

Identification and Evaluation of the Key Attributes of Project Management Culture

**(An Investigation into the Work-Related Values and Beliefs
of Project Management Professionals)**

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DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other institution, and to the best of my knowledge, contains no material previously published or written by another person, except where reference is made in the text of the thesis.

Signed:

Date:

23/4/2002

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ABSTRACT

According to relevant theories of professions, a profession creates and maintains its relatively unique work culture that can be minimally defined as a set of work-related values and beliefs shared by members of the profession. Professional culture plays an important role in determining people's work behaviours at the workplace. Project management (PM), as a newly-emerged profession, is assumed to have its own professional culture, ie., a PM culture. The purpose of this study was to identify and evaluate the key dimensions of the PM culture.

This study conducted a mail survey, using a specially-developed questionnaire titled the *Project Management Culture Survey*, of 790 AIPM (Australian Institute of Project Management) members with the membership grades of Member and Fellow. By exploratory and confirmatory factor analyses, four dimensions of the PM culture emerged and were confirmed. They were: (1) *Professional Commitment* (PC) – PM professionals' commitment to the PM profession; (2) *Project Team Integration* (PTI) – PM professionals' beliefs about project team integration for successful project management; (3) *Work Flexibility* (WF) – PM professionals' beliefs about work flexibility as an effective work means in project management; and (4) *Work Performance* (WP) – PM professionals' beliefs about viewing project team members in terms of what they do for the project instead of whom they are in ascription. Further, for each of the dimensions, two or three theoretically-identifiable sub-dimensions were confirmed by confirmatory factor analyses. Based on these dimensions and sub-dimensions, a full structural model of PM culture was successfully established. This model was valid from both the technical perspective of factor analyses and the theoretical perspective of relevant theories of actions, project management, and professions. In the full model, the PM culture construct had significant ($p < 0.01$, two-tailed) and positive effects on each of the dimensions, demonstrating that PM professionals should be committed to the PM profession and oriented towards project team integration, work flexibility, and work performance.

Based on the findings from factor analyses, PM professionals' current values and beliefs around the dimensions and sub-dimensions were then evaluated by calculating factor scores and using descriptive and inferential statistics. In general, PM professionals were committed to the PM profession and oriented towards project team integration and work performance. But their current beliefs about work flexibility neither supported nor rejected the "expected" beliefs revealed in the full model of PM culture. The current values and beliefs were discussed to reveal some potential for the improvement of the PM profession.

This study contributed a valid structural model of PM culture to the theory (the human side) of project management, which should aid the further professionalism of project management and the understanding of PM professionals' work behaviours. This study also provided empirical evidence to support the point of view in the theories of professions about the existence of professional culture. Furthermore, it showed a valid method for the exploration and measurement of professional culture which could be used for similar studies of other professions.

LIST OF ABBREVIATIONS

- ADF: **Asymptotically Distribution Free.** The estimation method used in the confirmatory factor analyses of this research
- AGFI: **Adjusted Goodness-of-Fit Index.** One of goodness-of-fit measures used in confirmatory factor analyses to evaluate model-data fit.
- AIPM: **Australian Institute of Project Management.** Australia-based professional association of project management.
- APM: **Association for Project Management.** UK-based professional association of project management.
- CFA: **Confirmatory Factor Analysis.** A statistical technique used to test the researcher's expectations of the model of PM culture.
- CMIN/DF: **Normed Chi-Square.** One of goodness-of-fit measures used in confirmatory factor analyses to evaluate model-data fit.
- CTI: **Consciousness of Team Identity.** One of the sub-dimensions of PM culture (Under the dimension *Project Team Integration*).
- EFA: **Exploratory Factor Analysis.** A statistical technique used to explore the key dimensions of PM culture.
- ESA: **Ethics, Standards and Accreditation.** The title of a report produced by the Project Management Institute in 1988.
- GA: **General Attitude towards working in leisure.** An error factor identified in the CFA model of sub-factors structure of *Professional Commitment*.
- GFI: **Goodness-of-Fit Index.** One of goodness-of-fit measures used in confirmatory factor analyses to evaluate model-data fit.
- ICB: **IPMA Competence Baseline.** A professional standard of project management issued by IPMA.
- IDP: **Identification with the PM profession.** One of the sub-dimensions of PM culture (Under the dimension *Professional Commitment*). It was renamed into *PM Career Pursuit* (PCP) during the process of model re-specification.
- IFP: **InFormal Process.** One of the sub-dimensions of PM culture (Under the dimension *Project Team Integration*).
- IPMA: **International Project Management Association.** UK-based professional organisation of project management (inter-national-association).
- JDC: **Job De-Codification.** One of the sub-dimensions of PM culture (Under the dimension *Work Flexibility*).
- KBI: **Knowledge-Based Influence.** One of the sub-dimensions of PM culture (Under the dimension *Project Team Integration*).
- LTP: **Leisure Time for PM.** One of the sub-dimensions of PM culture (Under the dimension *Professional Commitment*).
- NCSPM: **National Competency Standards for Project Management.** A professional standard of project management issued by AIPM.

NFI:	Normed Fit Index. One of goodness-of-fit measures used in confirmatory factor analyses to evaluate model-data fit.
OC:	Organisational Commitment. A concept about PM professionals' commitment to employing organisations, with which their <i>Professional Commitment</i> was compared.
OCP:	Organisational Career Pursuit. A concept about PM professionals' career pursuit in employing organisations, with which their <i>PM Career Pursuit</i> was compared.
ORG:	Organisational Reference Group. A concept about PM professionals' use of members in employing organisations as a reference group, with which their <i>PM Reference Group</i> was compared.
PC:	Professional Commitment. One of the dimensions of PM culture.
PCP:	PM Career Pursuit. One of the sub-dimensions of PM culture (Under the dimension <i>Professional Commitment</i>).
PM:	Project Management. The name of the management discipline (and profession) that deals with completing a multi-disciplinary one-off undertaking to maximally meet stakeholders' expectations.
PMBOK:	Project Management Body Of Knowledge. The professional body of knowledge of project management.
PMI:	Project Management Institute. United-States-based professional association of project management.
PMP®:	Project Management Professional®. The name of the project management certification program of PMI.
PRG:	Project Reference Group. One of the sub-dimensions of PM culture (Under the dimension <i>Professional Commitment</i>).
PSR:	PerSonal Relationships. One of the sub-dimensions of PM culture (Under the dimension <i>Work Performance</i>).
PTI:	Project Team Integration. One of the dimensions of PM culture.
RMSEA:	Root Mean Square Error of Approximation. One of goodness-of-fit measures used in confirmatory factor analyses to evaluate model-data fit.
RMSR:	Root Mean Square Residual. One of goodness-of-fit measures used in confirmatory factor analyses to evaluate model-data fit.
TLI:	Tucker-Lewis Index. One of goodness-of-fit measures used in confirmatory factor analyses to evaluate model-data fit.
WF:	Work Flexibility. One of the dimensions of PM culture.
WKA:	Work Autonomy. One of the sub-dimensions of PM culture (Under the dimension <i>Work Flexibility</i>).
WP:	Work Performance. One of the dimensions of PM culture.
WPI:	Work Performance Itself. One of the sub-dimensions of PM culture (Under the dimension <i>Work Performance</i>).

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Chapter 1

Introduction

Chapter 1 provides an introduction to this thesis. It discusses the research background, research objectives, and significance of the research. It also presents an overview of the research methodology and an outline of the organisation of this thesis. This chapter includes the following major sections:

- 1.1 Research Background
- 1.2 Research Objectives
- 1.3 Significance of the Research
- 1.4 Summary of Research Methodology
- 1.5 Outline of the Thesis

1.1 RESEARCH BACKGROUND

Project management (PM) is a field of study with ancient roots. *The Art of War* by Sun Tzu (approximately 500 B.C.) could be regarded as the first text focusing on a structured approach to project management (Toney and Powers, 1997). However, it is between the 1930s and 1950s when modern project management emerged (Morris, 1994). Since then, project management¹ has evolved to meet the challenges of big, complex, and multi-disciplinary projects and to solve the problems inherent in the traditional way of bureaucratic management which uses vertically hierarchical and horizontally functional structures to divide an organisation into many “small operational islands” (Kerzner, 1995: 4). The core task of project management is to integrate these islands toward project goals.

Since its emergence, project management has reached a level of maturity that has earned it a place in the theory and practice of contemporary management (Cleland, 1990), and it has demonstrated most of the essential characteristics of a profession (Adams, 1994). Recently, project management has become one of the fastest growing professions in the world (AIPM, 2001). The professionalism of project management was and is still supported by its professional associations, such as, the *Project Management Institute* (PMI) in the United States of America, the *International Project Management Association* (IPMA) in the United Kingdom, and the *Australian Institute of Project Management* (AIPM) in Australia. As a newly-emerged profession, project management is attracting interest and participation from a great number of people. For example, PMI (2001) estimated that about 4 million people (about 1.5% of the population) in the USA and 15 million people in the world might view project management as a profession of choice. The memberships of PM professional associations have recently grown by leaps and bounds. For example, PMI’s membership grew at an average of around 8% per annum from 1985 through 1993, and at 33% from 1994 through 1999 (Crawford, 2000); AIPM’s membership grew at 6% per annum from 1985 through 1993 and 25% from 1994 through 1999 (Crawford,

¹ From now on, *project management* or its abbreviation *PM* is used to refer only to *modern project management*.

2000). The PM profession is now represented by many things, such as, PM professional associations, PM body of knowledge and relevant skills, PM education and certification programs, PM codes of ethics, PM seminars and conferences, PM books and professional journals/magazines, PM experts/practitioners, specialised companies and departments, and PM softwares and other tools.

In Australia, the PM profession has developed rapidly since the *Project Managers Forum* (PMF) was established in Sydney in 1976 and the first tertiary project management course was established in the *South Australia Institute of Technology* in 1979 (AIPM, 1999). The growth of PMF created a demand in 1987 to turn it into the professional institute named the *Australian Institute of Project Management* (AIPM). As the only association dedicated to project management in Australia, AIPM is now internationally recognised as one of the leading PM associations, particularly for its competency standards and membership-ranking system. In universities throughout Australia, project management has become a common course at the postgraduate level. In 2001, the RMIT University even started to offer a world-first professional doctorate degree in project management, ie., *Doctor of Project Management*.

Traditionally, project management was defined as

... the application of a collection of tools and techniques (such as the CPM and matrix organization) to direct the use of diverse resources toward the accomplishment of a unique, complex, one-time task within time, cost and quality constraints (Olsen, 1981: 19; original 1971).

However, it is now recognised as much more than these traditional aspects. Project management is both a science and an art, involving both technical and social aspects (Knutson, 1996). The technical aspect involves a set of technical tools for planning and control. Viewed from this perspective, project management is to plan, monitor and track tasks' start and end dates, the hours of commitment of human and non-human resources, and the dollars allocated to the tasks.

The social aspect involves intangible, behavioural matters of the PM discipline reflected as a special way of thinking and behaving. It has become more and more important through the past decades. Viewed from this aspect, project management, as a management discipline and a unique profession, is recognised as a special management

philosophy and a set of values, beliefs and behavioural patterns needed for successfully completing a project (Cleland, 1999; Cleland, 1982; Gupta and Taube, 1985; Zwart, 1986; Firth and Krut, 1991; Hobbs and Menard, 1993), that can be referred to as a *project management culture* (PM culture). According to Cleland (1982: 181),

Taken in its cultural context, project management is a complex whole that includes knowledge, belief, skills, attitudes, and other capabilities and habits acquired by people who are members of some project society.

This statement of Cleland is actually the application into the PM area of a widely-cited definition of culture made by Tylor (1871) (for the definition, see Chapter 2, p. 16). So it can be regarded as a general definition of PM culture.

The existence of PM culture in the PM profession is consistent with relevant theories of professions. Similar to the fact that organisations develop *organisational cultures*, occupations/professions² create and sustain relatively unique work cultures referred to as *occupational/professional cultures* (Sherman, 1999; Bloor and Dawson, 1994; Trice, 1993; Osigweh, 1986; Van Maanen and Barley, 1984). A professional culture binds members of a profession to form a professional community, ensures the continuance of the profession as a group collectivity, and guides the members to think and behave as the profession requires. Studies of professional (occupational) culture are important to explain behavioural variability at the workplace (Van Maanen and Barley, 1984). If project management is a profession, it, too, must have its professional culture, ie., a PM culture. Studies of PM culture will help understand the social aspect of project management and PM professionals' work behaviours in performing project management tasks.

² In this thesis, the word “*occupation(al)*” can be read as “*profession(al)*” as needed in the context, but not necessarily vice versa.

1.2 RESEARCH OBJECTIVES

Assuming that members of the PM profession (hereafter called *PM professionals*) had, across organisational and industrial boundaries, a commonly held set of work-related values and beliefs that constituted the core of the PM culture, the purpose of this study was to *identify the key dimensions of the PM culture and to investigate and evaluate PM professionals' current work-related values and beliefs around these dimensions.*

In particular, the aims of this study were:

- To investigate the work-related values and beliefs of selected PM professionals at a *profession-wide* level across organisational and industrial boundaries;
- On the basis of the investigation, to identify the key dimensions and establish a model of PM culture; and
- On the basis of the model and the investigation, to analyse and evaluate PM professionals' current work-related values and beliefs around the dimensions of PM culture.

The research questions relevant to the research objectives were:

- Could the PM culture be described by a model consisting of several discrete dimensions on the basis of PM professionals' answers to written questions about work-related values and beliefs? It was expected that it could.
- What dimensions would empirically emerge? It was expected that the emerged dimensions would be in general consistent with the themes covered in the theoretical framework and the common values and beliefs discussed in the PM literature.
- What were PM professionals' current values and beliefs around the to-be-identified dimensions of PM culture? It was expected that most of them would be consistent with the "expected" values and beliefs revealed in the model of PM culture, but the examination of them would also reveal potential for improvement to the PM profession.

1.3 SIGNIFICANCE OF THE RESEARCH

As discussed before, project management has become a management philosophy, a set of values and beliefs, and a way of thinking and behaving, not just a set of technical tools. Although the PM literature has to some degree discussed this soft aspect of project management and recognised the existence of the PM culture within the community of PM professionals, it does not provide any systematic and empirical survey research in this area. There also exist two other obvious weaknesses in the previous discussions of PM culture: (1) The discussions lack any explicit theoretical framework and their procedures for listing some values and beliefs as *the dimensions of PM culture* are purely subjective, lacking any prior criteria for inclusion or exclusion of some dimensions and how to name and group them; and (2) most of the discussions regard PM culture as a culture within an *organisational* context instead of at a *profession-wide* level, neglecting the fact that the PM profession exists across organisational and industrial boundaries. Therefore, to address these weaknesses in the literature, it is necessary to study PM culture at a profession-wide level, using a sound theoretical framework and empirical data. This research would contribute new knowledge and empirical evidence to the soft aspect of project management.

This research's identification and evaluation of the key dimensions of PM culture would also be of value to the PM profession in, at least, the following aspects:

- To aid further professionalism of project management. According to relevant theories of professions, the existence of a unique professional culture is one of the criteria for measuring the degree of an occupation's professionalism (Osigweh, 1986; Lansbury, 1978; Montagna, 1977; Turner and Hodge, 1970; Harries-Jenkins, 1970; and Greenwood, 1962). The successful identification of the key dimensions of PM culture would convince people that PM has formed its professional culture. This would, together with other professionalism criteria, strengthen the position of project management as a unique profession and a management discipline.

- To aid a better understanding of PM professionals. The revealed cultural pattern of PM professionals would provide both insiders and outsiders of the PM profession with a clearer description of the ways in which PM professionals think and behave. This could improve insiders' self-image as PM professionals, enhance outsiders' recognition of the insiders as PM professionals, and increase the effectiveness and efficiency of the interaction in doing business between PM professionals and other management people.
- To enrich PM educational and training programmes. The concept and model of PM culture could be used to make the traditional technology-focused PM education more behavioural. The enriched education/training would help to internalise some core values and beliefs of project management into students and trainees so that they would not only be well prepared in technical aspects but also in a cultural aspect to join the PM profession.
- To help the development of the PM community. Being aware that they share a common set of PM values and beliefs, PM professionals would be able to identify themselves with one another and in turn to develop a true sense of their PM professional community which is beyond the boundaries of their employing organisations, industries and even countries.

In addition to its contributions to the PM literature and the PM profession, this research would contribute to the theory of professions some empirical evidence about the existence of professional culture and also demonstrate a new way of exploring such a culture at a profession-wide level. The literature abounds with discussions of professional culture but does not provide any specific guide about how to investigate and measure it. The results of this research were expected to show that a PM culture existed in the PM profession, and the process by which this research established the model of PM culture would provide a useful prototype to explore the professional cultures of other professions.

Furthermore, this research would contribute an empirical study guided by a sound theoretical framework to the literature of organisational behaviour. For various

reasons, the literature provides only a very limited number of studies in cultures of professions, compared with a huge number of arguments about the necessity of studying professional culture for the purpose of understanding people's behavioural variability in organisations. This demonstrates a limitation of the current literature of organisational behaviour.

1.4 SUMMARY OF RESEARCH METHODOLOGY

This research was a quantitative survey study of the PM culture of the PM profession. A theoretical framework for measuring PM culture was developed from (1) Parsons and Shils' (1951) *pattern variable scheme*, which was claimed to be a system to determine people's actions and (2) PM values and beliefs discussed in the PM literature, such as teamwork, horizontal management, flexibility, temporary relationships, a results orientation, etc.

Within the theoretical framework, five research variables were established to constitute a system determining PM professionals' behaviours in performing PM activities (usually within a project team context). They were: (1) PM professionals' commitment to the PM profession, (2) PM professionals' beliefs about teamwork, (3) PM professionals' beliefs about work flexibility, (4) PM professionals' beliefs about viewing team members in terms of work performance; and (5) PM professionals' beliefs about informal processes within a project team.

This study conducted a mail survey, using a specially-developed questionnaire (57 closed items, all on a 1-5 scale) titled *The Project Management Culture Survey*, of 790 AIPM members with the membership grades of *Member* and *Fellow*. The selection of the participants was to ensure that they formed a homogeneous professional group and had a certain level of PM education and experience. Three hundred and twenty three useable responses were received, representing a response rate of 42.0%.

This study used (1) exploratory factor analysis (EFA) to determine the key dimensions of PM culture, (2) confirmatory factor analysis (CFA) to test the expected sub-dimension structure for each of the dimensions and the expected dimensionality of the construct *PM culture*, and (3) descriptive statistics and *t*-tests to explore PM professionals' current values and beliefs around the dimensions and sub-dimensions. The statistical analyses were conducted using the software SPSS 10.0 for social science statistics and AMOS 4.0 for structural equation modeling.

1.5 OUTLINE OF THE THESIS

This thesis is organised into 10 chapters.

Chapter 2 discusses different concepts and perspectives of culture in the management and organisational literature. On the one hand, there is no universally agreed definition of “culture” and different authors focus on the different aspects of culture to serve their special interests and purposes. On the other, there are several elements which are common in most definitions of culture given by various authors. For the purpose of an empirical study, “culture” must be given an operational definition to make its measurement practicable.

After the description of culture in a general context in Chapter 2, Chapter 3 discusses culture in a special context: occupations and occupational communities. An occupational perspective is an important way of viewing how work is organised and interpreted. Similar to the fact that organisations develop their organisational cultures, occupations (professions) create and sustain their occupational (professional) cultures by which their members mentally identify themselves as members of the occupations (professions).

Chapter 4 is devoted to project management as a profession and a culture. Through reviewing the history of project management, this chapter shows readers how project management has evolved to be a profession increasingly demanded by clients across a variety of industries and why a PM culture can be assumed to exist. This chapter also discusses the characteristics of project management and reviews the limited discussions of the PM culture in the PM literature.

Chapter 5 is about the theoretical framework used for this research. To study the elusive concept of culture, a theoretical framework for measuring a culture is essential. After locating this research within a general framework of *levels of analyses*, *phenomena to study*, and *analyses perspectives*, this chapter chooses Talcott Parsons’ *general theory of action* (Parsons and Shils, 1951), particularly his *pattern variable*

scheme, as the theoretical framework for investigating PM culture. Parsons' *pattern variable scheme* is then particularly applied to and defined in the situation of project management to establish research variables for this research.

Chapter 6 is devoted to the discussion of the methodology, involving the general design of the research, the development of a research questionnaire, data collection, and data analyses. This research was designed as a quantitative study. A closed written questionnaire was used to collect data. Exploratory and confirmatory factor analyses were used to identify dimensions and sub-dimensions of PM culture, and descriptive and inferential statistics were used to reveal and evaluate the PM professionals' current work-related values and beliefs around the dimensions and sub-dimensions.

Chapter 7 presents firstly the demographic profile of the survey participants and then the processes and results of factor analyses. It shows readers how the key dimensions of PM culture are extracted by exploratory factor analyses and what they are and how the theoretically-identifiable sub-dimension structures were confirmed for each of the dimensions by confirmatory factor analyses. This chapter finally connects all the dimensions and their sub-dimensions to the single construct of *PM culture* to establish a full model of PM culture by a confirmatory factor analysis.

