



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tsa Dihlolefi

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

by

DONGDONG JIANG

Submitted in partial fulfilment of the requirements for the degree

**Philosophiae Doctor
(Project Management)**

in the
Faculty of Engineering, Built Environment and Information Technology
University of Pretoria
Pretoria

2011

© University of Pretoria

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.

Dongdong Jiang

Summary

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

by

Dongdong Jiang

Supervisor: Prof Leon Pretorius

Department: Department of Engineering and Technology Management
UNIVERSITY OF PRETORIA

Degree: PhD

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.

Acknowledgements

I would like to thank the following individuals for their support during the completion of this work:

At the University of Pretoria, Prof Leon Pretorius for his guidance and wisdom during the four years of my PhD study. His valuable comments on the journal articles and conference papers were highly appreciated. Also to Prof Koster and Prof Steyn for their supervision and guidance during my first two years of study. I would also like to convey my appreciation to Prof Wang, Prof Ding and Prof Qian, respectively at the Tsinghua University, Shandong University and Northwestern Polytechnical University, for academic support for my research survey in China.

Additional assistance was provided by the Graduate School of Technology Management staff. I would like to thank Helen Kriek for ensuring access to my supervisor and her assistance during the survey process, Mariette Stirk and Chantelle Janse van Rensburg for making all the conference travelling arrangements, and Marlene Mulder for providing PhD guidelines and processes.

My heartfelt thanks go to all my dear family members in China and South Africa who have provided me with moral support, and to my wife for her continuous support in my daily life.

I am also grateful to the University of Pretoria who awarded me a bursary for this PhD study.

Table of Contents

PART 1: BACKGROUND AND CONTEXT	1
Chapter 1: Problems in managing international projects – contextualising the research	1
1.1 Rationale for the research	1
1.2 Some problems in managing international projects	4
1.2.1 Problems encountered in international project management	5
1.2.1.1 Cultural differences	5
1.2.1.2 Political factors	6
1.2.1.3 Legal factors	6
1.2.1.4 Economic factors	7
1.3 Description of research problems	7
1.4 Research objectives	8
1.5 The contributions of this research	9
1.6 A brief introduction to the research methodology	10
1.7 The structure of the thesis	11
Chapter 2: Assessment of key concepts that are relevant to international project management	13
2.1 Introduction	13
2.2 Assessment of key concepts	13
2.2.1 Dimensions of a project	13
2.2.2 The differences between projects and products	14
2.2.3 Brief review of project management	15
2.2.4 The body of project management knowledge and standard	17
2.2.5 Evaluation of an international project	21
2.2.6 Foreign business environment	21
2.2.7 The characteristics of an international project management team ...	22
2.2.8 Project success review	24
2.3 Critical project success factors review	27
2.4 Project success measurement review	39
2.4.1 Introduction	39
2.4.2 The definition of project success criteria	39
2.4.3 The measures of project success	40
2.4.4 The findings from the literature review	51
2.5 Summary	53

PART 2: THE DEVELOPMENT OF THE CONCEPTUAL MODEL.....	55
Chapter 3: Literature review on international project management.....	55
3.1 Introduction	55
3.2 A brief research review on constraint factors in international project management.....	55
3.3 Cultural difference in international project management.....	59
3.3.1 Assessment of the concept of culture.....	59
3.3.2 Effects of cultural differences on international project management.....	68
3.4 Conclusions.....	74
Chapter 4: Review of gaps in previous research on international projects	75
4.1 Introduction	75
4.2 Some conclusions from the literature review.....	75
4.3 Summary.....	78
Chapter 5: Conceptual model for international project management	79
5.1 Introduction	79
5.2 The identification of typical Chinese behaviours.....	79
5.3 The key activities affected by cultural differences in an international project management process	87
5.4 Project management processes.....	90
5.5 The proposed solutions for overcoming cultural differences in international project management.....	90
5.6 A proposed conceptual model for managing cultural difference in international project management.....	92
5.7 Conclusions	94
PART 3: DATA ANALYSIS AND RESULTS	95
Chapter 6: Research methodology design	95
6.1 Introduction	95
6.2 The questionnaire design.....	96
6.3 The survey process	99
6.4 Conclusions.....	109
Chapter 7: Data analysis and discussion of results	111
7.1 Introduction to data analysis	111
7.2 Data analysis and results	114
7.2.1 Demographics of participants	114
7.2.2 Data analysis of B1 vs PM activities (A1 to A5).....	118
7.2.3 Data analysis of B2 vs PM activities (A1 to A5).....	124
7.2.4 Data analysis of B3 vs PM activities (A1 to A5).....	132

7.2.5	Data analysis of B4 vs PM activities (A1 to A5)	140
7.2.6	Data analysis of B5 vs PM activities (A1 to A5)	147
7.2.7	Data analysis of Behaviours and PM activities.....	155
7.3	Data analysis of additional survey	156
7.3.1	The demographics of the participants.....	157
7.3.2	Discussion of additional survey results	158
7.4	Conclusions	163
Chapter 8: Conclusions, limitations and recommendations for future		
	research	165
8.1	Introduction	165
8.2	Conclusions.....	165
8.3	Contributions of the research	178
8.4	Some limitations of the study and recommendations for future research	179
REFERENCES		181
APPENDIX 1:		193
QUESTIONNAIRE		193
APPENDIX 2:		198
QUESTIONNAIRE		198

