked first by respondents. Other authors also mention that political interventions can sometimes decide the success of foreign-invested firms (Buckley, Clegg & Hui, 2006). Political risks are the key risks to successful international construction contracting (Ashley & Bonner, 1987). For international projects, these factors can produce problems that may not be problematic in domestic projects. Dikmen, Birgonul and Han (2007) state that political risk factors receive the most attention from researchers in international projects.

1.2.1.3 Legal factors

Murphy (2005) perceives legal issues as one of the difficulties and risks of international projects. Companies often find themselves in an unfamiliar legal environment when implementing an international project. The laws of the host country often apply to contracts. Gunhan and Arditi (2005) agree that legal factors are still a risk despite the lowering barriers of international business.

1.2.1.4 Economic factors

Researchers pay a great deal of attention to economic risk factors in international projects (Dikmen, Birgonul & Han, 2007). Zhi (1995) states that economic factors are one of the international project risks associated with the host country. Miller (1992) believes that macroeconomic factors are one of the great uncertainties for international businesses.

1.3 Description of research problems

It should be evident from the high level discussions in the previous sections that managing international projects is a challenge for project managers. A number of unique constraining factors arising from foreign business environments have negative impacts on international projects and specifically construction type projects. The management of these constraining factors is a critical issue for international project success. In the brief literature review presented in the previous section, it was stated that social, economic, political, cultural, communication and legal factors were some of the constraining factors for international project success (Ling & Hoi, 2006; Ofori, 2003; Han & Diekmann, 2001). The authors mentioned agree that the main problems when managing international projects are no longer controlling and scheduling. However, very few academics and practitioners have done further research linking these constraining factors with project management practices. Some previous researchers stopped at identifying the problems caused by the abovementioned factors and did not really design systematic methods to overcome this barrier (Kwak, 2006; Shore & Cross, 2005; Loosemore &

Muslmani, 1999) Wang and Liu did a study on how to overcome the cultural barriers of Western project management in Chinese firms in 2007. The author has stated that the literature review did not reveal an appropriate empirical study focusing on how to modify project management practices to fit the Chinese culture or how to modify Chinese approaches.

Murphy and Ofori also highlighted some problems in international project research. Murphy (2005) describes the situation of research on international projects as follows: “In more than 20 years of managing international projects, I never found a definitive guide to help me perform my responsibilities to make a project succeed to the expectations of the company.”

Ofori (2003) states that the “international project has many peculiarities and problems, the impact of which will intensify in future. There is no suitable framework for analysing the factors that influence success in international construction.”

1.4 Research objectives

The overall aim of this research is to develop a systematic framework for the modelling, analysis and management of constraining factors in international projects. The aim is then to establish a linkage between cultural differences and project management activities and to control as well as mitigate the negative effects of cultural differences.

In order to achieve the overall objective, the research will:

- Identify typical Chinese behaviours and establish how Chinese behaviours affect project management activities.
- Do a comparative research of Chinese and South African project managers to identify the risks arising from cultural differences.
- Attempt to improve project team performance dynamics through a systematic analysis of risks arising from cultural differences.
- Research relevant knowledge related to cultural differences, project success and international project management.
- Find out how international project managers overcome these constraint factors in practice.
- Develop a systematic framework for the modelling, analysis and management of cultural differences in international projects.

1.5 The contributions of this research

The main contribution of this research is to explore the effects of cultural differences on project management activities and then establish the linkage between cultural differences with project management activities. This study takes the Chinese cultural behaviours as the base culture and compares the behaviours of South African and Chinese project managers. The results will fill the gap in the abovementioned perspective on the international project management arena. The focus of this research is more on construction type projects and there is no specific focus on international high technology or R and D projects.

More details of the main contributions are as follows:

- Contribute to the knowledge of managing projects in multicultural environments and cross-cultural studies in project management, especially to the South African and Chinese perspectives.
- Give a systematic description of the relevant aspects of Chinese culture and their effects on project management activities.
- The comparative data analysis of Chinese and South African project managers has implications for international project managers to handle the cultural differences between these two countries.
- The proposed model builds a linkage between cultural differences and project activities. Moreover, the proposed model will be evaluated by the empirical data.

1.6 A brief introduction to the research methodology

A combination of quantitative and qualitative research instruments was employed in this research. Primary data gathering was performed by means of questionnaires distributed to Chinese and South African project managers. Although the questionnaire was basically designed for the Chinese culture, South African project managers were also asked to participate in the survey in order to observe the differences. Descriptive analysis was performed to show the means and standard deviations of the variables (cultural behaviours). Moreover, independent sample t-tests were done to explore group differences between the Chinese and South African participants with regard to cultural behaviours. Spearman's rho correlation analysis was also used to explore the

relationships or correlations between some of the variables in the model presented to aid in the understanding of project management in this international context. Although Spearman's rho correlation used in this study does not imply causality, some useful correlations have been established between parameters in the proposed conceptual framework for the modelling, analysis and management of cultural differences in international projects. Future research outside the scope of this thesis will focus on evaluation of detailed relationships and causality in the proposed framework

1.7 The structure of the thesis

The thesis is subdivided into three parts with eight chapters, as described in the following research roadmap:

Part 1 contains two chapters. In this section, the basic research questions to be explored are defined. The background and the importance of the research issues are addressed. The background and context of this research are described. Some key theoretical and literature concepts are addressed in Chapter 2. A literature review is specifically conducted on critical success factors. Secondary research is conducted on the relevant literature in this field. The impact of the existing literature on the current research is evaluated. The relevant literature on project success and project success measurement is placed in a general context to aid in the appreciation of the proposed model.

Part 2 has three chapters. The relevant existing literature on international projects is researched in Chapter 3. The appropriate and relevant literature

and models for international project management are presented in this chapter. The shortcomings of previous research studies are addressed in Chapter 4 after a more comprehensive literature review. A primary model is developed from the literature study and presented in Chapter 5. The key attributes of the desired model are also addressed in this chapter.

Part 3 addresses the research design, data gathering and analysis. In this section, the study methodology of the survey is presented and a questionnaire, designed according to the research purposes in Chapter 6, is presented. A design survey research process is applied to obtain appropriate primary information. In Chapter 7, a combination of quantitative and qualitative research instruments is employed during the primary data-gathering and analysis process. In the analysing process, some statistical tools are applied to obtain scientific results. A comparative survey research method will be applied in this research as the research strategy and respondents from China and South Africa are selected. The data is analysed on three levels. In the data-analysis process, the research objectives are discussed and assessed. Some statistical correlation tests are also employed to build confidence in some of the relationships suggested in the proposed model. Chapter 8 presents the conclusions of the research, modifies the primary model according to the research findings and presents the final model. Some limitations of this research and recommendations for future research are also addressed in Chapter 8.

Chapter 2:

Assessment of key concepts that are relevant to international project management

2.1 Introduction

Understanding the appropriate key concepts is crucial to the study. This section examines some specific concepts related to international project management that are employed in this research. Literature that is relevant to the success of the project will also be addressed in the sense that it provides context and background for appreciation of the model to be proposed and evaluated in the ensuing chapters.

2.2 Assessment of key concepts

2.2.1 Dimensions of a project

A project may be defined in several different ways.

As far back as in 1983, Tuman defined a project as follows (in Pinto, 1986): “A project is an organisation of people dedicated to a specific purpose or objective. Projects generally involve large, expensive, unique, or high risk undertakings which have to be completed by a certain date, for a certain amount of money, within some expected level of performance. At a minimum,

all projects need to have well defined objectives and sufficient resources to carry out all the required tasks." A project is a combination of human and nonhuman resources pulled together in a temporary organisation to achieve a specified purpose (Cleland & Kerzner, 1985).

Archibald (in Shtub, Bard & Globerson, 1994) stated in 1976 that a project is the entire process required to produce a new plant, new system, or other specified results.

PMBOK (2008) defines a project as "a temporary endeavour undertaken to create a unique product, service, or result".

From the definitions above, the characteristics of a project can be summarised as follows:

- A project is a temporary, pre-planned endeavour with a beginning and an end
- A project has specific objectives that can be evaluated
- Every project is unique; all projects differ from each other
- A project needs different resources to achieve the desired deliverables

2.2.2 The differences between projects and products

Projects are different from products in many respects.

"Products are what the organisation is in business to make, deliver or sell, as stated in its mission. They maybe manufactured goods or services. Products generate revenue and therefore deliver the purpose or benefit of the project" (Knipe, Waldt, Niekerk, Burger & Nell, 2002).

The products of a project may for example be a bridge, or a sports stadium. The deliverables of projects are products. The description that projects are a temporary endeavour does not mean that the products and services they produce are temporary (Michael and Marina, 2004). The products of projects are generally ongoing for long periods and do not necessarily have a definite ending point. Projects, as compared to products, have a definite ending because they are scheduled to be completed within a specific time period This may have implications where for example team members in international teams have different cultural context and time conception behaviour specifically pertaining to the product that the project is supposed to deliver.

2.2.3 Brief review of project management

Although there are many different definitions of project management (PM), most of them are similar in that they contain the same elements.

Levine (1986) states that project management can be defined as the "planning, organising, directing, and controlling of resources for a specific time period to meet a specific set of one-time objectives".

"Project management is the application of knowledge, skills, tools and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project" (Duncan, 1996).

In their book, Harrison and Dennis (2004) define project management as “the achievement of project objectives through people and involving the organization, planning and control of resources assigned to the project”. The purpose of project management is achieved for the set project objectives in a risky environment.

According to the definition issued by the Project Management Institute, “project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Project management is accomplished through the appropriate application and integration of the 42 logically grouped project management processes comprising the 5 Process Groups (initiating, planning, executing, controlling, and closing)” (PMBOK 2008).

From these definitions, some common aspects of project management can be summarised:

- Effective management, including planning, controlling, organising and executing
- Meeting stakeholder requirements
- Project objective-orientated work
- The application of knowledge, skills, tools, techniques and methods

2.2.4 The body of project management knowledge and standards

PMBOK (2008) provides a framework of project management knowledge areas. Project management and practice are described in terms of their component processes. These processes have been organised into nine knowledge areas (Table 2.1). This table, and the following Table 2.2 are shown here for inter alia easy reference and to assess directly where cultural impact may occur; for example as part of the perform quality assurance activity under the Executing Process Group and Project Quality Management knowledge area as well part of the monitor and control risk activity under the Project Risk Management knowledge area.

- "Project integration management includes the processes and activities needed to identify, define, combine, unify, and coordinate the various processes and project activities within the project management process groups.
- Project scope management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.
- Project time management includes the processes required to manage timely completion of the project.
- Project cost management includes the processes involved in estimating, budgeting, and controlling costs so that the project can be completed within the approved budget.
- Project quality management describes the processes and activities of the performing organisation that determine quality polices, objectives, and

responsibilities so that the project will satisfy the needs for which it was undertaken.

- Project human resource management includes the processes that organise, manage and lead the project team.
- Project communications management includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information.
- Project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, and monitoring and control on a project.
- Project procurement management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team."

Table 2.1 shows that the IPMA (International Project Management Association) has developed the ICB (IPMA Competence Baseline), which is considered to be another global standard in project management (Pannenbäcker, Knofel & Communier, 2002).

Table 2.1: Overview of project management knowledge areas and project management processes

Project Management Process Groups					
Knowledge Areas	**Initiating Process Group**	**Planning Process Group**	**Executing Process Group**	**Monitoring and Controlling Process Group**	**Closing Process Group**
Project Integration Management	Develop project charter	Develop project management plan	Direct and manage project execution	Monitor and control project work Perform integrated change control	Close project or phase
Project Scope Management		Collect requirements Define scope Create WBS		Verify scope Control scope	
Project Time Management		Define activities Sequence activities Estimate activity resources Estimate activity durations Develop schedule		Control schedule	
Project Cost management		Estimate costs Determine budget		Control costs	
Project Quality Management		Plan quality	Perform quality assurance	Perform quality control	
Project Human Resource Management		Develop human resource plan	Acquire project team Develop project team Manage project team		
Project Communication Management	Identify stakeholders	Plan communication	Distribute information Manage stakeholder expectations	Report performance	
Project Risk Management		Plan risk management Identify risks Perform qualitative risk analysis Perform quantitative risk analysis Plan risk responses		Monitor and control risks	
Project Procurement Management		Plan procurement	Conduct procurements	Administer procurements	Close Procure-ments

(PMBOK, 2008)

"The ICB contains basic terms, tasks, practices, skills, functions, management processes, methods, techniques and tools that are commonly used in project management, as well as advanced knowledge, where appropriate, of innovative and advanced practices used in more limited situations" (IPMA Certification Yearbook 2005). Cultural behaviour may again be considered important in for instance element 2.14, values appreciation in Table 2.2.

Table 2.2: IPMA competence baseline

Technical competence elements		Behavioural competence elements		Contextual competence elements	
1.01	Project management success	2.01	Leadership	3.01	Project orientation
1.02	Interested parties	2.02	Engagement & motivation	3.02	Programme orientation
1.03	Project requirements & objectives	2.03	Self-control	3.03	Portfolio orientation
1.04	Risk & opportunity	2.04	Assertiveness	3.04	Project, programme & portfolio implementation
1.05	Quality	2.05	Relaxation	3.05	Permanent organisation
1.06	Project organisation	2.06	Openness	3.06	Business
1.07	Teamwork	2.07	Creativity	3.07	Systems, products & technology
1.08	Problem resolution	2.08	Results orientation	3.08	Personnel management
1.09	Project structures	2.09	Efficiency	3.09	Health, security, safety & environment
1.10	Scope & deliverables	2.10	Consultation	3.10	Finance
1.11	Time & project phases	2.11	Negotiation	3.11	Legal
1.12	Resources	2.12	Conflict & crisis		
1.13	Cost & finance	2.13	Reliability		
1.14	Procurement & contract	2.14	Values appreciation		
1.15	Changes	2.15	Ethics		
1.16	Control & reports				
1.17	Information & documentation				
1.18	Communication				
1.19	Start-up				
1.20	Close-out				

(IPMA Certification Yearbook, 2005)

2.2.5 Evaluation of an international project

Clifford and Erik (2000) classify projects as domestic, overseas, foreign and global projects. They state that a domestic project is one performed in its native country, an overseas project is one executed in a foreign country for a native firm, a foreign project is executed in a foreign country for a foreign firm, and a global project is implemented in multiple counties. They categorise projects executed elsewhere than in the native country as international projects. Ling, Ibbs and Hoo (2006) also state that an international project is one located outside the country where the company headquarters is based.

2.2.6 Foreign business environment

A business environment is created by factors such as the economic, cultural, legal, regulatory, financial, natural, institutional system and technical factors of a host country. The business environment is a rapidly changing environment (Collyer & Warren, 2009). Every country has its own unique business environment characteristics. The variety of business environment across regions and countries is commonly accepted as a barrier to doing business (Commander, Svejnar & Tinn, 2008). In this research study, a business environment that is out of one's native country is considered as a foreign environment. It is a key challenge for managers to understand uncertainty in the business environment (Burt, 2006).

2.2.7 The characteristics of an international project management team

Teams are very common in our lives. We often encounter a basketball team, soccer team, study team and so on. At the highest conceptual level, a team can be defined as a collection of people who work together to achieve a common goal (Frame, 1999).

Michael and Marina (2004) state that a project team is “a small number of people with complementary skills who are committed to a common purpose, performance, goals, and approach”. In some projects, the project team can also include other interested entities, such as stakeholders, client representatives and environmentalists. The project manager is the team leader whose responsibilities are to use a series of team development skills to improve the team performance.

A project team has at least the following components:

- a project manager who needs to motivate the team members and solve the conflicts among team members;
- goals that need to be established before project team building; and
- a group of people who have the necessary skills and commitment.

An international project management team also contains the abovementioned elements. Members of international teams differ from each other in many important ways: gender, thinking style, cultural background, function, profession and so on. In this research, a project team is considered to be an

international project management team when it contains the following elements (although it is recognised that some international teams have team members with the same native language):

- team members from different nationalities
- team members who do not have the same cultural background
- the native language of all the team members is not the same

Although this is simplistically represented, it concurs in a sense with the representation of virtual teams on four continua by Zigurs (2003):

- organisational dispersion
- geographical dispersion
- temporal dispersion
- cultural dispersion

This research thesis is then concerned mainly with the cultural and geographical dispersion elements of international teams that, under certain circumstances, may be considered as virtual teams (Zigurs, 2003; Lee-Kelly & Sankey, 2008).

Ochieng and Price (2010) state that little research has been done into multicultural teams on construction projects and that many international operations are often unable to deal with cultural factors. To a large extent the research in this thesis is then concerned with international teams on construction type projects

2.2.8 Project success review

As this research to some extent proposes that international project activities leading to project success is somehow dependant also on cultural behaviour it seems appropriate to explore to some extent the concept of project success. The first step in exploring and measuring project success is to reach consensus on the definition of "project success" (Dvir, Lipovetsky, Shenhar & Tishler, 1998; Tishler, Dvir, Shenhar & Lipovetsky, 1996; Diallo & Thuillier, 2004). In fact, the definition of "project success" has been researched by practitioners and academics for many years. However, there is still no consistent interpretation of the definition of "project success". Project success represents different meanings to different people with different viewpoints.

As far back as in1988, Pinto and Slevin pointed out that "there are few topics in the field of project management that are so frequently discussed and yet so rarely agreed upon as the notion of project success". In the same year, Baker, Murphy and Fisher (1988) proposed another definition of success: "If the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among: key people in the parent organization, key people in the client organization, key people on the project team, and key users or clientele of the project effort, the project is considered an overall success."

Some researchers and practitioners believe that project success is "perceived" in nature. Pariff and Sanvido (1993) state that "success" is an intangible

perspective feeling, a measuring criterion that varies with management expectations and varies among persons and with phases of project. Success is only “perceived success” (Diallo & Thuillier, 2004; Baker, Murphy & Fisher, 1988). Freeman and Beale (1992) give a very interesting example to describe “perceived project success”:

“An architect may consider success in terms of aesthetic appearance, an engineer in terms of technical competence, an accountant in terms of dollars spent under budget, a human resources manager in terms of employee satisfaction. Chief executive officers rate their success in the stock market.”

Other academics also have the perception that the assessment of a project’s success may differ, depending on the point of view of the person evaluating it (Lipovetsky, Tishler, Dvir & Shenhar, 1997; Lim & Mohamed, 1999; Bryde & Robinson, 2005; Shenhar & Levy, Dvir, 1997). Chan, Scott and Lam (2002) also argue: “The general concept of project success remains ambiguously defined because of varying perceptions, such a phenomenon also exists in the construction industry where different parties are involved, including the client, the architect, the contractor, and various surveyors and engineers.”

De Wit (1988) and Baccarini (1999) advocate that, before measuring project success, one must first distinguish between project success and project management success, because their objectives are not the same. Yu, Flett and Bowers (2005) agree that different definitions of the term “project” might warrant different success criteria. There is no universal checklist of project success criteria suitable for all projects. Success criteria will differ from project

to project. The issue of project success is far more subtle than the golden triangle (time, budget and required quality) (Westerveld, 2003). Apparently, there can be ambiguity in determining whether a project is a success or a failure. There are two main reasons for this ambiguity. One is that different parties perceive project success or failure differently; another is that lists of success or failure factors vary in various studies in the literature (Belassi & Tukel, 1996). Therefore, defining the concept of project success is an intractable issue.

Baccarini (1999) agrees that the measurement of project success is not an easy endeavour. He generalises the characteristics of project success as follows:

- It has “hard” and “soft” dimensions
- The project is perceived
- Success criteria must be prioritised
- Success is affected by time
- Success is not always manageable
- Success may be partial

Some academics link project success measurement with the organisation’s strategy management. Project success is strongly linked to an organisation’s success and effectiveness in the long run. The assessment of project success is a multidimensional framework. Such a framework should connect with the organisation’s strategy management and project selection as well as project

initiation from top-level decisions. To assess a project's success, one needs to understand the distinct dimensions and address different timeframes – from short-term to long-term. The specific success dimensions and their relevant importance will vary according to different projects (Shenhar，Dvir，Levy & Maltz, 2001; Diallo & Thuillier, 2004, Khang　Moe, 2008).

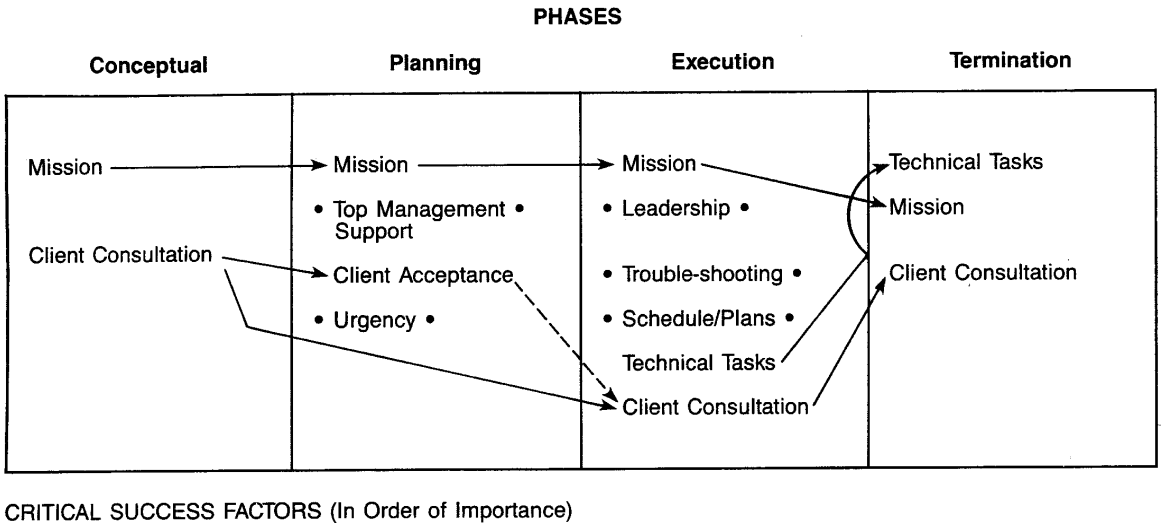
2.3 Critical project success factors review

The search for factors that influence project success or failure has been of great interest to both researchers and practitioners (Pinto & Mantel, 1990). Since the 1950s most work in project management has focused on project scheduling problems, assuming that the development of better scheduling techniques would result in better management and thus the successful completion of projects. However, there are many factors besides scheduling that could determine the success or failure of a project (Belassi & Tukel, 1996). Wang and Liu (2008) have a similar opinion. They state that a PM organisation should study project management techniques and cultural values to achieve a successful project.　Project success factors were also introduced by Rubin and Seeling (in Belassi & Tukel, 1996) in 1967. They identified technical performance as a measure of success and pointed out that the project manager's experience has a minimal impact but that the size of previously managed projects affects the manager's performance. The following reviews are in a chronological order:

Pinto and Slevin (1988) found ten factors (see Figure 2.1) to be of primary importance with regard to successful project management throughout the

lifecycle of a project. Their results were based on a survey of the literature and interviews with project and programme managers. The ten general factors that they found to be critical to the successful implementation of a project can be applied to a wide variety of project types and organisations. These factors served as the basis for a measurement instrument, the project implementation profile, which allows for an assessment of an organisation's ability to carry a project through to full implementation (Pinto et al., 1990).

Figure 2.1: The critical success factors across the project life cycle



(Pinto & Slevin, 1988)

The ten factors are:

1. Project mission: initial clarity of objective and general directions.
2. Management support: willingness of top management to provide the necessary resources and authority/power for project success.
3. Project schedule/plans: a detailed specification of the individual action steps required for project implementation.

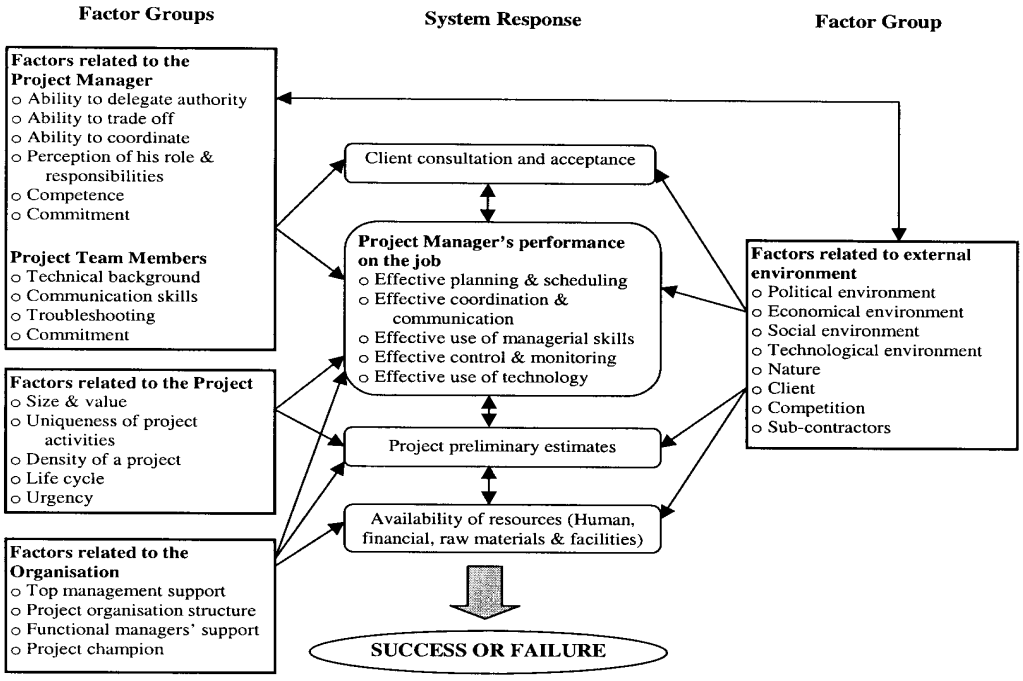
4. Client consultation: communication and consultation, listening to all parties involved.
5. Technical tasks: availability of the required technology and expertise to accomplish the specific technical action steps.
6. Client acceptance: the act of “selling” the final projects to their ultimate intended users.
7. Monitoring and feedback: timely provision of comprehensive control information at each stage of the implementation process.
8. Communication: the provision of an appropriate network and necessary data to all key actors.
9. Troubleshooting: the ability to handle unexpected crises and deviations from plan.
10. Personnel (recruitment, selection and training): recruitment, selection and training of the necessary personnel for the team.

In a study conducted by Belassi and Tukel in 1996, they found that there is ambiguity in determining, by researching existing literature of the field, whether a project is a success or a failure. There are two reasons for this ambiguity. First, as mentioned in a paper by Pinto and Slevin (in Belassi et al., 1996), it is still not clear how project success should be measured, because the parties who are involved in projects perceive project success or failure subjectively. The second reason, which is the motivation of their study, is that they found that the existing literature seems to tabulate individual factors rather than grouping them according to some criteria to help analyse their interaction and the possible consequences. They also state that many of these factors do not, in practice, directly affect project success or failure. Usually a combination of

many factors, at different stages of the project life cycle, results in project success or failure. They tried to determine the combined effects of these factors that eventually lead to project success or failure, instead of analysing individual factors.

The new framework of project success factors that they developed is given in Figure 2.2. The factors are categorised into four areas.

Figure 2.2: The new framework of success factors



(Belassi et al., 1996)

Tishler, Dvir, Shenhar and Lipovetsky published an article in 1996 on discovering the critical factors that are relevant to the success of defence projects by researching 110 defence projects executed in Israel over 20 years. The main factors found to be critical to the success of defence projects are:

Urgency of need

The extent to which the project is acknowledged as being urgent by the developing organisation and by the end-user.

Quality of the follow-up team

The team's level of professional expertise and its sense of responsibility for the success of the project are the most important variables in determining success.

Pre-project preparation

This refers to the preparations made by the contractor before actually commencing development. The most important variables in this factor are proving the technological feasibility of the project, evaluating the implications for project performance of the organisational structure and logistic processes, and the establishment of an appropriate organisational structure.

Quality of the development team and of its manager

The professional and managerial qualifications of this team and the team spirit are the most important variables of this factor.

Professional growth and continuity

An organisational culture encourages professional growth and prolonged periods of work on the same project.

Design policy of the developing organisation

Clear policy regarding decision-making procedures and internal and external communication procedures seems to contribute greatly to project success.

Design considerations in the early phases of the development cycle

Quality and reliability, produceability, and design-to-cost considerations exhibit high correlations with all dimensions of success.

Systematic use of methods to control schedule, budget and performance

These methods are used to detect problems as soon as they occur.

Dvir et al. (2006) used neural networks and linear regression to identify critical managerial success factors. The results showed that two analysis tools lead to different success factors with the same data. Some results that were obtained are listed in table 2.3. The number of variables in table 2.3 is to describe how well a certain managerial task was executed during the development process.

Table 2.3: Eight most important factors—regression vs. neural network

Neural network	No. of variables	Regression	No. of variables
Essential and urgent operational need	2	Essential and urgent operational need	1
Cohesion of the development team	2	Definition of operational and technical requirements	4
Quality of the escorting team	3	General-level management and delegation of authority	3
Involvement of the developing organization in the project definition	1	Existence of learning mechanisms in the development team	2
Existence of learning mechanisms in the development team	2	Existence of appropriate technological infrastructure at the developing organization	1
Budget and technical control	3	Involvement in the decision making process and open communication	2
Definition of operational and technical requirements	6	Managerial qualifications within the developing team	2
Managerial qualifications of the project manger	3	Cohesion of the development team	2

Dvir et al., (2006)

Cooke-Davies (2001) found 11 factors that are critical to comprehensive project success by answering three questions, namely:

- What factors lead to project success?
- What factors lead to a successful project?
- What factors lead to consistently successful projects?

He found that, in spite of many well-known research results and much literature on project management, despite decades of individual and collective experience of managing projects, despite the rapid growth in membership of project management professional bodies, and despite a dramatic increase in the amount of projects working in industry, project results continue to disappoint stakeholders. Thus, Cooke-Davies asked the question "What are the critical factors that really lead to a successful project?"