Chapter 8 is devoted to PM professionals' current work-related values and beliefs around the identified dimensions and sub-dimensions. This chapter calculates the respondents' scores on each of the dimensions and sub-dimensions of PM culture and also explores the effects of the respondents' demographic characteristics on their scores.

Chapter 9 discusses the results of analyses described in Chapters 7 and 8. The model of PM culture is examined from the technical perspective of exploratory and confirmatory factor analyses, such as, factor loadings, goodness-of-fit measures, and significant tests. To check its validity, the model is also examined from a perspective of theoretical justification, that is, being compared with both Parsons' *pattern variable scheme* and what are reflected in the literature of project management and professions. The discussion of PM professionals' current values and beliefs is organised in

accordance with the structure of the dimensions and sub-dimensions of PM culture. Its purpose is to interpret the survey results and reveal potential for improvement to the PM profession.

Chapter 10 presents the conclusions from the research and the implications of this research for the theory of project management, theories of professions and organisations, and practices in the PM profession and employing organisations. The limitations of this research and some areas for future research are also discussed in this chapter.

Chapter 2

Culture and Organisational Management

Chapter 2 presents a review of the origin of the concept of culture, the general and special definitions of culture, and the different sets of dimensions used to measure culture. In general, culture can be thought of and studied as having different levels including artefacts, values and beliefs, and underlying assumptions. But in particular, culture may be defined from different perspectives to meet an author's interest in a particular study. This chapter also presents a brief history of culture studies in the organisational literature and provides a general framework consisting of *levels of analyses*, *phenomena to study*, and *analyses perspectives*, in which a culture study must be located. This chapter includes the following major sections:

- 2.1 Introduction
- 2.2 The concept of Culture
- 2.3 Dimensions of Culture
- 2.4 History of Organisational Culture Studies
- 2.5 A General Framework for Culture Studies
- 2.6 Summary

2.1 INTRODUCTION

Concerns with workplace cultures – with informal organisations and work-group norms – are not new, and cultural research on organisations is not a recent development. Research on cultural phenomena in organisations dates back to the early 1930s during the last phase of the well-known Hawthorne studies at the Western Electric Company in Chicago, Illinois (Trice and Beyer, 1993). The Hawthorne studies began with experiments on the relationships between productivity and the physical work environment. The results of these experiments proved puzzling and not explicable in purely technical terms. Therefore the company decided to turn to behavioural scientists and incorporate them into the program of ongoing research. Elton Mayo, a faculty member in the Harvard Business School, and W. Lloyd Warner, an anthropologist, were hired to join the research. Their involvement began a new phase in the Hawthorne studies. They adopted anthropological field methods of observation and interviewing to describe three kinds of relationships occurring in the workplace: the technical, the social, and the ideological relationships. It was the ideological relationships that concerned the workers' culture – their shared beliefs and understandings regarding the work setting (Trice and Beyer, 1993). After the Hawthorne studies, there were a few scattered efforts in the research of cultural phenomena in organisations during the 1950s, 1960s, and 1970s, such as, Donald Roy's sustained efforts in studying culture within small work groups, the Tavistock Institute's research taking organisations as cultural systems, the research by Harrison Trice's team to explore both the substance and forms of organisational cultures (Trice and Beyer, 1993).

Although the study of organisational cultures is not new, it is the year of 1979 when modern *organisational culturalism* was born (Parker, 2000). Then, organisational cultures received a big impetus in the 1980s. Two factors are recognised as the major forces contributing to people's interest in organisational culture. One is the success of Japanese corporations in the highly competitive world market. Their success was interpreted as having something to do with specific cultural features and culture then became singled out as a possible tool for improving performance (Lewis, 1996;

Alvesson and Berg, 1992). The other is the publication of several best-selling books on organisational cultures, which further stimulated the research in this field (Alvesson and Berg, 1992; Trice and Beyer, 1993). Four important books published in the early 1980s were: Peters and Waterman's *In Search of Excellence* (1982), Ouchi's *Theory Z* (1981), Pascale and Athos' *The Art of Japanese Management* (1981), and Deal and Kennedy's *Corporate Cultures* (1982). They identify corporate culture as an important factor in determining corporate success.

Since the 1980s, it is remarkable that organisational culture has rapidly attained popularity and academic respectability (Alvesson and Berg, 1992). People have become more aware of the critical role that an understanding of culture plays in their efforts to stimulate organisational learning and change (Schein, 1992), and people have become more aware of the power of culture in influencing people's behaviours and organisational performance (Cox, 1993; Kotter and Heskett, 1992). A recent ABI/Inform database search in February 2001, using "corporate culture" as the search word, shows that corporate/organisational culture is still attracting people's interest.

2.2 THE CONCEPT OF CULTURE

2.2.1 The Origin of the Concept

The original and central domain of the concept of culture is anthropology. Since the end of the eighteenth century, anthropologists have been investigating culture as their basic and central concept (Sackmann, 1991). Some cultural anthropologists include all aspects of social life as part of cultures (Trice and Beyer, 1993). For example,

- In *The Macquarie Concise Dictionary* (1998: 271), culture is defined as “the sum total of ways of living built up by a group of human beings, which is transmitted from one generation to another.”
- One of the earliest widely cited definitions, offered by E.B. Tylor (1871: 1) over a century ago, defines culture as “that complex whole which includes knowledge, beliefs, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.”

Others apply the term *culture* to some of the specific aspects that are considered components of a culture such as artefacts, rituals, customs, knowledge, ideas, or symbols (Sackmann, 1991). For example, Sapir (cited in Sackmann, 1991: 14) sees culture “as something internalized by human beings as a world of meaning that affects the way they perceive the world”. The concept’s connotative meaning depends on an anthropologist’s assumptions about the topic (the anthropological school one belongs to) and his/her main foci and interests in research (Sackmann, 1991). Despite a century of exploration, it is impossible to find consensus among anthropologists on what culture is, what it means, what its characteristics are, what it is composed of, what it does, or how it should be studied. One text citing 164 different definitions of culture concludes:

Culture consists of patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievement of human groups, including their embodiments in artefacts; the essential core of culture consists of traditional (ie historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other hand as conditioning elements of future action (Kroeber and Kluckholm cited in Williams, Dobson and Walters, 1989: 9).

In addition to anthropology's influence on the concept of culture, culture had also received attention in the discipline of sociology before it was “discovered” in the field of management and organisational theory. Among sociologists, Talcott Parsons (1902-1979) is a well known representative of *professional* sociologists, in the sense that he played an important part in the development of sociology as an organised discipline (Hamilton, 1985). Talcott Parsons' theoretical efforts were primarily directed towards the development of a highly abstract general scheme for analysing action, which was designed to be applicable to a wide range of situations and to a diverse set of actors – from individuals to corporate bodies to entire societies (Brownstein, 1982). Parsons and Shils (1951) describe three systems – the *personality* (psychological) system, the *social* (interaction) system, and the *cultural* system – as the modes of organisation of the elements of action. They consider the first two systems as “concrete” system and the third as an “abstract” system which is internalised in personalities and institutionalised in social systems. Parsons and Shils (1951) further state that any personality system and social system have a culture element. They define culture as “ways of orienting and acting” (1951: 159), “whose different parts are interrelated to form value systems, belief systems, and systems of expressive symbols” (1951: 55).

2.2.2 General Concept of Culture in Management Literature

In general, many authors, such as, Schein (1992), Ott (1989), Williams, Dobson and Walters (1989), and Dyer (1985), agree that cultures can be thought of and studied as having different levels in terms of the degree to which cultural phenomena are visible to an observer. They adopt two-level, three-level, or four-level models. The three-level model is the most representative one. For example, Schein's (1992, 1985) model consists of the following three levels:

1. *Artefacts*: technology, art, and visible and audible behaviour patterns, which are obvious in people's awareness;
2. *Espoused values*: the reasons why people behave as they do, of which people are usually aware; and
3. *Basic underlying assumptions*: important assumptions supporting the first two levels, of which people are usually unconscious.

Other authors have developed culture models which are similar to Schein's model, such as:

- Kotter and Heskett (1992) use a two level way to think of and analyse organisational culture. The two levels differ in terms of their visibility and their resistance to change. At the deeper and less visible level are values shared by people in a group and that tend to persist over time even when group membership changes. At this level culture can be extremely difficult to change, in part because group members are often unaware of many of the values that bind them together. At the more visible level, culture represents the behaviour patterns or styles of an organisation that new employees are automatically encouraged to follow by their fellow employees. Culture in this sense is still tough to change, but not nearly as difficult as at the level of basic values.
- Hofstede (1991) describes the manifestations of culture in two different levels of depth that are “practices” (including symbols, heroes, and rituals) at the observable level and “values” at the deeper level.
- Trice and Beyer (1993) discuss cultures of work organisations by using the two broad levels: the *substance* of a culture – shared, emotionally charged belief systems that are called *ideologies*, and the *cultural forms* – observable entities, including actions, through which members of a culture express, affirm, and communicate the substance of their culture to one another.
- Williams, Dobson and Walters (1989) establish a culture model of three levels, consisting of common behaviour at the observable level, attitudes and values at the reportable level, and beliefs at the unconscious level.
- Dyer (1985) defines organisational culture by examining the four levels: artefacts, perspectives, values, and assumptions. Here a perspective is the set of ideas and actions a person uses in dealing with a *given* situation, while a value is an evaluation people make in general of such a *kind* of situation.
- Ott (1989) also defines culture in a four-level model including artefacts, patterns of behaviours, values and beliefs, and assumptions.

Table 2-1 summarises the above-mentioned models of culture.

Table 2-1: Summary of Culture Models

	Level 1: Visible		Level 2: Conscious		Level 3: Unconscious
Schein (1992)	1. Artefacts		2. Espoused values		3. Assumptions
Williams <i>et al.</i> (1989)	1. Common behaviours		2. Attitudes and values		3. Beliefs
Dyer (1985)	1. Artefacts		2a. Perspectives	2b. Values	3. Assumptions
Ott (1989)	1a. Artefacts	1b. Patterns of behaviour	2. Values and beliefs	3. Assumptions	
Kotter & Heskett (1992)	1. Behaviour patterns		2 & 3. Shared values		
Hofstede (1991)	1. Practices		2 & 3. Values		
Trice & Beyer (1993)	1. Cultural forms		2 & 3. Substance of culture, ie., ideologies		

2.2.3 Special Concepts of Culture in Management Literature

Despite the above general concept of culture accepted by many authors, most research of organisational culture is not stringently based on this concept, in part because the concept includes *everything* so that it is not actually operationalisable for a special research focus. From the broad literature review came an interesting phenomenon: it is not uncommon that an author begins his/her discussions with a general concept of culture, then turns to a special aspect of culture that is of his/her interest and develops a special concept of culture for his/her particular research. For example, Schein (1992) firstly discusses the concept of culture using the above-mentioned three levels model and then turns to the following definition of culture that meets his particular research interest:

[The culture of a group is] a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (Schein, 1992: 12)

Conceptions of culture in the organisational and management literature draw quite selectively from various anthropological and sociological sources. The selection tends to be based on an author's particular interest and approach. Three broad perspectives for defining culture can be differentiated in the managerial literature (Sackmann, 1991):

- A *holistic* perspective,
- A *variable* perspective, and
- A *cognitive* perspective.

The holistic perspective captures all the aspects of culture. Within this perspective, the cognitive, emotive, behavioural, and artefactual aspects of culture are integrated into a united whole (Sackmann, 1991). For example, According to Ferraro (1994: 17), “*Culture is everything that people have, think, and do as members of their society.*”

Tunstall (1983: 15) also defines culture from the holistic perspective:

Corporate culture may be described as a general constellation of beliefs, mores, customs, value systems, behavioral norms, and ways of doing business that are unique to each corporation, that set a pattern for corporate activities and actions, and that describe the implicit and emergent patterns of behavior and emotions characterizing life in the organization.

Because of its intention to capture all aspects of culture, the holistic perspective does not directly lend itself to research. It is understandable that no single research can cover all aspects of culture.

The variable perspective focuses on expressions of culture, which may take the form of verbal and physical behaviours or practices, of artefacts, and of their underlying meanings (Sackmann, 1991). From this perspective, culture is defined as “the way in which things are done here” (Pettinger, 1996: 393). The focus is placed on observable behaviour and artefacts. For example, Ouchi (1981: 35) states that:

The organizational culture consists of a set of symbols, ceremonies, and myths that communicate underlying values and beliefs of that organization and its employees.

Collective activities, such as rites, rituals, and ceremonies, as well as collective verbal behaviours, such as language, stories, and myths, are tangible and visible. However, it is difficult to “decipher” their underlying meanings.

The cognitive perspective focuses on ideas, concepts, beliefs, values, or norms that are seen as the core of a complex and multifaceted culture (Sackmann, 1991). From this perspective, culture is regarded as “the way we think about things around here” (Williams, Dobson, and Walters, 1989: 10). The cognitive perspective is widely

accepted in the management literature. Many studies are mainly based on this perspective, even though their authors may also discuss cultures from the holistic perspective and/or the variable perspective. In the management literature there are various degrees of specificity and concreteness within the cognitive perspective, that is, authors may focus on different aspects of culture. For example,

- Rather abstract is to think of culture as the collective programming of the human mind, as represented by Hofstede (1980). Hofstede (1980: 25) treats culture as “the collective programming of the mind which distinguishes the members of one human group from another.”
- Some authors focus on a set of shared values and beliefs. For example, Williams, Dobson and Walters (1989: 11) adopt the following working definition of culture for their culture-change research: “Culture is the commonly held and relatively stable beliefs, attitudes and values that exist within the organization.”
- Some others, such as Schein (1992) and Wilkins (1983), define culture as basic assumptions or the taken-for-granted. Wilkins (1983: 26) states that culture is most usefully thought of as “the ‘givens’, or the taken-for-granted and shared assumptions that people make about how work is to be done and evaluated and how people relate to one another.”

Table 2-2 summarises the three perspectives for defining culture and their implications for culture research.

Table 2-2: Summary of the three Perspectives for Defining Culture

	Concerned Aspects of Culture	Implications for Research
Holistic Perspective	All aspects of culture	Very difficult to be applied in any single research
Variable Perspective	Expressions of culture: verbal and physical artefacts, behaviours or practices, and their underlying meanings	Easy to observe but difficult to decipher the underlying meanings
Cognitive Perspective	Cognitive aspects of culture: shared values, beliefs, norms, etc.	It is generally an appropriate perspective for most cultural studies. There may be various degrees of focus speciality and concreteness within this perspective.

Besides the above-discussed three perspectives, culture may also be defined by various authors in other ways. For example,

- Vickers (1965: 66) describes organisational culture as a “shared appreciate system”, that is, “a set of readinesses to distinguish some aspects of the situation rather than others and to classify and value these [in a certain way]”. According to this definition, people are predisposed by culture to see some aspects rather than the other aspects of a situation.
- Schutz (cited in Neal, 1998) defines culture as the value system through which people interact with their social, economic, and natural environments. It involves two key concepts: the *natural attitude* – people assume that the world is what and how it appears to be, and the *reciprocity of perspectives* – people assume that other people understand things in the same way as they do.

2.2.4 Commonly-Agreed Characteristics of Culture

Despite the disparity in its definitions, culture has some basic characteristics to which most authors agree. It is these characteristics that constitute a common basis for studies of organisational culture.

Culture is collective and shared. Cultures cannot be produced by individuals acting alone. Individuals may originate specific ways of thinking about or doing things, but until these specific ways come to be collectively accepted and put into practice they are not part of a culture (Trice and Beyer, 1993). Culture is always a collective phenomenon. It is shared with people who live or lived within the same social environment and it can to some degree distinguish the members of one group from another (Hofstede, 1991).

Culture is a “meaning” system. Descriptions of culture focus variously on concepts such as ideologies (Trice and Beyer, 1993), basic assumptions (Schein, 1992), a set of values (Williams, Dobson and Walters, 1989), a set of beliefs (Williams, Dobson and Walters, 1989), a set of important understandings (Sathe, 1983), and a set of behavioural norms (Elashmawi and Harris, 1998), etc. The use of these concepts may reflect a particular author’s selective emphasis, or seem arbitrary because some authors use, for example, the term *value* in the same way that others use *belief* or vice versa.

However, a closer look at the wide array of definitions does uncover a central/common theme: culture as a mental system of *shared meaning*, by which people assign “meanings” to the world. Therefore, one thing that transcends all the debates of culture is that “culture is a concept that is used to make sense of, and explain, the world in which we live” (Neal, 1998: 19). According to Neal (1998: 18), “...what various theories of culture have in common ...[is] a concern for the ways in which “meaning” and “values” influence how people act, and how they therefore influence and sustain social and economic structures.”

Culture is historically based and learned. To develop a culture, a group of people need to have a sufficient history in solving the group’s internal and external problems (Schein, 1992). On the one hand, every particular culture is based in the unique history of a particular group of people coping with a unique set of physical, social, political, and economic circumstances, and no culture can be divorced from their histories (Trice and Beyer, 1993). On the other hand, culture is the result of a complex group learning process (Schein, 1992). The process starts with one or more members taking a leadership role in proposing courses of action and as these continue to be successful in solving the group’s problems, they come to be taken for granted as part of the culture and the assumptions underlying them cease to be questioned or debated. The development of a culture is also a continuous process in which it is passed down from one generation of members to the next.

Culture is powerful. Culture, as people’s shared values and beliefs system, is certainly powerful in determining people’s actions. Firstly, cultural patterns are internalised to become part of the structure of people’s personality and institutionalised to become part of the system of people’s social interaction (Parsons and Shils, 1951). According to Parsons and Shils (1951: 22), “*All concrete systems of action, at the same time, have a system of culture ...*” Secondly, culture, as the common way a group of people think about and do things, creates collective identity and commitment and social order (Trice and Beyer, 1993). Thirdly, culture’s power is also due to the fact that its central values and beliefs are taken for granted and mutually reinforced by members of a particular group (Wilkins, 1983). As the taken for granted, they are then emotionally charged by its members (Trice and Beyer,

1993). When relevant values and practices are questioned, their adherents react emotionally. This produces “ethnocentrism” – “people who endorse one set of ideas often come to distrust, fear, and dislike people with other ideas” (Trice and Beyer, 1993: 11).

Culture is dynamic and can be used to improve organisational performance.

While cultures create continuity and persist across generations of members, they are not static, but dynamic (Trice and Beyer, 1993). A particular group of people may, through their intentional or unintentional efforts, be able to create and change its culture. It is the dynamic nature that makes it possible to use culture as a means to improve organisational performance.

In conclusion, a minimal definition can be used to reflect the above mentioned common characteristics of culture:

The core of culture is composed of explicit and tacit assumptions or understandings commonly held by a group of people; a particular configuration of assumptions and understandings is distinctive to the group; these assumptions and understandings serve as guides to acceptable and unacceptable perceptions, thoughts, feelings, and behaviors; they are learned and passed on to new members of the group through social interaction; and culture is dynamic – it changes over time, although the tacit assumptions that are the core of culture are most resistant to change. (Sackmann et al., 1997: 25)

2.3 DIMENSIONS OF CULTURE

In the literature confusion exists about dimensions of culture. Different authors have attempted to determine different sets of dimensions as *the* dimensions or the most important dimensions of culture and consequently to establish their typologies of culture. These sets of dimensions are relevant for different purposes and make sense within their authors' frameworks. Listed below are some of the sets of dimensions.

Hofstede's four dimension typology. Hofstede's (1980) work has been enormously influential in the field of cultural research in business management. He identifies the four dimensions of national culture in terms of work-related values as:

- Power distance: the degree of inequality among people which the population of a country considers as normal: from relatively equal to extremely unequal;
- Uncertainty avoidance: the degree to which people in a country prefer structured over unstructured situations: from relatively flexible to extremely rigid;
- Individualism: the degree to which people in a country have learned to act as individuals rather than as members of cohesive groups: from collectivist to individualist; and
- Masculinity: the degree to which “masculine” values like assertiveness, performance, success and competition prevail over “feminine” values like the quality of life, maintaining warm personal relationships, service, caring, and solidarity: from tender to tough.

Hofstede *et al*'s six dimensions of organisational culture. Hofstede *et al* (1990) identify six main dimensions of organisational culture through a factor analysis of the data from a survey (using written questionnaires) of members of 20 organisational units. They are:

- Process-oriented (being concerned with the processes to achieve goals) versus results-oriented (being concerned with the achievement of goals);
- Employee-oriented (a concern for people) versus job-oriented (a concern for getting the job done);

- Parochial (employees derive their identity from the organisations) versus professional (employees derive their identity from their professions);
- Open system (regarding an organisation as an open system) versus closed system (regarding an organisation as a closed system);
- Tight control (needing a tight formal control in an organisation) versus loose control (needing a loose control in an organisation); and
- Pragmatic emphasis (market-driven attitudes) toward customers versus normative (inviolable-rules-driven attitudes) emphasis towards customers.