List of Tables

Table 2.1: Overview of project management knowledge areas and project management processes	189
Table 2.2: IPMA competence baseline.....	20
Table 2.3: Eight most important factors—regression vs. neural network.....	33
Table 2.4: The success factors for international development projects.....	38
Table 2.5: Four project success dimensions	47
Table 2.6: Criteria used for judging project success	48
Table 3.1 Integrated framework of the dimensions of national culture.....	65
Table 5.1: Apparent dimensional differences between Chinese and Western culture.....	80
Table 6.1: Typical Chinese behaviours	96
Table 6.2: The five identified project management activities.....	98
Table 6.3: Revised Chinese behaviours.....	100
Table 6.4: Variables generalised from B1	102
Table 6.5: Variables generalised from B2	103
Table 6.6: Variables generalised from B3	104
Table 6.7: Variables generalised from B4.....	105
Table 6.8: Variables generalised from B5	106
Table 7.1: Demographics of participants	115
Table 7.2: Identified variables in B1	118
Table 7.3: Survey results of Chinese respondents on Level 1 of B1	119
Table 7.4: Survey results of South African respondents on Level 1 of B1.....	120
Table 7.5: Survey results of Chinese respondents on Level 2 of B1.....	122
Table 7.6: Survey results of South African respondents on Level 2 of B1.....	122
Table 7.7: Survey results of Chinese and South African respondents on Level 3 of B1	124
Table 7.8: Identified variables in survey of B2.....	125
Table 7.9: Survey results of Chinese respondents on Level 1 of B2.....	126
Table 7.10: Survey results of South African respondents on Level 1 of B2.....	127
Table 7.11: Survey results of Chinese respondents on Level 2 of B2	129
Table 7.12: Survey results of South African respondents on Level 2 of B2.....	129
Table 7.13: Survey results of Chinese and South African respondents on Level 3 of B2	131

Table 7.14:	Identified variables in the survey of B3	132
Table 7.15:	Survey results of Chinese respondents on Level 1 of B3	134
Table 7.16:	Survey results of South African respondents on Level 1 of B3.....	135
Table 7.17:	Survey results of Chinese respondents on Level 2 of B3	137
Table 7.18:	Survey results of South African respondents on Level 2 of B3.....	137
Table 7.19:	Survey results of Chinese and South African respondents on Level 3 of B3	139
Table 7.20:	Identified variables in B4	140
Table 7.21:	Surveyed results of Chinese respondents on Level 1 of B4	141
Table 7.22:	Surveyed results of South African respondents on Level 1 of B4.....	142
Table 7.23:	Survey results of Chinese respondents on Level 2 of B4	144
Table 7.24:	Survey results of South African respondents on Level 2 of B4.....	144
Table 7.25:	Survey results of Chinese and South African respondents on Level 3 of B4	146
Table 7.26:	Identified variables in B5	148
Table 7.27:	Survey results of Chinese respondents on Level 1 of B5	149
Table 7.28:	Survey results of South African respondents on Level 1 of B5.....	150
Table 7.29:	Survey results of Chinese respondents on Level 2 of B5	152
Table 7.30:	Survey results of South African respondents on Level 2 of B5.....	152
Table 7.31:	Survey results of Chinese and South African respondents on Level 3 of B5	154
Table 7.32:	Correlation coefficients for the relationship between cultural behaviours and PM activities	156
Table 7.33:	Statistical results of additional survey.....	158
Table 7.34:	Likert value results for confirmation of proposed mitigating solutions	161

List of Figures

Figure 2.1: The critical success factors across the project life cycle.....	28
Figure 2.2: The new framework of success factors.....	30
Figure 2.3: The project excellence model	37
Figure 2.4: Project success framework.....	42
Figure 2.5: Macro viewpoint of project success	45
Figure 2.6: Micro viewpoint of project success	45
Figure 2.7: The consolidated framework for measuring project success	49
Figure 2.8: KPIs for construction project success	49
Figure 3.1: Environmental factors affecting international projects.....	57
Figure 3.2: Group of generalised national cultural characteristics	60
Figure 3.3: Culture shock cycle.....	66
Figure 4.1: Levels of research in construction management conducted across boundaries	76
Figure 5.1: Theoretical model of behaviour theory in social psychology.....	81
Figure 5.2: The conceptual model for managing cultural differences.....	93
Figure 6.1: Research and survey process	109
Figure 7.1: The data analysis level	112
Figure 7.2: Age distribution of Chinese participants.....	115
Figure 7.3: Age distribution of South African participants	116
Figure 7.4: Working experience distribution of Chinese participants	116
Figure 7.5: Working experience distribution of South African participants	117
Figure 7.6: Project style distribution of participants.....	117
Figure 7.7: Age distribution of participants.....	157
Figure 7.8: Working experience distribution of participants.....	157
Figure 7.9: Effect of cultural behaviours (B1-B5) in the five project management processes	159
Figure 7.10: Statistical results for confirmation of proposed mitigating solutions	161
Figure 8.1: A model for managing cultural behaviours in project management	176

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