Therefore, his study is naturally based on answering the questions below.

Question 1: What factors are critical to project management success?

The answer is:

Those practices that correlate to on-time performance are:

- Adequacy of company – wide education on the concepts of risk management.
- Maturity of an organisation's processes for assigning ownership of risks.
- Adequacy with which a visible risk register is maintained.
- Adequacy of an up-to-date risk management plan.
- Adequacy of documentation of organisational responsibilities on the project.
- Keep project (or project stage duration) as far below three years as possible (one year is better).

Those that correlate to on-cost performance are:

- Allow change to scope only through a mature scope-change control process.
- Maintain the integrity of the performance measurement baseline.

Question 2: What factors are critical to success on an individual project?

The answer is:

The existence of an effective benefits delivery and management process that involves the mutual cooperation of project management and line management functions.

Question 3: What factors lead to consistently successful projects?

The answer is:

- Portfolio and programme management practices that allow the enterprise to resource fully a suite of projects that is thoughtfully and dynamically matched to the corporate strategy and business objectives.
- A suite of project, programme and portfolio metrics that provide direct “line of sight” feedback on current project performance and anticipated future success, so that project, portfolio and corporate decisions can be aligned.

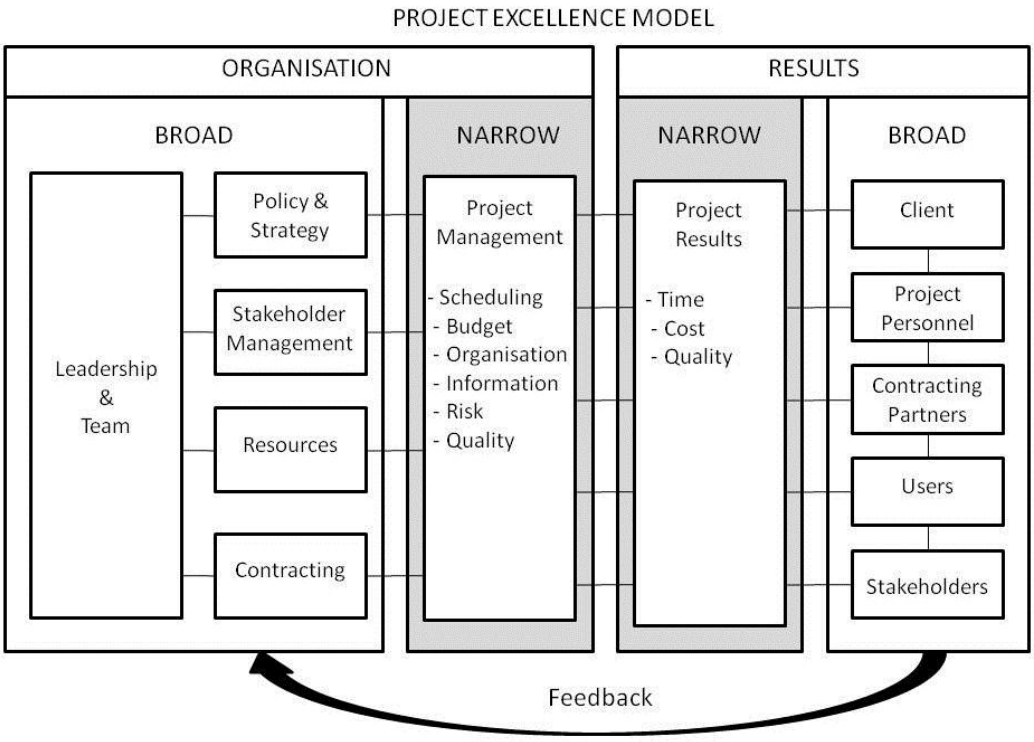
- An effective means of “learning from experience” on projects, which combines explicit knowledge with tacit knowledge in a way that encourages people to learn and to embed that learning into continuous improvement of project management processes and practices.

Westerveld, who created a project excellence model in 2003 (Figure 2.3), firstly built the linkage between success criteria and critical success factors. In his article, he generalises the critical success factors in a “project excellence model” as follows:

- Leadership and team: Represents the way the project manager runs the project and how tasks and responsibilities are divided. Leadership style of and cooperation in the project team greatly influence the working habits within the project organisation.
- Policy and strategy: What are the project goals and how are they accomplished? It is necessary to combine the interests of stakeholders into an end product.
- Stakeholder management: How does the project interact with various stakeholders? The cooperation of the project organisation with external parties determines the place of the project in its environment.
- Resources: Resources have to be utilised in an effective and efficient manner in order to achieve maximum benefit to the stakeholders involved.
- Contracting: Each project organisation establishes contractual relationships. The choices of contracts and partners evolve around the tasks at hand and the competencies of contracting parties.

- Project management (scheduling, budget, organisation, quality, information and risks): How does operational control of the project take place? The traditional aspects of sound project control play a key role in this process.
- Success criteria (external factors)

Figure 2.3: The project excellence model



(Westerveld, 2003)

In 2008, Kuhang and Moe did a study to explore the success criteria and factors for international development projects (see Table 2.3). The study presented a conceptual model for not-for-profit international projects from a perspective of project life-cycle phases. The empirical data confirm the validity of the model. They argue that little research has been done that pays adequate

attention to the critical success factors of international development projects. The critical success factors that are identified by the study are as follows.

Table 2.4: The success factors for international development projects

Life-cycle phase	Critical success factors
Conceptualising	• Clear understanding of project environment by funding and implementing agencies and consultants • Competencies of project designers • Effective consultations with primary stakeholders
Planning	• Compatibility of development priorities of the key stakeholders • Adequate resources and competencies available to support the project plan • Competencies of project planners • Effective consultation with key stakeholders
Implementing	• Compatible rules and procedures for PM • Continuing supports of stakeholders • Commitment to project goals and objectives • Competencies of project management team • Effective consultation with all stakeholders
Closing/completing	• Adequate provisions for project closing in the project plan • Competencies of project manager • Effective consultation with key stakeholders
Overall project success	• Donor and recipient government have clear policies to sustain project's activities and results • Adequate local capacities are available • There is strong local ownership of the project

(Kuhang & Moe, 2008)

2.4 Project success measurement review

2.4.1 Introduction

The construction industry has a dynamic nature. A construction project is a temporary endeavour with specific uncertainties and risks. Assessment of a project's outcome is extremely important to everyone involved in development projects (Lipovetsky, Tishler, Dvir & Shenhar, 1997, Dvir et al., 2006; Shenhar et al., 2002). Over the years, measuring project success has always been a debatable topic. Time, cost and quality have been defined for very long time as the iron triangle, that is, the basic criteria for measuring project success. However different ideas have also emerged. Although the topic of project success has been investigated for many years, research has not converged to a standard approach (Dvir, Raz & Shenhar, 2003; Ojiako, Johansen & Greenwood, 2008).

2.4.2 The definition of project success criteria

A criterion is defined as standard of judgment or principle by which something is measured (Oxford Dictionary 1990; The Concise English Dictionary, 1990). Lim and Mohamed (1999) define a criterion as a principle or standard by which anything is or can be judged. Chan and Chan (2004) define the criteria of project success as "the set of principles or standards by which favourable outcomes can be completed within a set specification". The criteria for measuring project success must reflect the various views of the different interested groups (stockholders, managers and end-users) (Tishler, et al.,

1996; Dvir et al., 2006; Shenhar et al., 2002). It may not be that difficult to define project success criteria, but “even when everybody agrees with a list of criteria, the measurement of project success remains a rather difficult task” (Diallo & Thuillier, 2004). “It is impossible to generate a universal checklist of criteria suitable for all projects” (Ojiako, Johansen & Greenwood, 2008).

2.4.3 The measures of project success

Over the years, various attempts have been made to explore the issue of measuring project success. However, measuring project success is a complex task, since success is intangible and can hardly be agreed upon. Measuring project success in large-scale studies has proven to be problematic (Larson, 1997). The difficulties in assessing project success have traditionally driven project managers to a simplistic formula (on time, to budget and at required quality) in measuring success (Shenhar & Levy, 1997). Basically, a project is considered to be successful if the building is delivered at the right time, budget, and quality (Chan, Scott & Lam 2002; Belassi &d Tukel 1996; Cooke-Davies, 2002).

Some other academics and practitioners have their own viewpoints on this issue. Project managers and project sponsors often no longer believe in the iron triangle (on time, to budget and at the required quality) (Gardiner and Stewart, 2000). They add more criteria to the traditional iron triangle or create other dimensions to measure project success. The measure of success is multidimensional (Pinto & Slevin, 1988). The internal measures of efficiency (traditional iron triangle) are partial and sometimes misleading; one situation

that cannot be overlooked is when, although a project ran efficiently, it did not meet the customer's needs and requirements (Lipovetsky, Tishler, Dvir & Shenhar,1997; Dvir, Ben-David, Sadeh & Shenhar, 2006).

The opinions of some other researchers are summarised below.

Baker, Murphy and Fisher (1988) point out that a perceived project success not only needs to meet technical specifications and/or project objectives, but also needs to satisfy the following parties:

- the parent company
- the client
- the users or clientele
- the project team itself

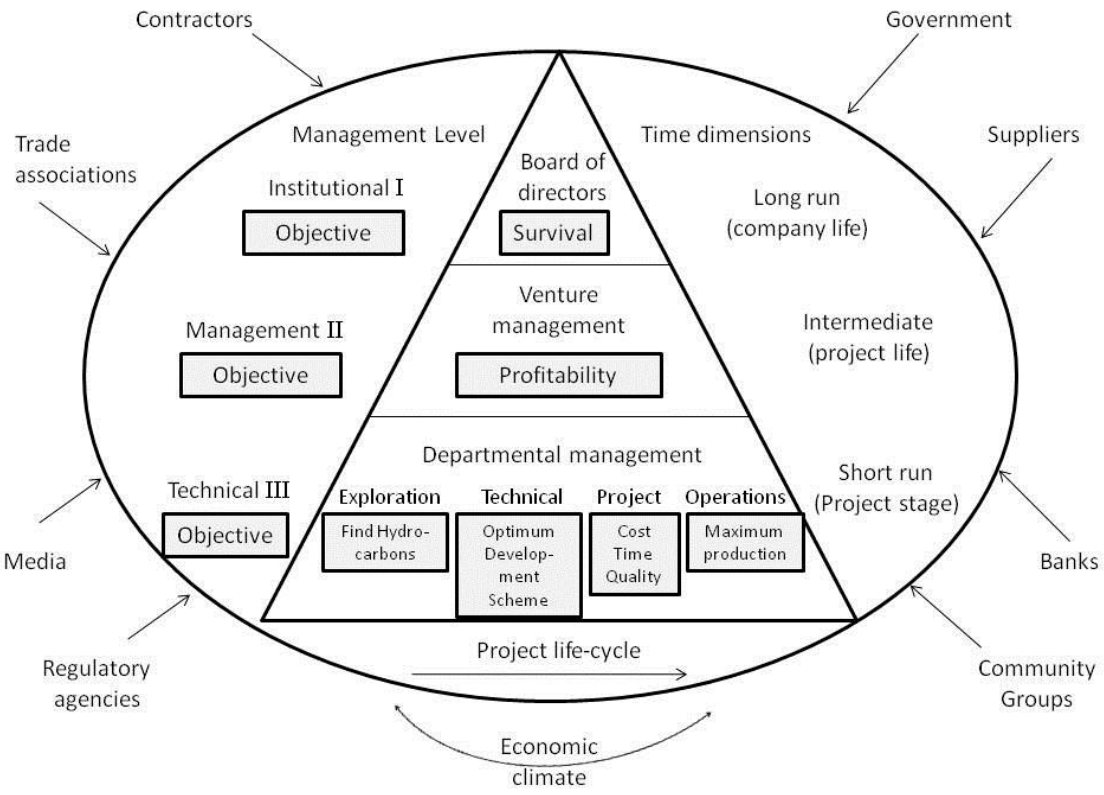
Pinto and Slevin (1988) advocate that the measurement of project success is based on the following characteristics:

- adherence to budget
- adherence to schedule
- level of performance achieved
- organisational validity
- organisational effectiveness

De Wit (1988) states that the most appropriate criteria for success are the project objectives. The success of the project is determined by the degree to

which these objectives have met. The objectives involved in a project are more than just cost, time and quality. A project success framework was developed by De Wit (1988) (see Figure 2.4)

Figure 2.4: Project success framework



(De Wit, 1988)

Pinto and Mantel (1990) identify three aspects of project performance as benchmarks for measuring the success or failure of a project:

- the implementation process itself
- the perceived value of the project
- client's satisfaction with the delivered project

Freeman and Beale (1992) attest that, from a financial perspective, project success can be measured from three viewpoints (sponsor, project manager and sponsor as project manager). They identified seven criteria from measuring project success:

- technical performance
- efficiency of project execution
- managerial and organisational implications
- personal growth
- project termination
- technical innovativeness
- manufacturability and business performance

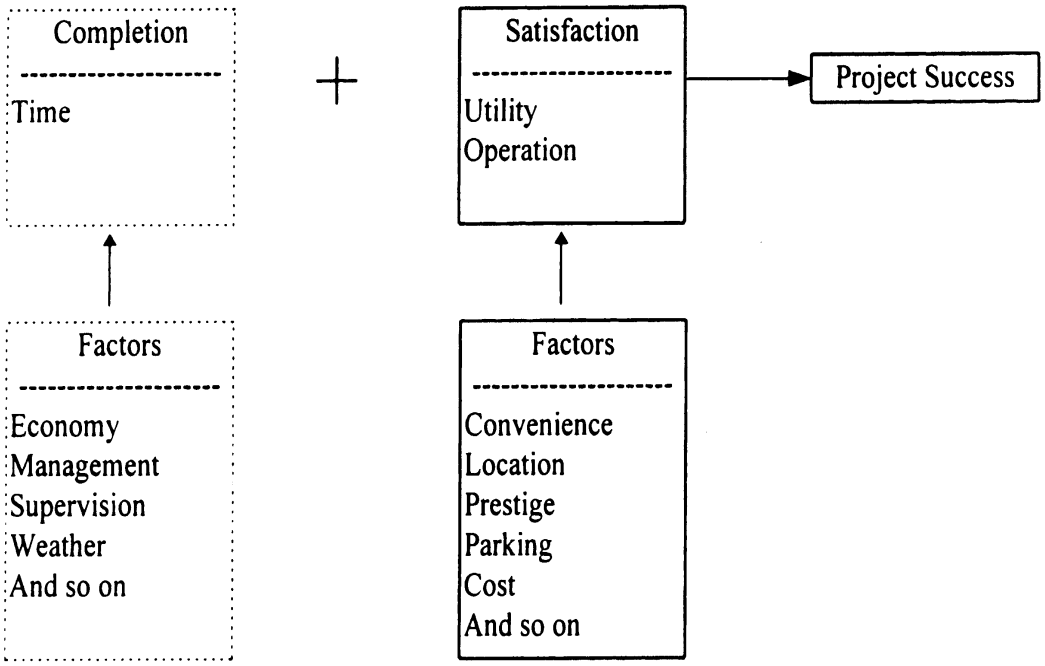
Gardiner and Stewart (2000) contend that the old statement of “on time, to budget and of the required quality” should be re-written to “with the best achievable NPV and to the required quality”. However, they agree with Freeman and Beale that the financial perspective could be a critical measurement for judging project success.

Wateridge (1995) advocated that meeting budget, timescales, user requirements and specifications is a limited criterion because it does not take into account other criteria (for example, quality and achievement of purpose). Project managers should not place too much emphasis on the time and budget aspect when judging project success and should pay more consideration to users’ criteria as measures of success.

Tishler, Dvir, Shenhar and Lipovetsky (1996) found that project managers evaluate project success from four different points of view: (1) from the customer's point of view (including meeting the functional and technical specifications), (2) from an operational point of view (meeting budget and schedule goals), (3) from the degree of the business success of the project, and (4) from the extent to which the project creates new opportunities and provides new technologies for use in future projects.

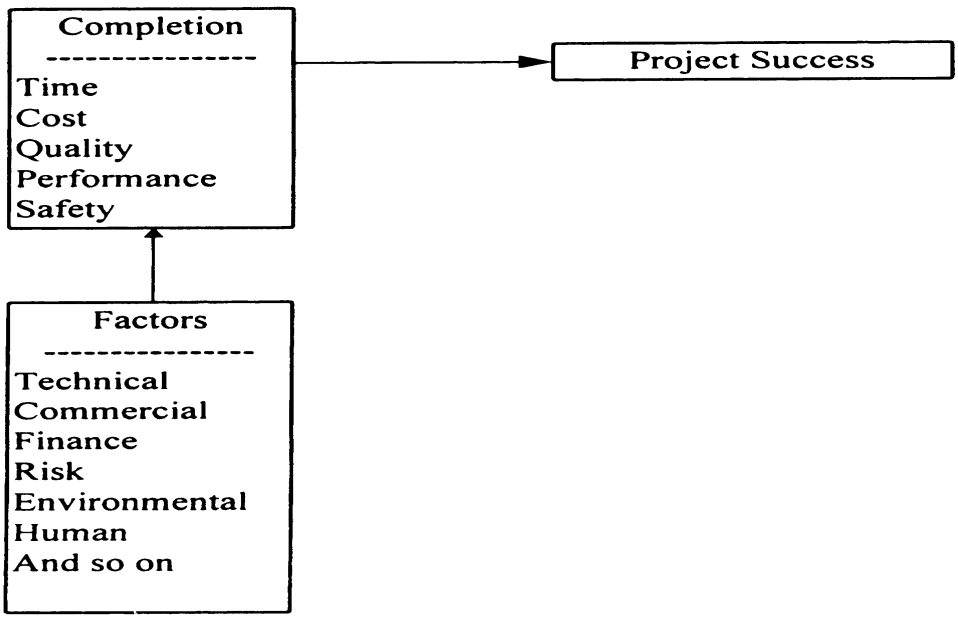
Lim and Mohamed (1999) classify project success into two categories: the macro and micro viewpoints. Users and stakeholders are usually concerned with project success from a macro viewpoint (as indicated for example by their focus on factors such as parking and location Figure 2.5). The construction parties are usually concerned with project success from micro viewpoint (Figure 2.6). These figures also emphasise the background to project success and the role that soft and hard factors play. This is important as context for the model to be proposed later in this research.

Figure 2.5: Macro viewpoint of project success



(Lim & Mohamed 1999)

Figure 2.6: Micro viewpoint of project success



(Lim & Mohamed 1999)

Shenhar，Dvir，Levy and Maltz (2001) as well as Shenhar, Dvir and Levy (1997) identify four success dimensions to measure project success (Table 2.5):

- project efficiency
- impact on the customer
- business success
- preparing for the future

Dvir (2005) stated that “project success was measured along three criteria (two constructs measuring success from two different points of view and an overall success measure) that were validated in previous research by Lipovetsky et al. (1997)”.

- 1. Meeting planning goals (project efficiency).
- 2. Customer benefits (success from the customer’s point of view).
- 3. Overall success (an integrative measure of project success).

These authors state that project managers should not be detached from the organisation’s strategic and long-term goals. Project definition, planning and success assessment should be integrated with the strategic planning and strategic management in organisations (Ojiako, Johansen & Greenwood, 2008).

Table 2.5: Four project success dimensions

Success dimension	Measures
1. Project efficiency	Meeting schedule goal
	Meeting budget goal
2. Impact on the customer	Meeting functional performance
	Meeting technical specifications
	Fulfilling customer needs
	Solving a customer's problem
	The customer is using the product
	Customer satisfaction
3. Business success	Commercial success
	Creating a large market share
4. Preparing for the future	Creating a new market
	Creating a new product line
	Developing a new technology

(Shenhar, Dvir, Levy & Maltz 2001)

White and Fortune (2002) conducted an empirical study aimed at capturing the "real world" experiences of people who are active in project management. They designed a questionnaire that was sent to 995 project managers. The survey achieved a response rate of 23.7%. One of the objectives of the survey was to identify any common criteria used for defining project success criteria. The results of the survey are shown in Table 2.6.

Table 2.6: Criteria used for judging project success

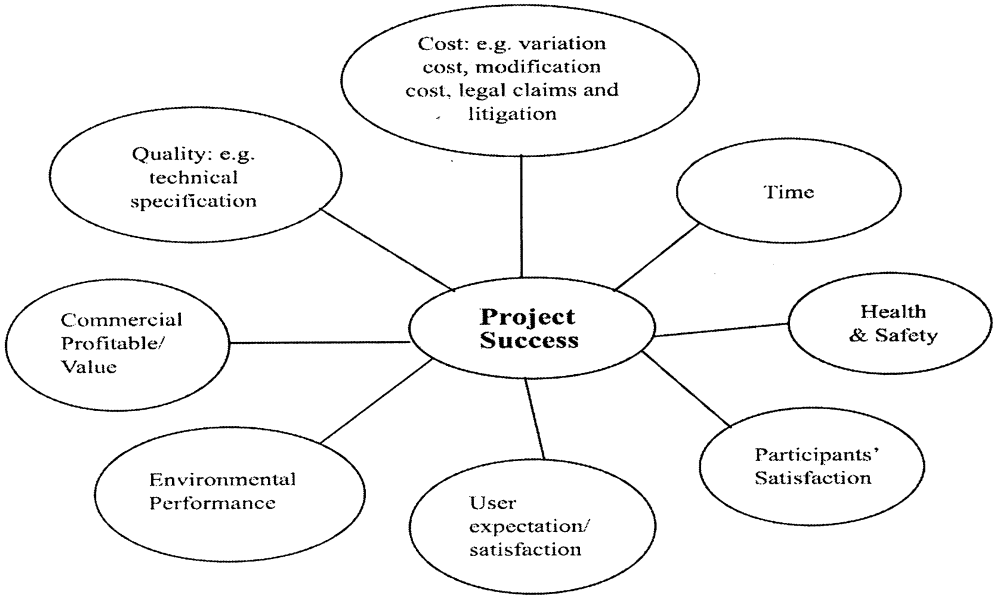
Criteria	Sum of re-coded ranking	Sums ranked
Meets client's requirements	970	1
Completed within schedule	850	2
Completed within budget	766	3
Meets organisational objectives	188	4
Yields business and other benefits	86	5
Causes minimal business disruption	71	6
Meets quality/safety standards	48	7
Other criteria	20	8

(White & Fortune, 2002)

From the survey results, we can see that "Meets client's requirements" is the criterion most often ranked first by the respondents, followed by "Completed within schedule" and "Completed within budget".

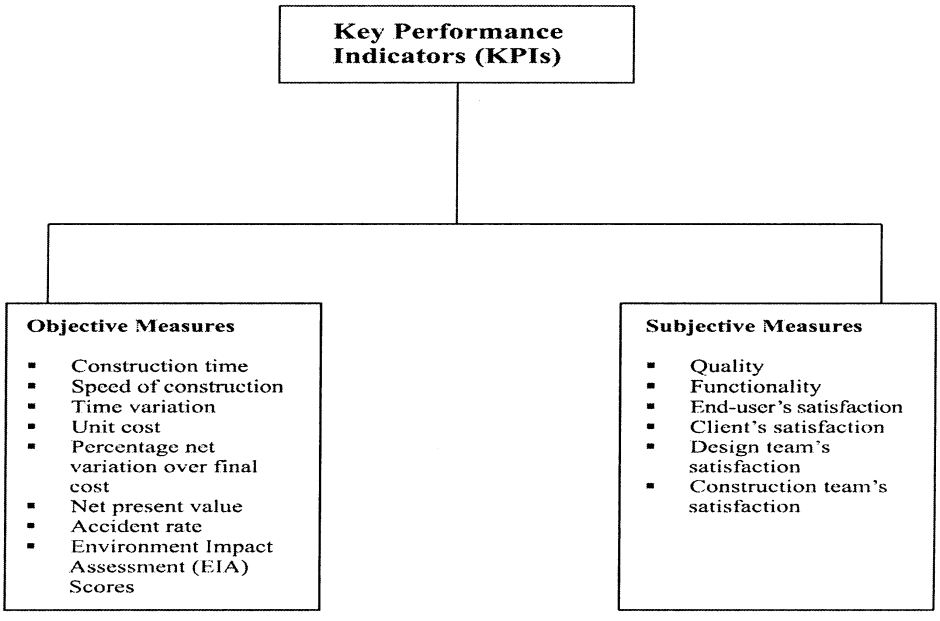
Chan and Chan (2004) undertook a comprehensive review of the literature on the measurement of project success in the1990s. They found that researchers proposed different criteria during the 1990s for measuring project success. Chan and Chan (2004) proposed a consolidated framework for measuring the success of construction projects (Figure 2.7) and advocated the use of KPIs (Key Performance Indicators) to measure the performance of a construction project (Figure 2.8).

Figure 2.7: The consolidated framework for measuring project success



(Chan & Chan, 2004)

Figure 2.8: KPIs for construction project success



(Chan & Chan, 2004)

Yu, Flett and Bowers (2005) propose a project-orientated and value-centred scheme for assessing project success. They identify two approaches addressing the inadequacies of the traditional criteria of the iron triangle (cost, time and quality). Their article defines two key concepts: the net project execution cost (NPEC) and the net project operation value (NPOV). Twelve possible project outcomes are outlined, based on the values of NPEC and NPOV at project completion compared to their initial estimates.

NPEC is defined as the net of all costs borne by the client minus all the benefits accrued to the client during project execution ($NPEC=C_{project}-B_{project}$).

The NPOV is defined to capture all the benefits a client derives from the created product during product operation minus any associated operational cost($NPOV=B_{operation}-C_{operation}$).

Diallo and Thuillier (2004) agree that success is only perceived success. They believe that success can be measured only when the evaluation dimensions are adequately defined. They propose the following list of evaluation dimensions:

- respect of the three traditional constraints
- satisfaction of the client
- satisfaction of the objectives as outlined in the logical framework
- project impact
- institutional or organisational capacity built in the organisation by the project
- financial returns (in the case of productive projects) or economic or social benefits (in the case of public sector projects)

- project innovative features (outputs, management or design)

Millis and Vanhoof did a study to evaluate the success of ICT projects in 2007 and the results showed that the iron triangle did not guarantee the success of the project. Other criteria such as user happiness and financial and commercial success should be incorporated into the set of criteria to evaluate the success of ICT projects.

Ojiako, Johansen and Greenwood (2008) argue that there is no universal checklist of criteria for all projects. Success criteria will differ from project variables such as size, uniqueness, industry, complexity and the stakeholders involved. The cost, time and quality criteria need to be established in the context of “project performance”.

2.4.4 The findings from the literature review

The literature review presented in the previous subsections is placed in context in this section. This exploratory research in the literature review found that there does not appear to be consensus among researchers and practitioners on the criteria for measuring project success (Wateridge, 1995). There exists a general disagreement on order of importance of measures of success (Bryde & Robinson, 2005). Success can indeed be evaluated only when the evaluation dimensions are adequately defined. There is no “absolute” success or consistency in overall success over time (Diallo & Thuillier, 2004).

The measurement of project success is ambiguous and there does not seem to be consensus on many aspects (Dvir, Raz & Shenhar, 2003; Yu, Flett & Bowers, 2005; Westerveld, 2003). One group of researchers has tried to add more dimensions to the iron triangle in order to complement its inadequacies. Those researchers created new dimensions to describe the meaning of project success in their respective ways (Pinto & Slevin, 1988; Baker, Murphy & Fisher, 1988; De Wit, 1988; Freeman & Beale, 1992; Shenhar，Dvir，Levy & Maltz, 2001; Chan & Chan, 2004; Milis & Vanhoof 2007; Ojiako, Johansen & Greenwood, 2008). The measurement of project success is continuously enriched as time passes.

Many academics and practitioners believe that measuring project success is perceived and sometimes subjective. The project success criteria vary, depending on the point of view, from project to project, and even from point of time to point of time. There is no “absolute” project success. One must define the criteria of project success prior to measuring it **(**Pariff & Sanvido,1993; Diallo & Thuillier, 2004; Baker, Murphy & Fisher, 1988; Freeman & Beale, 1992; Lipovetsky, Tishler, Dvir & Shenhar, 1997; Lim & Mohamed, 1999; Bryde & Robinson, 2005; Shenhar & Levy, 1997; Chan, Scott & Lam, 2002; Muller & Turner, 2007; Ojiako; Thomas & Fernandez,2008) **.**

Measuring project success should link organisational strategic management, strategic planning and long-term goals (Shenhar，Dvir，Levy & Maltz ,2001; Diallo & Thuillier, 2004; Shenhar，Dvir，Levy & Maltz, 2001; Shenhar & Levy, 1997; Milis & Vanhoof 2007; Ojiako, Johansen & Greenwood,2008,Lechler &

Dvir, 2010). Shenhar (2001) also argues that time is of relative importance for success factors.

Some project success criteria are “hard” (objectives), tangible and measurable. These normally refer to time, cost and quality. Other “soft” success criteria are subjective, subtle and more difficult to measure, such as satisfaction, user happiness, financial/commercial success, enhanced reputation and attention to detail (Baccarini, 1999; Milis & Vanhoof, 2007).

The measurement of progress of time, cost and quality is no doubt an essential part of measuring project success (De Wit, 1988; Atkinson, 1999). These three criteria (on time, to budget, to specification) were the highest ranked success criteria identified by project managers (White & Fortune, 2002). Budget, schedule and quality are the three generally accepted criteria and the most important performance indicators to achieve the objectives of a construction project (Chan, Scott & Lam, 2002; Chan & Chan, 2004; Ojiako, Johansen & Greenwood, 2008).

2.5 Summary

This chapter assessed some of the key concepts that are relevant to projects and project management, and compared aspects such as projects and products. The context of international projects as well as international project teams and foreign business environment were also described. Project success and project success measurement are a critical issue that must be interpreted before further research can be conducted. A detailed literature review on project success and project success measurement was conducted in this

chapter. The existing literature showed that, although measuring project success is an intangible and sometimes subjective endeavour, the iron triangle (time, cost, quality) appears to contain the essential elements for measuring project success.

Several peer reviewed international conference papers have been published by the author of this thesis (Jiang and Pretorius 2008, 2009, 2010) based partially on the contents of the following chapters.