Harrison's four main types of organisational culture. Harrison (1972) identifies four main types of cultures that exist in an organisation. They are:

- The power culture: Power-oriented organisations attempt to dominate their environment and those who are powerful within the organisation strive to maintain absolute control over subordinates;
- The role culture: This culture puts an emphasis upon people's formal roles which are stipulated in formal organisational rules and procedures;
- The task culture: This culture puts an emphasis upon the completion of the tasks, and nothing is allowed to get in the way of task accomplishment; and
- The people culture: This culture puts an emphasis upon serving the needs of their members.

Schein's work on culture. Schein (1992) analyses organisational culture from the three aspects of external adaptation, internal integration, and other more abstract, more general and deeper issues. The essential elements of culture in relation to a group's external adaptation and survival are:

- Shared assumptions about mission and strategy.
- Shared assumptions about operational goals derived from the mission.
- Shared assumptions about means to achieve goals.
- Shared assumptions about criteria for measuring results.
- Shared assumptions about remedial and repair strategies.

The processes related to a group's internal integration are:

- Creating a common language and conceptual categories.

- Defining group boundaries and criteria for inclusion and exclusion.
- Distributing power and status.
- Developing norms of intimacy, friendship, and love.
- Defining and allocating rewards and punishments.
- Explaining the unexplainable – ideology and religion.

The assumptions about more abstract, more general, and deeper issues are the ones about:

- The nature of reality and truth.
- The nature of time.
- The nature of space.
- The nature of human nature.
- The nature of human activity.
- The nature of human relationships

Brown and Dodd's CVF (Competing Values Framework) model of culture. Brown and Dodd (1998) measure organisational culture by using the CVF-based instrument developed by Quinn and Rohrbaugh (1983). The two sets of competing values are flexibility/control orientation and external/internal orientation. Along the two sets of values, a four cell model of organisational culture is created through the measurement of the following six different aspects of organisational culture:

- dominant characteristics;
- leadership;
- organisational glue;
- organisational climate;
- success criteria; and
- management style.

The four cells represent respectively four archetypes of organisational culture. They are:

- Cooperative team culture with high flexibility and internal focus;
- Responsive ad-hocracy culture with high flexibility and external focus;
- Rational firm culture with high control and external focus; and
- Stable hierarchy culture with high control and internal focus.

Wilkins' dimensions of work culture. Wilkins (1983) defines culture as the taken-for-granted and shared assumptions³ about how work is to be done and how people relate to one another. Wilkins focuses on the two categories of the most important assumptions:

- Implied work assumptions: whether there is a coherent and shared view of the nature of work and of how work is to be done. Assumptions about work ends and work means are the most important work assumptions.
- Implied reward assumptions. Reward assumptions guide people thinking about why they should or should not implement the work assumptions. Two important assumptions are: individual interests are served and people are treated equitably.

There are many other sets of dimensions of culture, such as, (1) Deal and Kennedy's (1982) two independent dimensions (the degree of risk orientation and the speed of feedback on actions taken) that leads to four distinctly different corporate cultures; (2) Mole's (1995) culture triangle including the three dimensions of communication, organisation, and leadership; and (3) Pumpin's (cited in Sackmann, 1991) seven orientations as relevant dimensions of a corporate culture, just to name a few.

³ In the literature, there are no universal criteria for the use of the terms *value*, *belief*, and *assumption*. Sometimes they are interchangeable, or one of them may be fully inclusive of the others. It is possible that, in a situation one author uses *value*, another author may use *belief* or *assumption*. Wilkins' use of *assumption* seems to be inclusive of *value*, *belief*, and *assumption*.

2.4 HISTORY OF ORGANISATIONAL CULTURE STUDIES

Early research in the 1960s concentrated on explaining the concept of culture (Lewis, 1996) and had a predominance of discussions and studies concerned with individual behaviour in organisations (Roberts, 1977). At this stage, empirical work concerned with more macro organisational variables was meagre and culture had not been looked at in systems terms (Roberts, 1977). According to Roberts (1977), most of the studies in the 1960s were based on anecdotal information or surveys which were not well thought out and were not well guided by theoretical underpinning, and as a consequence, data were often weak and conclusions were difficult to comprehend.

People began to use the concept of “corporate culture” in the late 1970s, and the 1980s saw a great growth of interest in culture related to organisational behaviour and management (Alvesson and Berg, 1992). Two events in 1979 caused Parker (2000) to claim that 1979 was the year when modern organisational culturalism was born. One was that a conference was held at the University of Champaign-Urbana that was the first to take this area as a topic; and the other was that the leading journal *Administrative Science Quarterly* published Andrew Pettigrew’s (1979) paper titled *On Studying Organizational Cultures*. The introduction of culture into the field of organisational theory is generally credited to this paper (Detert, Schroeder, and Mauriel, 2000).

What probably sparked off this enormous interest in corporate culture among academics and practitioners in the early 80’s was the assumption that corporate culture could actually be managed and thus used as a competitive advantage in business (Alvesson and Berg, 1992). Furthermore, culture has been regarded as being changeable, though changing a culture is not easy and takes a long time (Williams, Dobson and Walters, 1989). Several culture change models were developed by Sathe (1985a), Schein (1992), and Williams, Dobson and Walters (1989). In the later 1980s, a new line of inquiry began and has continued up to the present, with articles concentrating on the effects of culture on an organisation’s performance and how to manage and change culture to increase organisational effectiveness (Lewis, 1996).

During the period of the 1980s, some important books on organisational culture were published, such as Hofstede (1980), Ouchi (1981), Peters and Waterman (1982), Deal and Kennedy (1982), Kilmann *et al.* (1985), Frost *et al.* (1985), Sathe (1985b), and Schein (1985). These publications are elements further stimulating people's interest in the field of organisational culture research (Alvesson and Berg, 1992), and they are still widely referred to for culture/across-culture research in organisational behaviour today. For example,

- Peters and Waterman's story of the most successful American companies has convinced many managers that a strong corporate culture is an important key to corporate success. According to Isaac (1993) and Beer and Walton (1987), an upsurge in the interest in and literature on organisational culture resulted from the notable works of Peters and Waterman (1982) and of Deal and Kennedy (1982), as many managers sought to change their organisation's cultures in the hope of gaining a competitive advantage.
- Hofstede's culture model of four dimensions (power distance, uncertainty avoidance, individualism/collectivism, and masculinity/femininity) has stimulated many people's interest in work-related culture. After the publication of Hofstede's work, many similar across-country culture studies have been done to complement or extend Hofstede's research, such as Nicholson and Stepina (1998) and Dorfman and Howell (1988).
- Ouchi's work (1981) has convinced Western managers that the success of Japanese corporations was partly due to their special culture.

Also in the 1980s, leading scientific journals published a number of "special issues" about organisational culture, such as *Administrative Science Quarterly* 1983 (3), *Journal of Management* 1985 (2), *Journal of Management Studies* 1986 (3), *Organization Studies* 1986 (2), and *International Studies of Management and Organization* 1987 (3).

The concerns of culture management, culture change, and culture's impacts on organisational performance continued in the 1990s, for example, Schein (1992), Kotter and Heskett (1992), Denison (1990), Baron and Walters (1994). Also, in the 1990s,

much interest was aroused in the area of sub-culture dynamics, eg., Schein (1992), Alvesson and Berg (1992), Trice and Beyer (1993), and Trice (1993). From the view of systems thinking, a culture is a subculture when it is examined within its encompassing culture, and is an overall culture when examined with its encompassed cultures. Sub-cultural dynamics is about studying culture on both macro and micro levels from the view of systems thinking. It not only deals with culture in a company as a whole, but also pays attention to professional and functional sub-cultures within a company and the interaction among the sub-cultures (Alvesson and Berg, 1992). Although organisations have distinctive cultures, it would be a mistake to think that any particular organisation has only a single homogeneous culture. As various scholars, such as Riley (1983), Louis (1985), Gregory (1983), have observed, most organisations have multiple cultures, which are customarily called *subcultures* within their encompassing cultures. Organisations have often both an overall culture and a multiplicity of subcultures. The overall culture consists of something that is embraced by *everyone* in the organisation, but the subcultures, such as functional, departmental, professional (occupational), or hierarchical subculture, are shared only by *a particular group of people* within the organisation. According to Schein (1992), many problems that were once viewed simply as “communication failure” or “lack of teamwork” are now being more properly understood as a breakdown of inter-cultural communication between sub-cultures.

2.5 A GENERAL FRAMEWORK FOR CULTURE STUDIES

Due to the elusive nature of the concept of culture, a cultural study must be located somewhere within the framework of *levels of analyses*, *phenomena to study*, and *analyses perspectives*⁴ (Alvesson and Berg, 1992).

Levels of analyses indicate the selection, from the view of systems thinking, of a culture at a particular level as the research focus. Normally, such levels of analyses are the society/nation, region/industry, company/organisation, societal macrogroups (e.g. professions), groups in organisations, etc (Alvesson and Berg, 1992). For example, there are a bulk of studies dealing with national cultures; there are many studies dealing with a culture in a company as a whole; and there are also some studies focusing on professional and functional subcultures within an organisation. Alvesson and Berg (1992) identify the seven principal levels of analyses as:

- Culture in societies and nations (national cultures);
- Regional and local cultures;
- The cultures of industries and social sectors;
- Professional cultures;
- Organisational and corporate cultures;
- Functional subcultures in the organisation; and
- Social group subcultures in the organisation.

Phenomena to study refer to the items or aspects of a culture which are of an author's interest (Alvesson and Berg, 1992). A study may focus on artefacts, values and beliefs, or unconscious assumptions of a culture, or it may focus on only:

- one or several kinds of the artefacts, such as myths, rites/rituals, heroes, or jargon;
- one or several core values and beliefs, such as values in customer satisfaction; or
- one or several unconscious assumptions, such as assumptions about human nature.

⁴ Alvesson and Berg (1992) actually named it as *conventions and perspectives*. This research adopts only the central theme of their original concept of *conventions and perspectives* for culture study rather than their detailed classification under the concept. The author of this thesis believes that Martin's (1992) classification of analyses perspectives is more appropriate. So this thesis has changed the name to *analyses perspectives*.

Analyses perspectives refer to theoretical perspectives from which different approaches are applied to cultural studies. According to Martin (1992), there are three main perspectives which dominate research on organisational culture: *integration*, *differentiation*, and *fragmentation*. Any particular study usually focuses on one of these perspectives, although a second or even a third perspective may be given minor attention. The perspectives can be briefly explained as follows:

- The *integration* perspective portrays culture predominantly in terms of consistency, organisation-wide consensus, and clarity (Martin, 1992): (1) all cultural manifestations are interpreted as consistently reinforcing the same themes; (2) all members of an organisation are said to share an organisation-wide consensus; and (3) a culture is described as a realm where all is clear and ambiguity is excluded.
- The *differentiation* perspective describes cultural manifestations as sometimes inconsistent (for example, when managers say one thing and do another). Consensus occurs only within the boundaries of subcultures, which may co-exist in harmony, conflict, or indifference to each other. Subcultures are islands of clarity; and ambiguity is channelled outside their boundaries (Martin, 1992).
- The *fragmentation* perspective views ambiguity as an inevitable and pervasive aspect of organisational culture. Clear consistencies, like clear inconsistencies, are rare, consensus and dissensus are issue-specific and constantly fluctuating, and no stable organisation-wide or sub-cultural consensus exists (Martin, 1992).

Table 2-3 summarises the major elements of the three perspectives.

Table 2-3: Defining Characteristics of Cultural Study Perspectives

	Integration	Differentiation	Fragmentation
Orientation to consensus	Organisation-wide consensus	Subcultural consensus	Multiplicity of views (no consensus)
Relation among manifestations	Consistency	Inconsistency allowed	Complexity (not clearly consistent or inconsistent)
Orientation to ambiguity	Excluding it	Channelling it outside subcultures	Focusing on it
Metaphors	Clearing in jungle, monolith, hologram	Islands of clarity in sea of ambiguity	Web, jungle

Source: Adapted from Martin (1992: 13)

A summarised picture which draws together *levels of analyses*, *phenomena to study*, and *analyses perspectives* is presented in Figure 2-1.

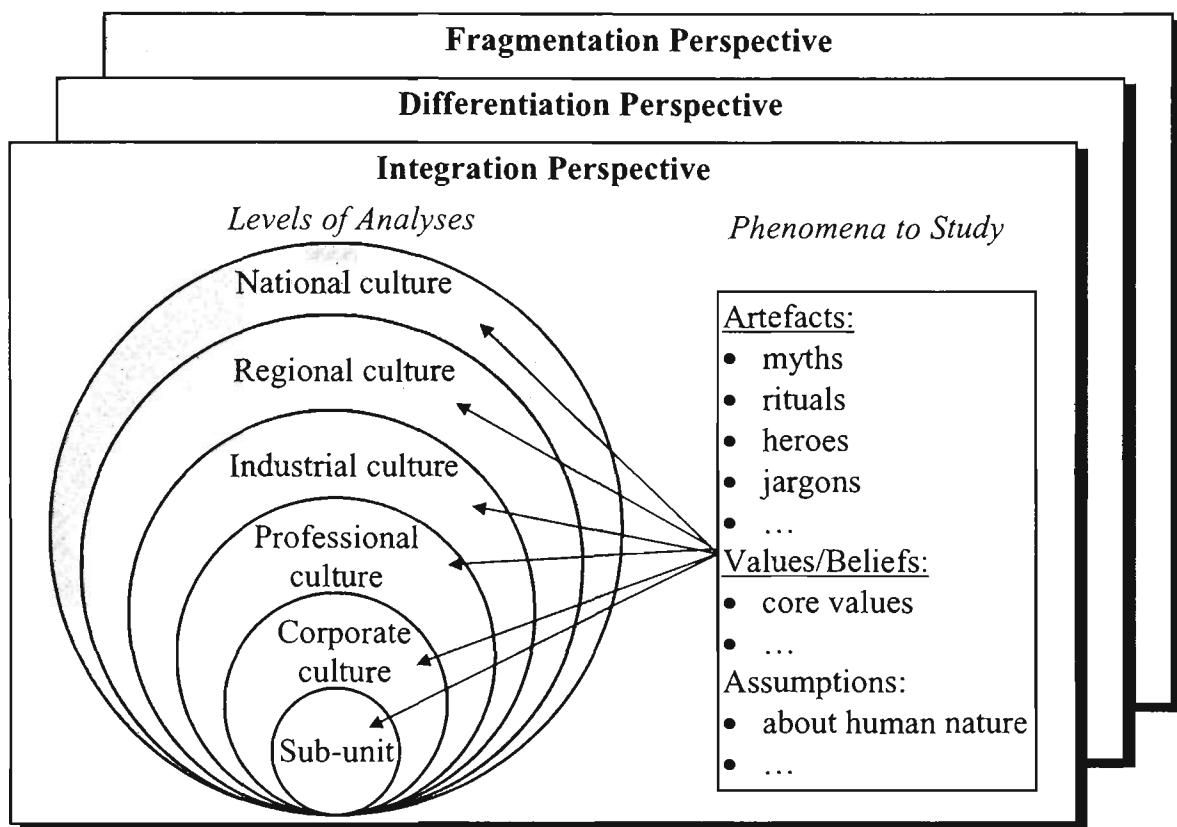


Figure 2-1: A General Framework for Culture Research

Source: Adapted from Figure 3.1 in Alvesson and Berg (1992: 56) with inputs from Martin (1992).

2.6 SUMMARY

The above text of this chapter can be summarised as the following key points:

- Many authors agree that culture can be usefully thought of and studied as having different levels in terms of their visibility and resistance to change. Previous research has developed two-level, three-level, and four-level models, of which the three-level model is the most representative one. Despite the difference in dividing the levels, it is common that all the models have a visible and tangible level (artefacts) at the surface and an unconscious level at the depth.
- Many authors give culture their *special* definitions for their particular studies according to their own interests. In this sense, the term *culture* has been defined in a variety of ways. Most people seem to agree that culture exists and that it is a useful concept, but far fewer agree on exactly what it is. Although much has been written about corporate culture, culture remains an elusive concept, difficult to grasp and even more difficult to describe (Baron and Walters, 1994).
- Despite the disparity in special definitions of culture, there are some common characteristics of culture which are accepted by most analysts. In terms of these common characteristics, culture can be minimally defined as the collective values and beliefs system shared by a particular group of people that serves as a guide to acceptable and unacceptable perceptions, thoughts, feelings, and behaviours. It is these common characteristics that constitute the common basis for various cultural studies.
- Culture can be described using different sets of independent dimensions. The literature exhibits many different sets of dimensions of culture, which make sense within their authors' frameworks.

- Culture can be studied at different levels of analyses, such as national culture, regional culture, industrial culture, professional culture, corporate culture, and functional culture within an organisation. For a particular study, once the level of analysis has been determined, two other questions should be addressed so that the study is appropriately located within a general framework: (1) What cultural phenomena are to be studied, myths, rituals, heroes, core values, or some important assumptions? and (2) What research perspective will be adopted? A particular culture may be viewed as an integrated one (the integration perspective), a differentiated one including several subcultures (the differentiation perspective), or an ambiguous one with no stable consensus among its members (the fragmentation perspective).

Chapter 3

Profession and Culture

Chapter 3 discusses culture in the context of a profession (occupation). An occupational perspective is an important way of viewing how work is organised and interpreted at the workplace. To be a profession, an occupation needs to develop a set of essential traits, such as, a body of knowledge, standards, a professional culture, a code of ethics, and certification and education programs, during the long process of professionalism. A profession creates and sustains its professional culture which binds its members to form a professional community. Studies of professional cultures are important for organisational theories to locate and explain behavioural variability at the workplace. This chapter includes the following major sections:

- 3.1 Alternative Perspectives to Viewing Work Organisation
- 3.2 Features of Occupation/Profession
- 3.3 Turner and Hodge's Approach for Studying Professions
- 3.4 Features of Occupational/Professional Community
- 3.5 Occupational/Professional Culture
- 3.6 Summary

3.1 ALTERNATIVE PERSPECTIVES TO VIEWING WORK ORGANISATION

3.1.1 Introduction

There are two alternative perspectives from which to view how work is organised and interpreted (Van Maanen and Barley, 1984). One views a person's work from an organisational frame of reference, ie. a rational or administrative form of work organisation; and the other employs an occupational perspective, ie. a communal or collegial form of work organisation. If the intention of the organisational perspective is to look at *vertical slices* of a work organisation, the focus of the occupational perspective is on *horizontal slices* (Louis, 1985). In today's world, an occupation may be distributed horizontally across various organisations or even industries, and an organisation may employ members from various occupations. When being practised within an organisation, occupations' boundaries are often not so obvious as the organisationally designed boundaries (such as departments, hierarchical levels). However, the occupational boundaries do still exist and play an important role in determining people's behaviours. The relationships between occupations and organisations are illustrated in Figure 3-1.

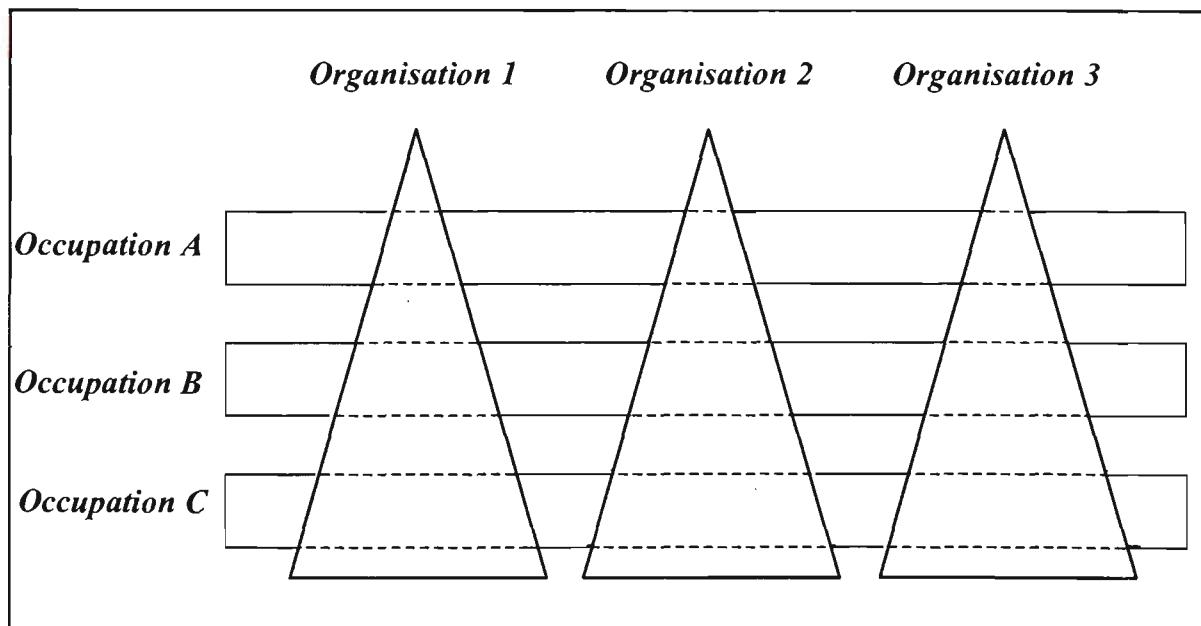


Figure 3-1: Occupation and Organisation

3.1.2 Organisational Perspective

Organisations are created on the basis that more can be achieved by people working in harmony and towards a stated purpose than by individuals acting alone (Pettinger, 1996). In an organisation, resources – technology, expertise, information, finance and property – can then be commanded and ordered for the stated purpose; and activities can be determined, coordinated and controlled. Organisations pervade all aspects of life in today's society, and in this sense it can be said that the modern society is founded on a highly complex and all-pervading network of organisations, each of which serves a given purpose and all of which serve the entire range of purposes required (Pettinger, 1996; Scott, 1992). Some analysts have pointed to the emergence and proliferation of organisations as one of the great social transformations that distinguishes the modern from the pre-modern world (Scott, 1992). According to Scott (1992), our society is an organisational society and organisations are a prominent, if not the dominant, characteristic of modern society. Organisations were present in older civilisations – Chinese, Greek, Indian – but only in modern industrialised societies are there large numbers of organisations engaged in performing many highly diverse tasks. The prevalence of organisations in every arena of social life is the most important indicator of their importance (Scott, 1992).

Many studies have been done in the fields of organisational theory and organisational behaviour to investigate the ways in which work is effectively and efficiently organised and undertaken. Consequently, some influential schools have formed, such as Taylor's *Scientific Management*, Fayol's *Administrative Theory*, Weber's *Theory of Bureaucracy*, the *Human Relations School*, and the *Systems and Contingency Theory School* (For details, see Dessler, 1976; Kast and Rosenzweig, 1985; Scott, 1992; Lavender, 1996).

3.1.3 Occupational Perspective

Occupations, resulting from the division of labour, play a critical role in the process of the transformation and development of societies (Turner and Hodge, 1970). For example, in the ancient world, the emergence of copper miners helped humankind move into the Bronze Age; engineers and architects built the aqueducts of ancient Rome, Solomon's temple, and the Tower of Babel; and blacksmithing was a common

and essential occupation when horses were basic to transportation (Trice, 1993). Occupations tend to be the result of conflict in which groups of workers struggle to win a social mandate to perform a set of tasks; and members of an occupation claim the right to perform a distinctive set of tasks and to exercise control over how they are done (Trice 1993). This occupational right is supported by the members' possession of a relatively distinct and unique body of knowledge and their ability to put it into practice. According to Trice (1993), much of people's work life is organised around occupations. People are often educated/trained to become and work as members of particular occupations. In addition, members of the same occupation usually form and maintain an informal network within their occupational community.

Since the industrial revolution, much interest by social scientists has turned to the systematic study of work, occupations, and professions and their implications to social systems and social changes (Hiremath, Gudagunti, and Kulkarni, 1996). As a result, the sociology of occupations has emerged as an important area of inquiry. Since the publication of *Division of Labor in Society* by Durkheim (1933), some basic issues related to professions and occupations have been studied to provide conceptual schemes and intellectual insights (Hiremath, Gudagunti, and Kulkarni, 1996). For example, many studies have been conducted for professions, which can be defined as occupations "based upon specialized intellectual study and training" (Hiremath, Gudagunti, and Kulkarni, 1996: 82), to provide an insight into the features of professions and the processes of their professionalism.

3.1.4 Difference between the Perspectives

Work organisations obviously play a very potent role in today's world, and at the same time occupations continue to play a prominent role in work life (Trice, 1993). In today's world, organisations are dependent on the knowledge and skills of various occupations to achieve their objectives, and occupations, with a few exceptions, apply their knowledge and skills within the framework of organisations. Consequently, people usually have dual identities with their organisations and their occupations, both of which shape their behaviours (Reisman, 1987; Pescosolido, Figert, and Lubell, 1996). So, both an organisational perspective and an occupational perspective should be taken in order to locate and explain the behavioural variability at the workplace.

Van Maanen and Barley (1984) discuss the major differences in views between the two perspectives. The differences could be summarised as shown in Table 3-1.

Table 3-1: Different Views from Organisational and Occupational Perspective

	Organisational Perspective	Occupational Perspective
Meaning of work	Accentuating the meaning that such work has for others	Concentrating upon the meaning of work for those who do it
Career pursuit	Most people are seen to regard their work careers largely in terms of movement (or lack thereof) within a set sequence of hierarchically ascending positions, each position offering more or less prestige, power, money, and other rewards.	People weave their perspectives on work and career from the existing social, moral, physical, and intellectual character of the work itself. Individual assessments of work and career are cast in terms of one's getting better (or worse) at what one does.
"Work" as a concept in explaining social order	Work is but a small part of the larger problems of coordination, authority, workflow, production method, or service design. Work is a concept subsidiary to the more abstract (but logically intertwined) relationships that are thought to engender the economic and social order of an organisation or the society at large.	Work is itself a focal concept for explaining social structure because it provides the basis of an occupationally stratified organisation or society.
Role of individuals	People are regarded as "employees" with organisationally designed job titles.	People are regarded as persons who undertake a particular set of tasks which are bundled together under a particular title of occupation.

Source: adapted from Van Maanen and Barley (1984: 289-290)

3.2 FEATURES OF OCCUPATION/PROFESSION

Implied in most of the writings on occupations are several sets of occupational categories, such as professional, semi-professional, non-professional; manual, non-manual; and skilled, semi-skilled, unskilled. The categories often serve as a guide to relevant analyses, though it may be unclear precisely which dimensions are being used to distinguish the categories (Turner and Hodge, 1970). The category of professional occupations (usually known as *professions*) attracts much attention from academics and practitioners. The twentieth century has been hailed by many writers as the era of the post-industrial society characterised, among other things, by a growing dependence on the skill and knowledge of professional experts (Lansbury, 1978).

Although a profession can be generally defined as an occupation “requiring advanced education and special training” (Heinemann Australian Dictionary, 1987: 842), the matter of defining it in more details has no simple answer. In the literature, most of the ways of defining a profession fall in the two sub-fields emphasising: (1) traits or discriminating characteristics of a profession; or (2) the process of professionalism.

3.2.1 The Trait Approach

The trait approach identifies some common attributes of professions as the criteria for measuring the degree of an occupation’s professionalism. The studies of professions by this approach tend to, explicitly or implicitly, construct a continuum, for each of the attributes, of the degree of professionalism. So the significant question to ask about occupations is not whether or not they are professions but to what extent they exhibit characteristics of professionalisation (Jackson, 1970). According to Montagna (1977),

The characteristics commonly attributed to a profession are: a body of knowledge and a developed intellectual technique with a formulated systematic theory or set of theories. This knowledge is transmitted by a formalized educational process and testing procedure set up by members of the profession. A code of ethics governs relations with colleagues, clients, and the public. This formally establishes the set of values of the profession, in which a service orientation is emphasized. There is the idea of a career, a “calling” in the service of the public which, through authority in its sphere of knowledge, monopoly in all matters related to its service, and objectivity in its theory and technique, will advance social progress. On the basis of this the public will grant the profession its

mandate, the formal recognition of status by means of state and federal licensing. The more of these attributes an occupation has and the more developed each of these attributes is, the more professionalized the occupation is. (pp. 196-197)

This quotation has been included not only because it indicates areas of central concerns to authors interested in occupations and professions, but also because it illustrates the common tendency towards a unitary conceptualisation of profession, though various authors may stress different sets of traits when doing a particular study of professions.

Some authors, such as Greenwood (1962), Kerr, Von Glinow and Schriesheim (1977), Lansbury (1978), Meginson, Mosley and Pietrie (1986), and Osigweh (1986), have identified their comprehensive sets of professionalism criteria (traits of a profession) through studies and broad literature reviews. These sets of criteria are drawn together in Table 3-2.

Table 3-2: Professionalism Criteria

Criteria	1*	2	3	4	5
A unique body of knowledge (theories and technologies)	✓	✓	✓	✓	✓
Intellectual training at a high level		✓			
Specialised autonomy/Professional authority	✓			✓	✓
Standard of entry			✓		
A unique professional culture		✓		✓	✓
Identification with the profession and fellow professionals	✓				
A code of ethics	✓	✓	✓	✓	✓
Commitment to a calling	✓	✓	✓	✓	
Service orientation (Altruism)	✓	✓		✓	
A reward system stressing professional achievements	✓				
Maintenance of standards	✓				
A sanctioning organisation		✓	✓		
Social/community recognition				✓	✓
A full-time occupation				✓	

* 1 = Kerr, Von Glinow and Schriesheim (1977); 2 = Lansbury (1978); 3 = Meginson, Mosley and Pietrie (1986); 4 = Osigweh (1986); and 5 = Greenwood (1962)

It should be noted that professions may not actually meet all the criteria as an “ideal” profession does (such as the profession of medicine, see Langman and Richman, 1987). Professions only come significantly closer to meeting these criteria than do non-professional occupations.

3.2.2 The Process Approach

To be recognised as a profession, occupations are active in shaping their identities through a process of professionalism, which involves

- establishing occupational associations,
- developing formal training programs, and
- establishing lobbying mechanisms at federal, state, and local levels (Langton, 1991).

Some authors (e.g. Langton, 1991) have sought to analyse professions in terms of the process of professionalism. Langton examines the evolution of nurse-midwifery during the period from 1925 to 1986 by using the process including the following important stages:

- Establishing an occupational association,
- Developing and accrediting educational training programs, and
- Achieving national certification and licensure.

Caplow (1964) cites five stages which he claims are readily applicable to any “professionalising” occupation:

- the establishment of a professional association,
- a change in the name of the occupation, if necessary,
- the development of a code of ethics,
- the obtaining of the support of the public, and
- the development of training facilities.

Wilensky (1964) proposes a similar sequence:

- the emergence of a full-time occupation,
- the establishment of special training programs,

- the founding of a professional association,
- political agitation directed towards the protection of the profession by law, and
- maintain the standards of performance and the adoption of a formal code of ethics.

It should be noted that the particular sequences in which various professions evolve may vary significantly, subject to their social and cultural contexts.

3.2.3 Other Approaches

In addition to the above two approaches, professions can also be examined using an *interactionistic* approach or a *legalistic* approach. The interactionistic approach views a profession as a set of role relationships between expert (professional) and client. Its central theme is that professionals profess to know the relevant knowledge and skills and to use them for their clients' benefits and they have the clients' trust that the professionals are working in the best interests of the clients (Montagna, 1977). The legalistic approach views as extremely important the recognition of the status of a profession by laws at federal or state levels (Lansbury, 1978). Some widely-recognised professions (e.g. medicine and accounting) have gained legal protection, such as registration, certification, and licensing. The legal protection is important for the professions to maintain or expand their control over their professional practices.

3.3 TURNER AND HODGE'S APPROACH FOR STUDYING PROFESSIONS

While acknowledging that the isolation of a series of characteristics of professions at least merits attention in the study of professions, Turner and Hodge (1970: 25) go further to state that “it is desirable to indicate at least the general theoretical orientations in terms of which the variables [characteristics] might be organized into a conceptual scheme.” This idea is supported by Johnson’s (1972) criticism of the traditional trait approach. According to Johnson, the procedure of listing attributes without any prior and explicit theoretical framework suffers a number of penalties, for example, the listed traits are not exclusive of one another and the relationships between the traits are not clear.

Turner and Hodge (1970: 25) have developed an approach that “has the merit of being utilizable at a sufficiently abstract level for purposes of general theorizing, yet provides a definite guide to the sort of lower level concepts and operational definitions which are required for empirical analyses in any particular field of study.” Their approach involves examining four fundamental aspects to determine the degree of the professionalism of an occupation. The four aspects are:

- **The degree of substantive theory and technique** in the practising of professional activities. An ubiquitous assumption in writing on professions appears to be that a profession has an essential underpinning of abstract principles which have been organised into a theory, set of theories, or at least a complex web of theoretical orientations. Alongside this set of basic principles are various practical techniques for the recurrent application of at least some of the fundamental principles. Substantive theory and techniques are central in underpinning a professional occupation.
- **The degree of monopoly.** The degree of monopoly over claimed professional activities involves both ideological and pragmatic aspects. At the ideological level, a profession claims a high degree of monopoly over “professional activities”. At the

pragmatic level, the esoteric nature of a profession's core knowledge and techniques determines that only its members hold such knowledge and skills.

- **The degree of external recognition of a profession.** Public recognition is a critical aspect of a profession. There are several possible publics to whom a profession may address themselves. Its "clients", whether individuals, groups, or large-scale organisations or some combination of these, constitute perhaps the most significant of these publics. Some other publics include: (1) Co-workers outside the profession, who are either necessarily or incidentally implicated because of their role in the division of labour; (2) Other occupational/professional associations, which may be either complementary or competitive; (3) Employing units and employers' associations; (4) Government bodies taking a direct legislative and/or administrative part in the regulation of occupational activities; (5) Educational and training institutions; and (6) Other individuals, groups and organisations, which collectively might be labelled as general public.
- **The degree of organisation of a profession.** Organisation is the primary means to exercise control over and manage access to basic professional activities. There are two general perspectives to viewing the organisation of a profession. One is the community approach and the other is the formal organisation approach. The community approach views a profession as a community within which an informal network of communication exists and its members are bound by a sense of identity and share values in common. The organisation approach examines the formal association of a profession, its structure and activities such as registration and licensing of competent professionals, the codification of standards of practice and conduct, and the application of formal control over members.

Turner and Hodge (1970) indicate that these four areas are closely interrelated. Claims to knowledge and skills are usually very closely linked with claims to some degree of monopoly over professional activities, and both of the two aspects may be intricately related to problems of the external recognition and organisation of a profession. So it is clearly necessary to devote detailed attention to the analysis of their interrelationships, as well as to each particular aspect of them.

3.4 FEATURES OF OCCUPATIONAL (PROFESSIONAL) COMMUNITY

An occupational community is

...a group of people who consider themselves to be engaged in the same sort of work; whose identity is drawn from the work; who share with one another a set of values, norms and perspectives that apply to but extend beyond work related matters; and whose social relationships meld work and leisure (Van Maanen and Barley, 1984: 287).

Members of the same occupation have some sort of common life together and are, to some extent, separate from the rest of society (Salaman, 1974). They build their lives around work, and their lives become so permeated with occupational relationships and ideologies that even their nonwork lives are strongly influenced by their occupational identity (Salaman, 1974; Trice and Beyer, 1993). Salaman (1974) develops a set of key components and determinants of an occupational community on the basis of a review of many published studies in the related areas. Salaman's three key components are:

- **People's self-image:** People in an occupation must see themselves in terms of their occupational role (as part of the occupation); just doing a certain kind of work is not enough. It is the self-definition of members – and not any organisationally conferred job title, census classification, or even government license or certification – that determines an occupational community.
- **Reference group:** Members of an occupational community regard other members of the same occupation as their major reference group, with whom they share a common set of beliefs, values, and norms, and they look to one another for support and confirmation of the meanings they ascribe to events around them, for approval and disapproval of patterns of behaviours, and for evaluation of their professional performance.
- **Fading boundaries between work and non-work lives:** People prefer to associate with other members of their occupation than with outsiders, and people carry work activities, interests and relationships into non-work lives.

Salaman's three key determinants related to the three components are:

- **Involvement in work:** members of the same occupation are emotionally involved in their work skills and tasks; they value their work not only for the extrinsic rewards it brings but also for the satisfaction they derive from actually doing it, and for the opportunities it offers them to use their work skills.
- **Marginal status or stratification situation:** members have to restrict their association to other members of their occupation when their ambition of identification and association with members of a higher-status group are unsuccessful.
- **The inclusiveness of the work situation:** the various types of “inclusive” factors because of which people’s non-work lives can be severely affected by their work roles.

According to Salaman, involvement in work is a *necessary* but not a *sufficient* causal factor in the determination of an occupational community, and at least one of the latter two factors is needed in such a determination.

A broad literature review reveals that these features of an occupational community are not necessarily true for *all* occupations, but certainly true for those occupations which can be called *professions*. The reason is that members of professions usually regard their professional work as a central life interest, while members of some non-professional occupations may not (Orzack, 1972; Dubin, 1956). According to Orzack:

It can hardly be assumed that professionals do not value their work. They may in fact consider it an end-in-itself. For the professional[s], work is a focal center of self-identification and is both important and valued. (Orzack, 1972: 55)

The fading boundaries between work and non-work lives in professions are also supported by Parker’s (1972) theory of work-leisure relationships. Parker’s (1972) theory identifies three patterns of work-leisure relationships, ie., extension, opposition, and neutrality, and associates each of them to a set of occupation-related variables. From the theory, it is clear that professionals are expected to be extension-pattern-oriented, that is, they have a strong tendency to extension of work into leisure, while members of other occupations may prefer the opposition or neutrality pattern. For professionals, a main function of leisure is continuation of personal development rather than entertainment (Parker, 1972).

3.5 OCCUPATIONAL/PROFESSIONAL CULTURE

Similar to the fact that organisations develop their organisational cultures, occupations/professions create and sustain relatively unique work cultures referred to as “occupational/professional cultures” (Sherman, 1999; Bloor and Dawson, 1994; Trice, 1993; Osigweh, 1986; Van Maanen and Barley, 1984).

3.5.1 Occupation/Profession as a Culture

Occupations are not simply technical terms, rather they are more or less publicly recognised cultural categories (Udy, 1980). Because cultures are first and foremost collectivities with distinct ideologies, occupations fit the concept to the extent that forces are present to facilitate group identity among members (Trice, 1993). Occupational communities

...create and sustain relatively unique work cultures consisting of, among other things, task rituals, standards for proper and improper behavior, work codes surrounding relatively routine practices and, for the membership at least, compelling accounts attesting to the logic and value of these rituals, standards and codes (Van Maanen and Barley, 1984: 287).

Trice (1993: xiii) also recognises that “occupations are distinct cultures in and of themselves.”

As discussed in Chapter 2, culture is an accumulated shared learning of a given group. According to Schein (1992), any group can form a culture if its members face common problems of external adaptation and internal integration and they have a sufficient history of shared experience in solving these problems. Included in this statement are the three factors which contribute to the formation of a culture within a particular group: (1) members’ dealing with common problems, (2) their formal and informal interaction with one another, and (3) sufficient length of time. The rationale is that a group develops solutions to its internal and external problems and if they work, the group starts to form a perceived value that the solutions are “good”, and then if some of them work repeatedly, they come to be part of the group’s culture (Schein, 1992).

An occupation (profession) can meet all these three conditions for culture formation:

- Instead of being formally created, an occupation emerges spontaneously within a group of people performing *like tasks* (Trice and Beyer, 1993).
- Every profession operates through interactions among members within a network of formal and informal groups (Greenwood, 1962; Osigweh, 1986). The formal groups include: (1) the organisations through which the profession performs its services; these provide the institutionalised setting where professionals and clients meet, such as hospitals, law offices, and engineering firms; (2) the educational and research centers whose functions are to replenish the profession's supply of talent and to update its knowledge; and (3) the professional associations which act as an expression of the growing consciousness-of-kind on the part of the profession's members, and which promote so-called group interests and aims. The informal groups are the officially unrecognised networks of interactions that exist within and around the above-mentioned formal groups (Greenwood, 1962; Osigweh, 1986).
- An occupation usually comes into existence by a quite long social process. Especially, to be a profession, an occupation needs to go through a long process of professionalism.

During its long history of members' dealing with common work tasks and interactions with one another, an occupation (profession) thus naturally develops its own occupational (professional) culture. The process of the emergence of an occupational culture could be summarised as follows:

In the process of claiming rights to perform certain tasks, members of occupations naturally tend to emphasize what makes them like one another and different from other workers. As they interact and work together, members of occupations come to share a similar view of their work and, more generally, of the world in which they perform it. Over time, members create self-definitions, ideologies, and values that help them to sustain their occupational identities and justify their rights. Occupational myths, rituals, symbols, rites, and other cultural forms emerge to help to express and affirm these distinct sets of understandings to current members, new recruits, and those outside the occupation. (Trice and Beyer, 1993: 180)

While acknowledging that all occupations may create their own "occupational" cultures, the literature stresses the existence of "professional" cultures within the communities of "professional" occupations (professions). According to Greenwood (1962), it is the attribute "professional culture" that most effectively differentiates

professions from non-professional occupations. For professionals, work is often regarded as the end of life itself instead of just the means. The central nature of work provides a sound basis for the evolution of professional cultures during the professions' long processes of professionalism. Compared with non-professional occupations, professions usually create and sustain cultures which are:

- More pervasive – a larger degree to which a culture is widespread or shared among members of a profession,
- More consistent (homogeneous) – a larger degree to which members' interpretations of the same artefacts and values are consistent with one another, and
- Stronger – a higher level of pressure that a culture exerts on members so that they feel compelled to follow the dictates of the culture.