PART 2:

THE DEVELOPMENT OF THE CONCEPTUAL MODEL

Chapter 3:

Literature review on international project management

3.1 Introduction

After having assessed some key concepts in the last chapter, a further literature review on constraint factors in international projects will be conducted in this chapter. This should then provide the appropriate context for cultural differences in project management that will be specifically addressed. Some results of the existing research will be generalised.

3.2 A brief research review on constraint factors in international project management

Global markets contain both opportunities and risks. Nowadays, most project companies are looking for international projects because of the potential good profits. The differences between the domestic and overseas environment result in some factors related to international projects differing from that of domestic projects. Normally the constraint factors facing international project are related to socio-cultural, economic, technological and political

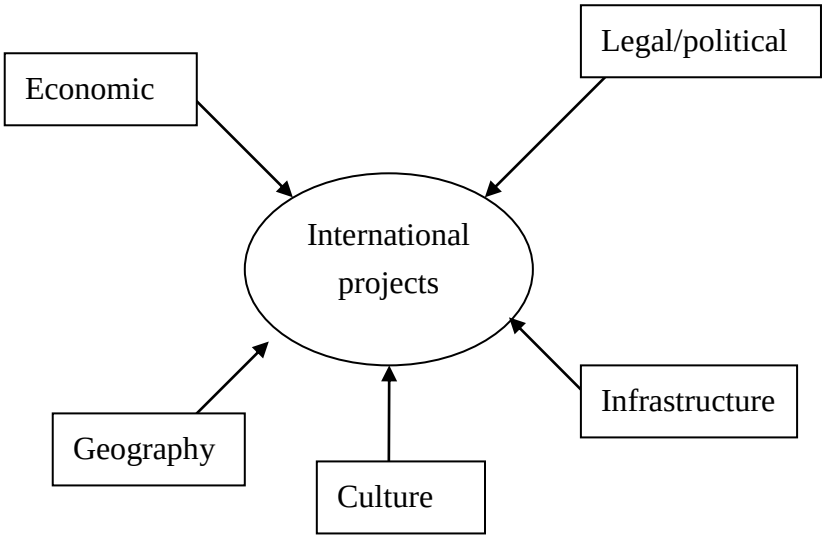
environments. Balio and Price (2003) define these factors as global risk factors that receive the most attention from researchers (Dikmen, Brigonul & Han, 2007).

Some researchers and practitioners have done research on international projects. They have already identified some factors that constrain international project success which will be discussed below.

It is a kind of international business endeavour in itself to implement projects abroad. Miller (1992) states that the uncertainties resulting from the general environment of international business endeavours can be categorised into political uncertainties, government policy uncertainties, macroeconomic uncertainties, social uncertainties and natural uncertainties. Howes and Tah (2003) state that international project management is a business endeavour operating in a foreign market. When making a decision to enter a foreign market, decision-makers must assess all aspects concerning the social, economic and political environment than could affect the company's stability and the trading environment. Each country has a distinct economic, political, legal, cultural and competitive context that organisations operate in. International organisations should respond positively to these differences (Low & Christopher, 1999). International projects are implemented in a foreign environment. Gray and Larson (2003) conclude that "the major challenge international project managers face is the reality that what works at home may not work in a foreign environment". The differences between nations and cultures could change international projects into nightmares. Gray and Larson state that if project managers were aware beforehand of the differences

between the host country environment and the domestic environment, the risks of the international project could be reduced. The factors typically affecting international projects can be interpreted as shown in Figure 3.1.

Figure 3.1: Environmental factors affecting international projects



(Gray & Larson, 2003)

Murphy (2005) is of the opinion that the main reason why companies step into the international arena are increased profits, growing the company, smoothing out the business cycle and extending the sales potential of existing products. He focuses on cultural issues, business competition, legal issues, currency issues and political issues as the key risks in managing international projects.

The authors mentioned below have the same point of view when discussing international projects. They believe that factors in host counties are the key constraint factors of international projects.

The international construction business environment entails political, financial, cultural and legal risks. An understanding of these risks could be of critical importance for the survival of construction companies (Gunhan & Arditi, 2005).

Han and Diekmann (2001) identify the essential risks associated with international construction projects. They believe that the risks related to conditions in other countries are cultural, legal, political, economic geographic, climate and environmental conditions.

Some salient points were obtained from the literature review. Project managers find it challenging to manage international projects. They are generally familiar with domestic projects. However, the differences are obvious because international projects are implemented in a foreign environment that is typically unfamiliar to the project managers. Most researchers and practitioners (Gray & Larson, 2003; Han & Diekmann, 2001; Gunhan & Arditi, 2005; Murphy, 2005) agree that the main factors that affect the success of an international project stem from the host country environment and not from the risks related to domestic projects.

Cultural, legal, political and economic factors have been identified as the key constraint factors by most authors (Han & Diekmann, 2001: Gunhan & Arditi, 2005; Murphy, 2005; Gray & Larson, 2003; Howes & Tah, 2003). Although some authors added, deleted or changed some factors, the abovementioned four factors are still the core of the context. If international project managers understand and deal with these factors correctly, the chances of failing to manage international projects properly should be reduced.

In this research study, the cultural differences affecting managing of international projects was been chosen as the research topic. The context of culture and international project management will be explored. What the cultural differences are that affect international project management and how they affect it will be addressed. The linkage between cultural differences and international project management will also be established. An international project team is typically a culturally diverse team. Members come from different cultural backgrounds with possibly even different native languages and values, beliefs and customs. If project managers do not understand cultural differences, an international team cannot function as an effective team. A situation of this kind would definitely increase the chance of failure in managing international projects.

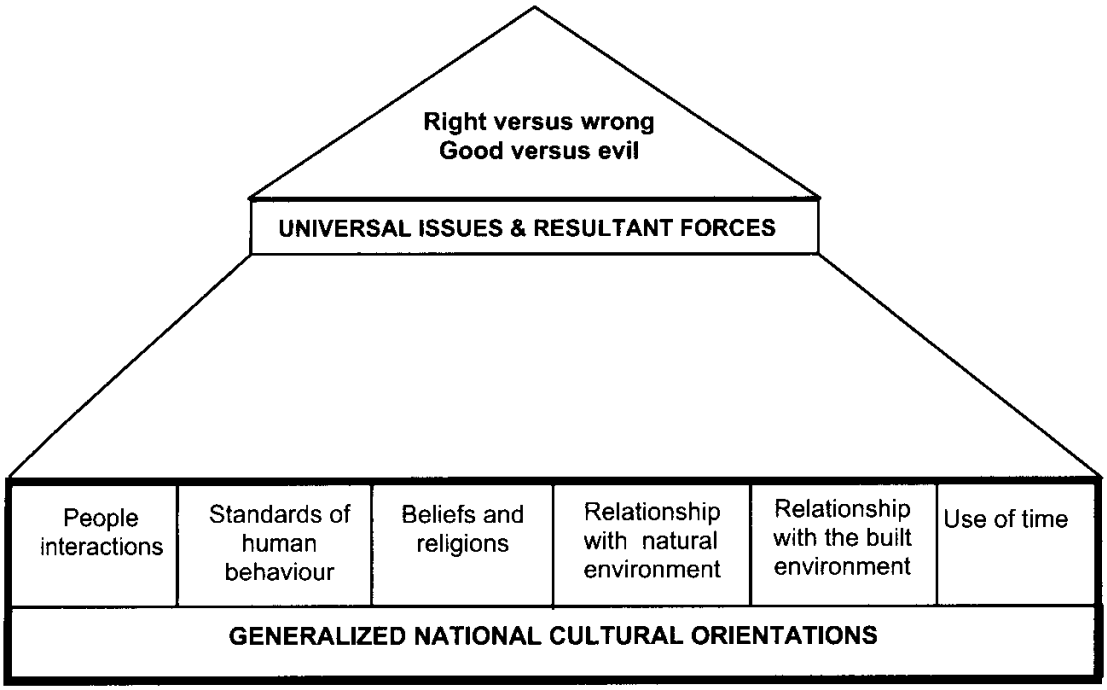
3.3 Cultural difference in international project management

3.3.1 Assessment of the concept of culture

It is essential to understand the meaning of the term "culture" before discussing cultural differences in international project management. The project management method is not universal, but culture sensitive (Chen & Partington, 2004; Wang & Liu, 2007). People often talk about cultures such as the Western culture, African culture or Eastern culture. Therefore, what is culture and which elements characterise different cultures? In fact, there is no one single definition that can encapsulate all the context of the term “culture" (Pheng & Leong, 2000). Howes and Tah (2003) define culture as acquired

knowledge based on assumptions and perceptions used to generate social behaviour. They described the characteristics of national culture as shown in Figure 3.2.

Figure 3.2: Group of generalised national cultural characteristics



(Howes & Tah, 2003)

The heart of culture indicated in Figure 3.2 is the universal issue of “right or wrong”, which is the foundation for morals and ethics. The bottom of the model generalises the nationalistic attitudes and beliefs of national culture.

Another definition by Gray and Larson (2003) implies that culture is “a system of shared norms, beliefs, value, and customs that bind people together, creating shared meaning and a unique identity".

From an observational point of view, the central elements of any culture can be classified into two groups (Dadfar & Gustavsson, 1992):

- Observable elements that constitute “surface culture”, such as customs, dressing, eating, technology, arts and behaviour.
- Hidden elements, called “deep culture”, such as values, beliefs and systems of thinking.

Fischer (2009) states that “defining culture has remained a formidable challenge”. In the trend of emerging on consensus of defining culture, Fischer (2009) points out that there are two key characteristics: culture is a collective phenomenon and that culture is learned and not transmitted genetically. According to him, "culture is passed on through socialization processes within specific groups, which require communication of key symbols, ideas, knowledge and values between individuals and from one generation to the next”.

From the above-mentioned definitions, we can see that culture consists essentially of people’s deep-held value and beliefs (Chen, et al., 2009). It is a collective phenomenon (Fischer,2009).Some authors (Gray & Larson 2003; Dadfar & Gustavsson,1992) define culture also based on these factors. Some factors may shape a specific culture as follows:

- **Values:** Values refer to the preferences people use to make work-related and communication-related decisions in projects (Horii, Jin & Levitt, 2004).

Cultural values shape people's beliefs and attitudes and guide their behaviour (Fan, 2000).

"Values that are important to one group of people may mean little to another" (Gunhan & Arditi, 2005). The dominant deep-rooted cultural values of people are hard to change (Sheridan, 1999, in Chen & Partington, 2004). Values guide people's actions and the behaviour of administrators (Staudt, 1991, in Kwak, 2002).

- **Religions**

"Religion is a system of beliefs in divine or superhuman powers, and ritual practices directed towards such powers" (Benjamin 2010).

- **Custom:** A practice or habit followed by people of a particular group or region (http://www.thefreedictionary.com/custom，2010-05-28).

- **Languages:** A human language is basically a signalling system, which is something to be spoken (Barber, 2000).

- **Norms:** Cultural norms are influential factors. However, they are very subtle (Yong, Javalgi, 2007).

"Norms are parts of the larger rules that prescribe, mandate, or require that certain actions be performed" (Nissenbaum, 2009).

- **Time conceptions:** The different attitudes to time often present problems when doing business in a cross-cultural environment (Mangaliso, 2001, in Thomas, 2003). The time dimension is very important in project management. Therefore, this element of culture should also be notable in international projects.

However those factors are not independent from each other. Karahanna, et al.(2005) propose that values are moderators of cognitive beliefs, attitudes, and social norms.

Regarding to cultural dimensions, some of the most influential work in cross-cultural dimensions are those of Hofstede (1980), Trompenaars (1993) and Schwartz (1994). Their models are dominated in anthropological and psychological studies (Chen, et al., 2009). Chen, et al. (2009) reviewed the three models as indicated below.

Hofstede (1980) studied the selected sample of workers and managers in IBM Corporation around 53 countries. The sample has similarities in other aspects except nationality. The research results show that there are four dimensions of culture that differentiate one with another. These dimensions are well-known as power distance (PD), individualism versus collectivism (ID), masculinity versus femininity (MA), and uncertainty avoidance (UA). Further research by Hofstede and Bond (1988) was conducted on 23 countries by using a questionnaire based on Chinese Value. A fifth dimension, long-term versus short-term orientation (LT) was added based on the results of the survey suggesting that Chinese have some difference comparing with the United

States and United Kingdom in terms of MA and UA and also more obvious differences on dimensions of PD,ID and LT.

Trompenaars (1993) did a study over 30 companies in 50 different counties. As a result of this study, the author identified seven dimensions of culture under three categories. There are five dimensions regarding the relationships with people, universalism versus particularism, individualism versus communitarianism, neutral versus emotional, specific versus diffuse, and achievement versus ascription. The sixth dimension is about attitudes to time, that is,linear and sequential time versus circular and synchronic time. Trompenaars' model has been described as conceptually related to some of Hofstede's dimensions and can be interpreted as supportive of Hofstede's model (Glatley, et al., 1996).

Schwartz (1994) proposed a continuum of cultural values representing the relationship between personality and cultural factors. His model was based on Hofstede's work and tested by using samples in 38 nations (Chen, et al.,2009). The two basic dimensions of Schwartz's model are conservatism versus autonomy (affective and intellectual) and self-enhancement (Hierarchy and mastery) versus self-transcendence (egalitarian commitment and harmony). Schwartz's model is believed to be a refinement of Hofstede's work because it arranges value types and broad dimensions into a continuum (Chen, et al., 2009). Schwartz's work categorized two types of cultural archetypes as contractual cultures and relationship cultures.

Thorne and Saunders (2002) suggested that the most influential of work identifying cross-cultural dimensions are those of Hofstede (1980,1991) and Hofstede and Boud (1998). Other more comprehensive work is that of Hampden-Turner and Trompenaars (1993) in the study of culture effect on individuals' ethical reasoning process. The authors briefly viewed the cultural dimensions in an integrated framework (Table 3.1) that describes the variety of individuals' value from a cross-cultural point of view.

Table 3.1 Integrated framework of the dimensions of national culture

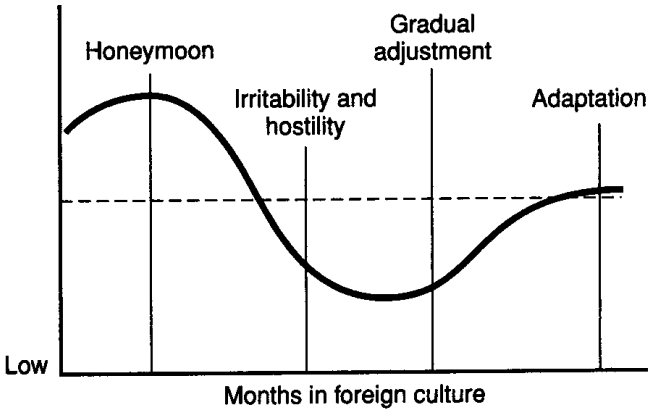
Dimensions & source	Definition	Illustrative example
Individualism/collectivism Hofstede(1980); Hampden-turner & Trompenaars(1993)	The degree of integration between members of society and the relative value of individual over collective needs	Individualists tend to believe that personal interests are more important than group interest are. In contrast, collectivists value group interests, reciprocation of favors, a sense of belonging and respect for tradition.
Power distance, Hofstede(1980); Equality/hierarchy, Hampden-turner & Trompenaars(1993)..	The degree to which an qunequal distribution of power is accepted in society.	Individuals with higher power distance perceive that superiors are entitled to special privileges. In contrast, individuals with low power distance are more likely to prefer democratic participation.
Uncertainty avoidance, Hofstede(1980)	The degree to which a society's members tolerate ambiguity or uncertainty.	Individuals with high uncertainty avoidance fell a need for written rules and procedures and are in tolerant of deviations from these rules. In contrast, individuals with low uncertainty avoidance are less concerned with codified rules.
Masculinity/femininity, Hofstede(1980)	The relative emphasis in society on achievement and accomplishment vs. overall quality of life.	Masculine individuals are interested in material success whereas feminine individuals are more concerned with human relationships.
Universalism / particularism, Hampden-turner & Trompenaars(1993)	The relative emphasis in society on rules of wide generality vs. consideration of special exceptions.	Universal individuals would tend to apply " the golden rule" to all situation/others whereas particularistic individuals recognize obligations to special relationships and particular circumstances.
Analysisi/integration, Hampden-turner & Trompenaars(1993)	The relative emphasis of society members to consider organizations or event in terms of separable parts vs. consideration of the whole.	High-integrated individuals tend to consider factors and implications beyond a specific domain, whereas high analysis individuals tend to focus on a specific domain or realm.

Achievement/ascription, Hampden-turner & Trompenaars(1993)	The relative emphasis in society on achieved status vs. ascribed status (e.g. by role, age, class etc.)	In an achievement culture, your status is based upon what you have accomplished. In contrast, in an ascription culture, your status is a function of your position in society an at birth.
Orientation toward the environment. Hampden-turner & Trompenaars(1993)	The relative emphasis of society's members on sources of motivation and values stemming internally from the individual versus the external environment.	When the source of motivation/values are the external environment, individuals strive to remain in harmony with their environment. In contrast, when the source of motivation/values are " internal," individuals attempt to control their environment.
Confucian dynamism, Hofstede(1980) Oritentation towards time. Hampden-turner & Trompenaars(1993)	The relative emphasis in society on others's perceptions and viewing events along a time continuum(i.e., short-term vs. long-term).	High Confucian dynamism individuals are more concerned with social norms, "saving face" and time along a continuum including the past, present and future(Schwartz,1992)

(Thorne & Saunders, 2002)

In the next paragraph, a cultural phenomenon will be briefly discussed, namely culture shock, which is a natural psychological disorientation that most people experience when they move into a foreign culture (Gray & Larson, 2003). A culture shock has four stages (see Figure 3.3).

Figure 3.3: Culture shock cycle



(Gray & Larson, 2003)

Culture shock is not a disease, but a natural response to a new environment. It is generally considered a positive sign to immerse oneself in a new culture instead of being isolated in an expatriate environment (Gray & Larson, 2003).

Culture is borderless and there may be several countries that share similar cultural profiles, for example, the USA, UK and Australia (Howes & Tah, 2003) and some countries in eastern Asia. People share similar norms, values and religions, resulting in similar cultures. Culture can be characterised through analysing certain dimensions. When someone steps into a kind of culture he is not familiar with, he needs a process to immerge himself into it. This process is called “culture shock”. Culture will, to a large extent, determine what motivates people to work positively or negatively. This is particularly crucial when team players from different nationalities come together to work in another country.

The concept of culture can be defined at organisational, industrial and national level, with all levels being relevant in the context of international project management (Loosemore, 1999).

In this research study, the term "cultural difference" refers to the national cultural differences between international project team members that affect international project management.

3.3.2 Effects of cultural differences on international project management

Project management is a management theory by nature. “Many cross-studies have shown that different cultures support different sets of management beliefs and practices, particularly when those cultures reflect fundamentally different conceptions of reality” (Chen & Partington, 2004). When a situation is difficult and uncertain, people usually make decisions that rely heavily on their value systems (Child & Tayeb, 1982). Ralston, Gustafson, Cheung and Terpsta (1993) state in their study that “different national cultures will contribute to the unique behaviours of managers in the different industrialized nations”.

A large body of literature (Cox, Lobel & Mcleod, 1991; Hall & Hall, 1997; Harris, Moran & Moran, 2004; Schneider & Meyer, 2006) discusses cultural differences, especially in global business. People often find it difficult to do something in a foreign cultural environment by using a similar approach to one that is effective in their home country. The same phenomenon can be observed in the arena of managing international projects. Consequently, the question of how which cultural differences affect the management of international projects must be answered.

Researchers realise that cultural differences have a negative impact on international project management. “Visiting project managers must accept and respect the customs, values, philosophies and social standards of their host country. Global managers recognise that if the customs and social cultural

dimensions of the host country are not accommodated, projects will not succeed. Too many audits and final reports of international projects reflect challenges and problems linked to cultural differences" (Gray & Larson, 2003). Dadfar and Gustavsson (1992) state that "cultural differences appeared as an important issue in all aspects of project management – from the tendering and negotiation phase to construction operations."

"Communication problems have emerged as one of the most significant contemporary challenges facing construction project managers in an increasingly international construction market" (Tone, Skitmore & Wong, 2009). Gray and Larson (2003) argue that cultural differences can actually be an obstacle to effective communication because of the language difference. Although a translator can help in such a situation, something is still lost in translation.

Sometimes religions can change the selected site for a project. An example cited by Lane and DiStefano (in Gray & Larson, 2003) indicates that a project manager from a large North American business was responsible for selecting a site for constructing a fish processing plant in a West African country. He chose an optimum position after doing a detailed analysis of all resources. However, no local people wanted to work there because the members of the local religion believed that that site was a place where the gods resided. This shows that cultural differences can change the site selection before the construction phase.

Ling and Hoi (2006) also conclude that cultural risk is one of key risks facing Singapore's architecture, engineering and construction (AEC) firms. It is

important for a new company to understand foreign culture in order to be a success. Ling and Hoi (2006) state that communication still breaks down because of the cultural difference despite the fact that many Indian people can speak English. It is also difficult to change Indian mindsets and their methods of working. The cultural shock is very obvious to the staff of foreign AEC firms who work in India. Ling and Hoi suggest that, to overcome this risk, those staff members should spend time on getting to know more about India and establishing relationships with the locals.

Kwak (2002) states that the “culture issue is the least known but the most hazardous in the context of international development projects”. If the international consultants are not familiar with local culture it often leads to lost opportunities, directing development efforts at the wrong groups, project cost overrun, and schedule delays. If a culture does not fit the project objectives and one does not have enough local knowledge and understanding, it could result in the rejection of the project by the intended client. Kwak (2002) states that if a project manager wants to be successful with international projects, he should consider cultural factors such as traditions, values, customs, and beliefs in the planning stage to ensure that the project objectives are in line with the values and customs of the beneficiaries.

Chen, Partington and Qiang (2009) did a study on cross-cultural understanding of the conceptions of their work by Chinese and UK construction project managers. In their article, they explain that the cross-cultural transfer of management is not always successful. Management should examine “the

extent to which the basic conceptions underlying Western project management theories and practices have been supported by the Chinese culture".

Gunhan and Arditi (2005) researched the factors affecting international construction. They conducted a Delphi study of international companies in the US and used the Analytical Hierarch Process (AHP) to analyse the data. They argue that the difficulties encountered in international projects can often be traced back to cultural differences.

Pheng and Leong (2000) conducted research on cross-cultural project management for international construction in China. They are of the opinion that the key concepts in cross-cultural management are organisational and national culture, cross-cultural communications, cross-cultural dispute resolution and cross-cultural negotiations. They analysed the above four dimensions of Chinese culture by using a construction project case that was implemented by APC (American) and YRTSB (Chinese). They state that the organisational and national culture in China can definitely affect the decision-making process. Another problem that occurred in the case study is that cultural differences caused misunderstanding between foreign firms and Chinese partners. The lack of a proper method for solving cross-culture disputes also contributed to the failure of the APC-YRTBS joint venture. They add that the Chinese culture characterises the negotiation style in China, and conclude that “foreign project managers should recognise the Chinese style of management when dealing with their Chinese counterparts” (Pheng & Leong 2000).

Muriithi and Crawford (2003) did a study aimed at investigating the applicability and relevance of project management approaches, tools and techniques in Africa. The authors suspected that Western management concepts might be inapplicable and irrelevant to other cultures. After researching the African cultural context, a number of modifications or extensions were made to existing project management standards and guides in order to improve their relevance and applicability to projects in Africa.

Chen, et al. (2009) conducted a study to research the cross-cultural understanding of construction project managers' conceptions of their work. The authors use Chinese and U.K construction project management concepts and pointed out that the study is limited to empirical cross-cultural understanding of conception of their work between Chinese and Western practicing managers' in the context of construction project management. There is little knowledge about the extent to which Chinese culture support western project management concepts. The authors revealed that there definitely were differences in terms of conception of their work. The identified differences included a Chinese emphasis on commercial awareness and a U.K. emphasis on health and safety.

Bony (2010) states that "despite the belief that managerial toll and processes can be exported worldwide, a different reality is often experienced at the local workplace" in his study, which explores the impact of national context on the integration of project management." A Dutch/French cooperation project in the field of R&D was studied. The results indicated that, even within Europe, the national culture has a major impact on the transfer of project management

practice, in this case between Dutch and French teams. The PM is interpreted and implemented differently by the Dutch and French partners.

The problem caused by cultural differences is therefore a crucial issue for international project managers to consider. Some authors have already provided useful information on this issue. The effects of all cultures on international projects cannot be discussed in one study because the cultures are too diverse. However we can generalise or extract some common perspectives on the basis of the studies reviewed in this chapter.

- Cultural differences do have some negative effects on international projects management .
- Previous research usually describes the impact of cultural differences on international projects by means of specific cases. This maybe because the cultures in question are too diverse.
- Previous researchers offered some solutions to overcome cultural differences, such as using intermediaries, studying the host country culture and creating common values in the company to which every member can subscribe.
- Previous researchers did not seem to set up a systematic linkage to bridge the gap between cultural differences with international project management.

3.4 Conclusions

International projects are distinct from domestic projects in numerous ways. Differences between countries and cultures are complex. In this chapter, the definition of culture was assessed before discussing the cultural differences' effects on international project management. Project managers need to understand and accept these differences and complete the project within the planned time and budget. To some extent the focus was on international project management in construction although some other relevant cases were also addressed. In the next chapter, some of the shortcomings of the previous research will be discussed.

Chapter 4:

Review of gaps in previous research on international projects

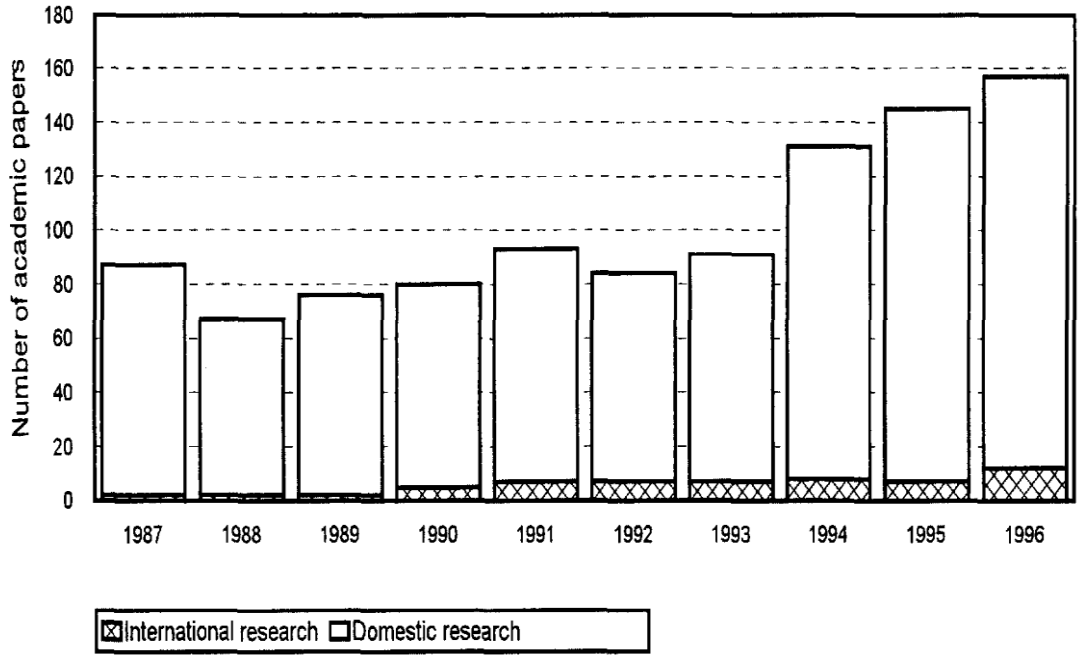
4.1 Introduction

The literature that is deemed relevant to the research topic was addressed in Chapter 3. Some researchers and practitioners have assessed the influence of cultural difference on the success of international projects. In this chapter, some limitations of the previous research will be addressed.

4.2 Some conclusions from the literature review

Conclusion 1: Adequate research has not been done on the influence of cultural differences on the success of international projects and there seems to be a lack of a systematic framework for the modelling, analysis and management of cultural differences in international project management (Shore & Cross, 2005). The evidence presented in Figure 4.1 indicates that research conducted across national boundaries is still relatively rare in the construction projects arena (Loosemore, 1999).

Figure 4.1: Levels of research in construction management conducted across boundaries



(Loosemore, 1999)

"To our best knowledge, there is still a lack of systematic and scientific studies on management of multicultural groups in construction projects. The earlier researchers on project management, coming mainly from industrial engineering, have concentrated on technical aspects and showed less interest in the social aspects of project management. Therefore, the issue of cultural management has not been seriously tackled in project management studies. The problem becomes more complicated when it concerns international construction projects involving various actors with different cultural backgrounds" (Dadfar & Gustavsson, 1992). Eriksson, Lillieskold, Jonsson and Novosel (2002) and Kruglianskas and Thamhain (2000) concur that although many studies explore the role of culture in management, very few of them

address the role of culture in project management. Shore and Cross (2005) argue that most research on cultural difference is done from a cultural perspective and is not linked to international project success. “While no study has specifically identified and linked cultural dimensions with project management issues, there have been a few studies that have addressed the cultural issue.”

Conclusion 2: There is a need to identify the common characteristics of different cultures that affect international project management. Are there situations or conditions where different cultures may affect international projects but some common characteristics can be generalised? From literature review, many researchers already recognized that cultural issues definitely affected project management project practice using various research methodologies including case study, survey, Delhpi study with AHP (Bony 2010; Chen , et al.,2009; Muriithi & Crawford, 2003; Pheng & Leong 2000, Gunhan & Arditi,2005). The results clearly show that cultural differences undoubtedly have some effect on project management activities. However, there is still a question on how cultural differences affect project management activities. In other words, are there any relationships between cultural behaviours and project activities and is it possible to establish relationships between them? From the literature study, there seem to be few studies exploring this issue. This is also a question to be explored.