Previous studies of occupations (professions) have provided some empirical evidence about the existence of unique occupational (professional) cultures within some particular occupations (professions). For example,

- Based on his twenty-five years efforts in studying organisational cultures, Schein (1992) concludes that Information Technology and Management (CEOs) as two occupational communities can be viewed as two sub-cultures in organisations, which have different assumptions about the nature of information, the nature of people, the learning process, organisations, and management.
- Miller (1992) examines the human service profession and states that human service professionals confer identities on themselves and others by distinguishing between their professional philosophies and those of other professions;
- Kerr, Von Glinow and Schriesheim (1977) conclude that engineers and scientists differ considerably in their work goals, needs, and job attitudes; and
- Peters (1995) finds that journalists and scientific experts have two different professional cultures.

3.5.2 Occupational Cultures and Organisations

Occupations are distinct cultures in and of themselves and, when practised within organisations (as they usually are), they can be potent subcultures (Trice and Beyer, 1993). Because the boundaries of an occupation span organisations, an occupational culture represents both external and internal influences on organisations. The external

influence comes from the occupational culture as an overall culture of the occupation, and the internal influence comes from the occupational culture as a subculture within a specific organisation (Trice and Beyer, 1993).

Occupational/professional culture is one of the major sources of organisational culture (Schein, 1992; Louis, 1985; Van Maanen and Barley, 1984). In deciding how to act, people have access not only to the operating system and cultural system of the organisation, but also to the codes and operating practices of their occupation (Bloor and Dawson, 1994). Actually, occupational cultures are rarely replaced or totally absorbed into the relevant organisational cultures (except when they become dominant as in professional organisations) because of the support they receive from their professional world outside (Bloor and Dawson, 1994).

Professional culture may override organisational culture to some extent. Fonne and Myhre (1996) conclude, from their investigation of 60 operational crewmembers from the Norwegian Air Ambulance Service, that despite a common goal and clear area of responsibility for the crewmembers, each occupational category (pilot, doctor, and paramedic) brings a set of specific attitudes and values from their professional background, which are then used as guidelines for performance, thereby influencing the interpretation of the organisation's established rules and procedures. In their study to investigate corporate culture in the pharmaceutical industry of the UK, Dorabjee *et al.* (1998) find that departments of the same kind, irrespective of their various parent companies, share a strong cultural identity, and they have more in common with each other than they do with other departments within their own companies. Thus it can be said that a professional employed in the industry retains his/her identity as a professional and the "professional" culture overrides the company culture. Especially, in a professional organisation, professional norms appear to be a powerful substitute for organisational rules and regulations (Nijmans, 1991). Nijmans (1991) ethnographically explores the social reality of a counselling and training institute and concludes:

Organizational rules were indeed limited in this professional community. If there were explicit house-rules or prescribed practices, they emerged mainly as "enabling conditions" to let professional autonomy prevail and to "maintain the

game” rather than to prescribe behaviour. Even the barely stated rules were subject to interpretation, enactment and further negotiation. (p. 17)

Trice and Beyer (1993) consider people’s occupations as the most highly organised, distinctive, and pervasive sources of subculture in work organisations. From an organisational perspective, occupations are imported subcultures, carrying ideas that originate outside organisations. For example, Zellmer-Bruhn, Gibson, and Aldag (2001) identify professional norms about time as one of major sources of the temporal elements of organisational culture; and Ulijin and Weggeman (2001) identify professional culture as one of the major determinants of corporate innovation culture. Within organisations, occupational sub-cultures often compete with specific organisational cultures for members’ minds and hearts. As a result of this competition, occupational cultures may reside more or less peacefully within (and as part of) organisational cultures, may exist alongside or in opposition to them, may be buried by them, or may even contain them (Van Maanen and Barley 1984). The position of an occupational culture in an organisation is determined by its members’ informal “negotiation” with the organisation (Sonnenstuhl and Trice, 1991).

3.5.3 Studying Professional Culture for Management Purposes

A professional culture is one of the most significant cohesive factors which ensure the continuance of a profession as a group collectivity (Harries-Jenkins, 1970). The study of professions is one of the foci in sociology. However, it is not an esoteric sub-section of industrial sociology, but a central area of sociological investigation that may supply insights and ideas which can fruitfully be applied in other areas (Hughes, 1958).

3.5.3.1 The necessity of studying occupational culture

Many authors in the management literature acknowledge the necessity of studying occupational (professional) culture. Van Maanen and Barley (1984) regard “occupational communities” as central bearers of cultural patterns in working life. From the point of view of the presumed dichotomy between communal or collegial and rational or administrative forms of work organisation (see Section 3.1 for details), Van Maanen and Barley (1984) state that both an “occupational lens” and an “organisational lens” should be utilised to view people’s behaviour in the workplace if organisational theories are to locate and explain more of the behavioural variability of

the workplace than has been the case to date. They point clearly to the need for the careful inclusion of occupational cultures in the study of work organisations. According to Van Maanen and Barley (1984), the study of occupational cultures can be beneficial as follows:

- To broaden people's understanding of social control in organisations. In various ways, occupational principles (such as peer pressure, codes of conduct) compete with administrative (organisational) principles (such as hierarchical discipline) for control of members' work-related behaviours.
- To cast new light on problems of diversity and conflict at the workplace. Many problems at the workplace are rooted in occupational diversity instead of organisational structures.
- To bring forth a concern regarding how a given line of work can be said to influence one's social conduct and identity, both in and out of the workplace.

Hofstede (1991, 1980) identifies occupational culture as one of the suggested future research topics. He recognises occupational culture as an important level of culture between national culture and organisational culture and acknowledges that differences between occupational value systems have important effects on communication between members of an occupation and those of other occupations in an organisational setting.

Many other authors also acknowledge the necessity of studying occupational cultures, such as,

- Trice (1993) and Trice and Beyer (1993) acknowledge that occupations are often very prominent subcultures in organisations but they have been largely overlooked by scholars who attempt to understand organisational behaviours and cultures.
- Bloor and Dawson (1994) recognise the significance of professional culture as a major determinant of an organisation's cultural system.
- Brien (1998) states that an appropriate professional culture can promote ethical behaviours more effectively than codes of ethics and legislation.
- Louis (1985) identifies professional and occupational groups as one of the main sources of workplace cultures.

- Alvesson and Berg (1992) establish a culture study model which recognises a professional group as one of the main object levels of culture studies.

3.5.3.2 Object levels of professional culture study

According to Alvesson and Berg (1992), professional culture studies can be undertaken within a given organisation, within a particular industry, or within a particular profession. Taking a professional group within a given organisation as the object, a researcher sees the professional culture as a *sub-culture* in the organisation. Taking the whole group of a particular profession as the object, a researcher sees the professional culture as the *overall* culture of the profession. A professional culture study within a particular industry is something between the two views.

The study of professional cultures at the subculture level attempts to find differences in behaviours, values, and beliefs between various professional groups within a given organisation, or the difference between each of the professional subcultures and the overall organisational culture. As a subculture, professional culture represents an internal influence on the organisation (Trice and Beyer, 1993).

The study of professional culture at the overall culture level aims to find the common artefacts, values, and beliefs shared by all members of a particular profession, who may be employed in various industries and organisations. As an overall culture originated outside any particular organisation, professional culture represents an external influence on the organisations where professionals work (Trice and Beyer, 1993). At the overall culture level, according to Alvesson and Berg (1992: 72),

professional culture studies describe how various occupational groups think, act and function. The organization is then considered to be of secondary interest for the simple reason that a profession is not limited to the framework of a given organization, but goes beyond the boundaries of the organization. Determinant factors which are external to the organization are crucial.

3.5.3.3 Limitations in cultural research in management literature

In 1984, Van Maanen and Barley argued that only lip service had been paid to occupational/professional culture research, and that focused and conceptually driven research, based on an occupational perspective, had been notably absent in the organisation behaviour literature. This represents a limitation in cultural research in the

field of organisational behaviour. Unfortunately, so many years after Van Maanen and Barley's publication, the research about occupational/professional culture seems to still stay at the "lip service" level, and only a very limited number of studies (e.g. Trice, 1993; Trice and Beyer, 1993; Raelin, 1986) have been done in this field. For example, using "professional culture" as the search word, there are only 10 hits during the period from 1985 to 1998 in the ABI/Inform database; and "occupational culture" only 6 hits, in comparison with more than 7,000 hits of "corporate culture". Occupational cultures have received considerably less attention in the literature than either national or organisational culture, with a few exceptions (Hofstede *et al*, 1990). Trice (1993) has a similar opinion, that is, occupations, as cultures, have been largely overlooked by scholars and students who attempt to understand organisational behaviours.

Another major limitation in the literature is that most studies discuss occupational culture only at the subculture level. Without the discussion of occupational culture at the overall culture level, it is not clear where the occupational subculture comes from.

3.6 SUMMARY

There are two alternative perspectives to viewing how work is organised and interpreted. One is from an organisational (administrative) frame of reference, and the other is from an occupational (communal) frame of reference. Correspondingly, both an “organisational lens” and an “occupational lens” are needed to view people’s behaviours in the workplace. Administrative principles compete with communal principles for control over members’ behaviours. Based on this rationale, a study of work-related culture at the workplace should include both “organisational culture” and “occupational culture”. The study of occupational culture represents one of the uses of the “occupational lens”, while the study of organisational culture represents one of the uses of the “organisational lens”.

Three factors determine the formation of a culture within a particular group: (1) members’ dealing with common problems, (2) their formal and informal interaction with one another, and (3) sufficient length of time. Although all occupations may to various degrees create and sustain their unique cultures, it is those occupations which can be called “professions” that develop maturer cultures (called “professional culture”) than “non-professional” occupations do. This is determined by their traits as professions and their process of professionalism. For professionals, work is a “central life interest”, and it is often regarded as the end itself instead of just the means. During their long process of professionalism, their professional associations, educational programs, and informal peer network all contribute to the evolution of their professional cultures. A professional culture can be well developed during the shared long history of its members’ dealing with their common internal and external problems.

At the workplace, organisational culture and professional culture are usually intertwined, except for the case of an organisation in which all its members are of the same profession and therefore the two cultures are the same. Because the boundaries of professions span organisations, professional cultures represent both external and internal influences on organisations. On the one hand, professional cultures are distinct

cultures of their professions; so, as overall cultures beyond organisational boundaries, they externally influence organisations. On the other hand, professions are usually practised within organisations; so as subcultures within organisational boundaries, they internally influence organisations.

The study of professional cultures for management purposes is the application of relevant themes of the sociology of professions: characteristics of a profession are examined in terms of their relevance to the management purposes. In the management literature, many authors have acknowledged the necessity of inclusion of occupational/professional cultures in organisational behaviour studies. However, only a very limited number of studies have been done in this area. Another major limitation in the management literature is that most studies discuss occupational cultures only as “subcultures” within organisations and do not see occupational cultures as “overall” cultures themselves.

To finish Chapter 3 is a citation from Van Maanen and Barley's (1984: 288) well-known study on occupational cultures in organisations:

... Rich accounts of occupational ways of life ...must be reckoned with if organizational theories are to locate and explain more of the behavioral variability of the workplace than has been the case to date.

Chapter 4

The PM Profession and Culture

Chapter 4 presents a review of the history of project management and shows readers how project management has evolved to be a profession and why a project management culture can be assumed to exist in the project management profession. This chapter also reviews the discussions of PM culture in the PM literature and their weaknesses. This chapter includes the following major sections:

- 4.1 Brief History of Project Management
- 4.2 The Professionalism of Project Management
- 4.3 Project Management Culture

4.1 BRIEF HISTORY OF PROJECT MANAGEMENT

There is a widespread agreement in the PM literature that project management emerged in the period from the 1930s to 1950s, or more strictly, was born in the 1950s.

4.1.1 Prior to 1950 – Early Development

According to Morris (1994), two important planning techniques were developed prior to the 1930s. The well-known planning technique, *Gantt Bar Chart*, was developed by Henry Gantt in the USA as part of the scientific management thought in 1917. The little known one, *Adamiecki's Harmonygraph*, was developed in Poland around 1896. This was the forerunner of today's popular work-flow network planning (such as CPM and PERT). Another precursor of networks, *Path Analysis* – a way of decomposing relationships between activities, was developed in 1918. And in the 1920s, product/brand management was created to make a manager responsible for all the functions of marketing, planning, and control of a brand or product (Morris, 1994). Product/brand management, with its role of integrating all relevant functions, was an early forerunner of project management.

During the 1930s, the US Air Corps' Material Division moved progressively towards a *project office* function to monitor the development and progress of aircraft, and the US process engineering companies began to develop a *project engineer* function to follow a project as it progressed through its various functional departments (Morris, 1994). Although the prevailing pattern of organisation at that time was almost without exception along pyramidal or functional lines (bureaucracy organisations), an author called Gulick did, in 1937, propose, for the first time, that a co-ordinator might be appointed to pull together the administration of a task involving several functional areas (Morris, 1994). According to Morris (1994:8),

By 1939, then, at the outbreak of the Second World War, modern project management was just emerging as an embryonic discipline, although probably evident only to a very few, mostly in the military and process engineering industries.

About the contribution of the Second World War to the development of project management, there exists a major disagreement between various authors. For example, Webster (1999: 63) states that “Out of the chaos of war came the orderliness of project management”; and Frame (1995: 1-2) states:

To a large degree, it [project management] was a byproduct of the major projects of World War II, the best known being the Manhattan Project. A conscious attempt was made to coordinate its enormous budget, schedule, and resource complexity as efficiently as possible. The Manhattan Project moved project management from the realm of the accidental to the domain – at least ideally – of the carefully contrived.

But Morris (1994: 10) has a very different opinion:

I regard only the Manhattan Project as a valid contributor to the subsequent practice of project management ... [and] even the Manhattan Project's contribution to the lexicon of modern project management is not major.

However, there is at least one clear point: there were notable examples of the early and effective use of project management during the War, such as the Manhattan Project and the Battle of Normandy. These examples to various degrees displayed the principles of organisation, planning, and direction that typify modern project management.

4.1.2 The 1950s – the Origin

In the 1950s, the most important points which together marked the birth of modern project management are as follows:

- The term *project manager* was firstly used in practice and magazines. Bechtel (1989) claims to have first used the term *project manager* in an international project beginning in the early 1950s. In May 1959, Paul O. Gaddis published his article “*The Project Manager*” in the journal *Harvard Business Review*. This article describes the role of the project manager in an advanced technology industry, the pre-requisites for performing the project management job, and the type of training recommended to prepare an individual for management of projects. It puts forth several basic notions about project management that are still true today.
- New project planning and control tools, the *Critical Path Method* (CPM), the *Project Evaluation Review Technique* (PERT), and the *Precedence Diagramming Method* (PDM), were developed (independently) in the USA in the late 1950s (Stretton, 1994a; Morris, 1994). CPM was developed during the period from December 1956 to February 1959 by du Pont in conjunction with Univac. PERT was developed in

1958 and 1959 by the US Navy. Also in 1958 and 1959, the networking method which later came to be called PDM was developed under a research contract by the US Bureau of Yards and Docks to Stanford University's Civil Engineering Department (Stretton, 1994a). The techniques of CPM, PERT, and PDM collectively constitute the “network techniques” of project management.

- The concept of systems thinking began to influence project management (Morris, 1994). It is reasonable to say that the development of project management as a discipline has taken place alongside the systems approach to management. Kerzner (1998) regards project management as an outgrowth of systems management, which attempts to integrate and unify scientific information across many fields of knowledge and to solve problems by looking at the total picture, rather than through analyses of the individual components.
- Also by the end of the 1950s, a number of organisational issues began to draw attention in the area of project management, such as the project manager's style, his/her need for organisational support, the need to take sub-optimal decisions for the sake of maintaining progress, the importance of conflict in projects, and the problems of authority and responsibility (Morris, 1994).

4.1.3 The 1960s and 1970s – Becoming a Management Discipline

According to Morris (1994: 38),

If the 1950s had been a decade of increasing systems integration ... and, towards the end, of the development of new project management planning and control tools, the 1960s were to see a veritable explosion in the development and use of both.

During the 1960s, the US Navy required the POLARIS contractors to use the PERT technique, and John W Mauchly (one of the CPM developers) made successful efforts to push CPM into the commercial market (particularly in the construction industry) in the USA (Kelley and Walker, 1989). As the computer technology developed, elaborate computer programmes began to be written allowing the much more efficient use of the CPM and PERT techniques (Adams, 1989). The advance of computer technology in the mid-1960s promised new methods of planning and controlling projects of increasing complexity (Blankevoort, 1983). The new computer-aided network planning techniques attracted so much attention that they were often thought of as synonymous with project

management. Indeed, the establishment of the *Project Management Institute* (PMI) of the USA was initiated by a businessman, E.A. Engman, who sold the McAUTO CPM and related software packages and services (Jenett, 1994).

During the 1960s, a matrix form of organisation was successfully applied on the Apollo program. The program was originally organised entirely along project (sub-project) grounds. Because of a number of problems created by the pure project structure of organisation, it was then re-organised in a matrix form including five functional divisions and four sub-project offices in order to stress both its functional/geographic needs and project requirements (Morris, 1988). In 1964, John Mee published the article titled “Matrix organization” in *Business Horizons* (Summer, 1964) to introduce a matrix form of organisation (cited in Cleland, 1988).

The second half of the 1960s saw a shift away from the preoccupation with scheduling and organisational aspects towards more comprehensive texts on project management (Morris, 1994). PM was regarded as a management discipline for systems integrations. By the end of the decade a theoretical basis, in organisational terms, for the need for such management integration had been developed and interest was being shown worldwide in the new management discipline of project management (Morris, 1994).

The C/SCSC (*Cost/Schedule Control Systems Criteria*) approach for project control, integrating time and cost considerations, represented another breakthrough in project management technique during this period (Archibald, 1987). Around the mid-60s, C/SCSC began to be the primary project control tool in both Department of Defense (DOD) and NASA in the USA. In 1967, the DOD formally “systemised” project management by the way of the C/SCSC (Tuman, 1993).

The establishment of two major PM associations in the late 1960s was a result of the PM evolution through the 1960s. One was the *International Project Management Association* (IPMA) in Europe and the other was the *Project Management Institute* (PMI) in the USA.

The 1970s saw an unprecedented expansion in application areas and development of project management as a distinctive discipline in its own right (Stretton, 1994b). Project management became a more common management practice in the 1970s (Morris, 1994). On the one hand, project-related organisations (eg., big construction companies) increasingly used project manager (project management) as an everyday line-management function, often in a matrix context (Morris, 1994). On the other, the concept of project management had spread to virtually all industries beyond the defence, space, and construction industries (Kerzner, 1979).

In the 1970s, the view of project management as a unique management discipline was accepted on a wider basis than in the 1960s. Project management became accepted as much more than the application of specialised tools usually requiring computerised support. Rather, project management was recognised as a unique field of management, with its own specialised problems and its own set of knowledge and skills, which in turn made a PM philosophy develop (Adams, 1989).

Towards the beginning of the 1970s, the human aspect was recognised as a major reason for the general lack of implementation success on development projects so far (Blankevoort, 1983; Morris, 1994). As the computer-based PM systems (network techniques) became more effective and efficient technical tools in the 60s and 70s, gaps began to open up between these systems and the project managers with the responsibility to manage and deliver the projects (Gabriel, 1990). Computer-based techniques were accurate, logical, but humans were not so accurate and logical. Despite the good network techniques, projects still often went wrong. The problem was on the human (soft) side of project management instead of the technical (hard) side of it. From the 1970s, recognition of the human side hit the world of project management. Lichtenberg (1989) recognises that the “humanised” third wave (generation) of project management has matured from the 1970s.⁵

⁵ Lichtenberg's three waves or generations of project management are: (1) the manual, highly intuitive Gantt chart based generation; (2) the computerised, highly detailed and logical, network-based generation, academically disregarding the real-world fuzziness, human lack of logic and related uncertainty; and (3) the “humanised” wave focusing on personal management control, flexibility, the acceptance of uncertainty, and the application of technical tools to serve the humanised management.

Also in the 1970s, many PM techniques were developed or refined, such as WBS (*Work Breakdown Structure*), OBS (*Organisation Breakdown Structure*), responsibility assignment matrices (eg, *Linear Responsibility Charts*), and “*earned value*” methods (Stretton, 1994b).

4.1.4 The 1980s and 1990s – Becoming a Mature Discipline and a Unique Profession

In the 1980s, project management moved into the stage of becoming a mature management discipline and a unique profession, as

- various areas of PM experience were integrated into accepted principles and practices (for example, PMI’s *PMBOK® Guide*) common to most application areas (Stretton, 1994c);
- degree programmes and professional certifications began in some countries such as USA, UK, and Australia (Stretton, 1994c; Morris, 1994); and
- it was recognised as a management philosophy which can be used in the management of any organisation, at any level, and for any function (Gupta and Taube, 1985).

In USA, PM professionalisation and associated issues had been frequently discussed within PMI during the 1970s. However, it was from 1981 that a systematic pursuit of the topic began, when the formal proposal of the *Ethics, Standards and Accreditation (ESA)* project was approved by the PMI Board (Stretton, 1994c). The ESA project produced a report known as the *ESA Report* in 1983, which was the basis for PMI’s standards, certification and education programs. Also in the report was that a new project management function, ie., *project scope management*, was added to the three traditional functions of time, cost, and quality management (Stretton, 1994c).