Conclusion 3: In the literature section, there seems to be a number of studies done to explore cultural differences’ effect on management, such as Chinese vs. UK (Chen, et al.,2009); Singapore vs. India (Ling & Hoi,2006) and Kenya vs. UK (Ochieng & Price,2010), However there is little literature that has

been done to investigate the cultural difference issue between China and South Africa. However trade and economic co-operation between these two countries has developed greatly. From the Chinese government statistics, the volume of trade between these two countries was more than 16 billion USD in 2009. This figure is 10 times more than that of 1998. For instance, there are 65 huge projects being executed on the African continent (including 1.6 billion USD investment in a hydroelectric power station in Botswana) financed by the co-operation between Standard Bank of South Africa and Commercial Bank of China (Internet resource, 2011) . These facts indicate that there should be closer relationships between South Africa and China in terms of project management practice in the future. Nevertheless, there are very limited studies touching this field from the literature review. This is also a gap to be filled.

4.3 Summary

In this chapter, some limitations of the research on the effect of cultural differences on the success of international projects have been discussed. There is not enough research evidence that links the cultural issue with project management (Shore & Cross, 2005). A systemic framework should be developed for an effective study of the influence of cultural differences on international project management. The issue of cultural differences in project teams between China and South Africa can also be explored in more depth. Chapter 5 will focus more on a conceptual model to address some of these research gaps.

Chapter 5:

Conceptual model for international project management

5.1 Introduction

Some gaps in the previous research were summarised in Chapter 4. A conceptual model to address some of the gaps will be developed in this chapter. The variables of cultural differences and the appropriate key activities of international project management will be identified.

5.2 The identification of typical Chinese behaviours

Each culture has its own characteristics that distinguish it from other cultures. Although sufficient research has not been done on the effect of cultural differences on international project management, some key variables in cultural differences that affect international projects can still be identified from the experience of previous researchers and international project managers. Some previous research identified fundamental dimensions in culture, including studies by Hofstede (1980, 1991, 1993 and 2001), Tormpenaars (1993), Hampden-Turner & Trompenaars (1993) and Schwartz (1992,1994). The four fundamental dimensions of culture (power distance, individualism versus collectivism, masculinity versus femininity and uncertainty avoidance) identified by Hofstede (1980, 1991, 1993 and 2001), are widely recognised also by academics (e.g. Yan, 2005).

Hofstede did further study with Bond in 1988 and their study suggests that Chinese culture differs with United States and United Kingdom (Western culture) in different dimensions. Trompenaars (1993) also advises that Chinese culture has a synchronous view of time. The Chinese culture typically has longer-term orientation which is different from a short-term orientation (as compared to United states and United Kingdom). Schwartz (1994) points out in his study that cultures similar to China adopt more conservative values and accommodate value tensions between hierarchy and harmony.

Chen, et al. (2009) reviewed different influential models in cross-cultural literature and they have identified some apparent uniqueness in Chinese culture. They proposed an integrated framework to demonstrate the fundamental differences between Chinese and Western cultures based on Hofstede (1980), Trompenaars(1993) and Schwartz (1994) (see Table 5.1).

Table 5.1: Apparent dimensional differences between Chinese and Western culture

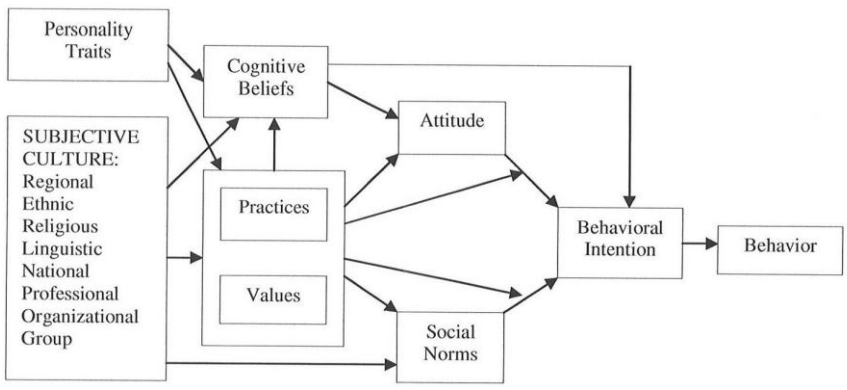
Chinese culture	Western culture (United kingdom& United States)
Collectivism Large power distance Strong uncertainly avoidance Long-term orientation Outer directed Relationship Conservatism, tension between hierarchy and harmony	Individualism Small power distance Weak uncertainty avoidance Short-term orientation Inner directed Contractual Autonomy, tension between mastery and egalitarian commitment/harmony

(Chen, et al., 2009)

The abovementioned studies have pointed out that Chinese culture has its own uniqueness. Chinese culture differences (as compared to other cultures) can be observed from the personal behaviours. This view is supported by the study from Karahanna, et al. (2005).

They developed a theoretical model (see Figure 5.1) to illustrate how cultural factors characterize personal behaviour. The model clearly describes how the different cultural elements such as religious and ethics can eventually shape personal behaviours. That means personal behaviours are a combination of cultural factors. Moreover, they state that in the past two decades, cross-cultural variables have been highlighted in management theories. The effect of cultural differences on work behaviours has become increasingly evident. Such cultural differences can be observed by the differences between personal behaviours. Thus, for the aim of this research study, the Chinese behaviours are to be identified to explore the cultural differences which may affect international project management.

Figure 5.1: Theoretical model of behaviour theory in social psychology



(Karahanna, et al., 2005)

China has a history of 5 000 years with specific outstanding cultural characteristics. Substantial literature has identified the typical Chinese behaviours. This research study broadly categorizes through exploratory research these literature sources and identifies five main behaviours. B1 to B5 denotes the five behaviours.:

B1. Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves as a prerequisite to avoid being involved in conflicts or fights (Zeng, 2003; Li, 2004).

The sub-behaviours of B1 can be generalised as follows from the literature study:

B1.1 As a manager, keep track of your team member to avoid being cheated/undermined by him one day (Zeng, 2003).

B1.2 As a team member, always protect yourself first when doing a job, to avoid risks (Zeng, 2003).

B1.3 Trust can only be established after a series of tests/trials from small events (Zeng, 2003).

B1.4 Act modestly and hide your ability and power to survive (Tao Guang Yang Hui) (Li, 2004).

B1.5 Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) (Li, 2004).

B2. "Face/image" is important to the Chinese, as it represents prestige, respect, dignity and social status (Ji, 2000; leung and Chan, 2003; Yao, 2007).

The sub-behaviours of B2 can be generalised as follows from the literature study:

B2.1 Commenting or rejecting directly on others' opinions will make them lose "face/image" (leung and Chan, 2003).

B2.2 Saving others' "face/image" is critical to maintain harmonious Guanxi (personal relationship) (leung and Chan, 2003).

B2.3 "Face/image" is more important than profits in some cases (Yan, Yao, Xie & Ling, 2007).

B2.4 Strive for their own "face/image" to be recognised and save others' "face" at the same time (Yao, 2007).

B3. Personal relationships: Guanxi – is critical for getting favours and conducting business successfully (Davies, Leung, Luk & Wong, 1995; Arias, 1998; Xin & Pearce, 1996; Yeung & Tung, 1996; Tsang, 1998;

Buckley, Clegg & Tan, 2006; Chen in Chen & Ma, 2001; Pheng & Leong, 2000).

The sub-behaviours of B3 can be generalised as follows from the literature study:

B3.1 Developing Guanxi (personal relationships) is an important job for a manager (Xin & Pearce, 1996).

B3.2 Guanxi (personal relationship) is a resource of sustainable competitive advantage (Yeung & Tung, 1996; Tsang, 1998; Clegg & Tan, 2006).

B3.3 Prefer business partners with good Guanxi (personal relationships) (Buckley, Clegg & Tan, 2006).

B3.4 Guanxi (personal relationship) is more stable than contractual relationships (Davies, Leung, Luk & Wong, 1995).

B3.5 Trust and “face/image” saving are the foundations of establishing good Guanxi (personal relationship) (Yeung & Tung, 1996).

B3.6 The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager (Buckley, Clegg & Tan, 2006).

B3.7 First make friends and then do business (Yeung & Tung, 1996; Pheng & Leong, 2000).

B2.8 Reciprocity determines whether Guanxi (personal relationship) can be established successfully (Li Shang Wang Lai) (Kirkbride,Tang & Westwood, 1991; Yeung & Tung, 1996; Chen in Chen & Ma, 2001).

B4. Communication – the purpose is maintaining satisfactory harmony (Zeng, 2003, 2005, 2007; Chen & Ma, 2001; Ma, 1996).

The sub-behaviours of B4 can be generalised as follows from the literature study:

B4.1 Indirectly communicate with others and try to make nobody lose their "face/image" to pursue a conflict-free interpersonal and social relationship (Chen in Chen & Ma, 2001).

B4.2 Communicating with appropriateness is sometimes more important than revealing the truth (Zeng, 2003).

B4.3 Announce decisions during meetings while discussions should be held upfront and privately (Zeng, 2003).

B4.4 Not delivering all the information by using vague language to protect oneself (Hua Liu San Fen) (Zeng, 2003, 2007; Ma, 1996).

B4.5 Not willing to take initiative in communication with others (Zeng, 2005).

B5. Conflict-solving: Hua Jie – softening, smoothing, compromising and aligning instead of direct solving to uphold harmonious relationships (Zeng, 2003; Chen in Chen & Ma, 2001; Leung, Koch & Lu, 2002; Hwang, 1997–8; Kirkbride, Tang & Westwood, 1991).

The sub-behaviours of B5 can be generalised as follows from the literature study:

B5.1 Transform serious problems to small problems and then soften small problems to nothing (Da Shi Hua Xiao, Xiao Shi Hua Liao) (Zeng, 2003).

B5.2 Refusing, delaying, avoiding and aligning as a way of problem-solving (Tui Tuo La) (Zeng, 2003).

B5.3 Indirect way of conflict resolution by giving evasive answers or by saying "no" in a subtle, non-verbal way (Bu Shang He Qi) (Chen in Chen & Ma, 2001; Kirkbride,Tang & Westwood, 1991).

B5.4 Not causing others others to “lose face” in the conflict-solving (Liu Mianzi) (Kirkbride, Tang & Westwood, 1991; Chen in Chen & Ma, 2001).

B5.5 Believe personal trust and mutual interests are important to avoid conflicts.

B5.6 Respect people who are older and have a higher status during conflict-solving in order to maintain Guanxi (personal relationship) (Hwang, 1997–8; Chen in Chen & Ma, 2001; Kirkbride,Tang & Westwood, 1991).

B5.7 Agree publicly but disobey privately to avoid conflicts if one disagrees with one's supervisor's opinions (Yang Feng Yin Wei) (Hwang, 1997–8; Zeng, 2003).

B5.8 If one disagrees with the company or government policies, one will behave as follows: "You have your policies, and I have my ways of getting around them" (Shang You Zheng Ce, Xia You Dui Ce) (Zeng, 2003).

The above cultural behaviours could affect certain project management activities in a project-team environment.

5.3 The key activities affected by cultural differences in an international project management process

A review of the existing literature indicated that limited formal research has been done regarding project management activities that could be affected by cultural differences, especially in the arena of international project management with construction projects. Influencing project management activities is a way that cultural differences can impact the project management process. This research identifies the project management activities that can be easily affected by cultural differences. Different researchers may identify different project management activities that can be affected by cultural differences. Some researchers (Chan, Wong and Scott, 1999; Pheng and Leong, 2000; Chen and Partington, 2004) have pointed out some project management activities which can be easily influenced by Chinese culture

when executing projects in China or with a Chinese counterpart. These can briefly be described in five categories with a detailed review as shown below.

Project communication: Some authors suggest that cultural differences include the language barrier and language differences are recognised as a critical cause of the obstruction of effective communication (Loosemore & Muslmani, 1999; Pheng & Leong, 2000; Gray & Larson, 2003). “Language differences are recognised as one of the major sources of communication problems” Gray and Larson (2003) also argue that language differences are obstacles in effective communication. Zeng (2003) points out that Chinese communication behaviour has its own characteristics and sometimes confuse foreigners. In project management, project communication is recognized as an important knowledge area (PMBOK 2008).

Project negotiation: Differences in culture can affect the negotiation style in some situations. Pheng and Leong (2000) argue that the Chinese culture characterises the negotiation style in China. Their study results show that cultural differences can affect negotiation style. Graham and Lam (2003) also argue that the context of Chinese culture impacts on the Chinese negotiation style. Moreover, deep cultural differences have created seemingly incompatible contrasts between Chinese and Westerners’ approaches to negotiation.

Project conflict resolution: Chen and Partington (2004) state that cultural differences result in Chinese and UK project managers who describe different approaches to resolving conflicts. Chan (1997) also maintains that the causes

of disputes and the different methods for resolving disputes are both closely associated with a society's unique culture. "Chinese traditionally depend more on good faith than tightly drafted deals to resolve conflicts and handle post –deal misunderstandings, Westerners, by contrast, tend to emphasize the letter of the law more" (Sebenius,2002).

Project contract process: Chan, Wong and Scott (1999) did a study on managing projects in China. They found that some of the difficulties in contract management result from the characteristics of the Chinese culture. Conflicts are easily created in the project contact process because the culture differences cause different attitudes to the contract (Sebenius, 2002). "Because of the deep confucian aversion to law and orientation toward interpersonal relationships, the Chinese believe in people more than contracts" (Ghauri and Fang, 2001).

Project team building: Chen and Partington (2004) conducted their empirical research to compare the Western and Chinese project managers' perceptions of their work. The results showed that cultural differences result in a preference for different organisational structures.

The above five identified project management activities are chosen for the primary research survey. "A1" to "A5" will denote "Activity 1" to "Activity 5" in this study.

5.4 Project management processes

In the world of project management, many project managers use the Project Management Body of Knowledge (PMBOK) as a guide in conducting their project management process. PMBOK is a structured approach to project management that was developed by the Project Management Institute.

In this research we use the processes of PMBOK (2008) as the typical project management processes.

- Initiating
- Planning
- Executing
- Monitoring and controlling
- Closing

5.5 The proposed solutions for overcoming cultural differences in international project management

Gray and Larson (2003) suggest that problems with cultural differences when managing international projects can be reduced in two ways:

Use intermediaries**:** Gray and Larson (2003) argue that the common practice to overcome cultural difference is to rely on intermediaries, who are often natives with a foreign education. This kind of person is usually able to bridge the gap between different cultures. They play different roles, such as translators, culture guides, network builders and local government negotiators.

Learn local culture: Project managers should try to understand the host country culture. “As far as possible, the project should be managed in such a way that local-country norms and customs are honoured.” Project managers should at least understand the following aspects of host countries: religion, dress codes, education system, holidays, daily eating patterns, family life, business protocols, social etiquette and equal opportunity (Gray & Larson, 2003).

Howes and Tah (2003) argue that companies are usually familiar with their own home culture. However, it is difficult to transfer their home cultures to other cultures. Therefore, trans-national companies need to adopt and accommodate a multicultural approach. They believe that “part of the answer is to find a common set of values that represent the company culture to which all employees can subscribe”. Chevrier (2003) points out that, "if leaders of international project teams cannot draw upon shared national cultures, they may resort to other international cultures such as professional or corporate cultures to federate participants”.

Gunhan and Arditi (2005) argued that a number of suggestions on overcoming this issue focus on keeping an open mind and not judging people as being absolutely right or wrong when they do things in different ways.

From the abovementioned literature studies, the following possible solutions for overcoming cultural differences can be listed. These possible solutions will be used in the conceptual model. However, the question of whether or not

these proposed possible solutions are worktable in the project management practice may be answered by means of survey used in this study.

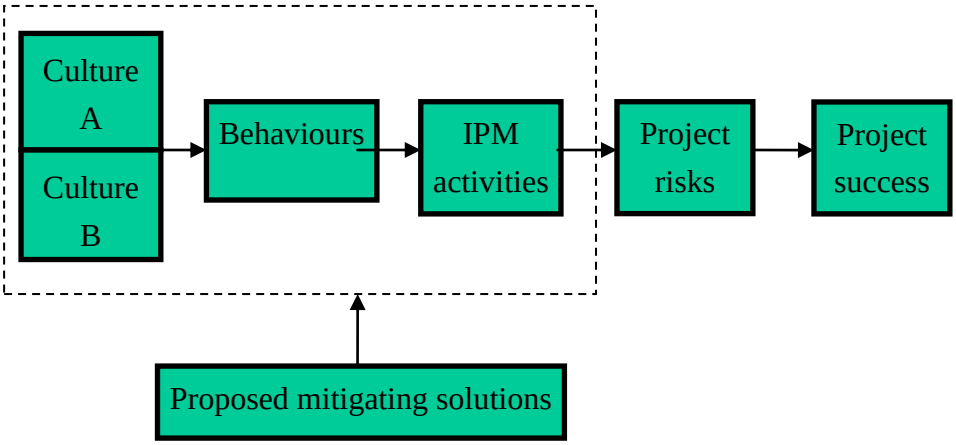
The proposed solutions to be included in the conceptual model are as follows:

- Use intermediaries: such a person normally bridges the gap between different cultures. (Gray & Larson, 2003).
- Learn the host country culture: project managers should spend time and effort to understand the culture of the host country to reduce the risks related to cultural differences (Ling & Hoi, 2006; Gray & Larson, 2003; Pheng & Leong 2000).
- Create an organisational culture: create a common value or culture for the company to which every member can subscribe (Howes & Tab, 2003; Chevrier, 2003).
- Embrace different cultures: keep an open mind and do not simply judge right or wrong in the typical way of your own culture (Gunhan & Arditi 2005).

5.6 A proposed conceptual model for managing cultural difference in international project management

The proposed model shown in Figure 5.2 has been developed using exploratory research, literature review results and deductive reasoning. It illustrates the relationships that are identified in the literature as the key relationships between cultural differences in international project success. The model also shows the relationships between the components and the proposed mitigating solutions that are according to some literature sources able to mitigate the negative effect of cultural differences. The dotted block in the conceptual model will be the focus of this thesis and examined empirically.

Figure 5.2: The conceptual model for managing cultural differences



From the conceptual model, it is proposed that the different cultures A and B will lead to difference in behaviours. The cultural behaviour difference may cause project managers to act differently in international project management (IPM) activities. This is proposed to be the possible reasons for the creation of risks due to cultural differences in international project management. This conceptual model gives a clear image of the path along which cultural differences affect project success through changing the risk profile.

There are four attributes in this model (Figure 5.2) that are briefly discussed:

- The model establishes the relationships between cultural differences and project management activities.
- The model indicates how cultural differences affect project management activities.
- The model shows a proposed solution to mitigate the negative effects that stem from cultural differences.

- The model contributes to a systems approach to managing cultural differences in international project management.

5.7 Conclusions

In Chapter 5, the five typical Chinese behaviours (philosophy of surviving, “face/image”, personal relationships (Guanxi) and conflict-solving) and five project management activities (project communication, project negotiation, project conflict resolution, project contract process and project team building) have been identified. These cultural and project management variables were used to design a research questionnaire and survey presented in the next chapter. A conceptual model describing relationships between cultural behaviour and project risk has also been designed and presented in this chapter. Some contributions by the proposed model were addressed. Chapter 6 will address the research method followed to evaluate to some extent the proposed model.

PART 3:

DATA ANALYSIS AND RESULTS

Chapter 6:

Research methodology design

6.1 Introduction

The research study presented in this thesis is a combination of exploratory and comparative research. An exploratory study is used to explore a phenomenon, event, issue or problem and a comparative study is used to compare two or more research processes (Page & Meyer, 2003).

Although the questionnaire to assess some of the previously identified project management activities indicated in the proposed model, Figure 5.2, was designed based on the Chinese culture, South African project managers have also been asked to participate in order to illustrate differences, where applicable. Participants from China and South Africa were involved in this research survey. A confirmation survey was conducted in order to eliminate the unreasonable measurements established from the literature study. A comparative survey was implemented after the confirmation survey. The questionnaire and research design were developed in accordance with the recommendations of Cooper and Schindler (2006). The samples of both South African (63 valid returned questionnaires) and Chinese project managers (75

valid returned questionnaires) were selected mainly from advanced courses for experienced engineering and technology project managers.

In this study, several statistical techniques were used to empirically examine the proposed model. The cultural behaviours impacting on project activities by Chinese and South African project managers were explored by using the t-test for independent samples. In addition, the strength of the relationship between cultural behaviours and project activities was explored using Spearman's rho correlations. This statistical technique determines the strength of the correlation between two variables (with a significant level of $p<0.001$). Moreover, the relationships between mitigating solutions and cultural differences were explored using the same statistical technique.

6.2 The questionnaire design

As discussed in Chapter 5, five typical Chinese behaviours and five project management activities have been identified and utilised in the questionnaire. They are listed in Table 6.1 and Table 6.2:

Table 6.1: Typical Chinese behaviours

Typical Chinese behaviours and their description
B1: Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves as a prerequisite to avoid being involved in conflicts or fights. **Sub-behaviours** B1.1 As a manager, keep track of your team members to avoid being cheated/undermined by them one day. B1.2 As a team member, always protect yourself when doing a job to avoid risks. B1.3 Trust can only be established after a series of tests/trials from small events. B1.4 Act modestly and hide your ability and power to survive. B1.5 Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame).

Typical Chinese behaviours and their description
B2: “Face/image” is important to the Chinese, as it represents prestige, respect, dignity and social status **Sub-behaviours** B2.1 Commenting directly on or rejecting others’ opinions to make them lose “face/image”. B2.2 Saving others “face/image” to maintain harmonious Guanxi (personal relationships) B2.3 “Face/image” is more important than profits in some cases B2.4 Strive for your own “face/image” to be recognised and save others’ face at the same time
B3: Personal relationships: Guanxi – is critical for getting favours and conducting business successfully. **Sub-behaviours** B3.1 Developing Guanxi (personal relationships) is an important job for a manager. B3.2 Guanxi (personal relationships) is a resource of sustainable competitive advantage. B3.3 Prefer business partners with good Guanxi (personal relationships). B3.4 Guanxi (personal relationship) is more stable than contractual relationships. B3.5 Establishing trust and “face/image” saving are the foundations of establishing good Guanxi (personal relationships). B3.6 The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager. B3.7 First make friends and then do business. B3.8 Reciprocity determines whether Guanxi (personal relationships) can be established successfully.
B4: Communication – the purpose is to maintain satisfactory harmony **Sub-behaviours** B4.1 Indirectly communicating with others and trying to make nobody lose face/image to pursue a conflict-free interpersonal and social relationship. B4.2 Communicating with appropriately is sometimes more important than revealing the truth. B4.3 Announcing decisions during meetings while discussions should be held upfront and privately. B4.4 Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen). B4.5 Not willing to take the initiative in communication with others.
B5: Conflict-solving: Hua Jie – softening, smoothing, compromising and aligning instead of direct solving to uphold harmonious relationships **Sub-behaviours** B5.1 Transform serious problems to small problems and then soften small problems to nothing (Da Shi Hua Xiao, Xiao Shi Hua Liao). B5.2 Refusing, delaying, avoiding and aligning as the way to problem-solving (Tui Tuo La). B5.3 Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi). B5.4 Not causing others to lose “face/image” in the conflict-solving process (Liu Mianzi). B5.5 Believe that personal trust and mutual interests are important to avoid conflicts. B5.6 Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships). B5.7 Agree publicly but disobey privately to avoid conflicts if one disagrees with one’s supervisor’s opinions (Yang Feng Yin Wei). B5.8 If one disagrees with the company or government policies, one will behave as follws: “You have your policies, and I have my ways of getting around them.” (Shang You Zheng Ce, Xia You Dui Ce).

Table 6.2: The five identified project management activities

Project management activities	Description
A1	Project communication
A2	Project negotiation
A3	Project conflict resolution
A4	Project contract process
A5	Project team building

The research questionnaire used in the survey consists of four sections:

Section A: Contact information (optional)

In this section, the respondents are asked to fill in basic information such as name, company telephone number and email. This section is optional.

Section B: General information (not optional)

Gender, age and working experience in project management should be provided in this section.

Section C: Project descriptions

The basic information of the project with which the respondents are/were involved should be provided.

Section D: Personal behaviours and project management activities

In this section, the respondents are asked whether the identified cultural behaviours occurred during their project-management activities. If they answer in the affirmative, they are asked to rate the importance of those behaviours.

6.3 The survey process

The research survey was carried out on a population of Chinese and South African project managers. The process comprised six steps, which will be discussed in detail below.

Step 1: Identify the typical Chinese behaviours and five project management activities

The five typical Chinese behaviours and sub-behaviours have been generalised from the literature study. Five project management activities that may be affected by cultural differences have been identified. The variables are listed in paragraph 5.2.

Step 2: A confirmation test

The purpose with identifying the typical Chinese behaviours from the literature study was to draw up a questionnaire based on the Chinese culture. However, the typical Chinese behaviours obtained from the literature study still needed to confirmed by a pre-test because the real Chinese survey sample might

disagree with aspects of the literature. In order for the questionnaire to be representative and reasonable, a confirmation test was conducted to eliminate the behaviours that Chinese people disagreed with from the literature study. The number of participants of the confirmation test is 25 Chinese project managers selected from the advanced project management course (they have at least 3 years working experience). A behaviour was eliminated when more than 50% of the respondents rejected it.

After the confirmation test, the Chinese behaviours to be surveyed were modified and renumbered, as indicated in the following tables.

Table 6.3: Revised Chinese behaviours

Typical Chinese behaviours and descriptions
B1: Philosophy of surviving: Ming Zhe Bao Shen –wise people should be skilled at protecting themselves to avoid being involved in conflicts or fights. **Sub-behaviours** B1.1 As a manager, keep track of your team members to avoid being cheated/undermined by them one day. B1.2 As a team member, always protect yourself first when doing a job to avoid risks. B1.3 Trust can only be established after a series of tests/trials from small events. B1.4 Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame).
B2: “Face/image” is important to Chinese as it represents prestige, respect, dignity and social status. **Sub-behaviours** B2.1 Commenting directly on others’ opinions or rejecting them to make them lose “face/image”. B2.2 Saving others “face/image” to maintain harmonious Guanxi (personal relationships). B2.3 “Face/image” is more important than profits in some cases. B2.4 Strive for your own face/image to be recognised and save others' “face/image” at the same time.

Typical Chinese behaviours and descriptions
B3: Personal relationships: Guanxi –is critical for getting favours and conducting business successfully. **Sub-behaviours** B3.1 Developing Guanxi (personal relationships) is an important job for a manager. B3.2 Guanxi (personal relationships) is a source of a sustainable competitive advantage. B3.3 Prefer business partners with good Guanxi (personal relationships). B3.4 Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships). B3.5 The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager. B3.6 Reciprocity determines whether Guanxi (personal relationships) can be established successfully.
B4: Communication – the purpose is maintaining satisfactory harmony. **Sub-behaviours** B4.1 Communicating appropriately is more important than revealing the truth. B4.2 Announce decisions during meetings while discussions should be held upfront and privately. B4.3 Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen)
B5: Conflict-solving: Hua Jie –softening, smoothing, compromising and aligning instead of direct solving to uphold harmonious relationships. **Sub-behaviours** B5.1 Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi). B5.2 Not causing others to lose face/image in the conflict-solving process (Liu Mianzi). B5.3 Believe that personal trust and mutual interests are important to avoid conflicts. B5.4 Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships).

After comparing Table 6.2 with Table 6.3, nine identified Chinese behaviours (B1.4, B3.4, B3.7, B4.1, B4.5, B5.1, B5.2, B5.7 and B5.8) were deleted in accordance with the confirmation test. After having revised the surveyed

Chinese behaviours, the generalised variables in the main survey are listed in the following tables (table 6.4 to 6.8):

Table 6.4: Variables generalised from B1

B1: Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves to avoid being involved in conflicts or fights.	
B1.1A1	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project communication.
B1.1A2	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project negotiation.
B1.1A3	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project conflict resolution.
B1.1A4	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project contract process.
B1.1A5	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project team building.
B1.2A1	As a team member, always protect yourself first when doing a job to avoid risks during project communication.
B1.2A2	As a team member, always protect yourself first when doing a job to avoid risks during project negotiation.
B1.2A3	As a team member, always protect yourself first when doing a job to avoid risks during project conflict resolution.
B1.2A4	As a team member, always protect yourself first when doing a job to avoid risks during project contract process.
B1.2A5	As a team member, always protect yourself first when doing a job to avoid risks during project team building.
B1.3 A1	Trust can only be established after a series of tests/trials from small events during project communication.
B1.3 A2	Trust can only be established after a series of tests/trials from small events during project negotiation.
B1.3 A3	Trust can only be established after a series of tests/trials from small events during project conflict resolution.
B1.3 A4	Trust can only be established after a series of tests/trials from small events during project contract process.
B1.3 A5	Trust can only be established after a series of tests/trials from small events during project team building
B1.4 A1	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project communication.
B1.4 A2	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project negotiation.
B1.4A3	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project conflict resolution.
B1.4A4	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project contract process.
B1.4A5	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project team building.

Table 6.5: Variables generalised from B2

B2: "Face/image" is important to Chinese people as it represents prestige, respect, dignity and social status.	
B2.1A1	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project communication.
B2.1A2	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project negotiation.
B2.1A3	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project conflict resolution.
B2.1A4	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project contract process.
B2.1A5	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project team building.
B2.2A1	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project communication.
B2.2A2	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project negotiation.
B2.2A3	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project conflict resolution.
B2.2A4	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project contract process.
B2.2A5	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project team building
B2.3A1	"Face/image" is more important than profits in some cases during project communication.
B2.3A2	"Face/image" is more important than profits in some cases during project negotiation.
B2.3A3	"Face/image" is more important than profits in some cases during project conflict resolution.
B2.3A4	"Face/image" is more important than profits in some cases during project contract process.
B2.3A5	"Face/image" is more important than profits in some cases during project team building.
B2.4A1	Strive for your own "face/image" to be recognised and save others' face at the same time during project communication.
B2.4A2	Strive for your own "face/image" to be recognised and save others' face at the same time during project negotiation.
B2.4A3	Strive for your own "face/image" to be recognised and save others' face at the same time during project conflict resolution.
B2.4A4	Strive for your own "face/image" to be recognised and save others' face at the same time during project contract process.
B2.4A5	Strive for your own "face/image" to be recognised and save others' face at the same time during project team building.

Table 6.6: Variables generalised from B3

B3: Personal relationships: Guanxi – is critical for getting favours and conducting business successfully.	
B3.1A1	Developing Guanxi (personal relationships) is an important job for a manager during project communication.
B3.1A2	Developing Guanxi (personal relationships) is an important job for a manager during project negotiation.
B3.1A3	Developing Guanxi (personal relationships) is an important job for a manager during project conflict resolution.
B3.1A4	Developing Guanxi (personal relationships) is an important job for a manager during project contract process.
B3.1A5	Developing Guanxi (personal relationships) is an important job for a manager during project team building.
B3.2A1	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project communication.
B3.2A2	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project negotiation.
B3.2A3	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project conflict resolution.
B3.2A4	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project contract process.
B3.2A5	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project team building.
B3.3A1	Prefer business partners with good Guanxi (personal relationships) during project communication.
B3.3A2	Prefer business partners with good Guanxi (personal relationships) during project negotiation.
B3.3A3	Prefer business partners with good Guanxi (personal relationships) during project conflict resolution.
B3.3A4	Prefer business partners with good Guanxi (personal relationships) during project contract process.
B3.3A5	Prefer business partners with good Guanxi (personal relationships) during project team building.
B3.4A1	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project communication.
B3.4A2	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project negotiation.
B3.4A3	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project conflict resolution.
B3.4A4	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project contract process.
B3.4A5	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project team building.
B3.5A1	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project communication.
B3.5A2	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project negotiation.
B3.5A3	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project conflict resolution.

B3: Personal relationships: Guanxi – is critical for getting favours and conducting business successfully.	
B3.5A4	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project contract process.
B3.5A5	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project team building.
B3.6A1	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project communication.
B3.6A2	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project negotiation.
B3.6A3	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project conflict resolution.
B3.6A4	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project contract process.
B3.6A5	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project team building.

Table 6.7: Variables generalised from B4

B4: Communication – maintaining satisfactory harmony is the purpose	
B4.1A1	Communicating appropriately is more important than revealing the truth during project communication.
B4.1A2	Communicating appropriately is more important than revealing the truth during project negotiation.
B4.1A3	Communicating appropriately is more important than revealing the truth during project conflict resolution.
B4.1A4	Communicating appropriately is more important than revealing the truth during project contract process.
B4.1A5	Communicating appropriately is more important than revealing the truth during project team building.
B4.2A1	Announcing decisions during meetings while discussions should be held upfront and privately during project communication.
B4.2A2	Announcing decisions during meetings while discussions should be held upfront and privately during project negotiation.
B4.2A3	Announcing decisions during meetings while discussion should be held upfront and privately project conflict resolution.
B4.2A4	Announcing decisions during meetings while discussion should be held upfront and privately during the contract process.
B4.2A5	Announce decisions during meetings while discussion should be held upfront and privately during project team building.
B4.3A1	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project communication.
B4.3A2	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project negotiation.
B4.3A3	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project conflict resolution.
B4.3A4	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project contract process.
B4.3A5	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project team building.

Table 6.8: Variables generalised from B5

B5: Conflict-solving: Hua Jie – softening, smoothing, compromising and aligning instead of direct solving to uphold harmonious relationships**.**	
B5.1A1	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during project communication.
B5.1A2	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during project negotiation.
B5.1A3	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during conflict resolution.
B5.1A4	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during the contract process.
B5.1A5	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during project team building.
B5.2A1	Not causing others to lose face/image in conflict-solving process (Liu Mianzi) during project communication.
B5.2A2	Not causing others to lose face/image in conflict-solving process (Liu Mianzi) during project negotiation.
B5.2A3	Not causing others to lose face/image in conflict-solving process (Liu Mianzi) during conflict resolution.
B5.2A4	Not causing others to lose face/image in conflict-solving (Liu Mianzi) during project contract process.
B5.2A5	Not causing others to lose face/image in conflict-solving (Liu Mianzi) during project team building.
B5.3A1	Believe that personal trust and mutual interests are important to avoid conflicts during project communication.
B5.3A2	Believe that personal trust and mutual interests are important to avoid conflicts during project negotiation.
B5.3A3	Believe that personal trust and mutual interests are important to avoid conflicts during project conflict resolution.
B5.3A4	Believe that personal trust and mutual interests are important to avoid conflicts during project contract process.
B5.3A5	Believe that personal trust and mutual interests are important to avoid conflicts during project team building.
B5.4A1	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project communication.
B5.4A2	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project negotiation.
B5.4A3	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project resolution.
B5.4A4	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project contract process.
B5.4A5	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project team building.

Step 3: Revising the questionnaire

After the confirmation test, the Chinese behaviours that were not acceptable to the Chinese people were eliminated and the questionnaire was revised in accordance with the new variables that are listed in Step 2.

Step 4: The questionnaire was sent to Chinese and South African project managers (mainly those who have attended advanced courses in engineering and technology management).

Both Chinese and South African project managers were asked to participate in this academic PhD research. The respondents filled in the questionnaire according to their working experience and knowledge. A cover letter was attached to the questionnaire to describe the purpose and contents of the research. In the letter, all respondents were thanked for using their precious time to fill in the questionnaire.

Step 5: Data collection

In the data collection process, only the valid questionnaires were recognised as useful data. The total of 200 questionnaires were distributed and after careful selection, the questionnaires of 75 Chinese project managers and 63 South African project managers were deemed to be valid. Therefore the response rate is 69%.

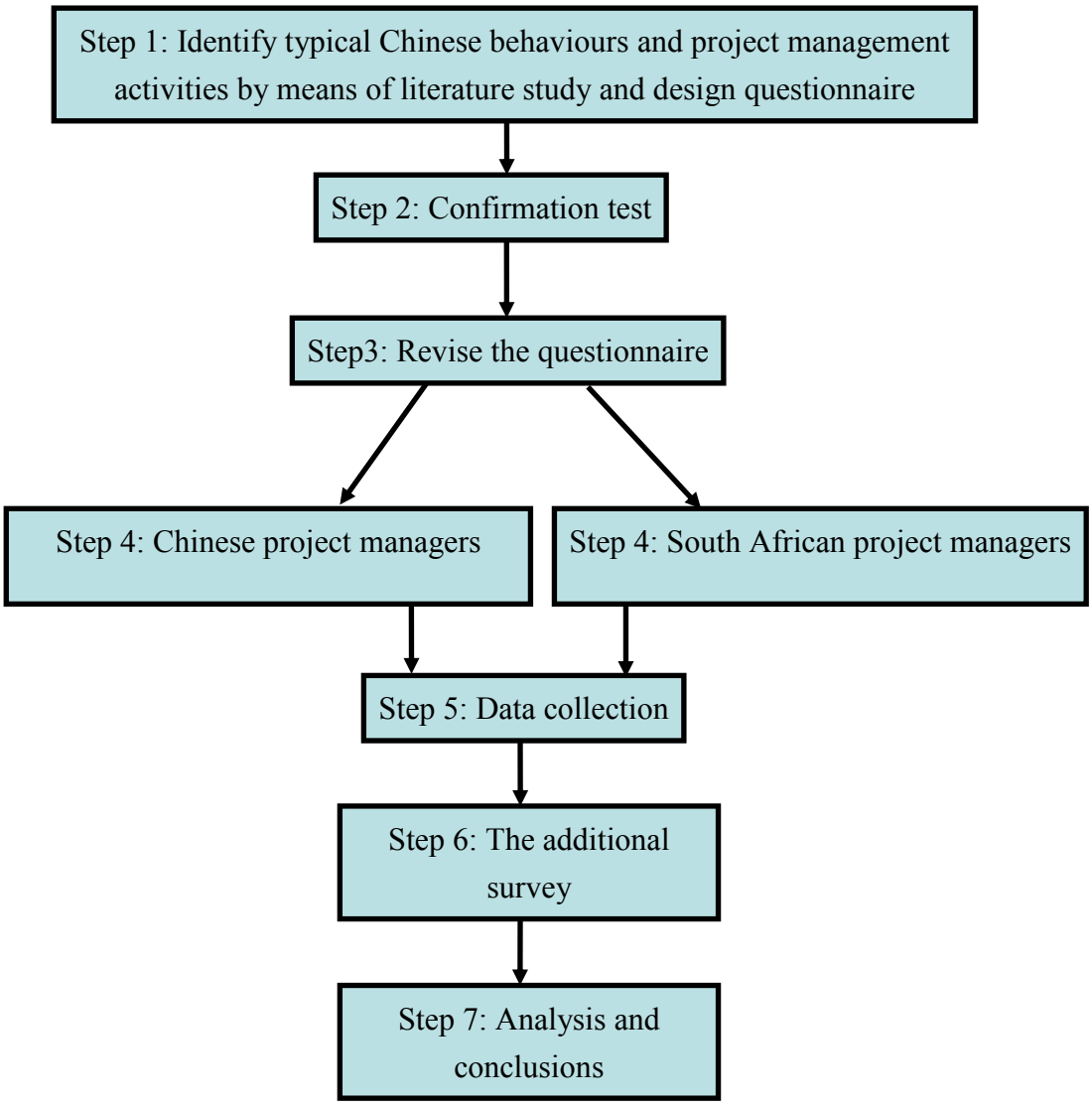
Step 6: An additional survey was conducted to obtain more information on the effect of cultural behaviours on each phase of a project and on the proposed mitigating solutions.

The purpose of the additional survey was to establish the influence of the identified cultural behaviours' effect on different project management processes and to confirm the proposed mitigating solutions that were found during the literature study.

Step 7: Data analysis and conclusion

The SPSS data analysis software was used in this research. A combination of quantitative and qualitative analysis was used in the data analysis and conclusion. The research and survey processes used are summarised in Figure 6.1.

Figure 6.1: Research and survey process



6.4 Conclusions

After the confirmation research survey, the unreasonable variables were eliminated. The variables that were used in the main research survey were renumbered and listed as indicated in tables 6.4 to 6.8. The entire survey comprised seven steps. The research methodology process is presented in Figure 6.2. In the data-collection process, only the valid questionnaires were

recognised as useful data. After careful selection, the questionnaires of 75 Chinese project managers and 63 South African project managers were deemed to be valid. In the additional survey, 40 selected valid questionnaires (20 from China and 20 from South Africa) were analysed.

The data analysis and a discussion of results are presented in Chapter 7 and some interesting points are addressed.

Chapter 7:

Date analysis and discussion of results

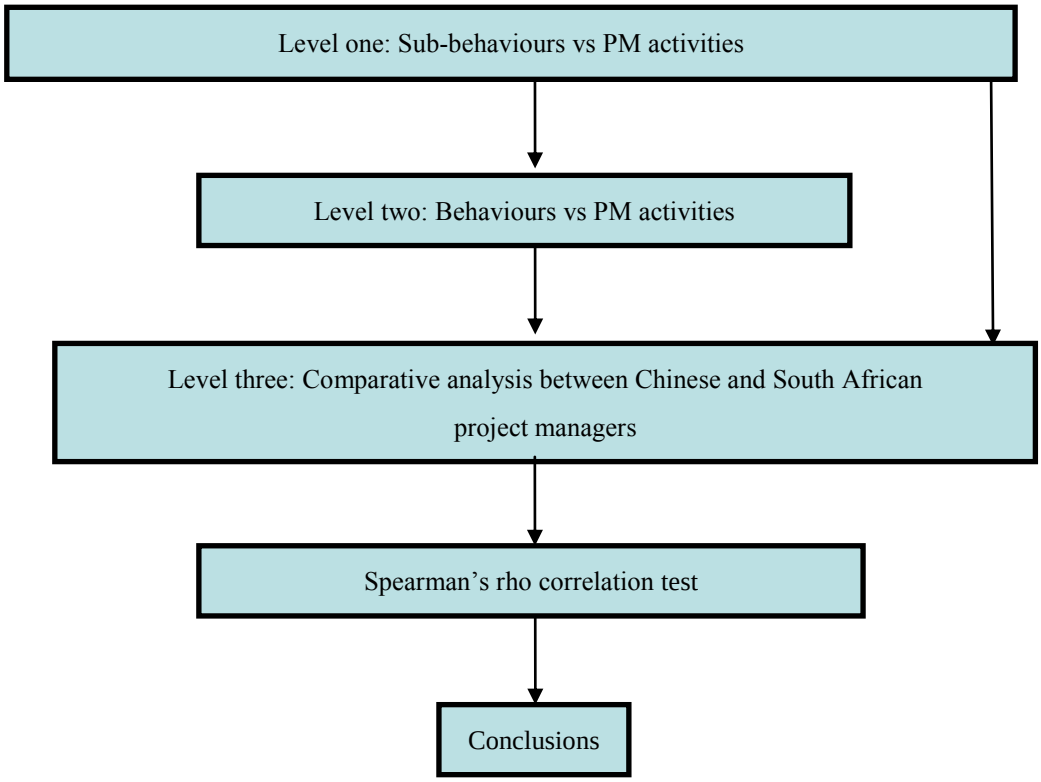
7.1 Introduction to data analysis

Although the questionnaire used in this research to assess some of the previously identified project management activities was designed based on Chinese culture, South African project managers have also been asked to participate in order to illustrate differences, where applicable. A survey was conducted to validate the cultural behaviours obtained from a literature study prior to the main survey. The questionnaire and research design were done in accordance with the recommendations of Cooper and Schindler (2006). The samples of South African (63 valid returned questionnaires) and Chinese project managers (75 valid returned questionnaires) were selected mainly from advanced courses for experienced project managers. In the questionnaire, they were asked to rate the importance of a specific cultural behaviour during a specific project activity. For example, Behaviour 2.1 during Activity 1 (denoted as B2.1A1 later in this section). A Likert scale is used in the questionnaire. If respondents choose “no”, the value is 0. If respondents choose “yes”, 1 to 5 was used to indicate the opinion on the relevant questions.

SPSS was used as the data analysis tool. A comparative study between the two samples was conducted by performing independent sample t-tests on the group means (Group 0: South African project managers, Group 1: Chinese project managers). The data analysis consists of three levels plus exploring relationships between some variables using Spearman’s rho correlation test.

The research methodology can be interpreted using the diagram in Figure 7.1.

Figure 7.1: The data analysis level



The entire data analysis process was designed in three levels, from the sub-behaviours level to group level. Each level was analysed according to the results listed in the tables. Some recommendations were made in view of the results. A comparative analysis was done in some cases, as indicated.

Level 1: Sub-behaviour vs project management activities

The survey score of each sub-behaviour was calculated to determine their degree of application against each project management activity for the two groups. Some analyses, such as ranking and comparison, were done at this level. Subsequently, a comparative analysis was conducted to evaluate the differences between Chinese and South African project managers in terms of sub-behaviour level against project management activities.

Level 2: Behaviours vs project management activities

The total score of the sub-behaviours for each behaviour was calculated using a reliability test to decide if the score could represent each behaviour. If the score was representative, a comparative analysis between Chinese and South African project managers was done. Otherwise, a factor analysis was done to compare the differences between the two groups. A corresponding analysis was conducted for each behaviour result.

Level 3: Group comparison between two groups

After the analysis of each behaviour on the second level, one comparison analysis of each behaviour vs each project management activity between Chinese and South African project managers was conducted to see if any differences existed. Some special recommendations were made on this level.

Spearman's rho correlation test:

The relationships between cultural behaviours and project activities are explored by using Spearman's rho correlation test. This statistical technique determines the strength of correlation between two variables (with a significant level of $p<0.001$). Moreover, the relationships between mitigating solutions and cultural differences are explored using the same statistical technique. Causality can however not be inferred from this test and will be the focus of future research but is excluded from the research for this thesis.

7.2 Data analysis and results

7.2.1 Demographics of participants

The demographics of the participants in the survey are described in Table 7.1. Basic information such as age and working experience is listed in the table. It is about 57.3% Chinese participants' age between and 35 years old and 63.5% that of South African participants. 54.7 % of Chinese participants and 52.4% of South African participants have working experience no more than 5 years. According to the results, the demographic profiles of the two groups are similar.

Table 7.1: Demographics of participants

Age	**Chinese**		**South African**	
	No.	Percentage	No.	Percentage
<25 years	6	8.0	2	3.2
25 <= 35 years	43	57.3	40	63.5
35 < =45 years	25	33.3	16	25.4
> 45 years	1	1.3	5	7.9
Total	75	100.0	63	100.0
Working experience	**Chinese**		**South African**	
	No.	Percentage	No.	Percentage
=<5 years	41	54.7	33	52.4
6=<10 years	24	32.0	17	27.0
11=<15 years	8	10.7	8	12.7
>15 years	2	2.7	5	7.9
Total	75	100.0	63	100.0

Figure 7.2: Age distribution of Chinese participants

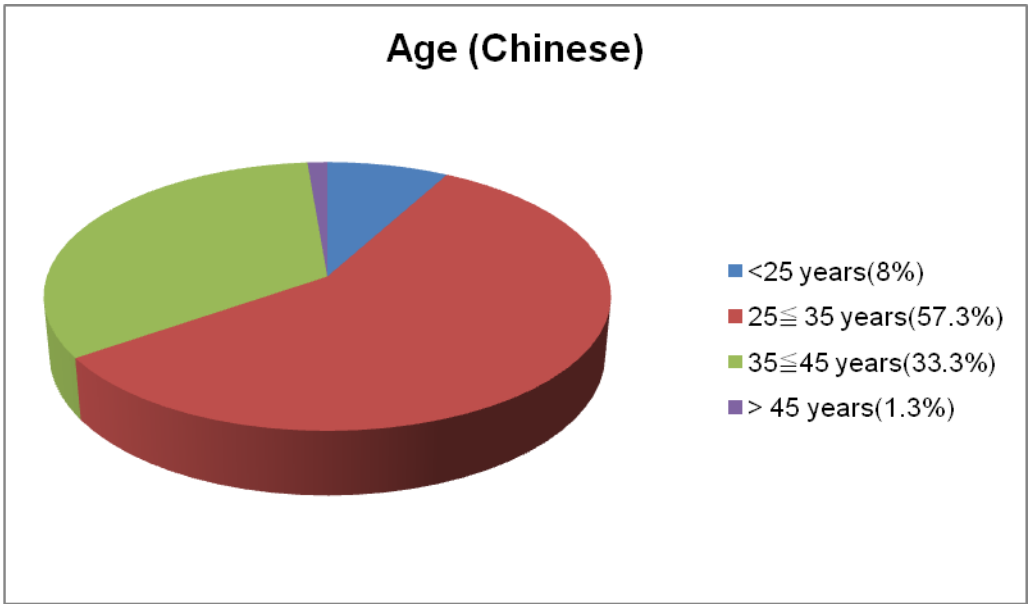


Figure 7.3: Age distribution of South African participants

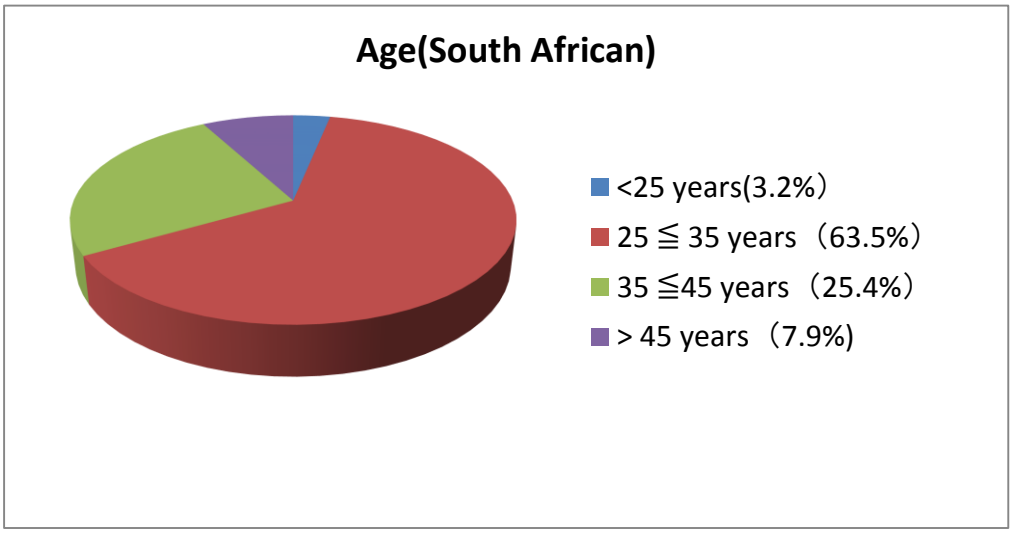


Figure 7.4: Working experience distribution of Chinese participants

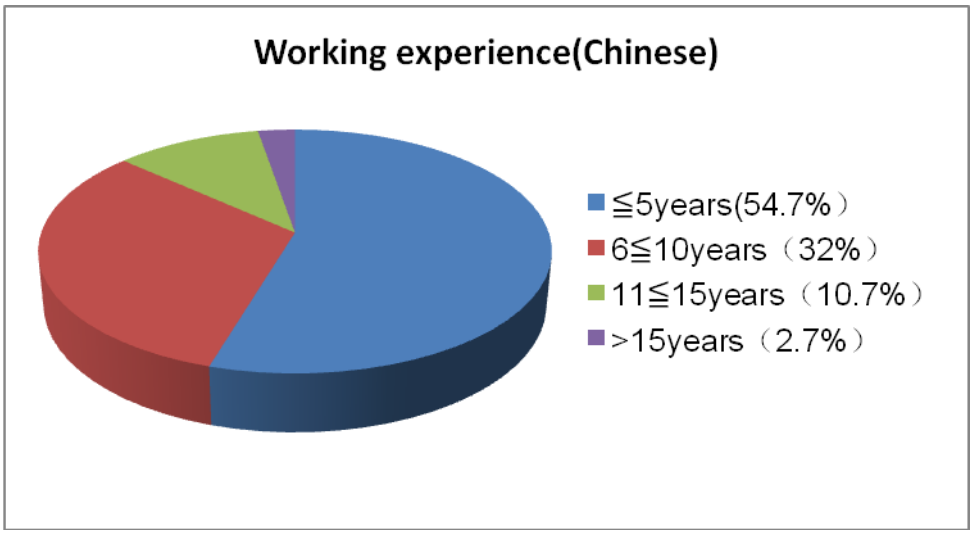


Figure 7.5: Working experience distribution of South African participants

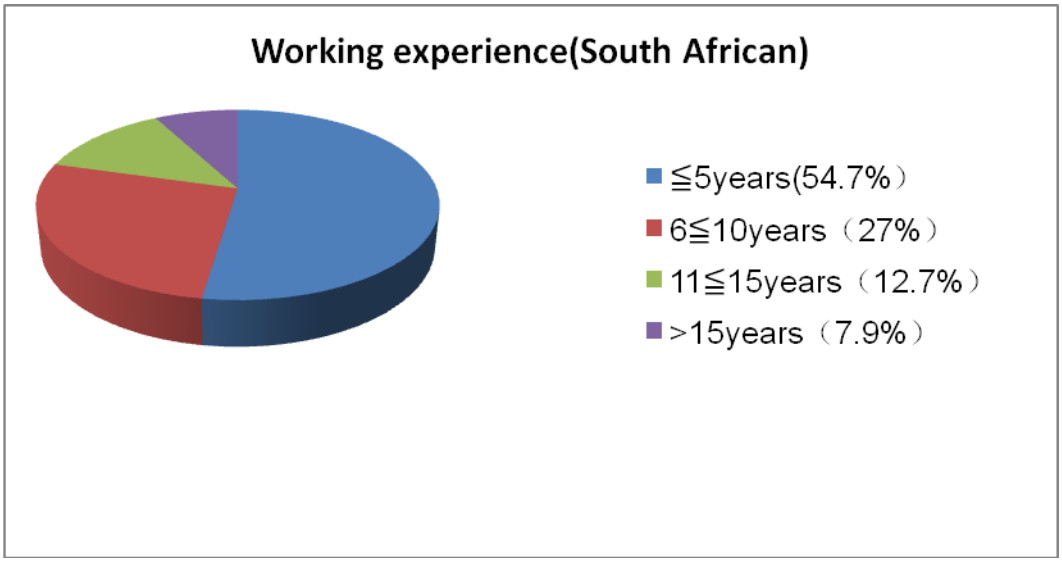
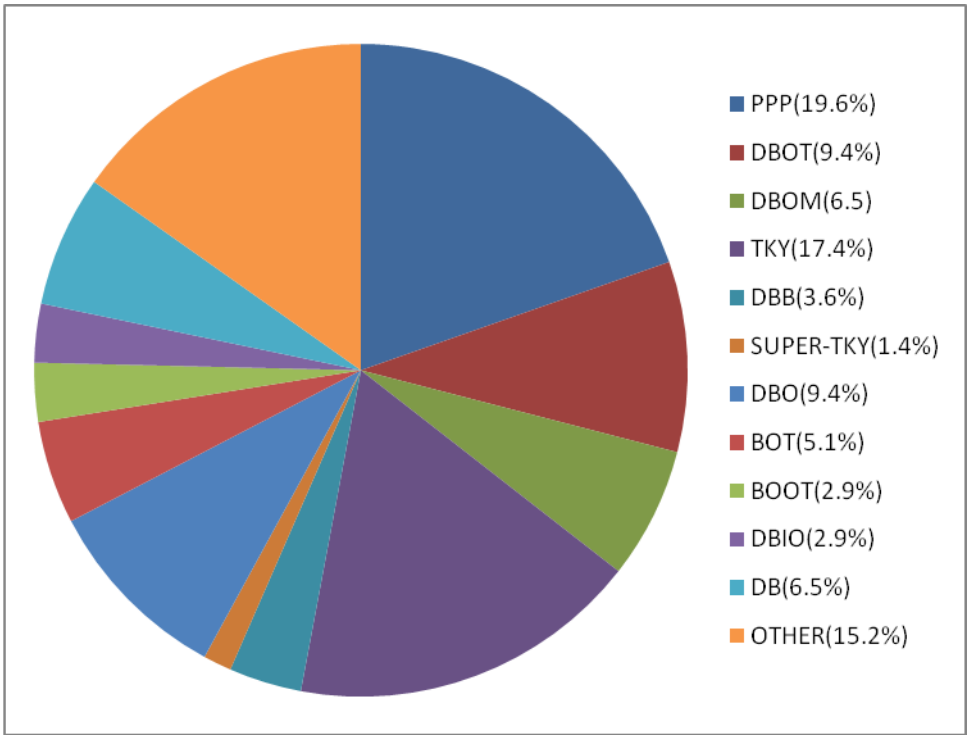


Figure 7.6: Project style distribution of participants



As indicated in Figure 7.6, 84.8% of projects that participants involved are constrcution projects. Others are 15.2%.

7.2.2 Data analysis of B1 vs PM activities (A1 to A5)

The variables identified in the survey of B1 are listed in the following table:

Table 7.2: Identified variables in B1

B1: Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves to avoid being involved in conflicts or fights.	
B1.1A1	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project communication.
B1.1A2	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project negotiation.
B1.1A3	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project conflict resolution.
B1.1A4	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project contract process.
B1.1A5	As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project team building.
B1.2A1	As a team member, always protect yourself first when doing a job to avoid risks during project communication.
B1.2A2	As a team member, always protect yourself first when doing a job to avoid risks during project negotiation.
B1.2A3	As a team member, always protect yourself first when doing a job to avoid risks during project conflict resolution.
B1.2A4	As a team member, always protect yourself first when doing a job to avoid risks during project contract process.
B1.2A5	As a team member, always protect yourself first when doing a job to avoid risks during project team building.
B1.3 A1	Trust can only be established after a series of tests/trials from small events during project communication.
B1.3 A2	Trust can only be established after a series of tests/trials from small events during project negotiation.
B1.3 A3	Trust can only be established after a series of tests/trials from small events during project conflict resolution.
B1.3 A4	Trust can only be established after a series of tests/trials from small events during project contract process.
B1.3 A5	Trust can only be established after a series of tests/trials from small events during project team building
B1.4 A1	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project communication.
B1.4 A2	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project negotiation.
B1.4A3	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project conflict resolution.
B1.4A4	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project contract process.
B1.4A5	Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project team building.

Level 1: Data analysis of surviving behaviour effects on PM activities at sub-behaviour level

Certain variables are highlighted to assist the reader in understanding the discussions that follow the tables.