In the 1990s, project management continued its process of professionalism, such as,

- PM body of knowledge was refined. In 1994 and 1996, PMI published two updated versions of PMBOK titled *A Guide to Project Management Body of Knowledge* (the *PMBOK® Guide*)⁶ (PMI, 1996). In 1992, the UK-based *Association for Project*

⁶ This thesis uses the 1996 edition of the *PMBOK Guide*. Its latest 2000 edition has not yet been available from the University’s library.

Management (APM) published an European version of PMBOK, ie., APM's *Body of Knowledge*, which has been revised several times (Turner, 2000).

- Standards for PM competency became a new hot point in the community of project management. In 1996, AIPM published its *National Competency Standards for Project Management* (AIPM, 1999). In 1999, IPMA issued its *IPMA Competence Baseline (ICB)* (Turner, 2000)
- Efforts were made to establish a global profession of project management. Since 1994, global cooperation was established among various PM associations to promote the globalisation of the PM profession (Kooyman, 1995; PMI, 2000). In the 1990s, several global work groups were established to address some essential matters of the globalised PM profession, such as, international PM standards, certifications, and educations.
- Members of PM associations and holders of PM certifications grew by leaps and bounds (For details, see Section 4.2.1).
- Degree-granting PM courses gained popularity in many countries around the world. Also, a large numbers of short courses and seminars were offered by various PM associations and companies (For details, see Section 4.2.1).

4.1.5 Summary

The literature review reveals that:

- Project management emerged in the defence, construction, and aerospace industries, then expanded into almost all other industries.
- In general, project management has developed from pure technical tools through administrative (organisational) structures to a comprehensive approach with a body of knowledge and relevant techniques. This route is similar to that of the evolvement of general management⁷. Figure 4-1 shows the evolvement of project management in comparison with that of general management.

⁷ For the development of general management, please refer to Scott (1992), Kast and Rosenzweig (1985), Dessler (1976), etc.

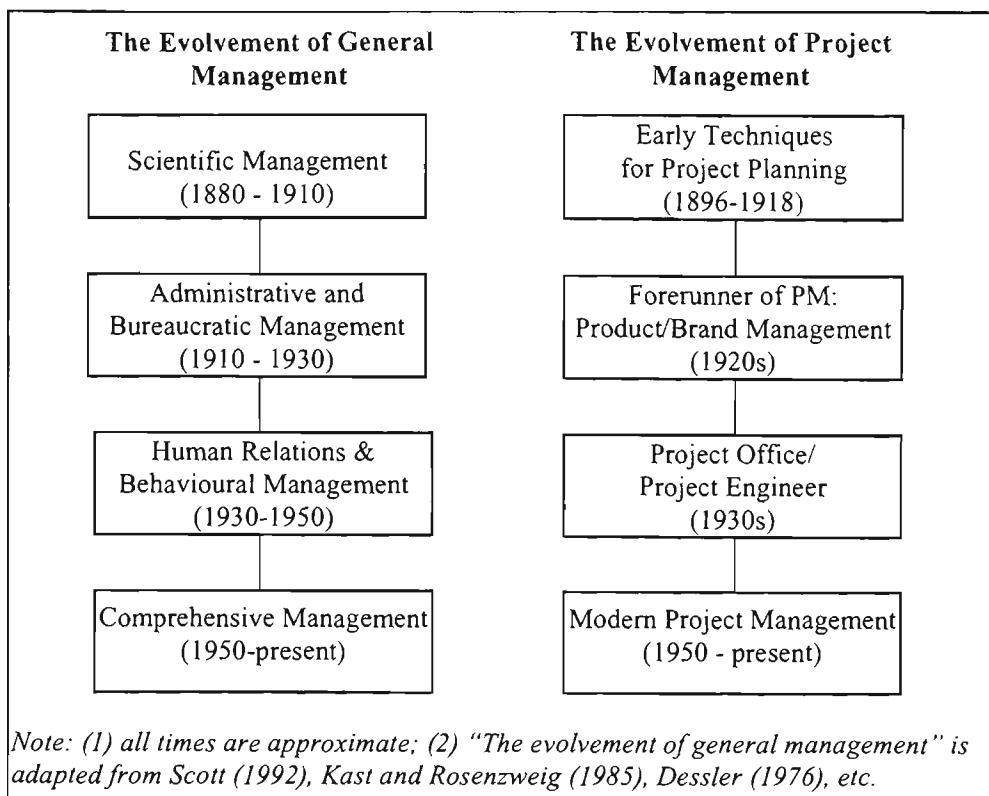


Figure 4-1: History of PM: Compared with General Management

- The early development of project management concentrated on techniques for planning and control and organisational structure, but recent developments have recognised the central role of people in project management. Since its emergence in the 1950s, the evolution of project management can be summarised as Table 4-1.

Table 4-1: Summary of the Evolution of Modern Project Management

Period and Central Theme	Important Development
1950s: Emergence of modern project management	The appearance of network techniques including CPM, PERT, and PDM
1960s: Network-based project management	The network techniques were pushed into commercial markets with the support of computer technology.
1970s: Humanised project management	The human factor began to be recognised as the important soft side of project management.
1980s: Project management became a discipline of management and a profession	Various experiences were integrated into a project management body of knowledge (PMBOK), and degree programmes and professional certification began in USA, UK, and Australia.
1990s: The development of a sense of professionalism in the practice of project management	Memberships and professional certification programs of project management associations grew rapidly; and degree courses in project management were offered in many universities.

4.2 THE PROFESSIONALISM OF PROJECT MANAGEMENT

During the 1960s and 1970s, if project management could be called a “profession”, it was an “accidental profession” (Davis, 1981; Frame, 1995). It was accidental in at least two senses. First, it was not a profession that people consciously chose to pursue. At that time, most project managers never really planned to be project managers – it happened almost by accident. They did not plan, study, and prepare for project management, and they did not pursue it as a career. Second, knowledge of how to run projects often was not acquired through systematic inquiry but was gained in a hit-or-miss fashion. Receiving little or no formal preparation for their jobs, the accidentally-appointed project managers had to reinvent the “wheel” of project management.

In the 1980s, this situation began to change, and, in the 1990s, a sense of the professionalism of project management was well-established within the PM community. It was during the 1990s that PM gained a rapid growth of its professional associations and popularity of its body of knowledge and education and training programs. Project management has become a newly-emerged profession. For example, the PMI’s *Fortune 500 Project Management Benchmarking Study*⁸ shows that all respondents feel that project management should be a career track (Toney and Powers, 1997). There is more consensus on this issue than on any other covered by the study.

From Chapter 3, it is known that features of a profession can be examined by the use of the trait approach (including Turner and Hodge’s approach), the process approach, and the other approaches (such as the interactionistic approach and the legalistic approach). For the purpose of understanding project management as a profession, it is necessary to examine the particular features of the PM profession and its process of professionalism.

4.2.1 Traits of the PM Profession

This thesis uses Turner and Hodge’s (1970) approach to examine the traits of the PM profession. As discussed in Chapter 3, Section 3.3, Turner and Hodge’s approach

⁸ The participants are predominantly large Fortune 500 companies dealing with large numbers of very large projects.

provides additional advantages, compared to the traditional method of subjectively listing some traits of a profession without any prior and explicit theoretical framework.

4.2.1.1 Substantive theory and techniques (Body of Knowledge)

It is widely agreed that a PM body of knowledge exists, which is well-known as PMBOK. According to PMI (1996: 3), the PMBOK

... is an inclusive term that describes the sum of knowledge within the profession of project management ... The body of knowledge rests with the practitioners and academics who apply and advance it. The full PMBOK includes knowledge of proven, traditional practices which are widely applied as well as knowledge of innovative and advanced practices which have seen more limited use.

And according to Cleland (1995: 83),

This body of knowledge has reached a level of maturity that requires a continuing assessment of its contribution to the evolving field of project management.

The review of the PM literature (eg. PMI, 1996; Walta, 1995) reveals that the PMBOK includes: (1) looked at horizontally, not only documented knowledge, but also not-yet-documented knowledge; (2) looked at vertically, not only PM theories, but also PM techniques; and (3) looked at extrapolatively, not only general practices applicable in all areas of PM application, but also special practices applicable only in one or several areas of PM application (such as within the boundaries of a country or an industry).

Figure 4-2 shows a PMBOK model reflecting these three perspectives.

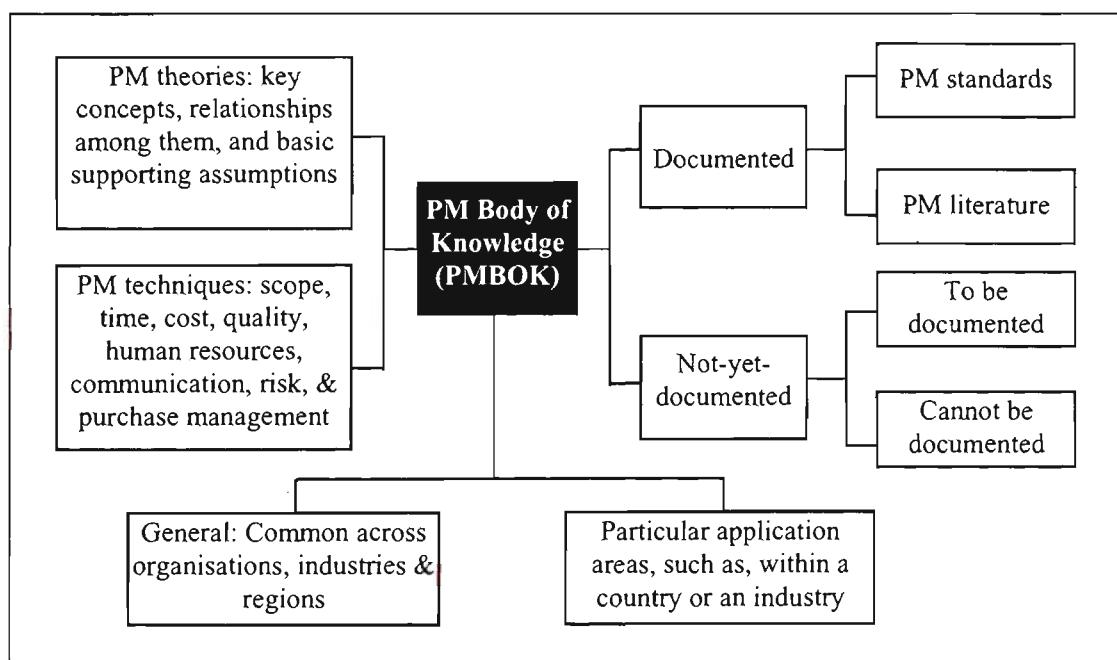


Figure 4-2: PMBOK Model

The PMBOK, particularly its documented part, is important for people to overcome the “reinventing the wheel” problem. The best-known document of PMBOK is *A Guide to the Project Management Body of Knowledge* (the *PMBOK® Guide*) published by PMI. With over 300,000 copies in circulation, PMI claims that it has become the *de facto* global project management standard⁹ (PMI, 1999a). The *PMBOK® Guide* is central to the main thrust of PMI’s program of PM professionalisation. It addresses a general PM framework and identifies nine areas of PM knowledge (refer to Figure 4-3).

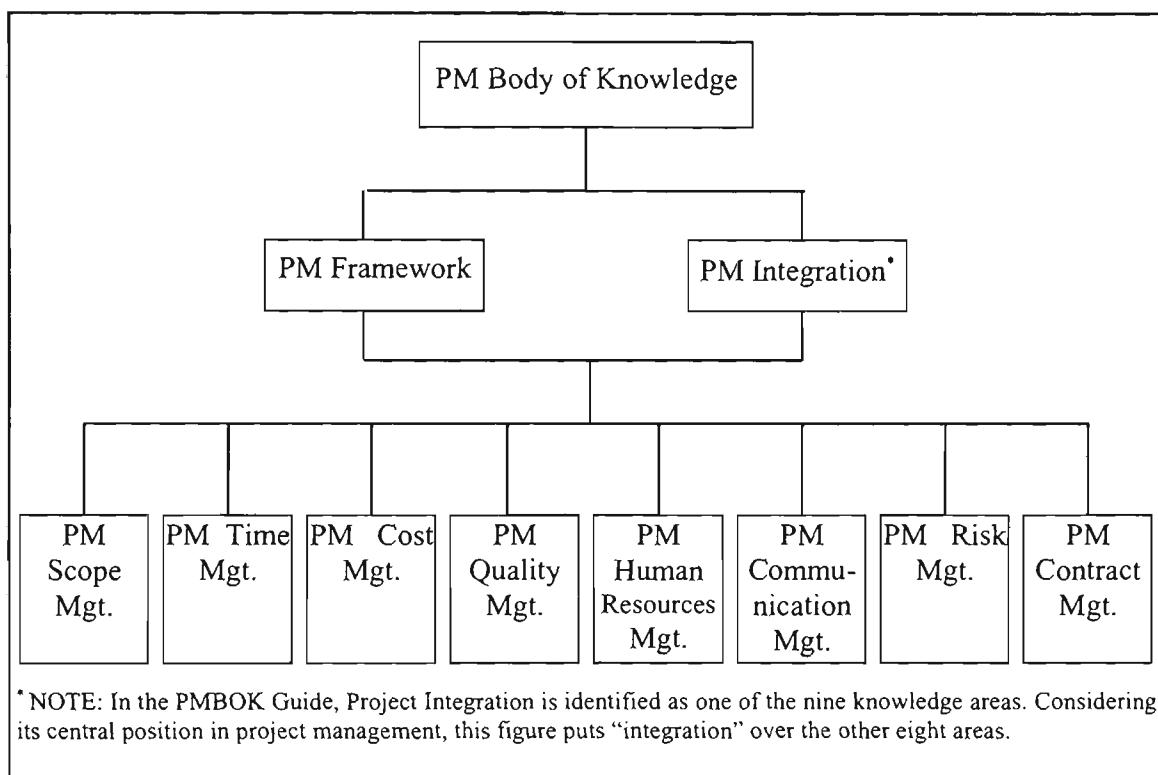


Figure 4-3: PMI’s PMBOK Structure

According to PMI (1996:3), the *PMBOK® Guide*

is to identify and describe that subset of the PMBOK which is *generally accepted*. Generally accepted means that the knowledge and practices described are applicable to most projects most of the time, and that there is widespread consensus about their value and usefulness. Generally accepted does *not* mean that the knowledge and practices described are or should be applied uniformly on all projects; the project management team is always responsible for determining what is appropriate for any given project.

As stated by Allen (1995), the *PMBOK Guide* represents the authority in such areas as:

⁹ To meet the international demand for the *PMBOK Guide*, PMI is seeking to publish official translation versions of the *PMBOK Guide* (2000 Edition) in eight other languages including Brazilian Portuguese, Mandarin Chinese, French, German, Italian, Japanese, Korean, and Continental Spanish (source: PMI Headquarter, May 2001).

- defining the practices which are unique or nearly unique to the practice of project management and which are generally accepted;
- defining the basis of certification testing for PM professionals; and
- defining the basis for the accreditation of degree-granting PM education programs.

Besides the *PMBOK® Guide*, some other national and international organisations have developed their own PMBOK documents, such as the *IPMA Competence Baseline (ICB)*¹⁰, APM's *Body of Knowledge*, NAPM's (*Norwegian Association of Project Management*) *Fundamentals of Project Management*, ISO 10006 *Guidelines to Quality in Project Management*, etc. In Australia, AIPM developed a draft reference curriculum for PM courses in 1992, which was virtually a draft Australian PMBOK. However, then, AIPM changed its priority to the development of a PM competency standard (Stretton, 1995). AIPM is now using the *PMBOK® Guide* as its PMBOK document.

4.2.1.2 The degree of monopoly

According to Turner and Hodge (1970), the degree of monopoly over professional activities involves both ideological and pragmatic aspects. Ideologically, a profession claims a high degree of monopoly over professional activities, and pragmatically, the nature of the core techniques and applications of the professional knowledge determines that only the profession is able to have and develop the knowledge and techniques needed to do the professional activities.

Except for the management of projects of very low complexity, the PM profession does, ideologically and pragmatically, claim a monopoly over *formal* project management. For example, AIPM expresses its vision as “Project Management is permanently established in the Australian community as an eminent profession, **with professional project management an integral part in the delivery of every project**” (bold added) (AIPM, 1999: 3); and Nunn (1994) strongly claims that the real professionals in project management are the holders of the *Project Management Professional*¹¹ (PMP®)

¹⁰ Turner (2000) says that the ICB has greater claim to the status of global standard than the *PMBOK Guide* simply because of IPMA has over 30 member national associations from America, Europe, Africa and Asia.

¹¹ The term *Project Management Professional* (abbreviated to PMP®) in title case refers to those who hold a Project Management Professional Certificate from PMI, and the term *project management professional* (abbreviated to PM professional) in low case refers to all members of the PM profession as defined in this thesis.

certificates. As Stewart (1995) states, although there are no simple rules of thumb, the four yardsticks, *Scope*, *Unfamiliarity*, *Complexity*, and *Stake*, can be used to judge if a project should be managed with a PM approach. The higher the rating of a project on the four aspects, the more it needs to be managed with formal project management.

Formal project management is certainly based on the PMBOK. It is the PMBOK that constitutes the basis on which it can be said that only PM professionals, who have met certain PM education and practical experience requirements established by the profession, are able to conduct formal project management. From the perspective of the PMBOK, the PM profession's monopoly over formal project management can be further illustrated by the two points as follows:

- No occupations but the PM profession manipulates and is able to further improve the systematic PMBOK, and
- the systematic study of the PMBOK requires many years of PM education and experience, so no persons but PM professionals are able to manipulate the PMBOK.

The PM profession's claim over the monopoly can be further evidenced by its programs of PM certification and education accreditation. Through these programs, the PM profession claims that a minimum standard for entry into the profession is needed. PM associations, such as, PMI, IPMA, APM and AIPM, have established their own certification and accreditation programs.

In USA, PMI's PMP® certification program has been offered since 1984, following the 1982 survey showing that 86 percent of PMI members surveyed "favoured some type of certification program" (Stretton, 1994c; Webster, 1994a). To achieve PMP® certification, each candidature must satisfy all educational and experiential requirements established by PMI, agree to adhere to the ethics code, and pass the PMP® examination to demonstrate an acceptable level of knowledge of project management. As of the end of 2000, the PMP® program has certified 27,804 PM professionals worldwide (Personal communication with PMI Headquarter, March 29, 2001). Further, since PMI instituted its program to encourage the development of degree-granting PM education programs in 1983 (In August 1983, PMI published the report titled *Ethics, Standards,*

Accreditation), many postgraduate PM courses have been established in many countries.

In Europe, APM was the first PM association implementing a certification scheme (News, 1991). The scheme was launched in 1992. It includes a three level PM qualification from the lowest *APM Professional* (APMP) through *Member of APM* (MAPM) to the pinnacle of the profession *Certified Project Manager* (CPM) (APM, 1999). IPMA has also offered a four-level certification program since 1999, which is accepted in its all member countries (Turner, 2000; IPMA, 1999).

In Australia, AIPM instituted the certification program of *Registered Project Manager* (RegPM) in 1997 based on its *National Competency Standards for Project Management* (NCSPM), which was approved by the *Australian National Training Authority* (ANTA) in 1996. The program includes three levels from the lowest *Qualified Project Practitioner* (QPP) through *Registered Project Manager* (RPM) to the highest *Master Project Director* (MPD). AIPM's *Project Management Course Accreditation Program* was instituted in 1998, but its origin can be traced back to the draft reference curriculum developed in 1992 (AIPM, 1999).

4.2.1.3 The degree of external recognition

Public recognition is a critical aspect of a profession. Project management has earned a rapidly increasing recognition from society in the past decades.

Client organisations' demand for and recognition of formal project management are probably of the most significance to the PM profession. The literature review reveals that the professionalism of project management was virtually the result of industrial organisations' desires/demanding for improving their competencies of project management. For example,

- The US Department of Defence has played an important role in the search for the professionalism of project management (Dechaineux, 1991). In the 1980s, they established a detailed professional development path that required a minimum eight years of post-graduate education, acquisition experience and specialist management training before an officer could be considered for a major PM position.

- Through its *Project Management Job Study*, AT&T identified a need for a comprehensive PM educational program to develop a recognised cadre of professional project managers within AT&T. Then, AT&T, in collaboration with the Educational Services Institute and the George Washington University, developed two innovative, graduate-level curriculum in project management: one for managers of AT&T's federal telecommunications/computer systems projects (firstly presented in July 1989) and one for managers of commercial projects (firstly presented in May 1990) (Ward, *et al.*, 1990).
- The inter-university post-graduate program titled “project management in the export industry” was taught for the first time in Austria in 1983 as the result of the desire to have a recognised course in project management, which was expressed in 1981 by representatives of the Austrian export industry (INTERNET News, 1983).