Table 7.3: Survey results of Chinese respondents on Level 1 of B1

Chinese	N	Minimum	Maximum	Mean	Std. deviation
B1.3.A1	75	0	5	3.71	1.531
B1.1.A1	75	0	5	3.43	1.726
B1.3.A5	75	0	5	2.84	1.838
B1.1.A5	75	0	5	2.76	1.859
B1.4.A1	75	0	5	2.75	1.932
B1.1.A4	75	0	5	2.69	1.770
B1.4.A3	75	0	5	2.67	1.913
B1.3.A3	75	0	5	2.65	1.797
B1.2.A4	75	0	5	2.52	1.982
B1.2.A3	75	0	5	2.35	1.856
B1.1.A3	75	0	5	2.32	1.725
B1.3.A2	75	0	5	2.21	1.855
B1.3.A4	75	0	5	2.20	1.867
B1.2.A2	75	0	5	2.17	1.920
B1.4.A5	75	0	5	2.11	1.997
B1.2.A1	75	0	5	2.00	1.845
B1.4.A2	75	0	5	1.92	1.937
B1.2.A5	75	0	5	1.88	1.881
B1.1.A2	75	0	5	1.65	1.573
B1.4.A4	75	0	5	1.57	1.932

Table 7.4: Survey results of South African respondents on Level 1 of B1

South African	N	Minimum	Maximum	Mean	Std. deviation
B1.1.A1	63	0	5	3.33	1.503
B1.2.A1	63	0	5	3.10	1.701
B1.3.A1	63	0	5	2.87	1.809
B1.3.A5	63	0	5	2.71	1.979
B1.1.A5	63	0	5	2.68	1.925
B1.1.A3	63	0	5	2.59	1.593
B1.1.A4	63	0	5	2.56	1.890
B1.2.A4	63	0	5	2.48	1.891
B1.2.A3	63	0	5	2.30	1.811
B1.1.A2	63	0	5	2.21	1.797
B1.3.A4	63	0	5	2.14	2.007
B1.3.A3	63	0	5	2.13	1.888
B1.2.A2	63	0	5	2.11	1.824
B1.3.A2	63	0	5	2.08	1.817
B1.4.A1	63	0	5	1.98	1.988
B1.4.A3	63	0	5	1.94	1.917
B1.4.A5	63	0	5	1.92	1.994
B1.2.A5	63	0	5	1.81	1.857
B1.4.A2	63	0	5	1.73	1.944
B1.4.A4	63	0	5	1.46	1.803

Chinese project managers gave higher ratings to B1.3A1 (Trust can only be established after a series of tests/trials from small events during project communication) and B1.1A1 (As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project communication), for which the values were above 3.00. This means that

Chinese project managers do not easily trust team members or counterparts. This result indicates that Chinese project managers feel strongly about risk avoidance during project management activities. On the other hand, South African project managers rated B1.1A1 (As a manager, keep track of your team members to avoid being cheated/undermined by them one day during project communication) and B1.2A1 (As a team member, always protect yourself first when doing a job, to avoid risks during project communication) a value above 3.00. This shows that South African project managers have high-risk avoidance characteristics as well.

A very interesting phenomenon was observed, namely that B1.4A4 (Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame) during project contract process) were both rated at the lowest value. Both groups of respondents believed that a project contract process should strive for benefit.

We can also note from above tables that South African project managers all gave very low response values to variables from B1.4A1 to B1.4A5 (five out of six lowest values). This shows that B1.4 of South African respondents has very little effect on the five project activities. However, Chinese respondents gave a relatively high value to the variables of B1.4A1 to B1.4A3. This illustrates that the effect of behaviour B1.4 of Chinese respondents does affect project communication and conflict resolution.

Level 2: philosophy of surviving behaviour effects on PM activities

In this section, an average value of rated sub-behaviour is calculated to represent a philosophy of surviving behaviour AveB1Ax:

AveB1Ax = (B1.1Ax+B1.2Ax+B1.3Ax+B1.4Ax)/4

Table 7.5: Survey results of Chinese respondents on Level 2 of B1

Chinese	N	Minimum	Maximum	Mean	Std. deviation
AVEB1A1	75	0	5	2.9700	1.09356
AVEB1A3	75	0	5	2.4967	1.15189
AVEB1A5	75	0	5	2.3967	1.20605
AVEB1A4	75	0	5	2.2467	1.25033
AVEB1A2	75	0	5	1.9900	1.16061

Table 7.6: Survey results of South African respondents on Level 2 of B1

South African	N	Minimum	Maximum	Mean	Std. deviation
AVEB1A1	63	0	5	2.8214	1.09841
AVEB1A3	63	0	5	2.2817	1.39085
AVEB1A5	63	0	5	2.2381	1.25276
AVEB1A4	63	0	5	2.1587	1.31853
AVEB1A2	63	0	5	2.0317	1.37187

Note: the reliability test has proven that B1 can be represented by sub-behaviours.

B1A1 (Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves to avoid being involved in conflicts or fights during project communication) was rated the highest by both Chinese and

South African project managers, as can be seen in tables 7.5 and 7.6. This indicates that the philosophy of surviving has a relatively big effect on project communication in both groups. Both Chinese and South African project managers have a tendency to protect themselves when communicating in project management.

Attention should be given to B1A2 (Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves to avoid being involved in conflicts or fights during project negotiation). B1A2 was rated the lowest by both groups. It is interesting to conclude that respondents from China and South Africa will not protect themselves too much and will dare to take some kind of risk in project negotiation. Therefore, the impact of a philosophy of surviving is small on the two groups during negotiation.

Level 3: Group comparative analysis of philosophy of surviving behaviour of Chinese and South African project managers

In this section, the independent sample's t-test was employed to compare group means from the results of the data analysis of Level 2.

There are two groups: South African project managers (denoted as group 0) and Chinese project managers (Group 1). The purpose of this test was to explore if there is any difference between the ways in the two groups rate the impacts of each behaviour on the five project activities. A significant level of 0.05 is selected (95% confidence that the difference is not a chance difference).

Table 7.7: Survey results of Chinese and South African respondents on Level 3 of B1

	South African/ Chinese	N	Mean	Std. deviation	Sig/No (level 0.05)
AVEB1A1	South African	63	2.8214	1.09841	No
	Chinese	75	2.9700	1.09356	
AVEB1A2	South African	63	2.0317	1.37187	No
	Chinese	75	1.9900	1.16061	
AVEB1A3	South African	63	2.2381	1.25276	No
	Chinese	75	2.4967	1.15189	
AVEB1A4	South African	63	2.1587	1.31853	No
	Chinese	75	2.2467	1.25033	
AVEB1A5	South African	63	2.2817	1.39085	No
	Chinese	75	2.3967	1.20605	

The survey results show that there is no significant difference between Chinese and South African project managers on the effect of item of B1 (Philosophy of surviving) on the five identified project activities (A1 to A5).

7.2.3 Data analysis of B2 vs PM activities (A1 to A5)

The variables identified in the survey are listed in Table 7.8 below.

Table 7.8: Identified variables in B2

B2: "Face/image" is important to Chinese people as it represents prestige, respect, dignity and social status.	
B2.1A1	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project communication.
B2.1A2	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project negotiation.
B2.1A3	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project conflict resolution.
B2.1A4	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project contract process.
B2.1A5	Commenting directly on or rejecting others' opinions to make them lose "face/image" during project team building.
B2.2A1	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project communication.
B2.2A2	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project negotiation.
B2.2A3	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project conflict resolution.
B2.2A4	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project contract process.
B2.2A5	Saving others' "face/image" to maintain harmonious Guanxi (personal relationships) during project team building
B2.3A1	"Face/image" is more important than profits in some cases during project communication.
B2.3A2	"Face/image" is more important than profits in some cases during project negotiation.
B2.3A3	"Face/image" is more important than profits in some cases during project conflict resolution.
B2.3A4	"Face/image" is more important than profits in some cases during project contract process.
B2.3A5	"Face/image" is more important than profits in some cases during project team building.
B2.4A1	Strive for your own "face/image" to be recognised and save others' face at the same time during project communication.
B2.4A2	Strive for your own "face/image" to be recognised and save others' face at the same time during project negotiation.
B2.4A3	Strive for your own "face/image" to be recognised and save others' face at the same time during project conflict resolution.
B2.4A4	Strive for your own "face/image" to be recognised and save others' face at the same time during project contract process.
B2.4A5	Strive for your own "face/image" to be recognised and save others' face at the same time during project team building.

Level 1: Data analysis of the effects of "face/image" behaviour on PM activities at sub-behaviour level

Table 7.9: Survey results of Chinese respondents on Level 1 of B2

Chinese	N	Minimum	Maximum	Mean	Std. deviation
B2.2.A1	75	0	5	3.72	1.429
B2.4.A1	75	0	5	3.52	1.554
B2.4.A3	75	0	5	3.21	1.613
B2.4.A2	75	0	5	2.93	1.679
B2.1.A1	75	0	5	2.91	1.847
B2.2.A2	75	0	5	2.75	1.853
B2.3.A1	75	0	5	2.61	1.747
B2.4.A5	75	0	5	2.56	1.772
B2.3.A3	75	0	5	2.47	1.711
B2.2.A3	75	0	5	2.27	1.913
B2.2.A5	75	0	5	2.25	1.889
B2.1.A3	75	0	5	2.16	1.925
B2.3.A5	75	0	5	2.00	1.924
B2.4.A4	75	0	5	1.92	1.844
B2.1.A2	75	0	5	1.77	1.871
B2.1.A5	75	0	5	1.75	1.802
B2.3.A2	75	0	5	1.69	1.747
B2.2.A4	75	0	5	1.63	1.858
B2.3.A4	75	0	5	1.43	1.764
B2.1.A4	75	0	5	1.32	1.733

Table 7.10: Survey results of South African respondents on Level 1 of B2

South African	N	Minimum	Maximum	Mean	Std. deviation
B2.2.A1	63	0	5	2.73	1.825
B2.4.A1	63	0	5	2.41	1.793
B2.4.A3	63	0	5	2.30	1.898
B2.4.A5	63	0	5	2.30	1.964
B2.2.A2	63	0	5	2.24	1.820
B2.4.A2	63	0	5	2.21	1.815
B2.2.A3	63	0	5	2.16	1.825
B2.2.A5	63	0	5	2.16	1.928
B2.4.A4	63	0	5	2.06	1.839
B2.3.A5	63	0	5	1.97	1.934
B2.3.A1	63	0	5	1.75	1.750
B2.3.A3	63	0	5	1.73	1.743
B2.3.A2	63	0	5	1.60	1.709
B2.2.A4	63	0	5	1.59	1.681
B2.1.A3	63	0	5	1.46	1.767
B2.1.A2	63	0	5	1.46	1.785
B2.1.A1	63	0	5	1.32	1.865
B2.3.A4	63	0	5	1.27	1.598
B2.1.A5	63	0	5	1.14	1.865
B2.1.A4	63	0	5	1.10	1.604

The results indicate that the top three variables of both surveyed groups are the same.

B2.2A1: Saving others' “face/image” to maintain harmonious Guanxi (personal relationships) during project communication.

B2.4A1: Strive for your own “face/image” to be recognised and save others’ face at the same time during project communication.

B2.4A3: Strive for your own “face/image” to be recognised and save others’ face at the same time during conflict resolution.

The respondents show similar perceptions of the above behaviours during project communication and conflict resolution. It seems that during project communication and conflict resolution, “face/image” is important for Chinese and South African respondents. They do not like to lose “face/image” in project communication and conflict resolution activities.

B2.1.A4 (Commenting directly on or rejecting others’ opinions to make them lose “face/image” during project contract process) is another variable that should be noted. It was rated the lowest by both Chinese and South African respondents. Communicating directly with little concern for the “face/image” of one's counterpart in project contract process attracted remarkable consensus from both groups.

It is worth noting that B2.1.A1 (Commenting directly or rejecting on others’ opinions to make them lose “face/image” during project communication) was rated highly by Chinese respondents and very low by South African respondents. There is a real difference between the two groups on this

variable. Chinese project managers consider the “face/image” of others more than South African project managers during project communication. It seems that “face/image” is not that important to South African project managers during project communication.

Level 2: The effects of “face/image” behaviour on PM activities

In this section, the average value of rated sub-behaviour is calculated to represent philosophy of surviving behaviour AveB1Ax:

AveB2Ax = (B2.1Ax+B2.2Ax+B2.3Ax+B2.4Ax)/4

Table 7.11: Survey results of Chinese respondents on Level 2 of B2

Chinese	N	Minimum	Maximum	Mean	Std. deviation
aveB2A1	75	0	5	3.1900	1.13961
aveB2A3	75	0	5	2.5267	1.28962
aveB2A2	75	0	5	2.2867	1.24844
aveB2A5	75	0	5	2.1400	1.35270
aveB2A4	75	0	5	1.5733	1.39423

Table 7.12: Survey results of South African respondents on Level 2 of B2

South African	N	Minimum	Maximum	Mean	Std. deviation
aveB2A1	63	0	5	2.0516	1.21662
aveB2A3	63	0	5	1.9127	1.21662
aveB2A5	63	0	5	1.8929	1.34233
aveB2A2	63	0	5	1.8770	1.14465
aveB2A4	63	0	5	1.5040	1.21855

Note: the reliability test has proven the B2 can be represented by sub-behaviours.

It is can be seen from tables 7.11 and 7.12 that the mean of the score for “face/image” behaviour of Chinese respondents is much higher than that of South African respondents. The recognition of “face/image” in the identified five project management activities by Chinese project managers is much higher than that of South African project managers. However, behaviour B2A4 was given almost the same low scores by both groups. This indicates that both groups believe that “face/image” in the project contract process is not a critical factor to be considered.

Level 3: Group comparative analysis of “face/image” behaviour by Chinese and South African project managers

In this section, the independent sample’s t- test is employed to compare group means from the results of the data analysis of Level 2.

There are two groups: South African project managers (denoted as group 0) and Chinese project managers (Group 1). The purpose of this test is to determine if there is any difference between the ways in which the two groups rate the impacts of each behaviour on the five project activities. A significant level of 0.05 is selected (95% confidence that the difference is not a chance difference).

Table 7.13: Survey results of Chinese and South African respondents on Level 3 of B2

	South African/ Chinese	N	Mean	Std. deviation	Sig/No (level 0.05)
Average of B2A1	South African	63	2.0516	1.21662	Sig
	Chinese	75	3.1900	1.13961	
Average of B2A2	South African	63	1.8770	1.14465	Sig
	Chinese	75	2.2867	1.24844	
Average of B2A3	South African	63	1.9127	1.21662	Sig
	Chinese	75	2.5267	1.28962	
Average of B2A4	South African	63	1.5040	1.21855	No
	Chinese	75	1.5733	1.39423	
Average of B2A5	South African	63	1.8929	1.34233	No
	Chinese	75	2.1400	1.35270	

Generally, there are significant differences between Chinese and South African project managers' “face/image” behaviour with regard to three project activities (A1: project communication, A2: project negotiation, and A3: project conflict resolution), as can be seen from Table 7.13. These differences could have a negative impact on project communication, negotiation and conflict resolution, and thus lead to more problems. Chinese project managers consider the “face/image” as representative of prestige, respect, dignity and social status, but it seems as if South African project managers do not care about Chinese project managers’ “face/image” during project communication, negotiation and conflict resolution. Some difficulties may arise in the above project management activities of international engineering teams because of cultural differences. Chinese project managers also seem to realise that

South African project managers do not have the same conception of "face/image" in some project management activities, as can be gathered from Table 7.13.

7.2.4 Data analysis of B3 vs PM activities (A1 to A5)

The relevant variables identified in the survey are listed in Table 7.14 below.

Table 7.14: Identified variables in B3

B3: Personal relationships: Guanxi – is critical for getting favours and conducting business successfully.	
B3.1A1	Developing Guanxi (personal relationships) is an important job for a manager during project communication.
B3.1A2	Developing Guanxi (personal relationships) is an important job for a manager during project negotiation.
B3.1A3	Developing Guanxi (personal relationships) is an important job for a manager during project conflict resolution.
B3.1A4	Developing Guanxi (personal relationships) is an important job for a manager during project contract process.
B3.1A5	Developing Guanxi (personal relationships) is an important job for a manager during project team building.
B3.2A1	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project communication.
B3.2A2	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project negotiation.
B3.2A3	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project conflict resolution.
B3.2A4	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project contract process.
B3.2A5	Guanxi (personal relationships) is a resource of sustainable competitive advantage during project team building.
B3.3A1	Prefer business partners with good Guanxi (personal relationships) during project communication.
B3.3A2	Prefer business partners with good Guanxi (personal relationships) during project negotiation.
B3.3A3	Prefer business partners with good Guanxi (personal relationships) during project conflict resolution.
B3.3A4	Prefer business partners with good Guanxi (personal relationships) during project contract process.

B3: Personal relationships: Guanxi – is critical for getting favours and conducting business successfully.	
B3.3A5	Prefer business partners with good Guanxi (personal relationships) during project team building.
B3.4A1	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project communication.
B3.4A2	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project negotiation.
B3.4A3	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project conflict resolution.
B3.4A4	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project contract process.
B3.4A5	Establishing trust and face/image saving are the foundations of establishing good Guanxi (personal relationships) during project team building.
B3.5A1	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project communication.
B3.5A2	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project negotiation.
B3.5A3	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project conflict resolution.
B3.5A4	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project contract process.
B3.5A5	The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager during project team building.
B3.6A1	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project communication.
B3.6A2	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project negotiation.
B3.6A3	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project conflict resolution.
B3.6A4	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project contract process.
B3.6A5	Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project team building.

Level 1: Data analysis of the effects of personal relationships (Guanxi) behaviour on PM activities at a sub-behaviour level

Table 7.15: Survey results of Chinese respondents on Level 1 of B3

Chinese	N	Minimum	Maximum	Mean	Std. deviation
B3.1.A1	75	0	5	4.03	1.230
B3.4.A1	75	0	5	3.60	1.375
B3.2.A1	75	0	5	3.56	1.445
B3.1.A5	75	0	5	3.31	1.668
B3.6.A1	75	0	5	3.25	1.817
B3.5.A1	75	0	5	3.20	1.708
B3.3.A1	75	0	5	3.07	1.758
B3.1.A3	75	0	5	3.05	1.723
B3.2.A5	75	0	5	2.99	1.842
B3.2.A3	75	0	5	2.95	1.700
B3.1.A2	75	0	5	2.92	1.873
B3.2.A2	75	0	5	2.87	1.803
B3.6.A2	75	0	5	2.85	1.814
B3.5.A5	75	0	5	2.80	1.867
B3.5.A2	75	0	5	2.79	1.840
B3.4.A2	75	0	5	2.79	1.605
B3.4.A5	75	0	5	2.77	1.907
B3.6.A4	75	0	5	2.72	1.983
B3.4.A3	75	0	5	2.68	1.795
B3.5.A3	75	0	5	2.67	1.982
B3.1.A4	75	0	5	2.60	1.993
B3.2.A4	75	0	5	2.60	1.845
B3.6.A3	75	0	5	2.57	1.939
B3.3.A2	75	0	5	2.53	1.870
B3.3.A4	75	0	5	2.51	1.906
B3.3.A5	75	0	5	2.45	1.905
B3.6.A5	75	0	5	2.40	1.938
B3.4.A4	75	0	5	2.29	1.844
B3.5.A4	75	0	5	2.24	1.965
B3.3.A3	75	0	5	2.07	1.848

Table 7.16: Survey results of South African respondents on Level 1 of B3

South African	N	Minimum	Maximum	Mean	Std. deviation
B3.1.A1	63	0	5	3.41	1.738
B3.5.A1	63	0	5	3.21	1.824
B3.1.A5	63	0	5	3.21	1.993
B3.3.A1	63	0	5	3.03	1.858
B3.1.A2	63	0	5	2.98	1.972
B3.5.A2	63	0	5	2.89	2.017
B3.5.A3	63	0	5	2.89	1.952
B3.2.A5	63	0	5	2.87	2.136
B3.5.A5	63	0	5	2.86	2.031
B3.4.A1	63	0	5	2.81	1.874
B3.2.A1	63	0	5	2.76	2.022
B3.3.A2	63	0	5	2.76	2.046
B3.1.A3	63	0	5	2.75	2.000
B3.4.A5	63	0	5	2.68	1.999
B3.3.A5	63	0	5	2.65	2.215
B3.4.A2	63	0	5	2.63	1.970
B3.2.A2	63	0	5	2.60	2.044
B3.3.A4	63	0	5	2.59	2.076
B3.3.A3	63	0	5	2.56	2.131
B3.4.A3	63	0	5	2.38	2.075
B3.1.A4	63	0	5	2.37	2.074
B3.5.A4	63	0	5	2.32	2.078
B3.2.A3	63	0	5	2.30	2.068
B3.2.A4	63	0	5	2.22	2.075
B3.4.A4	63	0	5	2.16	1.928
B3.6.A1	63	0	5	2.05	1.938
B3.6.A2	63	0	5	1.84	1.928
B3.6.A5	63	0	5	1.76	2.014
B3.6.A3	63	0	5	1.75	1.900
B3.6.A4	63	0	5	1.51	1.795

Several interesting points were noted here. B3.1A1 (Developing Guanxi (personal relationships) is an important job for a manager during project communication) was rated the highest by both groups. The respondents agreed that using project communication to develop Guanxi (personal relationships) is an important job for a project manager. Therefore, the behaviour B3.1 has a great influence on project management activity A1. Another variable, B3.1A5 (Developing Guanxi (personal relationships) is an important job for a manager during project team building) was also given a relatively high score in the survey. It is clear that project managers place emphasis on project team building as a medium to develop Guanxi (personal relationships).

Another very special phenomenon was observed regarding B3.6 A1–B3.6A5 (see Table 7.15 and Table 7.16).

All the participating South African project managers gave those five variables (the bottom five) very low scores. However, the Chinese project managers' choices are very scattered. B3.6A2 (Reciprocity determines whether Guanxi (personal relationships) can be established successfully during project negotiation) obtained a relatively high score. The diversity of scores by Chinese respondents and the consistency of South African respondents' scores for this behaviour illustrate that B3.6 (Reciprocity determines whether Guanxi (personal relationships) can be established successfully) has little influence on the five project activities according to the South African project managers; however there seems to be differences in the degree of influence on different project activities to the Chinese project managers .

Level 2: The effects of personal relationships (Guanxi) behaviour on PM activities

In this section, the average value of rated sub-behaviour is calculated to represent philosophy of surviving behaviour AveB1Ax:

AveB3Ax = (B3.1Ax+B3.2Ax+B3.3Ax+B3.4Ax+B3.5Ax+B3.6Ax)/6

Table 7.17: Survey results of Chinese respondents on Level 2 of B3

Chinese	N	Minimum	Maximum	Mean	Std. deviation
aveB3A1	75	0	5	3.4511	1.11997
aveB3A2	75	0	5	2.7911	1.21832
aveB3A5	75	0	5	2.7867	1.30446
aveB3A3	75	0	5	2.6644	1.35885
aveB3A4	75	0	5	2.4933	1.32555

Table 7.18: Survey results of South African respondents on Level 2 of B3

South African	N	Minimum	Maximum	Mean	Std. deviation
aveB3A1	63	0	5	2.8783	1.35573
aveB3A5	63	0	5	2.6720	1.57801
aveB3A2	63	0	5	2.6190	1.55555
aveB3A3	63	0	5	2.4365	1.58748
aveB3A4	63	0	5	2.1931	1.62259

Note: The reliability test has proven that B3 can be represented by sub-behaviours.

The analysis of Level 2 shows that the results of the two groups are similar. Personal relationships (Guanxi) have a big effect on A1 (project communication) and a smaller effect on A4 (project contract process). The standard deviation of scores of the South African group is higher than that of the Chinese, probably because the cultural diversity of South Africa.

Level 3: Group comparative analysis of personal relationships (Guanxi) behaviour by Chinese and South African project managers

In this section, the independent sample's t- test is employed to compare group means from the results of the data analysis of Level 2.

There are two groups: South African project managers (denoted as group 0) and Chinese project managers (Group 1). The purpose of this test is to determine if there is any difference in the ways in which the two groups rate the impacts of each behaviour on the five project activities. A significant level of 0.05 was selected (95% confidence that the difference is not a chance difference)

Table 7.19: Survey results of Chinese and South African respondents on Level 3 of B3

	South African/ Chinese	N	Mean	Std. deviation	Sig/No (level 0.05)
Average of B3A1	South African	63	2.8783	1.35573	Sig
	Chinese	75	3.4511	1.11997	
Average of B3A2	South African	63	2.6190	1.55555	No
	Chinese	75	2.7911	1.21832	
Average of B3A3	South African	63	2.4365	1.58748	No
	Chinese	75	2.6644	1.35885	
Average of B3A4	South African	63	2.1931	1.62259	No
	Chinese	75	2.4933	1.32555	
Average of B3A5	South African	63	2.6720	1.57801	No
	Chinese	75	2.7867	1.30446	

The analysis of Level 3 showed a significant difference in the scores for variable B3A1. This means that although both groups place emphasis on personal relationships (Guanxi) during project communication (the average score is high for both groups), the influence of personal relationships (Guanxi) on project communication is seen as significantly different. The two groups may have some similarities in some sub-behaviours, but from an overall perspective of B3A1 they still have distinct perceptions of it. If they are not aware of their different perceptions of this behaviour in project communication, the result may be a barrier to a successful project for an international team composed of South African and Chinese nationals. The influence of B3 on A2, A3 and A4 is not significantly different between the surveyed groups, as can be concluded from Table 7.19.

7.2.5 Data analysis of B4 vs PM activities (A1 to A5)

The relevant variables identified in the survey are listed in Table 7.20 below.

Table 7.20: Identified variables in B4

B4: Communication – maintaining satisfactory harmony is the purpose	
B4.1A1	Communicating appropriately is more important than revealing the truth during project communication.
B4.1A2	Communicating appropriately is more important than revealing the truth during project negotiation.
B4.1A3	Communicating appropriately is more important than revealing the truth during project conflict resolution.
B4.1A4	Communicating appropriately is more important than revealing the truth during project contract process.
B4.1A5	Communicating appropriately is more important than revealing the truth during project team building.
B4.2A1	Announcing decisions during meetings while discussions should be held upfront and privately during project communication.
B4.2A2	Announcing decisions during meetings while discussions should be held upfront and privately during project negotiation.
B4.2A3	Announcing decisions during meetings while discussion should be held upfront and privately project conflict resolution.
B4.2A4	Announcing decisions during meetings while discussion should be held upfront and privately during the contract process.
B4.2A5	Announce decisions during meetings while discussion should be held upfront and privately during project team building.
B4.3A1	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project communication.
B4.3A2	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project negotiation.
B4.3A3	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project conflict resolution.
B4.3A4	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project contract process.
B4.3A5	Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen) during project team building.

Level 1: Data analysis of the effects of communication behaviour on PM activities at sub-behaviour level

The analysis of the ratings (B4.1, B4.2, B4.3) for communication behaviours in activities (A1, A2, A3, A4, A5) from the survey results are shown in Table 7.21 and Table 7.22 below.

Table 7.21: Survey results of Chinese respondents on Level 1 of B4

Chinese	N	Minimum	Maximum	Mean	Std. deviation
B4.1.A1	75	0	5	2.91	1.726
B4.3.A1	75	0	5	2.31	1.924
B4.3.A2	75	0	5	2.23	1.984
B4.1.A3	75	0	5	2.17	1.920
B4.2.A1	75	0	5	2.16	1.925
B4.2.A2	75	0	5	1.81	1.964
B4.1.A5	75	0	5	1.76	1.895
B4.3.A3	75	0	5	1.72	1.857
B4.1.A2	75	0	5	1.71	1.880
B4.2.A3	75	0	5	1.69	1.860
B4.2.A5	75	0	5	1.44	1.742
B4.3.A5	75	0	5	1.43	1.702
B4.3.A4	75	0	5	1.35	1.782
B4.2.A4	75	0	5	1.35	1.728
B4.1.A4	75	0	5	1.23	1.783

Table 7.22: Survey results of South African respondents on Level 1 of B4

South African	N	Minimum	Maximum	Mean	Std. deviation
B4.2.A1	63	0	5	1.67	1.926
B4.2.A5	63	0	5	1.56	2.038
B4.1.A1	63	0	5	1.56	1.899
B4.2.A2	63	0	5	1.37	1.799
B4.3.A1	63	0	5	1.22	1.773
B4.2.A3	63	0	5	1.19	1.777
B4.1.A2	63	0	5	1.17	1.700
B4.2.A4	63	0	5	1.16	1.743
B4.3.A4	63	0	5	1.13	1.727
B4.3.A2	63	0	5	1.11	1.733
B4.3.A5	63	0	5	1.11	1.788
B4.3.A3	63	0	5	1.00	1.732
B4.1.A5	63	0	5	1.00	1.675
B4.1.A3	63	0	5	.98	1.540
B4.1.A4	63	0	5	.94	1.564

In an item level analysis, the results of Chinese project managers can be categorised into two sections according to the level of effects. The means of five items are above 2.00 (see Table 7.21). B4.1.A1 was rated the highest by the Chinese project managers. That means that, in project communication, Chinese project managers may be inclined to use appropriateness instead of telling the truth in order to maintain a harmonious relationship. B4.3.A1 is rated in the second place after B4.1.A1. This is also recognised to be a characteristic of Chinese communication behaviour in project management communication. Chinese project managers do not deliver all the information to counterparts, due to self-protection. South African project managers gave all items a low

rating on average. This seems reasonable, because this questionnaire was designed based on the Chinese culture.

An interesting point that should be noted is that one item scores below 1.00 (B4.1.A3), as shown in Table 7.22. The Chinese project managers rated this item relatively highly. There is a big difference between two groups. The implication of this is that South African project managers seem to disagree with Chinese project managers on this communication behaviour in project management activity (B4.1.A3): *Communicating appropriately is more important than revealing the truth in conflict resolution.* This means that South African managers do not behave like Chinese project managers in project conflict resolution. This situation may cause new conflicts during project conflict resolution.

Interestingly, B4.1.A4 was rated the lowest by both groups. Therefore, both sides agreed that communication in the contract process should be straight and to the point, aimed at and telling or revealing the truth.

Level 2: Communication behaviour effects on PM activities

In this section, an average value of each rated communication behaviour is calculated to represent communication AveBAx:

AveB4Ax = (B4.1Ax+B4.2Ax+B4.3Ax)/3

The reliability tests showed that B could be represented by calculating the mean of measurements B4.1, B4.2 and B4.3 for the various activities. The results of the two surveyed groups are listed in tables 7.23 and 7.24.

Table 7.23: Survey results of Chinese respondents on Level 2 of B4

Chinese	N	Minimum	Maximum	Mean	Std. deviation
AVEB4A1	75	0	5	2.4578	1.38609
AVEB4A2	75	0	5	1.9156	1.43225
AVEB4A3	75	0	5	1.8622	1.44892
AVEB4A5	75	0	5	1.5422	1.41716
AVEB4A4	75	0	5	1.3067	1.40757

Table 7.24: Survey results of South African respondents on Level 2 of B4

South African	N	Minimum	Maximum	Mean	Std. deviation
AVEB4A1	63	0	5	1.4815	1.45269
AVEB4A5	63	0	5	1.2222	1.47743
AVEB4A2	63	0	5	1.2169	1.34692
AVEB4A4	63	0	5	1.0741	1.35261
AVEB4A3	63	0	5	1.0582	1.35670

Note: The reliability test has proven that B4 can be represented by sub-behaviours.

According to Table 7.23, the outstanding average communication behaviour of project managers that affects project management activities is AveB4A1 (*A1: project communication*). AveB4A1 was rated first by the Chinese respondents. South African project managers also rated AveB4A1 the highest in the survey.

This indicates that both sides have a tendency to maintain a satisfactory and harmonious environment during project communication activities. This also shows that both South African and Chinese project managers try to avoid conflict during project communication. AveB4A4 (*in A4: Project contract process*) was rated relatively low by the two groups. This means that both Chinese and South African project managers try to convey the information in the project contract management process activity clearly and comprehensively. They endeavour to mitigate the cultural effects of communication behaviour on the contract management process. On this point, there is a similar result in the analysis of Level 1 measurement level. The average SD value is a little higher in the South African project manager group than in the Chinese project manager group. This could be because the South African culture is more diverse than that of China.

Level 3: Group comparative analysis of communication behaviours by Chinese and South African project managers

In this section, the independent sample's t- test is employed to compare group means from the results of the data analysis of Level 2.

There are two groups: South African project managers (denoted as group 0) and Chinese project managers (Group 1). The purpose of this test was to determine if there are differences in the ways in which the two groups score the impacts of each behaviour on the five project activities. A significant level of 0.05 is selected (95% confidence that the difference is not a chance difference).

From the results of the group test (Table 7.25), AveB4A1, AveB4A2 and AveB4A3 are recognised to be rated significantly differently by Chinese and South African project managers in terms of communication behaviour effects on project activities. The ultimate purpose of communication behaviour (B4) for Chinese project managers is to maintain a satisfactory harmony. In order to achieve this, Chinese project managers often use B4.1, B4.2 and B4.3 as tools. The statistical results show that the communication behaviours of the two groups in project communication (A1), project negotiation (A2) and project conflict resolution (A3) activities are significantly different. The main implication of the difference is that the South African group disagrees with the Chinese group's communication behaviour in project activities, because the mean value of the South African group is much lower than that of the Chinese group.

Table 7.25: Survey results of Chinese and South African respondents on Level 3 of B4

	South African/ Chinese	N	Mean	Std. deviation	Sig/No (level 0.05)
AVEB4A1	South African	63	1.4815	1.45269	Sig
	Chinese	75	2.4578	1.38609	
AVEB4A2	South African	63	1.2169	1.34692	Sig
	Chinese	75	1.9156	1.43225	
AVEB4A3	South African	63	1.0582	1.35670	Sig
	Chinese	75	1.8622	1.44892	
AVEB4A4	South African	63	1.0741	1.35261	No
	Chinese	75	1.3067	1.40757	
AVEB4A5	South African	63	1.2222	1.47743	No
	Chinese	75	1.5422	1.41716	

Although there is no significant difference between variables B4A4 and B4A5, this does not mean that no risks emanate from B4A4 and B4A5. It could only imply that the two groups' communication behaviours in the project contract process and project team building activities are similar.

7.2.6 Data analysis of B5 vs PM activities (A1 to A5)

The relevant variables identified in the survey are listed in Table 7.26 below.

Table 7.26: Identified variables in B5

B5: Conflict-solving: Hua Jie – softening, smoothing, compromising and aligning instead of direct solving to uphold harmonious relationships**.**	
B5.1A1	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during project communication.
B5.1A2	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during project negotiation.
B5.1A3	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during conflict resolution.
B5.1A4	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during the contract process.
B5.1A5	Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during project team building.
B5.2A1	Not causing others to lose face/image in conflict-solving process (Liu Mianzi) during project communication.
B5.2A2	Not causing others to lose face/image in conflict-solving process (Liu Mianzi) during project negotiation.
B5.2A3	Not causing others to lose face/image in conflict-solving process (Liu Mianzi) during conflict resolution.
B5.2A4	Not causing others to lose face/image in conflict-solving (Liu Mianzi) during project contract process.
B5.2A5	Not causing others to lose face/image in conflict-solving (Liu Mianzi) during project team building.
B5.3A1	Believe that personal trust and mutual interests are important to avoid conflicts during project communication.
B5.3A2	Believe that personal trust and mutual interests are important to avoid conflicts during project negotiation.
B5.3A3	Believe that personal trust and mutual interests are important to avoid conflicts during project conflict resolution.
B5.3A4	Believe that personal trust and mutual interests are important to avoid conflicts during project contract process.
B5.3A5	Believe that personal trust and mutual interests are important to avoid conflicts during project team building.
B5.4A1	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project communication.
B5.4A2	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project negotiation.
B5.4A3	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project resolution.
B5.4A4	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project contract process.
B5.4A5	Respect people who are older and have a higher status in conflict-solving in order to maintain Guanxi (personal relationships) during project team building.

Level 1: Data analysis of the effects of conflict-solving behaviour on PM activities at sub-behaviour level

Table 7.27: Survey results of Chinese respondents on Level 1 of B5

Chinese	N	Minimum	Maximum	Mean	Std. deviation
B5.4.A1	75	0	5	3.17	1.631
B5.2.A3	75	0	5	3.07	1.687
B5.3.A1	75	0	5	3.07	1.671
B5.4.A3	75	0	5	3.00	1.693
B5.2.A1	75	0	5	2.99	1.697
B5.1.A3	75	0	5	2.71	1.887
B5.1.A1	75	0	5	2.55	1.848
B5.4.A5	75	0	5	2.49	1.891
B5.2.A2	75	0	5	2.39	1.777
B5.3.A3	75	0	5	2.39	1.859
B5.3.A2	75	0	5	2.32	1.810
B5.2.A5	75	0	5	2.29	1.880
B5.4.A2	75	0	5	2.29	1.880
B5.3.A5	75	0	5	2.07	1.954
B5.1.A2	75	0	5	1.96	1.892
B5.2.A4	75	0	5	1.81	1.836
B5.1.A5	75	0	5	1.64	1.998
B5.4.A4	75	0	5	1.56	1.840
B5.3.A4	75	0	5	1.45	1.773
B5.1.A4	75	0	5	.92	1.667

Table 7.28: Survey results of South African respondents on Level 1 of B5

South African	N	Minimum	Maximum	Mean	Std. deviation
B5.4.A1	63	0	5	2.33	1.926
B5.3.A1	63	0	5	2.33	1.832
B5.3.A5	63	0	5	2.27	2.034
B5.3.A3	63	0	5	2.22	1.862
B5.4.A5	63	0	5	2.02	1.988
B5.3.A2	63	0	5	1.97	1.892
B5.4.A3	63	0	5	1.94	1.857
B5.2.A1	63	0	5	1.86	1.857
B5.2.A3	63	0	5	1.81	1.916
B5.2.A2	63	0	5	1.79	1.842
B5.3.A4	63	0	5	1.78	1.853
B5.4.A2	63	0	5	1.78	1.896
B5.2.A5	63	0	5	1.71	1.913
B5.2.A4	63	0	5	1.56	1.873
B5.4.A4	63	0	5	1.32	1.803
B5.1.A3	63	0	5	1.19	1.683
B5.1.A1	63	0	5	1.05	1.549
B5.1.A5	63	0	5	.95	1.621
B5.1.A2	63	0	5	.94	1.501
B5.1.A4	63	0	5	.87	1.529

At this level of analysis, B5.4A1 (Respect people who are older and have a higher status during conflict-solving in order to maintain Guanxi (personal relationships) during project communication) was rated in the first place by both groups. It indicates that Chinese and South African project managers consider the opinions of older people with a higher status as more important

than others in project communication during conflict resolution. In this respect, the culture-related behaviour has a similar influence on activity A1.

Another interesting variable is B5.3A5 (Believe that personal trust and mutual interests are important to avoid conflicts during project team building). The Chinese respondents gave it a low rating, and the South African group positioned this variable in the third place. It can be concluded that Chinese and South African project managers have different opinions on conflict resolution during project team building. Chinese project managers may like to use power and authority to solve conflicts during project team building and South African project managers may like to use personal trust and mutual interests such humanistic methods to avoid conflicts.

B5.1A3 (Indirect way of conflict resolution by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi) during conflict resolution) is another variable where a big difference in the results is evident. The Chinese group placed it in the top six, but the South Africans placed it in the last five positions. The cultural impact of conflict resolution on project activities is obviously different. This difference may easily lead to new conflicts during conflict resolution.

Another very interesting point that needs to be noted resulted from behaviours B5.1A1 to B5.1A5. The South African project managers strongly disagreed with those statements. Therefore, those variables are the last five in the results for the South African respondents; however, Chinese respondents showed a scattered distribution of ratings of these behaviours and activities.

Level 2: The effects of conflict-solving behaviour on PM activities

In this section, the average value of each rated conflict-solving behaviour was calculated to represent conflict-solving AveBAx:

AveB5Ax = (B5.1Ax +B5.2Ax+B5.3Ax+B4.4Ax)/4

The reliability tests showed that B could be represented by calculating the mean of measurements B5.1, B5.2, B3.3 and B5.4 for the various activities. The results for the two surveyed groups are listed in Table 7.29 and Table 7.30.

Table 7.29: Survey results of Chinese respondents on Level 2 of B5

Chinese	N	Minimum	Maximum	Mean	Std. deviation
AVE_B5A1	75	0	5	2.9433	1.28503
AVE_B5A3	75	0	5	2.7900	1.39802
AVE_B5A2	75	0	5	2.2400	1.36402
AVE_B5A5	75	0	5	2.1233	1.60677
AVE_B5A4	75	0	5	1.4367	1.31075

Table 7.30: Survey results of South African respondents on Level 2 of B5

South African	N	Minimum	Maximum	Mean	Std. deviation
aveB5A1	63	0	5	1.8929	1.32646
aveB5A3	63	0	5	1.7897	1.35466
aveB5A5	63	0	5	1.7381	1.51433
aveB5A2	63	0	5	1.6190	1.36404
aveB5A4	63	0	5	1.3810	1.33566

Note: the reliability test has proven that B5 can be represented by sub-behaviours.

The results show that both groups rated B5A1 and B5A4 on the second level in the first place and the last place, respectively. The means of these two variables are obviously different. It indicates the dissimilarity of cultural behaviour in B5: the effects of conflict-solving on the five identified project activities. We can conclude that the ratings of the five behaviours by South African respondents are all much lower than those of the Chinese respondents. This indicates that, from an overall point of view, there is a big difference in conflict-solving behaviour for the five project management activities.

Level 3: Group comparative analysis of conflict-resolving behaviour by Chinese and South African project managers

In this section, the independent sample's t- test was employed to compare the group means from the results of the data analysis of Level 2.

There are two groups: South African project managers (denoted as group 0) and Chinese project managers (Group 1). The purpose of this test is to determine if there are differences between the ways in which the two groups rate the impacts of each behaviour on the five project activities. A significant level of 0.05 is selected (95% confidence that the difference is not a chance difference)

Table 7.31: Survey results of Chinese and South African respondents on Level 3 of B5

	South African/ Chinese	N	Mean	Std. deviation	Sig/No (level 0.05)
Average of B5A1	South African	63	1.8929	1.32646	**Sig**
	Chinese	75	2.9433	1.28503	
Average of B5A2	South African	63	1.6190	1.36404	**Sig**
	Chinese	75	2.2400	1.36402	
Average of B5A3	South African	63	1.7897	1.35466	**Sig**
	Chinese	75	2.7900	1.39802	
Average of B5A4	South African	63	1.3810	1.33566	**No**
	Chinese	75	1.4367	1.31075	
Average of B5A5	South African	63	1.7381	1.51433	**No**
	Chinese	75	2.1233	1.60677	

The big difference in means noted previously in Table 7.29 and Table 7.30 resulted from three variables (B5A1, B5A2 and B5A3) being significantly different, as indicated in Table 7.30. This result proved the observation in the analysis of results at Level 2 for conflict-solving behaviour. South African project managers' perceptions are distinct from those of Chinese project managers in terms of project communication, project negotiation and project conflict resolution activities for conflict-solving behaviour. This situation may cause new conflicts when someone wants to solve the conflicts in the abovementioned project activities of such an international team.

7.2.7 Data analysis of Behaviours and PM activities

To further examine the relationship between culture behaviours (B1 to B5) and PM activities, Spearman's rho correlation is chosen as the statistical technique for the initial exploratory correlation analysis. The variable *cultural behaviour* is seen as how strongly the respondent behaves under the specified cultural behaviour. It is measured in this study by counting the number of 'yes' for each sub-behaviour under a main behaviour in a specific project activity in the questionnaire to indicate 'the level of existence of sub-behaviours'. When a respondent acknowledges the existence of *all* sub-behaviours (by ticking 'yes' in the questionnaire) under a specific main behaviour, he/she is strongly behaving in that specific main behaviour. If the respondent does not acknowledge the existence of one or more sub-behaviours, then the level of existence of sub-behaviours is lower and the respondent can be seen as less strongly acknowledging the specific main behaviour to the fullest extent. The other variable, PM activities, are measured by calculating the average score that the respondents rate in the questionnaire. This average score shows the level of impact of a specific behaviour on a specific PM activity. Spearman's rho is used to initially explore whether there is a statistical significant relationship between the two variables. The correlation coefficients are reported in Table 7.32. All the coefficients in the table are statistically significant ($p<0.001$) and positive. Moreover, all coefficients are larger than 0.7 indicating strong correlations. This means that there is a significant and strong positive relationship between behaviours and PM activities; however it is

realised that causality cannot be inferred from this test but will be explored in future research outside the scope of this thesis.

Table 7.32: correlation coefficients for the relationship between cultural behaviours and PM activities

	A1: *Project communication*	A2: *Project negotiation*	A3: *Project conflict resolution*	A4: *Project contract process*	A5: *Project team building*
B1: *Philosophy of surviving*	0.784	0.881	0.778	0.861	0.872
B2: *Face / Image*	0.790	0.823	0.812	0.914	0.855
B3: *Personal relationship*	0.732	0.823	0.823	0.858	0.825
B4: *Communication*	0.890	0.955	0.947	0.964	0.956
B5: *Conflict- solving*	0.854	0.917	0.877	0.957	0.937

7.3 Data analysis of additional survey

Twenty South African and twenty Chinese project managers were selected to participate in an additional survey. The participants were asked to rate the five cultural behaviours identified previously against each project management process (PMBOK 2008), using a Likert scale in order to discover the cultural behaviours' impact on project management processes. The respondents were also requested to rate the proposed mitigating solutions to overcome the cultural differences. If there was no agreement with the proposed mitigating solution, “0” should be selected, otherwise a choice of 1 to 5 was used to indicate the opinion on the relevant questions.

7.3.1 The demographics of the participants

Figure 7.7: Age distribution of participants

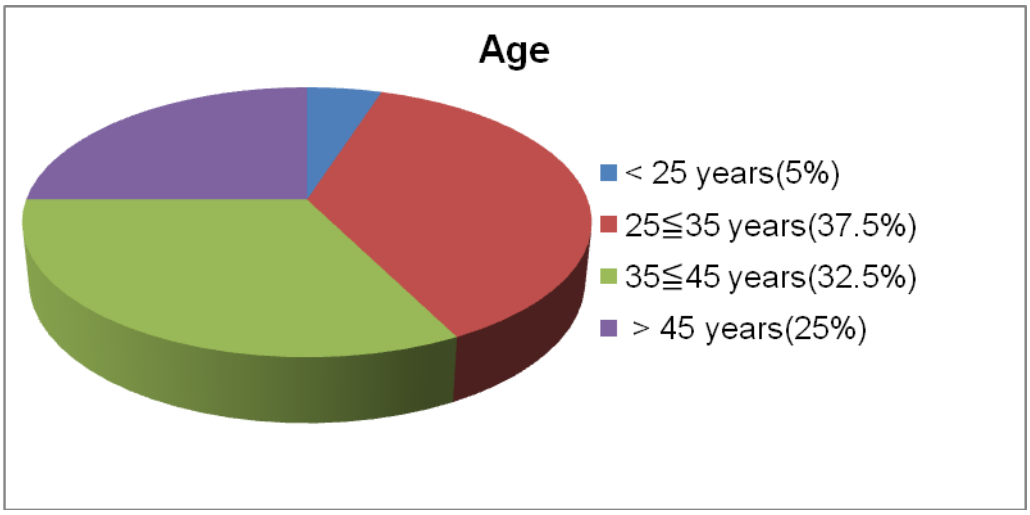
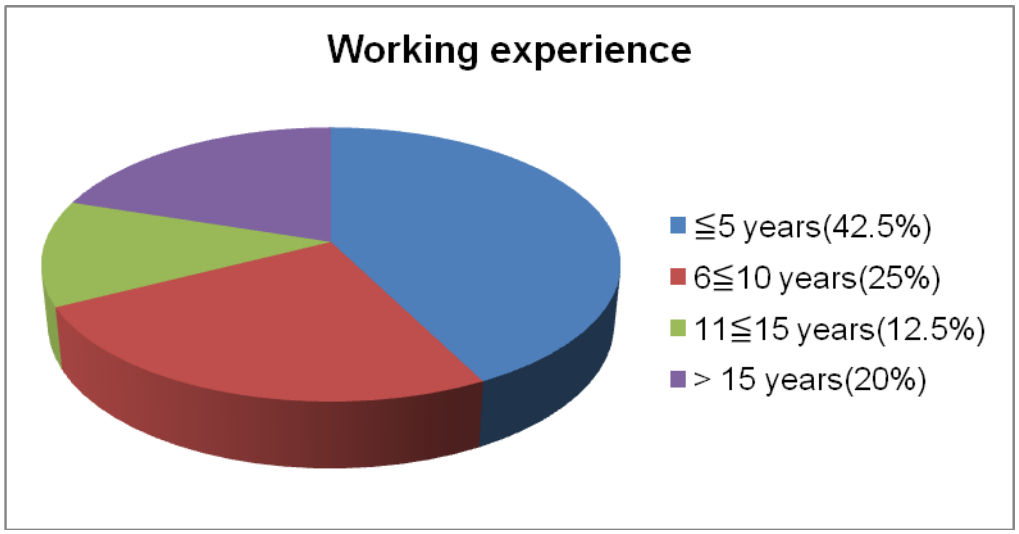


Figure 7.8: Working experience distribution of participants



7.3.2 Discussion of additional survey results

Figures 7.6 and 7.7 show that most participants (95%) are older than 25 years, and 25% of participants are more than 45 years old. Of the participants, 58.5% have six and more years of working experience, and 42.5% of participants have less than five years of working experience. The results show that the project managers from both countries have enough social and working experience, which is good for the survey. 7.3.2 Discussion of additional survey results

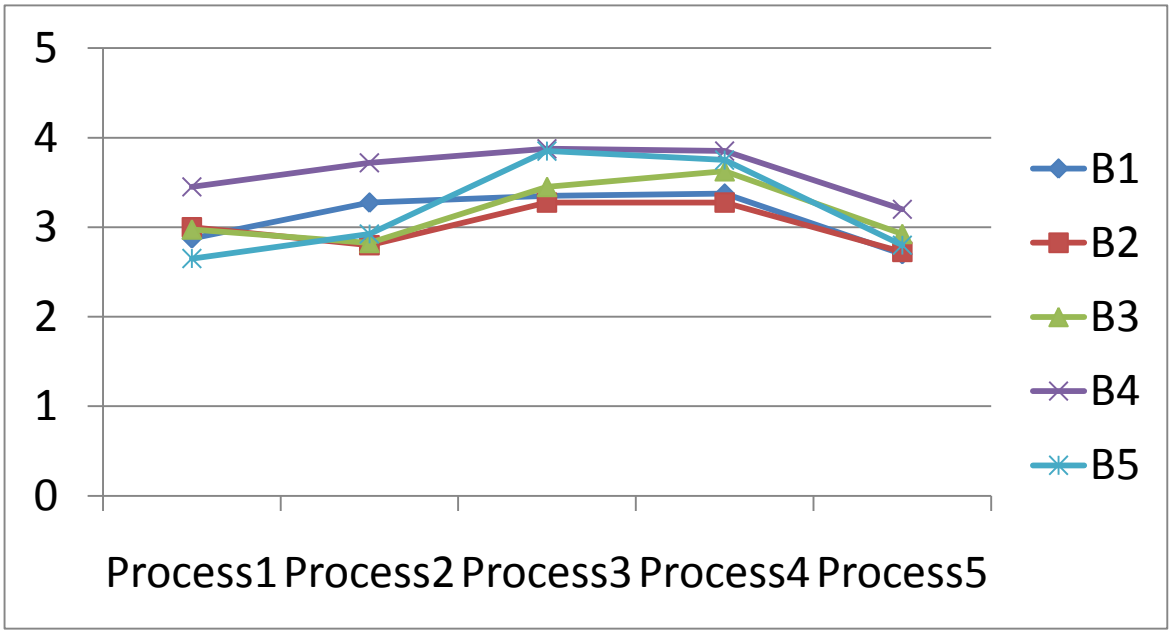
Table 7.33: Statistical results of additional survey

Behaviours		Process 1	Process 2	Process 3	Process 4	Process5
B1	Mean	2.8750	3.2750	3.3500	3.3750	2.7000
	SD	1.20229	0.96044	0.97534	1.05460	1.20256
B2	Mean	3.0000	2.8000	3.2750	3.2750	2.7250
	SD	1.06217	0.91147	0.75064	0.96044	1.01242
B3	Mean	2.9750	2.8250	3.4500	3.6250	2.9250
	SD	1.25038	0.95776	1.10824	1.03000	1.14102
B4	Mean	3.4500	3.7250	3.8750	3.8500	3.2000
	SD	0.93233	0.96044	1.04237	0.97534	0.88289
B5	Mean	2.6500	2.9250	3.8500	3.7500	2.8000
	SD	1.18862	0.97106	1.05125	1.05612	0.93918

Table 7.33 clearly shows that the participants agreed that cultural behaviours B1 to B5 do affect project management processes, because most scores are above 3.00 and the standard deviation is relatively low. The agreement can be confirmed. The influence of identified cultural behaviours on project management processes fluctuates as the projects progress. Project managers

from both countries gave scores above 3.00 on B4 in all project management processes. This shows that the participants agreed that B4 has more effect on project management processes than B1, B2 and B3.

Figure 7.9: Effect of cultural behaviours (B1-B5) in the five project management processes



The results of the additional survey (Figure 7.8) clearly show that cultural behaviours have differing effects in the project management processes in the life-cycle of a project. The cultural influence fluctuates with different project management processes. According to Figure 7.8, the influence of cultural behaviours in Process 3 and Process 4 seems to be stronger than in other processes. The results also show that the cultural behaviours have a relatively large influence in all project management processes because the Likert values are usually above 3. Furthermore, the curve for communication behaviour (B4) is very close to 4.

Some notable conclusions can be drawn from the additional survey.

- The curve of B4 is above that for other cultural behaviours in all project management processes. This indicates that communication behaviour has a greater effect than other behaviours in all project management processes because the curve of communication behaviour is very close to 4. This is a very high value in the survey. Consequently, communication behaviour is a very critical factor in project management (Gido & Clements, 2009).

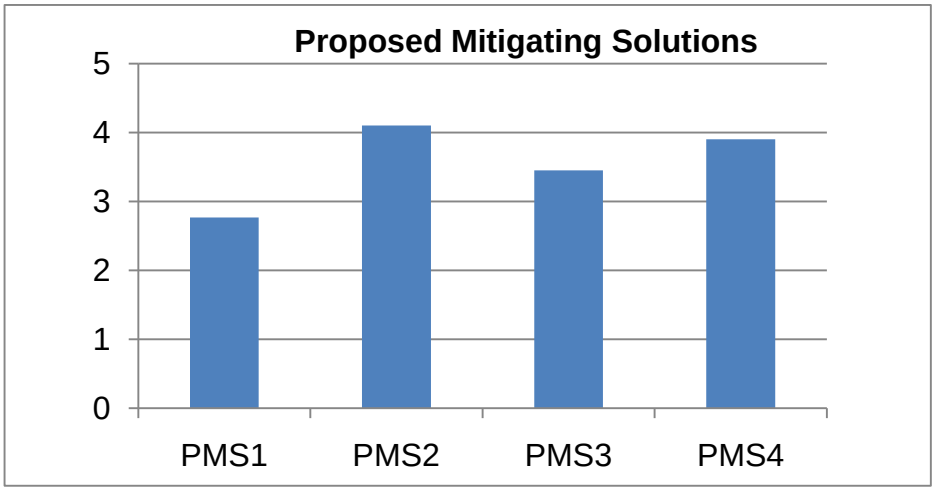
- The curve of B1 has a similar shape to that of B4, but the curve of B1 is below that of B4 (See Figure 7.8).This means that the average value of B1 is lower than B4, and therefore the degree of influence of cultural behaviour B1 is also lower than B4 for most project management processes.

  The B2, B3 and B5 behaviour groups follow a similar “S” shape across all project management processes. B5 is a special member of this group. It has a very low value in Process 1 and very high value in Process 3 and Process 4. This illustrates that there is less conflict in Process 1 than in Process3 and Process 4.

Table 7.34: Likert value results for confirmation of proposed mitigating solutions

Mitigating solutions	Percentage of disagreement	Percentage of agreement	Means and SD
Use intermediaries	5.00%	95.00%	Mean:2.7692 SD: 1.37538
Learn host country culture	2.50%	97.50%	Mean:4.1 SD :1.17233
Create organisation culture	2.50%	97.50%	Mean:3.45 SD :1.25983
Embrace different cultures	2.50%	97.50%	Mean:3.9 SD :1.29694

Figure 7.10: Statistical results for confirmation of proposed mitigating solutions



Another purpose of the additional survey was to discover whether or not the project managers agreed with the proposed mitigating solution (in section 5.7). The four proposed mitigating solutions were evaluated by 40 project managers

(20 from China and 20 from South Africa). The project managers were asked to indicate their disagreement or agreement (using a six -point Likert scale) on the workability of the proposed mitigating solutions (PMS). The results show high mean values and each with a low standard deviation, which indicates a normal distribution for each variable. The results in Figure 7.9 present a strong agreement on 4 proposed mitigating solutions (PMS). This means that the four proposed mitigating solutions may be a workable method to overcome cultural differences in project management practice. In future, project managers who are involved in leading an international project team should benefit from these results.

In order to explore the relationship between the mitigating solutions and its impact on culture differences, this study uses Spearman's rho correlation as the statistical technique. It is however realised that causality cannot be inferred from this test but will be explored in future research outside the scope of this thesis The variable, mitigating solution, is measured by counting the number of 'yes' which is seen as the degree that the respondents use these solutions. If a respondent acknowledges the use of all four mitigating solutions (by ticking 'yes' to all the questions in the questionnaire), then the degree of using mitigating solution is the highest (i.e. number of 'yes' = 4). On the other hand, if the respondent acknowledges only a few mitigating solutions, then the degree is low. The other variable, impacts on cultural differences, is measured by taking the average score of the impact of the mitigating solutions on cultural differences. After analysing the data gathered in this additional survey, the correlation coefficient is 0.867 which is statistically significant (at level

p<0.001). This result shows that there is a significant and positive relationship between mitigating solutions and impact on cultural differences.

7.4 Conclusions

In Chapter 7, the SPSS statistical analysis software was employed in the data analysis. Each cultural behaviour and project activity combination was analysed on three levels (sub-behaviours level, behaviours level and group level). From sub-behaviour level to group level, the differences and similarities were discussed. The additional survey was also discussed in this chapter. From the results, some primary conclusions could be drawn: Also conclude on the correlation tests.

Conclusion 1: The results clearly show that cultural differences affect cultural behaviours, which influence project activities. Risks could be identified due to the differences in personal behaviours because of different cultural backgrounds. The relationship between cultural difference and project success has been established.

Conclusion 2: The effect of cultural behaviours on the project activities of Chinese and South African project managers has been explored. The two groups have similar cultural behaviours in some project activities and differ in others. For example, the results show that both of them have high risk avoidance behaviours and do not easily trust their team members in the beginning. Chinese and South African respondents agree that the “face and image” are not important during the project contract process. However, South African project managers strongly disagree on communication behaviour

(B4.1A3) that obtained a very favourable rating from Chinese project managers. They also disagree on conflict solving during international engineering project team building activities.

Conclusion 3: The impact of five cultural behaviours during project management processes has been researched. The results illustrate that cultural behaviours definitely have effect on project management processes . This also illustrated that project management theory is not a universal tool, but culturally sensitive, as mentioned by Chen and Partington (2004) and Muriithi and Crawford (2003).

Conclusion 4: The proposed mitigating solutions to overcome cultural differences have been accepted by the respondents. The findings should benefit project managers who are involved in project with international engineering project teams. The proposed mitigating solutions should contribute to a reduction of risk and conflict due to their effect on the impact on cultural differences. More detailed conclusions are presented in Chapter 8.

Chapter 8: Conclusions, limitations and recommendations for future research

8.1 Introduction

The conclusions on the identified research themes and gaps will be presented in this chapter and a revised conceptual model resulting from the exploratory literature study and empirical research results discussed in previous sections will be presented. The limitations of this study will be addressed and recommendations for the further research will be made. Some novel contributions to international project performance will be presented.

8.2 Conclusions

Working in an international team is always a challenge for a project manager. Culture is a critical factor in the international project management context. The international business environment is risky and more complicated than domestic environment (Ozorhon, Arditi, Dikmen & Brigonul, 2007). This research has indicated a statistically significant difference in five cultural behaviours in five identified project management activities between South African and Chinese project managers in the engineering and construction environment. The results show that certain cultural behaviours definitely have an influence on project management activities and are therefore important to consider for project success in an international context. Project managers

usually try to adhere to certain project management theories in the international environment. However, the cultural behaviours are an influential factor that can affect the project management activities spontaneously. We cannot ignore its existence and merely copy the project management theories and methodologies of other countries. The results of this study reveal that the significant difference in cultural behaviours between the surveyed two groups may lead to difficulties and barriers to a successful project in an international engineering project management environment.

Detailed conclusions to achieve the research objectives are shown in the sections that follow.

Conclusion 1 to Research Objective 1: Identify typical Chinese behaviours and establish how Chinese behaviours affect project management activities.