During the 1990s, project management has become widely recognised by a wide range of organisations in industry, commerce and government. Previously, project management was thought of as primarily applying to the defence, engineering and construction industries. Today the application of project management has extended far beyond these traditional boundaries to almost all industrial and non-industrial organisations. For example,

- a survey by Turner (2000) shows that all the nine listed industries and sectors are selected as important areas of PM applications by the participants¹².
- The membership of PMI in USA is made up of only 25 percent from engineering and construction. The rest is in pharmaceuticals, the finance industry, defence, petrochemicals, IT, the film industry, etc (AIPM, 1998).
- In Australia, AIPM’s current membership reflects the diversity of industries/sectors recognising the PM profession, although its origin, PMF, was formed in 1978 with a strong building and construction focus (AIPM, 1999).

¹² Twenty-two members of the International Editorial Board and eighty odd referees of the *International Journal of Project Management* were asked to choose two most important areas of PM applications from a list of 9 industries and sectors, and the answer covers all the nine ones. The listed industries and sectors are: Engineering & construction; Manufacturing & process; IT, Computers & Electronics; Communications; Infrastructure & WETT (Water, Energy, Transport and Telecommunications); Defense; Services, Financial & Leisure; Government; and Voluntary Sector.

While a PM professional certification may provide a person with a degree of job security, customers see certification as a guarantee of an individual's professional competency. Some organisations, such as AT&T, IBM, Digital Equipment Corporation, and Procter and Gamble in the USA, and Telstra in Australia, now require the completion of PM certification programs as a pre-requisite for advancement in the ranks of project management (Wirth and Tryloff, 1995; AIPM News, 1999). But many others have not yet such a requirement. For example, the PMI's Fortune 500 study shows that the majority (82 percent) of participants require no professional certification for its project managers (Toney and Powers, 1997). Only 18 per cent of the participants require some kinds of professional certification in project management. In Australia, a survey of PM positions advertised in the *Sydney Morning Herald*, *Financial Review* and *Weekend Australian* over the year of 1998 shows that "while advertisers called for competence in project management there was little or no mention of project management qualifications as such" (Hovey, 1999: 2). The primary reasons are probably that (1) there is no clear correlation between PM certification and improved PM performance and (2) despite the rapid increase over the past several years, the number of people holding PM certificates is still small, compared with the huge number of projects worldwide. From this perspective, project management as a profession has already a good start, but still has a lot of work to do in the future.

Project Management has also obtained good recognition from educational institutions. Project management has become a popular course at many universities around the world. Masters programs in project management are now offered by universities throughout the developed countries such as the United States, Canada, the United Kingdom, and Australia. Some universities in the developing countries, such as India and China, have also started to offer degree-granting courses in project management. Furthermore, a professional doctorate program in project management has started to draw attention from universities, such as the RMIT University in Australia, which formally launched its *Doctor of Project Management Program* in the early 2001. Most, if not all, PM degree courses at universities around the world are offered at post-graduate (Masters) level, so "PM education is recognised as akin to a MBA, but having a project focus rather than a general organisational one" (Baccarini, 1999:4). In addition, project management also constitutes an important component in some courses

(at both undergraduate and graduate levels) of other disciplines. The AIPM's annual survey of PM courses and the PMI's annual survey of PM consultants and trainers clearly show that project management as a discipline and profession has obtained a high degree of recognition from educational and training institutions¹³.

Project management has also obtained a certain degree of recognition from relevant government bodies and other professional associations, while a higher degree of such recognition can be expected in the near future. PMI's *PMBOK® Guide* was approved by the American National Standards Institute (ANSI) as an American Standard in September 1999, and PMI's PMP® certification program attained ISO9001 certification in 1999, a globally recognised mark of a quality management system (PMI, 1999b). Also, the *PMBOK® Guide* was adopted by the *Institute of Electrical and Electronic Engineers* (IEEE) in the early 1999 as its project management standard (PMI, 1999b). In Australia, AIPM's world-first *National Competency Standards for Project Management* were approved in June 1996 by the *Australian National Training Authority*. Project management associations have established close relationships with other professional associations, for example, AIPM with RAIA, IEAust, the *Performance Management Association*, and the *Standards Australia* (AIPM, 1999).

4.2.1.4 The degree of organisation of a profession

Organisation is the primary means of exercising control over and access to basic professional activities. According to Turner and Hodge (1970), both a formal organisation approach and a community approach should be used to examine the degree of organisation of a profession. The organisation approach examines the formal association of a profession. The community approach views a profession as a community within which an informal network of communication exists and its members are bound by a sense of identity and share values in common.

Professional associations of project management have been well established in many countries around the world. They provide leadership, issue standards for project

¹³ For results of the AIPM's 2000 survey and PMI's 1998 survey, please refer to "Project management courses", *Australian Project Managers*, 20 (3), 23-39; and "1998 Survey of project management consultants and trainers", *PM Network*, 12 (6), 27-42.

management practices and conduct, certify competent PM professionals, accredit PM educational and training courses, conduct/encourage PM research, organise PM conferences and seminars, publish PM magazines and journals, and other things relevant to the professionalism of project management. Among all the associations, PMI, IPMA, APM, and AIPM are among the most active ones. All these four associations are influential participants in the *Global Project Management Forum*. Listed below are brief introductions to them:

- PMI has experienced a rapid growth in its certification and membership programs, especially during the 1990s (see Figure 4-4 and Figure 4-5). It now has over 140 chapters in not only the USA but many other countries. Its *PMBOK® Guide* and PMP® program are well accepted in the world.
- IPMA, previously (before 1994) known as INTERNET, is a network organisation among various national PM associations primarily in Europe, registered in Switzerland and with a secretarial office in the UK. It has twenty-nine national PM associations representing more than 20,000 members primarily in Europe but also in Africa and Asia. It publishes the well-known PM journal, *International Journal of Project Management*.
- The UK-based APM has its own Body of Knowledge and a certification program, which are widely accepted in Europe.
- What makes AIPM stand out from other associations is its *National Competency Standards for Project Management* (NCSPM), which is “the first ever common understanding of the definition of the practice, terminology and competency levels required to perform specific project management tasks” (AIPM, 1999: 9). The NCSPM has given AIPM a world-wide leadership role in the development of project management competency standards.

Table 4-2 summarises the information of the four leading PM associations.

Table 4-2: Summarised Information of PMI, IPMA, APM, and AIPM

	PMI	IPMA	APM	AIPM
Where based	United States of America	Switzerland registered, United Kingdom based secretary office	United Kingdom	Australia
When formed	1969	1967	1972	1978
Members	Over 70,000	Over 20,000 members (represented by its national associations)	Over 10,500	Over 3,000
Chapters	140 chapters in both the USA and some other countries	29 national associations around the world	15 Branches in UK and overseas	7 state and territory chapters in Australia, 2 regional forums
Core document	A Guide to Project Management Body of Knowledge	The IPMA Competence Baseline	The APM Body of Knowledge	National Competency Standards for Project Management
Regular Publication	Project Management Journal (quarterly); PM Network (monthly); PMI today (monthly)	International Journal of Project Management (bi- monthly); Newsletter (quarterly)	Project (monthly)	Australian Project Manager (quarterly); AIPM Press (monthly)
Conference	Every year	Every year	Annual participation with others	Every two years
Certification program	The Project Management Professional Program	IPMA Certification (4 levels)	Professional Project Management Qualifications (3 levels)	The Registered Project Manager Program (3 levels)
Course accreditation	Yes	Accreditation of national association certification programmes	Yes	Course endorsement
Code of ethics	Yes	No	Yes	Yes

Sources: Personal communications with the headquarters of the four associations, April 2001.

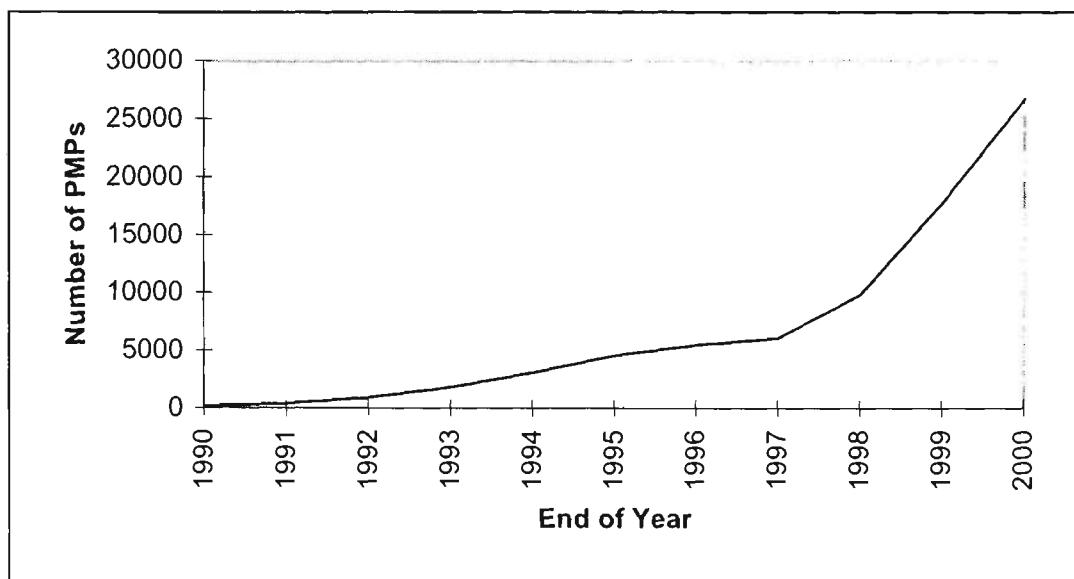


Figure 4-4: PMI's Growth in PMP® Program

Source: Personal communication with PMI Headquarter, March 29, 2001

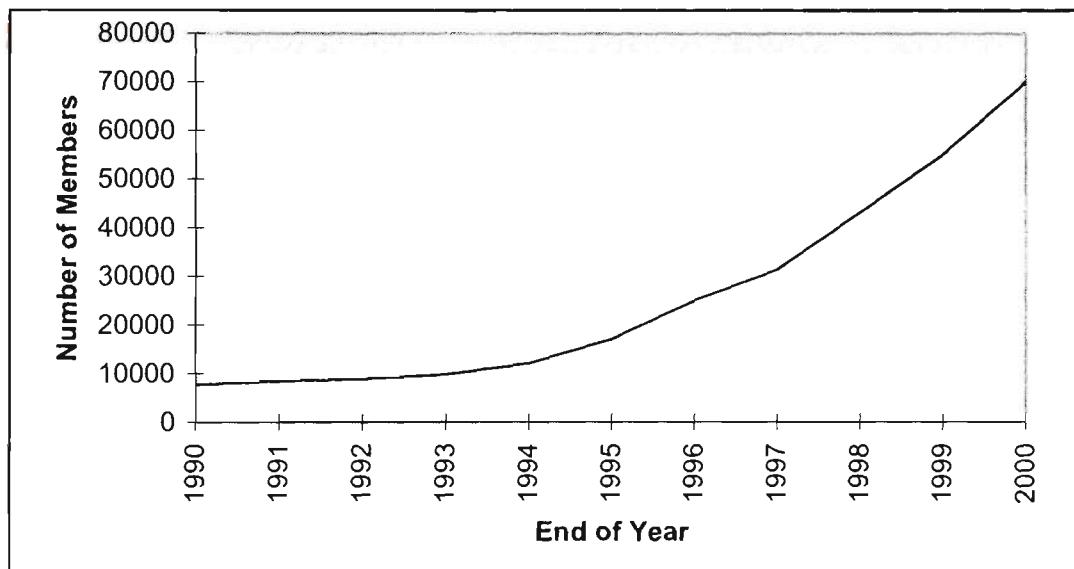


Figure 4-5: PMI's Growth in Membership

Source: Personal communication with PMI Headquarter, March 29, 2001

From the community perspective of Turner and Hodge (1970), project management has developed its informal communication network within, around, and beyond its professional associations. On the one hand, PM associations have established many chapters and SIGs (special interest groups) around the world to convenience communication among their members. On the other hand, there are some informal PM

forums on the INTERNET, which provide the PM community with a flexible, powerful means for communication, such as

- the Project Management Forum at <http://www.pmforum.org>;
- the American Project Management Forum at <http://www.pmi.org>;
- PMNET at <http://lists.uts.edu.au/mailman/listinfo/PMNET>; and
- NewGrange Center for Project Management at <http://www.newgrange.com>.

It is known from Chapter 3 that a profession is characterised by its unique professional culture. So, from the community perspective, the PM community could be expected to have a shared set of core values and beliefs related to the professional activities, that is, a professional culture called PM culture. The PM literature has to some extent recognised the existence of such a culture but provided no systematic empirical research of it (The details will be discussed in Section 4.3).

4.2.2 The Process of PM Professionalism

The evolution of project management has been briefly discussed in Section 4.1, and the current status of project management as a profession has been discussed in Section 4.2.1. This section is to focus on the process of PM professionalism, in which project management became a recognised profession step by step. The understanding of this process can provide a basis on which the expectation of the existence of a PM culture is established. Because of its leading position and the better availability of its information, the development of PMI is used as a representative of the process; and the development of IPMA/APM and AIPM will be used as supplements.

Generally speaking, the process of PM professionalism is similar to that discussed in Chapter 3, Section 3.2.2, ie., from establishing occupational associations through developing training and certificate programs to obtaining the protection by law.

Table 4-3 briefly shows the process of PM professionalism.

Table 4-3: The Process of PM Professionalism

Decade	Year	Represented by the USA (PMI)	Supplemented by Europe (IPMA/APM) and Australia (AIPM)
1960s: Starting	1969	PMI formed	In Europe, IPMA formed in 1967
1970s: Preparing	1970	<i>Project Management Quarterly</i> (PMQ) firstly published. It is the first journal dedicated to PM. (The current title of PMQ is <i>Project Management Journal</i> (PMJ))	In Australia, <i>Project Manager Forum</i> (PMF) formed in 1978, and the first post-graduate (Graduate diploma) course offered at the <i>South Australian Institute of Technology</i> in 1979.
1980s: Forming a sound basis	1983	The <i>Ethics, Standards and Accreditation Report</i> (ESA Report) approved as the basis for PMI's standards, accreditation and certification programs.	In Europe, the <i>International Journal of Project Management</i> firstly published in 1983.
	1984	The PMP® certification program instituted	In Australia, PMF renamed as AIPM in 1987.
	1987	<i>Project Management Body of Knowledge (PMBOK)</i> published	
	1989	“Developing a true sense of professionalism in PM” identified as the PMI’s fundamental goal for the 1990s	In Australia, AIPM’s membership grades was put into operation in 1989; the first PM masters course offered in South Australia
1990s: Building a true sense	1994	The first update of the PMBOK with a new title <i>A Guide to the Project Management Body of Knowledge (the PMBOK® Guide)</i>	In Europe, APM’s <i>Guide to Project Management and Related Courses</i> published in 1990; and the APM’s Body of Knowledge published in 1992, APM’s certification program instituted in 1992.
		In 1994 the Global Project Management Forum (Annual) started by PMI, IPMA/APM, and AIPM; as a result of the first forum, Global Cooperation Communiqué signed by PMI, IPMA, and AIPM, aiming at establishing a global project management association and accreditation process.	In Australia, a draft curriculum for PM developed by AIPM in 1992
	1996	A new version of the <i>PMBOK® Guide</i> published	In Australia, the National Competency Standards for Project Management issued in 1996; AIPM’s Certification program instituted in 1997; Course accreditation program instituted in 1998.
	1999	The <i>PMBOK® Guide</i> approved by ANSI as an American national standard; PMP® program attained ISO9001 certification;	In Europe, the IPMA Competence Baseline (ICB) published and its corresponding certification program instituted in 1999
		In the 1990s, PMI members and PMP® certificate holders have dramatically increased.	

Notes:

- It is not clear that when the first PM degree course was established in the USA and in the Europe. According to relevant information revealed by the literature, it is probably at the second half of the 1970s.
- Sources: (1) For PMI, Jenett (1994), Duncan (1995), PMI (1999b), etc.; (2) For IPMA/APM, Turner (2000), Willis (1995), News (1992), News (1990), IPMA (1999) and APM (1999); and (3) For AIPM, AIPM (1999) and AIPM (2000)

It is clear that the process of PM professionalism started at the end of the 1960s and great progress has been achieved since the late 1980s. The PM profession is now making efforts towards

- a wide acceptance of its professional certifications, such as RegPM and PMP®, as a pre-requisite for the recruitment and advancement of PM positions;
- obtaining formal recognition from relevant government bodies; and
- the globalisation of the profession, with the establishment of a global standard and certification program.

To achieve these objectives is still some distance into the future. However, the most important is that the profession is on the way.

4.2.3 Summary

The PM profession is a fact, although it needs to work towards obtaining formal recognition from relevant government bodies and increased recognition from the public. All the four characteristics of a profession recommended by Turner and Hodge (1970) are in place for project management:

- Project management has developed a body of knowledge including basic theories and applicable techniques /tools, which is usually known as PMBOK.
- The PM profession claims the monopoly over the PMBOK-based project management through its professional programs of PM certification and education. Although it is not reasonable to expect that all projects be managed by professional project managers, it is for multi-disciplinary and large projects of high complexity.
- The PM profession has obtained a good recognition from society. PM associations, PM certification and educational programs have grown by leaps and bounds over the last two decades, especially in the 1990s. Members of the associations, holders of the certificates, and PM students/trainees come from a wide variety of business, industry, and government. Some organisations have already required some kinds of PM certification as a pre-requisite for their project managers. PMI's *PMBOK® Guide* and PMP® certification program have obtained endorsement from relevant standards organisations in USA, and AIPM's PM competency standard has been approved by ANSI as an Australian national standard. All these represent the public's recognition of project management as a profession.

- Project management has already established many well-organised associations around the world. They are very active in organising all kinds of activities to improve the PM profession. Some informal networks of communication have formed within the PM community. It can also be expected, on the basis of relevant theories of professions, that the PM profession has formed a set of work-related values and beliefs, despite the lack of empirical studies in this area (This research was expected to provide some empirical evidence about the existence of such a set of work-related values and beliefs).

4.3 PROJECT MANAGEMENT CULTURE

Traditionally, project management was defined as “the application of a collection of tools and techniques ... to direct the use of diverse resources toward the accomplishment of a unique, complex, one-time task within time, cost and quality constraints” (Olsen, 1981: 19; Original 1971). Today, project management is recognised as much more than these traditional aspects. Project management is also “a management philosophy” (Cleland and Gareis, 1994: xi) and “a system of attitudes and behavior patterns that can be referred to as a project-management culture” (Hobbs and Menard, 1993: 96). Project management culture is such a culture developed in a project (one-off task) environment to implement project management successfully and it may be introduced into an organisation as a sub-culture or even a dominant culture (such as in a project-oriented company) (Firth and Krut, 1991; Schacht, 1997). Due to their educational and practical experience, PM professionals are the most important bearers of the PM culture; and because organisations use projects to implement change, they need, to various degrees, a PM culture as a means of becoming proficient at change. Therefore, PM culture could be regarded, firstly, as a professional culture of the PM profession and, secondly, as a part of an organisational culture when considered in an organisational context.

4.3.1 The Basis for the Formation of PM Culture

As discussed in Chapter 3, a profession creates and sustains its relatively unique work culture consisting of artefacts (such as jargons, rituals and behaviour patterns) and core values and beliefs. The previous discussion in this chapter has shown that the PM profession is a fact, with its unique body of knowledge, professional associations, certification programs, and educational courses. So, it is simply reasonable to assume that project management has developed its own professional culture, ie., a PM culture.

If the PM profession is examined using Schein’s (1992) three contributing factors to the formation of a culture, the existence of PM culture is even more convincing. According to Schein (1992), any group can develop a culture if (1) its members deal with common problems, (2) they keep formal and informal interaction with one

another, and (3) the group has sufficient length of time. The PM profession meets all these three conditions:

- It is certain that PM professionals face a set of common problems in their professional activities. All of them perform PM tasks to complete a one-off undertaking within time, cost, and performance constraints to meet stakeholders' requirements of the undertaking (PMI, 1996). The review of PM literature (eg., Kerzner, 1998; Lewis, 1998b) reveals that PM professionals (in many cases as project managers) deal with the common matters as follows, which are different from what traditional functional management do:
 - ◆ As a project is a unique (one-off) undertaking, they deliver a *unique* product that is specially designed for a particular purpose. This kind of uniqueness make them face a considerable uncertainty (risk) in project implementation and completion.
 - ◆ As a project has a definite start and finish time, they work with a *temporary* team. Due to the temporary nature, they have to face problems arisen from the disbanding of their project teams, such as low commitment, reduced motivation and future work opportunities.
 - ◆ As a project is usually across several disciplines, they work with a *multi-disciplinary* team. The biggest challenge faced by project managers is to effectively integrate all efforts of the various disciplines which are highly differentiated in functional organisations.
 - ◆ As a project has various stakeholders, they work with *conflicting* stakeholders who have different interests in the project. It is very difficult or even impossible for project managers to meet all the stakeholders' requirements at the same time.
 - ◆ As many projects are implemented under a matrix form of organisation, they often work with *borrowed* resources (particularly human resources). In this case, project managers probably do not have sufficient formal authority commensurate with their responsibility. Under a matrix form of organisation, project team members report to both the project manager and their host functional managers and so the members' loyalty to the project may be a problem.