The Chinese culture has a strong influence on people's minds. Chinese project managers are not excluded from this. From the empirical research results, it is evident that the Chinese culture influences Chinese project managers' behaviours in various respects. These influences further affect project activities. Some Chinese project managers' characteristics are summarised as follows:

B1. Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves to avoid being involved in conflicts or fights (Zeng, 2003; Li, 2004)

The philosophy of surviving in the Chinese culture results in Chinese project managers not easily trusting their team members or counterparts. They would like to establish trust with team members or counterparts after a series of tests/trials. From this point of view, Chinese project managers show high risk avoidance during project management activities. It is not workable with Chinese project managers to establish trust only by project communication.

Even in the project contract process activity, the philosophy of surviving still plays an important role. This is very different from South African project managers.

Although Chinese project managers overall indicate high risk avoidance, they do not protect themselves too much and dare to take risks in project negotiation. It can be concluded from this result that Chinese project managers usually are hard negotiators.

B2. "Face/image" is important to the Chinese as it represents prestige, respect, dignity and social status (Ji, 2000; leung and Chan, 2003, Yao, 2007)

During project communication, and project conflict resolution, Chinese project managers think the "face/image" is important. On the one hand, they do not want to lose "face/image" in these project activities, but on the other hand they try to save others' "face/image" and do not make counterparts lose "face/image". Therefore, it would be beneficial to South African project

managers involved in project management activities with Chinese counterparts to recognise the “face/image” perception of Chinese project managers.

However, Chinese project managers like to use direct communication and do not consider their “face/image” or that of their counterparts during the project contract process. The “face/image” issue is not very important in the project contract process.

B3. Personal relationships: Guanxi – is critical for getting favours and conducting business successfully (Davies, Leung, Luk & Wong, 1995; Arias, 1998; Xin & Pearce, 1996; Yeung & Tung, 1996; Tsang, 1998; Buckley, Clegg & Tan, 2006; Chen in Chen & Ma, 2001; Pheng & Leong, 2000)

Developing personal relationships (Guanxi) is important to Chinese project managers. They place emphasis on developing personal relationships in their daily jobs and believe that good relationships can easily bring about business favours. Chinese project managers also think that project team building is a good medium for developing personal relationships. Consequently, one should not ignore any casual contact with a Chinese project manager because it may be an opportunity to establish a good personal relationship.

Chinese project managers believe that reciprocity is the basis for establishing good personal relationships. They will even adhere to this policy in project communication and negotiation. However, South African project managers disagree strongly with them on this issue.

B4. Communication – the purpose is to maintaining satisfactory harmony (Zeng, 2003, 2005, 2007; Chen & Ma, 2001; Ma,1996)

The communication behaviour of Chinese project managers has a remarkable characteristic. They like using appropriateness instead of revealing the truth in project communication and project conflict resolution. The results further show that Chinese project managers normally do not deliver all the information in project communication. The reason for that is that Chinese project managers want to maintain a harmonious atmosphere.

However, Chinese project managers believe that they should deliver all the information and tell the truth when communicating in the project contract process.

B5. Conflict-solving: Hua Jie – softening, smoothing, compromising and aligning instead of direct solving to uphold harmonious relationships (Zeng, 2003; Chen in Chen & Ma, 2001; Leung, Koch & Lu, 2002; Hwang,1997/8; Kirkbride,Tang & Westwood,1991)

Chinese project managers respect people who are older and have a higher status in conflict solving. Therefore it is advisable to have an old person with a high status as a backup when solving conflicts with Chinese project managers.

From the research results it is evident that Chinese project managers do not want to lose “face/image” or let their counterparts lose it when solving project

conflicts. Therefore they like using an indirect way of saying “no” and believe personal trust and mutual interests are critical factors in solving project conflict.

Conclusion 2 to research objectives 2 and 3: Do a comparative study of Chinese and South African project managers to identify the risks arising from cultural differences and attempt to improve project team performance dynamics through a by systematic analysis of risks emanating from cultural differences.

A comparative empirical survey was conducted to research the differences between the two groups. The results show that Chinese and South African project managers have differences regarding some behaviours and thus affect project activities differently, which can produce potential risks. There are also some similarities between the two groups. The analysis is mainly focused on differences that cause the risks to occur. A detailed analysis is shown in the following sections.

B1. Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves to avoid being involved in conflicts or fights (Zeng, 2003; Li, 2004)

Overall, the results show that Chinese and South African project managers do not differ significantly on the effect of the philosophy of surviving on the five identified project activities. Both groups are avoid high risk by nature. Both have an intention to protect themselves in project management activities. Therefore there is only a small possibility of risks stemming from cultural

behaviour B1 (Philosophy of surviving). There is a little difference during project communication and project conflict resolution, because South African project managers are perhaps more aggressive in terms of benefits in these project activities than Chinese project managers. The results of the survey show that South African project managers have rated the statement of not striving for wealth and fame much lower than their Chinese counterparts.

B2. "Face/image" is important to Chinese as it represents prestige, respect, dignity and social status (Ji, 2000; leung & Chan, 2003; Yao, 2007)

The survey results indicate that there is no significant difference in B2 A4 and B2A5 between the two groups and there are significant differences on B2A1, B2A2 and B2A3. Therefore, the main risks are from these latter aspects. Chinese project managers consider "face/image" as a very important factor during project communication, negotiation and conflict resolution because "face/image" represents prestige, respect, dignity and social status. The different conceptions of "face/image" during those project activities will create potential risks, such as misunderstanding each other, unsatisfactory negotiation results and new conflicts during project conflict resolution. The root of those potential risks is that South African project managers treat "face/image" as less important than Chinese project managers during project activities A1, A2 and A3. For example, Chinese project managers believe that directly commenting on or rejecting the opinions of others will result in losing "face/image". South African project managers do not agree.

B3. Personal relationships: Guanxi – is critical for getting favours and conducting business successfully (Davies, Leung, Luk & Wong, 1995; Arias, 1998; Xin & Pearce, 1996; Yeung & Tung, 1996; Tsang, 1998; Buckley, Clegg & Tan, 2006; Chen in Chen & Ma, 2001; Pheng & Leong, 2000)

The results indicate that South African and Chinese project managers agree that developing personal relationships during project communication and team building is an important job of a competitive project manager.

South African project managers believe that B3.6 has little influence on the five project activities; however, Chinese project managers believe that B3.6 does have an influence on project activities. This is an obvious difference in this section. The results of the group test show that there is a significant difference between the two groups on B3A1. It means that South African and Chinese project managers have different points of view on the statement that “personal relationships are critical for getting favours and conducting business successfully during the project communication activity”. Chinese participants rated it very highly. It seems that Chinese project managers would like to use personal relationships to get favours, but South African project managers do not really believe that personal relationships are a critical factor for obtaining favours. The difference of in the perception of personal relationships (Guanxi) could cause agreement and conflicts in project communication activity.

B4. Communication – the purpose is maintaining satisfactory harmony (Zeng, 2003, 2005,2007; Chen & Ma, 2001; Ma,1996)

There is a significant difference in communication behaviour in project activities A1 (project communication), A2 (project negotiation) A3 (project conflict resolution) at group level. The main cause of these differences is that South African project managers strongly disagree with Chinese project managers on communication behaviours B4.1 and B4.3. Chinese project managers would like to use appropriateness rather than revealing the truth, and partly deliver information by using vague language to protect themselves during project communication. This popular Chinese communication method has a great effect on project activities (A1, A2 and A3). However, South African project managers seem to be confused about it. Therefore, risks could occur in project communication, negotiation and conflict resolution. The potential risks can be summarised as follows:

- Misunderstandings
- Not delivering correct and complete information
- Confusing each other
- Negotiations disrupted with an unhappy ending
- Conflicts cannot be solved because of misunderstanding in the team due to cultural behaviours

Therefore, the performance of an international project team can be greatly reduced because different cultural behaviours affect project management activities differently, which results in inappropriate actions.

B5. Conflict-solving: Hua Jie – softening, smoothing, compromising and aligning instead of direct solving to uphold harmonious relationships (Zeng, 2003; Chen in Chen & Ma, 2001; Leung, Koch & Lu, 2002; Hwang,1997/8; Kirkbride,Tang & Westwood,1991)

The survey results also show that the influence of cultural behaviour B5 (conflict resolution) on A1, A2 and A3 is significantly different between the two groups. Chinese and South African project managers have different approaches to solving conflict in project communication, negotiation and conflict resolution. For example, Chinese project managers have a tendency to use power and authority to solve conflicts during project team building, whereas South African project managers may like to use personal trust and mutual interest to avoid conflict. Another example is that Chinese participants prefer using an indirect way of conflict resolution by giving evasive answers or saying "no" in a subtle and non-verbal way. The South African participants clearly disagree with this approach.

Conflict resolution is critical to international team dynamics. The cultural differences cause different actions in conflict resolution in projects that will definitely act as barrier to team performance. The main risk is that new conflicts will arise during project activities (A1, A2 and A3).

Conclusion 3 to Research Objective 3: Research relevant knowledge related to cultural differences, project success and international project management.

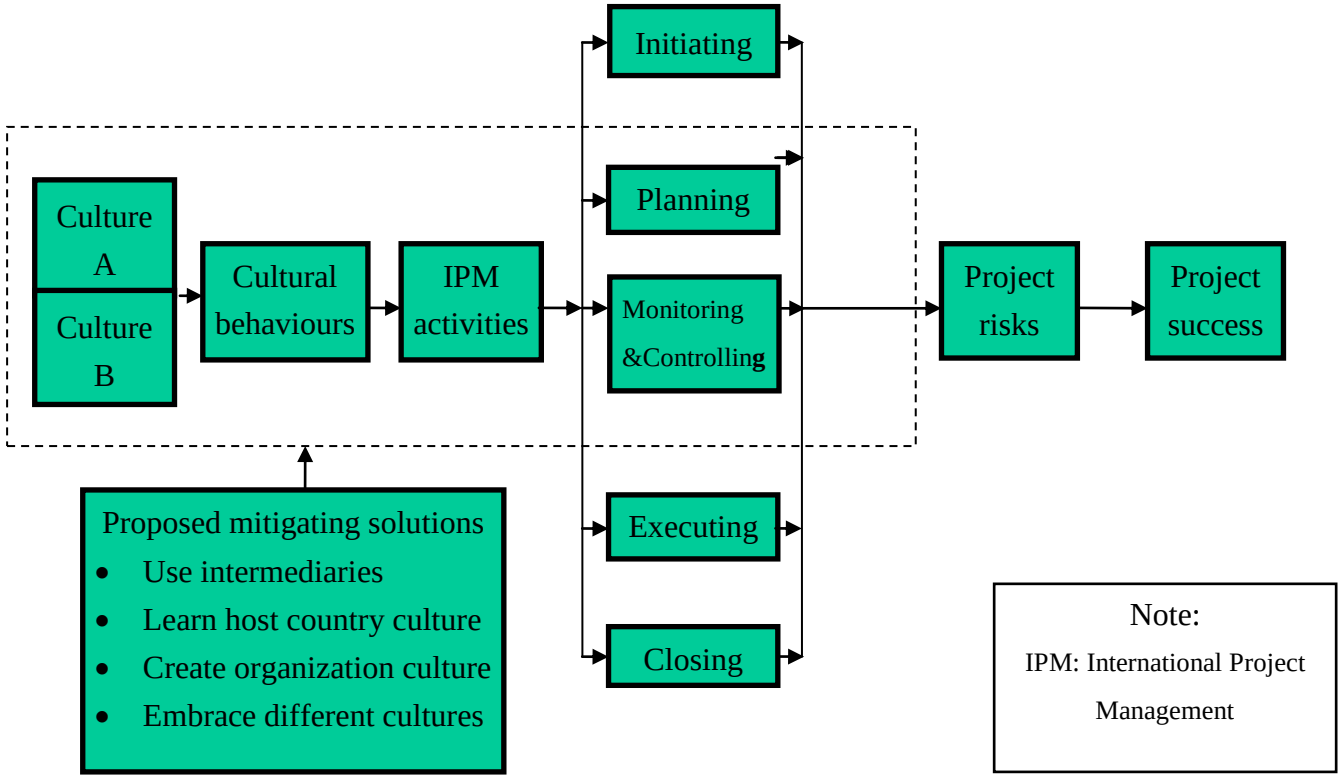
This objective was achieved from Chapter 1 to Chapter 4. Key concepts that are relevant to international project management and cultural difference were assessed. The constraints of international projects were reviewed. Furthermore, project success and project success measurement were studied. The literature review showed that there is not enough research that links the culture issue with project management (Shore & Cross, 2005). A systematic framework for effectively studying the management of cultural differences in international project management needs to be developed.

Conclusion 4 to Research Objective 4: Find out how international project managers overcome these constraint factors in practice.

Four proposed mitigating solutions were identified in a literature review and were proved by the results of an additional survey. The participants strongly agreed with the proposed mitigating solutions and the standard deviation on response values is relatively low. This indicates that the proposed mitigating solutions are useful and effective according to the experience of participants.

Conclusion 5 to Research Objective 5: Develop a systematic framework for modeling, analysis and management of cultural differences in international projects.

Figure 8.1: A model for managing cultural behaviours in project management



Because of the diversity of the global village, it will become more and more important for project management practitioners and academics to know how to control and mitigate the negative effects of cultural differences. The model for cultural differences in cultural behaviours presented in Figure 8.1 as a result of the research results may be useful in mitigating risks in international projects. The model was devised and revised on the basis of the survey results. This study has used several statistical techniques to empirically examine the model proposed. The cultural behaviours impacting on project activities between Chinese and South African project managers are explored by using independent samples t-test. In addition, the strength of the relationships between cultural behaviours and project activities is explored using Spearman's rho correlations. The relationships between mitigating solutions and cultural differences are also examined using the same correlation technique. It is however realised that causality cannot be inferred from this test but will be explored in future research outside the scope of this thesis The other parts of the model, project risk and project success, are explored by using deductive reasoning from literature studies. Some of its attributes can be summarised as follows:

- The model simply illustrates the conceptual relationships between cultural differences and project management. The model bridges the gap between cultural differences and project management. Cultural differences do not affect international project management directly, but rather cause conflicting cultural behaviours. These cultural behaviours then affect project activities and the negative effect on project activities further reduces the performance of the international project team.

- The model systematically demonstrates that cultural differences impact project activities as well as project management processes. Cultural differences influence every project management process of a project lifecycle. The survey results show that the more activities a project management process includes, the stronger the effect of cultural differences.

- The proposed mitigating solutions have been confirmed by the respondents to be an effective way to overcome the negative effects of cultural differences. The proposed mitigating solutions will have an influence on the process of cultural difference, affecting each project management process.

- The model also illustrates that risks would resulting from cultural differences The risks can be mitigated by using the four proposed mitigating solutions indicated in Figure 8.1 in order to reduce the effect of culture differences. The proposed mitigating solutions that have been approved by the participants are not necessarily the only solutions. Other useful mitigating solutions may be found by means of further research.

The model can only partly describe the reality. There are always terms and conditions that apply. The limitations of this research will also be addressed in Section 8.4.

8.3 Contributions of the research

The research established a linkage between cultural differences and international project management, which had not previously been thoroughly researched according to the literature review. The study also established some novel characteristics of behaviours of Chinese project managers as well as the cultural difference between groups of the two countries' project managers through a comparative survey. The results indicate that the cultural behaviours definitely affect project activities on different levels. There are some significant differences between Chinese project managers and South African project managers relating to cultural behaviours in different project activities. For example, Chinese project managers seem to prefer indirect communication in project communication, project negotiation and project conflict resolution. However South African project managers seem disagree with this. They prefer direct communication more than indirect communication. These findings also contribute to cross-cultural research and risk management in international

project management. This study confirms and reinforces the results of previous researchers such as Chen and Partington (2004), Muriithi and Crawford (2003) and Bony (2010) for other cultural contexts. All those researchers' results led to the conclusion that project management theory is not a universal tool, but is culturally sensitive.

The results of this study contain useful managerial implications for improving international project team dynamics and performance. For example, Chinese project managers have a tendency to use power and authority to solve conflicts during project team building, whereas South African project managers may like to use personal trust and mutual interest to avoid conflict in project team building. Some obstacles that reduce international project team performance have been summarised and solutions have been proposed. The research also identified the effect of the cultural behaviours in each project management process. This result is useful for managing cultural differences from a project lifecycle perspective. The proposed risk mitigating solutions promoted in this research will also benefit current and future project managers who are involved or will be involved in an international project team.

8.4 Some limitations of the study and recommendations for future research

The main limitation of this research is the limited number of participants in the survey because of a lack of access to resources and a lack of time and funding. Another factor that could affect the results is the diversity of the South African culture which makes the standard deviation of results for the South African group somewhat higher than for the Chinese group. Future studies may consider the influence of this factor on the results.

The questionnaire was developed from a Chinese perspective. It may be useful to subject both groups to a questionnaire developed from a South African cultural perspective to determine the influence of cultural bias on questionnaire design. Furthermore, when studying the relationships between

cultural behaviours and project management, researchers should examine the different segments in a nation. This is another area for future research.

The Spearman's rho correlation used in this study is to establish useful correlations between cultural behaviours and project activities. It is realised that causality cannot be inferred from this test but can be explored in future research outside the scope of this thesis. Multi-variate regression can also be done for future research.

Lastly, this study Includes project risk and project success in the model based from deductive reasoning but they are not empirically examined for the Chinese South African cultural context. For future research, these two variables can be empirically examined in the model.

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APPENDIX 1:

QUESTIONNAIRE

Dear participant
You have been selected to participate in this doctoral survey due to your experience and expertise in project management. Please complete the questionnaire below. Your valuable contributions to this research are highly appreciated. Anonymity will be maintained.

Section A: Contact information (optional)

Name of respondent	_____
Name of company	_____
Telephone number	_____
E-mail	_____

Section B: General information (please tick, not optional)

Gender	□ Male	□ Female		
Age	□ < 25 years	□ 25≦35 years	□ 35≦45 years	□ > 45 years
Working experience in project management	□ ≦5 years	□ 6≦10 years	□ 11≦15 years	□ > 15 years

Section C: Project descriptions
Please provide a description of the projects in which you were personally involved by answering the following questions:

C.1 Project style	*Please tick all applicable options or answer where appropriate*

What kinds of projects have you been involved in? □ domestic □ international

Please tick the styles of the projects you have been involved in:

□ PPP (public-private partnerships)
□ DBOT (design-build-operate-transfer)
□ DBOM (design-build-operate-maintain)
□ TKY (turnkey)
□ DBB (design-bid-build)
□ Super-TKY (super-turnkey)
□ DBO (design-build-operate)
□ BOT (build-operate-transfer)
□ BOOT (build-own-operate-transfer)
□ DBIO (design-build-improve-operate)
□ DB (design-build)
□ Other (please specify) _____

C.2 Location	*Please tick all applicable options*
Where were the projects located?	□ European and North American cultural area □ African cultural area □ South American cultural area □ Arabic cultural area □ Chinese (Eastern) cultural area
C. 3 Project size	*Please tick only one option*
What was the average cost of the projects?	□ ≦1M USD dollars □ 1M ≦3M USD dollars □ > 3M USD dollars
C.4 Project duration	*Please tick only one option*
What was the average duration of the projects?	□ ≦1 year □ ＜ 1 ≦3 year □ >3year
C. 5 Project team	*Please tick all applicable options*
How was the project team usually organised?	□ All the team members and staff from the same home country □ Members and staff from different countries with different cultural backgrounds

Section D: Personal behaviours and project management activities

Do the following behaviours occur during your project management activities? (Yes or No). If yes, please indicate the extent of the behaviour in each activity.

Important note: Please note that even though the questions are designed based on Chinese cultural behaviours, your views as a non-Chinese respondent are applicable to this comparative research to show whether or not your behaviours also follow these trends.

B1. Philosophy of surviving: Ming Zhe Bao Shen – wise people should be skilled at protecting themselves to avoid being involved in conflicts or flights

Behaviours	**Project management activities**	**Yes or No**	**If yes, please rate** very little 1 2 3 4 5 very much
B1.1 As a manager, you keep track of your team members to avoid being cheated/undermined by them one day	F1: Communication	□Yes □ No	□ □ □ □ □
	F2: Negotiation	□Yes □ No	□ □ □ □ □
	F3: Conflict resolution	□Yes □ No	□ □ □ □ □
	F4: Contract process	□Yes □ No	□ □ □ □ □
	F5: Project team building	□Yes □ No	□ □ □ □ □
B1.2 As a team member, you always protect yourself first when doing a job, to avoid risks	F1: Communication	□Yes □ No	**1 2 3 4 5** □ □ □ □ □
	F2: Negotiation	□Yes □ No	□ □ □ □ □
	F3: Conflict resolution	□Yes □ No	□ □ □ □ □
	F4: Contract process	□Yes □ No	□ □ □ □ □
	F5: Project team building	□Yes □ No	□ □ □ □ □
B1.3 Trust can only be established after a series of tests/trials from small events	F1: Communication	□Yes □ No	**1 2 3 4 5** □ □ □ □ □
	F2: Negotiation	□Yes □ No	□ □ □ □ □
	F3: Conflict resolution	□Yes □ No	□ □ □ □ □
	F4: Contract process	□Yes □ No	□ □ □ □ □
	F5: Project team building	□Yes □ No	□ □ □ □ □

B1.4 Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame)	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B1.5 Life is much more important than Ming Li (wealth and fame) and one does not strive for Ming Li (wealth and fame)	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B2. "Face/image" is important to the Chinese, as it represents prestige, respect, dignity and social status								
B2.1 You comment directly on or reject others' opinions to make them lose face	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B2.2 Saving others' face to maintain harmonious Guanxi (personal relationships)	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B2.3 "Face/image" is more important than profits in some cases	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B2.4 Strive for your own "face/image" to be recognised and save others' face at the same time	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B3. Personal relationships: Guanxi – is critical for getting favours and conducting business successfully								
B3.1 Developing Guanxi (personal relationships) is an important job for a manager	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □

B3.2 Guanxi (personal relationships) is a resource of sustainable competitive advantage	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B3.3 Prefer business partners with good Guanxi (personal relationships)	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B3.5 Establishing trust and saving "face/image" are the foundations for establishing good Guanxi (personal relationships)	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B3.6 The ability to build good Guanxi (personal relationships) is a critical criterion for a competitive manager	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B3.8 Reciprocity determines whether Guanxi (personal relationships) can be established successfully	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B4. Communication – the purpose is to maintaining satisfactory harmony									
B4.2 Communicating appropriately is more important than telling the truth	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B4.3 Announcing decisions during meetings while discussion should be held upfront and privately	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □
B4.4 Not delivering all the information by using vague language to protect yourself (Hua Liu San Fen)	F1: Communication F2: Negotiation F3: Conflict resolution F4: Contract process F5: Project team building	□Yes □Yes □Yes □Yes □Yes	□ No □ No □ No □ No □ No	**1** □ □ □ □ □	**2** □ □ □ □ □	**3** □ □ □ □ □	**4** □ □ □ □ □	**5** □ □ □ □ □

B5. Conflict resolution: Hua Jie – softening, smoothing, compromising and aligning instead of direct solving to maintain harmony									
B5.3 Indirect way of conflict-solving by giving evasive answers or saying "no" in a subtle and non-verbal way (Bu Shang He Qi)				**1**	**2**	**3**	**4**	**5**
	F1: Communication	□Yes	□ No	□	□	□	□	□
	F2: Negotiation	□Yes	□ No	□	□	□	□	□
	F3: Conflict resolution	□Yes	□ No	□	□	□	□	□
	F4: Contract process	□Yes	□ No	□	□	□	□	□
	F5: Project team building	□Yes	□ No	□	□	□	□	□
B5.4 Not causing others to lose "face/image" in the conflict-solving process (Liu Mianzi)				**1**	**2**	**3**	**4**	**5**
	F1: Communication	□Yes	□ No	□	□	□	□	□
	F2: Negotiation	□Yes	□ No	□	□	□	□	□
	F3: Conflict resolution	□Yes	□ No	□	□	□	□	□
	F4: Contract process	□Yes	□ No	□	□	□	□	□
	F5: Project team building	□Yes	□ No	□	□	□	□	□
B5.5 Believe that personal trust and mutual interests are important to avoid conflicts				**1**	**2**	**3**	**4**	**5**
	F1: Communication	□Yes	□ No	□	□	□	□	□
	F2: Negotiation	□Yes	□ No	□	□	□	□	□
	F3: Conflict resolution	□Yes	□ No	□	□	□	□	□
	F4: Contract process	□Yes	□ No	□	□	□	□	□
	F5: Project team building	□Yes	□ No	□	□	□	□	□
B5.6 Respect people who are older and have a higher status during conflict-solving in order to maintain Guanxi (personal relationships)				**1**	**2**	**3**	**4**	**5**
	F1: Communication	□Yes	□ No	□	□	□	□	□
	F2: Negotiation	□Yes	□ No	□	□	□	□	□
	F3: Conflict resolution	□Yes	□ No	□	□	□	□	□
	F4: Contract process	□Yes	□ No	□	□	□	□	□
	F5: Project team building	□Yes	□ No	□	□	□	□	□

APPENDIX 2:

QUESTIONNAIRE

Dear participant
You have been selected to participate in this doctoral survey due to your experience and expertise in project management. Please complete the questionnaire below. Your valuable contributions to this research are highly appreciated. Anonymity will be maintained.

Section A: Contact information (optional)

Name of respondent	_____
Name of company	_____
Telephone number	_____
E-mail	_____

Section B: General information (please tick, not optional)

Gender	□ Male	□ Female		
Age	□ < 25 years	□ 25≦35 years	□ 35≦45 years	□ > 45 years
Working experience in project management	□ ≦5 years	□ 6≦10 years	□11≦15 years	□ > 15 years

Section C: Project descriptions
Please provide a description of the projects in which you have been personally involved by answering the following questions:

C.1 Project style	*Please tick all applicable options or answer where appropriate*

What kinds of projects have you been involved in? □ domestic □ international

Please tick the styles of the projects you have been involved in:

□ PPP (public-private partnerships) □ DBOT (design-build-operate-transfer) □ DBOM (design-build-operate-maintain) □ TKY (turnkey) □ DBB (design-bid-build) □ Super-TKY (super-turnkey)	□ DBO (design-build-operate) □ BOT (bulid-operate-transfer) □ BOOT (build-own-operate-transfer) □ DBIO (design-build-improve-operate) □ DB (design-build) □ Other (please specify) _____

C.2 Location	*Please tick all applicable options*
Where were the projects located?	□ European and North American cultural area □ African cultural area □ South American cultural area □ Arabic cultural area □ Chinese (Eastern) cultural area

C. 3 Project size	*Please tick only one option*
What was the average cost of the projects?	□ ≦1M USD dollars □ 1M ≦3M USD dollars □ > 3M USD dollars
C.4 Project duration	*Please tick only one option*
What was the average duration of the projects?	□ ≦1 year □ ＜ 1 ≦3 year □ > 3years
C. 5 Project team	*Please tick all applicable options*
How was the project team usually organised?	□ All the team members and staff from the same home country □ Members and staff from different countries with different cultural backgrounds

Section D: Personal behaviours and project management activities

There will be five cultural behaviours (philosophy of surviving, "face/image", personal relationships (Guanxi), communication and conflict resolution) vs. each project management process. Please choose 1 (very little) to 5 (very much) to indicate the effects of each behaviour on each project management process.

Behaviours	**Project management activities**	**If yes, Please rate** **Very little**				**Very much**
		1	**2**	**3**	**4**	**5**
B1: Philosophy of surviving: effect on project management process	P1: Initiating	□	□	□	□	□
	P2: Planning	□	□	□	□	□
	P3: Executing	□	□	□	□	□
	P4: Monitoring and controlling	□	□	□	□	□
	P5: Closing	□	□	□	□	□
		1	**2**	**3**	**4**	**5**
B2: "Face/image": effect on project management process	P1: Initiating	□	□	□	□	□
	P2: Planning	□	□	□	□	□
	P3: Executing	□	□	□	□	□
	P4: Monitoring and controlling	□	□	□	□	□
	P5: Closing	□	□	□	□	□
		1	**2**	**3**	**4**	**5**
B3: Personal relationships (Guanxi): effect on project management process	P1: Initiating	□	□	□	□	□
	P2: Planning	□	□	□	□	□
	P3: Executing	□	□	□	□	□
	P4: Monitoring and controlling	□	□	□	□	□
	P5: Closing	□	□	□	□	□
		1	**2**	**3**	**4**	**5**
B4: Communication: effect on project management process	P1: Initiating	□	□	□	□	□
	P2: Planning	□	□	□	□	□
	P3: Executing	□	□	□	□	□
	P4: Monitoring and controlling	□	□	□	□	□
	P5: Closing	□	□	□	□	□
		1	**2**	**3**	**4**	**5**
B5: Conflct resolution: effect on project management process	P1: Initiating	□	□	□	□	□
	P2: Planning	□	□	□	□	□
	P3: Executing	□	□	□	□	□
	P4: Monitoring and controlling	□	□	□	□	□
	P5: Closing	□	□	□	□	□

SECTION E: Possible solutions to overcome cultural differences						
Four possible solutions to overcome cultural differences in project management have been identified. if you do not agree, please choose 0 (do not agree). If you agree, please choose 1 (very little) to 5 (very much).						
1. Use intermediaries: person usually bridges gap between different cultures.	**0**	**1**	**2**	**3**	**4**	**5**
	□	□	□	□	□	□
2. Learn host country's culture: project managers should spend effort and time on understanding the host country's culture to reduce risks related to cultural differences.	**0**	**1**	**2**	**3**	**4**	**5**
	□	□	□	□	□	□
3. Create an organisational culture: create a common value or culture of the company to which every member can subscribe.	**0**	**1**	**2**	**3**	**4**	**5**
	□	□	□	□	□	□
4. Embrace different cultures: keep an open mind and do not simply judge right or wrong according to one's own culture.	**0**	**1**	**2**	**3**	**4**	**5**
	□	□	□	□	□	□