- The PM profession has established formal and informal networks of interaction among its members. The formal networks involve PM companies, educational and research centers, and associations:
 - ◆ Along with the professionalism of project management, a lot of companies have been established or restructured to provide PM services (eg., as shown by PMI's 1998 *Survey of Project Management Consultants and Trainers*). These companies dedicate themselves to project management or at least take project management as an important component of their services.
 - ◆ Many degree and non-degree PM courses have been established around the world. These courses bring together students with different backgrounds for the study of project management and enable them to accept or form some core values and beliefs in project management. Indeed, many universities put an emphasis on the human side of project management in their PM courses.
 - ◆ As discussed before, the PM profession already has established associations around the world. These associations are very active in standardising PM practices and conduct, publishing PM articles and books, organising PM conferences and seminars, etc. Through the associations members of the PM profession come together for their common interests, no matter where they study and work.

In addition to the formal networks of interaction, the PM profession has also developed an informal network of interaction among PM professionals. Many members have exchanged their ideas and information through the informal network (Refer to Section 4.2.1.4).

- Since its emergence in the 1950s, project management has a history of 50 years. To develop a culture, a profession must have a sufficiently long history. But there is no criteria for how long is considered "sufficiently long". In the case of the PM profession, due to the significance of its professional activities and the high intensity of interaction among its members (especially in the 1980s -1990s), it is reasonable to assume that a project management culture has formed during its not-so-long history.

4.3.2 Discussions of PM Culture in the PM Literature

4.3.2.1 The concept of PM culture

The concept of culture is applicable to the PM profession. On the one hand, project management as a culture can be thought of as having different levels usually known as artefacts, values and beliefs, and unconscious assumptions underlying the values and beliefs; that is, project management has its own technologies, tools, glossary, etc.; its own values and beliefs that are commonly believed to be supportive to the success of project performance by PM professionals; and its own assumptions that are taken for granted in project management. On the other hand, project management as a culture can be described and measured with some key attributes and dimensions. For convenience and practicability, the following discussion will concentrate on the values and beliefs level of PM culture as is the case in most of the literature, adopting the minimal definition of culture as defined in Chapter 2 Section 2.6 the third dot point.

In the PM literature, the term “project management culture” is mostly used to refer to a subculture or dominant culture in an organisation, eg.,

- Duncan (2001) has developed a PM culture model which “provides a mechanism to assess how ‘project friendly’ an organization is”.
- In Kerzner (2000: 212), the term *project management cultures* means “corporate cultures for project management”. He states that “project management cultures can exist within any organizational structure” and “it is almost impossible to transpose a project management culture from one company to another”.
- Schacht (1997: 56) states that “for a project management culture to flourish, it must be embraced and supported by the majority of an organization’s population. ... An organization with a culture of project management runs its business from a project perspective”.

Some authors explicitly use the term *PM culture* or other similar terms to refer to the culture of the PM profession, eg., Cleland (1982) and Hobbs and Menard (1993) (Their statements of PM culture will be cited in the next section of this chapter).

It is understandable that, even in the first case, the discussions of PM culture cannot be free of the PM profession and the authors also acknowledge (maybe implicitly) that the origin of PM culture is in the PM profession.

4.3.2.2 Project management as a culture

Many implicit and explicit statements on PM culture are scattered in the PM literature. Most of them appear in various authors' discussions of the social/soft/human aspect of project management. The review of the literature reveals some important ones as follows:

- Cleland (1982) takes project management as a management philosophy and states: "Taken in its cultural context, project management is a complex whole that includes knowledge, belief, skills, attitudes, and other capabilities and habits acquired by people who are members of some project society" (p. 181).
- Kerzner (1998: xix) believes that "project management is much more behavioral than quantitative", so his book includes ten chapters on behavioural aspects of project management prior to the chapters on planning and control. Kerzner (1998) claims that the first ten chapters are needed to develop the cultural environment for all projects.
- Hobbs and Menard (1993: 96) states that "project management is more than the use of planning and control techniques and a way of organizing. It is also a system of attitudes and behavior patterns that can be referred to as a project management culture ... that would support project success ...".
- Knutson (1996: 5) states that "project management is a delicate balance of social and technical factors", and "[the] social part of project management has become more and more important through the years", and "the role of the project manager has become one not only of coordinating the tangible data around the project, but also one of becoming proficient at dealing with the intangible, behavioral aspects of the discipline".
- Gareis (1994) argues that an important "subculture" of project-oriented companies is the project-management culture, that is, the different communication forms, roles, techniques, documentation standards, and leadership styles specifically applied on projects.

- Webster (1994b) argues that, while project management seemed to be almost entirely the application of network-based techniques, today the use of these techniques for planning, scheduling, and control can be considered at most 10 percent of modern project management. Behavioural considerations, contract management, risk management, and other concepts have been recognised to be of far greater significance.
- Gilbreath (1988) states that the emergence and proliferation of the project model of work, of work as integrated pulses rather than a continuous line, is helping to define a new and very different business culture.
- Harrison's (1992) argument is that, in a way, project management is another branch or specialised form of management, similar to production management, marketing management, etc, but in many ways it is far more than that primarily because of (1) its special forms of organisation, (2) its characteristics of human relations, and (3) its own culture.
- Gabriel (1990) argues that, as a result of the profession's efforts in closing the gap opened up along with computer technology development between computer-based PM systems and human-based project teams, "the cultural and behavioral aspects of project management have replaced the systematic and procedural approach" (p. 71).
- Zwart (1986: 13) argues that "the difference [between a normal, traditional pattern of work and the style of work on projects] is not that we use different tools and instruments, but that we practice different basic orientations and inner attitudes".

These authors' discussions demonstrate the importance of the cultural aspect of project management and imply the necessity of further studying it.

4.3.2.3 Dimensions of PM culture

Project management is basically different from traditional business and operations management which operate in a vertical organisational structure and emphasises a strong superior-subordinate relationship in a relative stable environment (Kerzner, 1998; Turner, 1993). Psychologically, the cultures of hierarchy and projects are fundamentally different (Firth and Krut, 1991).

Firth and Krut (1991) discuss how to integrate a PM culture with an organisation's traditional dominant line management culture to increase its response and flexibility in an increasingly competitive environment. They compare dimensions of PM culture with those of hierarchical culture (see Table 4-4).

Table 4-4: Dimensions of Line and Project Management Cultures

Hierarchical Management	Project Management
Suited to a stable environment	Suited to instability
Evolutionary changes	Step changes
Works efficiently within a definition	Challenges, creates definition
Concerned mainly with routine activity	Assumes non-routine work
Single responsibilities	Multiple responsibilities
Organised by function	Organised by task
Hierarchical/pyramid shaped	Network/web/matrix shaped
Manage subordinates	Manage to all levels
Historical, hard information used to control	Forward looking controls and predictive measures
You are what you "own"	Your are what you do
Many rule, little guidance	Few rules, much guidance
Committee meetings	Task force meetings
Information flows: predominantly vertical	Information flows: governed by individual need
Authority gives power	Relies on networking, negotiating, counselling etc

Source: Firth and Krut (1991: 438)

Acknowledging the implementation of PM practices requires significant adjustments in attitudes, understanding, responsibilities, methods and reporting relationships in an organisation. Archibald (1991) identifies eight areas in which PM shows different values and attitudes from those of traditional functional management. They are:

1. Integrative roles below a general manager: The project manager's role as an integrator creates the subconscious feeling that he/she looks like a general manager.
2. Shared responsibilities for projects: In a matrix organisation, the project manager is responsible for what (project scope), when (project schedule) and how much (project budget), and the functional managers are responsible for who does the work and how the work is performed.
3. Direction from two bosses: functional and project. In a matrix organisation, members have to report to the two bosses.

4. Integrative, predictive planning and control. In project management, information shall flow as needed for integrative and predictive planning and control instead of being held back for power.
5. Computer-supported management information systems. Project management uses computer-based information systems for management purposes.
6. Project objectives over department objectives. For effective project management, the importance of project objectives must be recognised.
7. Working, and being rewarded, as a team rather than as individuals. Successful projects require all project contributors to work closely together as a team.
8. Temporary assignments on projects, rather than permanent niches in the bureaucracy. A project situation is a temporary and risky one where the end is in sight, rather than a long-lasting organisation that can provide staff with more security of employment.

Graham (1993) discusses a process followed by one organisation in an attempt to change from a bureaucratic-oriented culture to a PM culture. From the organisation's experience, dimensions of a PM culture are identified in comparison with those of a bureaucratic culture (see Table 4-5).

Table 4-5: Bureaucratic Culture vs. Project Management Culture

Bureaucratic Culture	Project Management Culture
Many standard procedures	Few, new procedures
Repeated processes and products	New process and product
More homogenous teams	More heterogeneous teams
On-going	Limited life
High staff level	Low staff level
High structure	Low structure
People more interchangeable	People not interchangeable
Little teamwork	More teamwork and team building
Positional authority	Influence authority
Departmental structure	Matrix structure

Source: Graham (1993: 314)

Hobbs and Menard (1993) define PM culture as a system of attitudes and behaviour patterns, and list some of the attitudes and behaviour patterns that are either supportive of or detrimental to project success (see Table 4-6).

Table 4-6: Attitudes and Behaviour Patterns Supportive of or Detrimental to Project Success

Supportive	Detrimental
Open communications and free circulation of information	Guarded communications and restricted information flows
Frequent lateral communications	Communications following the chain of command
Willingness and ability to make decision	Conformity to multistep multiperson approval process
Flexibility; organic	Rigidity; bureaucratic ness
Collaboration	Power struggles; conflicts
Proactive; willingness to take initiatives, risks	Reactiveness; waiting for assignments, approval
Confrontation of ideas	Avoidance and submission: "The boss is right"
Assuming responsibility for results	Avoiding responsibility
Prime loyalty to project	Prime loyalty to function
Behavior regulated by project needs (e.g., work on evenings, weekends)	Behavior regulated by rules (e.g., the 9-to-5 syndrome)

Source: Hobbs and Menard (1993: 97)

There are many other authors who have more or less discussed PM culture, even though the term *project management culture* may not be used, such as, Gilbreath (1988), Harrison (1992), Schacht (1997), Knutson (1996), Turner, Grude and Thurloway (1996), and Hofstede (1983), just to name a few. Among them,

- Harrison (1992) states that project management has a culture of its own, which include (1) thinking globally and not parochially about one's own commitments and contribution, (2) a total commitment to goals, (3) accepting change as a way of life, and (4) dealing with flexibility, uncertainty, complexity, indefinite and inadequate authority, temporary situations and relationships, and a high level of imagination.
- Hofstede (1983) applies his well-known four dimensions of culture to project management. According to Hofstede (1983), (1) project management assumes a

village market model of organisations, that is, no decisive hierarchy, flexible rules, and a resolution of problem by negotiation (small power distance and weak uncertainty avoidance); (2) project management, as an idea born of an individualist culture, is very much task-oriented and people are expected to be motivated by their part of the task for the time they are associated with it and so the relationships are peripheral and fluctuating; and (3) the masculinity/femininity dimension is less relevant to the way project management works.

4.3.2.4 Weaknesses of the literature

There exist several obvious weaknesses in the literature's discussion of PM culture:

- Most of the discussions, e.g. Kerzner (2000), Graham (1993), and Firth and Krut (1991), regard PM culture as a culture or sub-culture within an *organisational* context and pay little or no attention to it at a *profession-wide* level. Because the PM profession is not limited to the framework of a given organization or even a given industry or nation, discussions of the PM culture should go beyond the boundaries of organisations, or even industries and nations.
- The discussions obviously lack any explicit theoretical framework¹⁴. Firstly, the authors do not operationalise the *elusive* concept of culture and do not clearly state what phenomena of PM culture are of their interest and what analysis perspective they are using to see the PM culture. Secondly, without any explicit theoretical framework, their procedures of listing some attributes as the attributes of PM culture are purely subjective, lacking any prior criteria for inclusion or exclusion of some attributes and how to name and group the attributes.
- The discussions are supported by no or very few data from empirical surveys. They look like intuitive, anecdotal information or expert sayings/judgment about PM culture. Without the support of empirical data, a discussion of the case for PM culture is not as convincing as it should be. For example, does the PM community show, as discussed by Hofstede (1983), a small power distance, weak uncertainty avoidance, individualist, and the irrelevance of masculinity/femininity? These conclusions should certainly be subject to empirical investigations.

¹⁴ Hofstede's discussion is probably an exception, but his four dimensions of culture seem inappropriate to measure PM culture.

- The literature does not provide any systematic and comprehensive study of PM culture. The existing discussions are only a small part of a book or a short article in a journal, and many of them are even only scattered and implied in a variety of books and articles.

4.3.3 Summary

Project Management has developed from a pure set of technical tools to a mature management discipline and a unique profession. It is now recognised as a management philosophy and a set of values and beliefs referred to as a project management culture. On the basis of both its technical and social aspects, project management can be defined as *a specific management philosophy, a set of professional values and beliefs, and a set of technical tools for completing a one-off undertaking within time, cost, quality, and scope constraints to maximally meet stakeholders' expectations of the undertaking*.

Because of their special educational and practical backgrounds, PM professionals are the strongest bearers of the PM culture. As organisations use project management as a means to improve their responses and flexibility in increasingly competitive markets, PM culture can be introduced into organisations as a subculture or even as a dominant culture. Therefore, PM culture could be referred to, firstly, as a professional culture of the community of PM professionals, and secondly, when considered in the context of organisation, as a sub-culture or dominant culture of an organisation.

PM professionals deal with common PM tasks. They work on temporary, unique (one-off), and multi-disciplinary undertakings (projects) with temporary teams of high diversity and a variety of stakeholders who may have conflicts of interests with one another. To improve their ability to deal with the common PM tasks, PM professionals have active formal and informal interaction within their PM community, through PM companies, educational organisations, professional associations, and various kinds of information/experience exchanges. Based on the common tasks and active interaction, a PM culture can be assumed to have developed during the 50 year history of project management.

PM culture has been, explicitly and implicitly, discussed in the literature, e.g., Kerzner (2000), Kerzner (1998), Graham (1993), Hobbs and Menard (1993), Harrison (1992), Firth and Krut (1991), Hofstede (1983), and Cleland (1982). The literature review reveals some common work-related values and beliefs in the area of project management as follows:

- PM is pre-occupied with the integration of various efforts and disciplines;
- PM is a horizontal management;
- PM is results-oriented;
- Temporary situations and relationships are normal;
- Uncertainties and changes are taken as a way of life;
- People's status comes from what they do rather than who they are;
- Speed, flexibility, and lateral communication are emphasised;
- Teamwork is highly valued;
- People are task-oriented rather than boss-oriented; and
- Indefinite and inadequate authority is not unusual.

However, there exist several obvious weaknesses in the previous discussions of PM culture in the literature. Most of them regard PM culture as a culture within an *organisational* context instead of at a *profession-wide* level. The discussions lack any explicit theoretical framework and their procedures for listing some values and beliefs as *the* dimensions of PM culture are purely subjective, lacking any prior criteria for inclusion or exclusion of some dimensions and how to name and group them. Also, they do not provide any systematic and empirical survey research of PM culture. Therefore, to address these weaknesses in the literature and to promote the further professionalism of project management, it is necessary to study PM culture at a profession-wide level, using a sound theoretical framework and empirical data.

Chapter 5

Theoretical Framework

Chapter 5 presents a theoretical framework for this research. To study the *elusive* concept of culture, a theoretical framework is essential. After locating this research within a general framework of *phenomena to study*, *levels of analyses*, and *analyses perspectives*, this chapter chooses Talcott Parsons' *General Theory of Action* (Parsons and Shils, 1951), particularly his *pattern variable scheme*, as the theoretical framework for investigating PM culture. Parsons' *pattern variable scheme* is then particularly applied to and defined in the situation of project management. On the basis of the theoretical framework, this chapter develops research variables, questions, and hypotheses. This chapter includes the following major sections:

5.1 A General Framework

5.2 A Framework for Measuring Culture

5.3 Applying Parsons' Scheme to this Research

5.4 Research Variables and Questions

5.5 Summary

5.1 A GENERAL FRAMEWORK

In Chapters 2 and 3 attention was directed at gaining an understanding of the concepts of “culture” and “professional culture”. Chapter 4 has shown the process of the professionalism of project management and the literature’s discussions of PM culture. For the purpose of this study, however, it is necessary to go further than these to locate the study of PM culture within the framework of *phenomenon to study, level of analysis, and analysis perspective* (for details of the framework, see Chapter 2).

5.1.1 Phenomenon to Study

Recognising that a culture has the three levels (elements) of contents: artefacts, values and beliefs, and unconscious assumptions, this study selected the work-related values and beliefs of PM professionals as the phenomena to study. It did not investigate the other two levels of PM culture, ie., artefacts and unconscious assumptions.

Despite the disagreement about a definition of culture, most analysts agree that culture can be minimally defined as a collective values and beliefs system shared by a particular group of people that serves as a guide to acceptable and unacceptable perceptions, thoughts, feelings, and behaviours. The values and beliefs system is the most important part of culture to determine people’s actions (Parsons and Shils, 1951). Furthermore, it is not as difficult to observe as the level of unconscious assumptions, nor to decipher as the level of artefacts. The values and beliefs level is generally appropriate for most studies of culture as is the case in the literature.

In the literature there are no universal criteria for the use of the terms *value* and *belief*. In some cases they are interchangeable, and in some others one of them may be fully inclusive of the other. However, in general, they may be defined as follows:

- a value is about “justification of behaviour” – a preferred outcome enhancing people’s state of being or the ideals worthy of effort in attaining (Hofstede, 1980; Issac, 1993). According to Hofstede (1980), someone holds a kind of value if he/she has a broad tendency to prefer a certain state of affairs over others, and a value has both intensity and direction, that is, the issue involved has a certain relevance for a

person (intensity) and he/she identifies certain outcomes as “good” and others as “bad” (direction). Being interested in the work-related culture of the PM profession, this research used the term *value* in the sense of *work-end value* in order to know what work-ends were important to and preferred by PM professionals. The concept of *work-end value* is similar to that of *terminal value* used by Rokeach (1973) and Isaac (1993).

- Whereas a value is about a person’s favourable or unfavourable evaluation of an outcome, a belief represents the information he/she has about an object (Fishbein and Ajzen, 1975; Williams, Dobson and Walters, 1989). A person has a belief about an object if he/she holds a perception of what is true with the object. Specifically, a belief links an object to some attributes. For example, we know that the population of Australia is now comprised of many races from the world, so we have the belief “Australia is a country with multi-races”. This belief links the object “Australia” to the attribute “a country with multi-races”. In general, “the object of a belief may be a person, a group of people, an institution, a behavior, a policy, an event, etc., and the associated attribute may be any object, trait, property, quality, characteristic, outcome, or event” (Fishbein and Ajzen, 1975: 12). In this research, an object is a work-means that is believed to be effective in achieving preferred work-ends. In this sense, a belief can be referred to as a *work-means belief*, which is similar to Rokeach’s (1973) and Isaac’s (1993) concept of *instrumental value*. According to Fishbein and Ajzen (1975), a belief has a measurement of strength, that is, “the perceived likelihood that the object has (or is associated with) the attribute in question” (p. 12). Therefore, in this research, a belief is a work-means belief – a person’s self-confidence that a certain kind of work means will cause favourable outcomes (work-ends).

5.1.2 Level of Analysis

This study selected the PM profession as the level of analysis, that is, it treated PM culture as a professional culture of the PM profession at a profession-wide level, rather than as a sub-culture or dominant culture in organisations.

From Chapter 3, it is known that a profession develops its own culture during its history of performing professional activities. Chapter 4 has shown that project

management as a profession is a fact and it does have a sound basis for the formation of a PM culture. Although a professional culture could be a sub-culture or dominant culture in organisations if it is considered within an organisational context, its origin is the profession that cuts across organisational or even industrial boundaries. So the study of a professional culture must firstly be undertaken at a profession-wide level of analysis, and then may be conducted at other analyses levels (such as at a sub-culture level within an organisation). Because no previous study has been done of PM culture at the profession-wide level, this study must be done at such a level.

5.1.3 Analysis perspective

This study took an integrative perspective as the analysis perspective. Viewed from the integration perspective, a professional culture exists within the PM community in terms of its consistency, profession-wide consensus, and clarity. Its core values and beliefs consistently reinforce the PM performance; PM professionals share a set of work-related values and beliefs across organisational/industrial boundaries, and the values and beliefs are clear as valid solutions to professional matters within the profession.

To study PM culture, a differentiation or even a fragmentation perspective could also be useful. The differentiation perspective is helpful if people want to know the differences in values and beliefs among special areas of PM application, say, between construction project management and IT project management, or between Australia and the United States of America. The fragmentation perspective is helpful for understanding the complexity of PM culture, say, if people hope to know whether and how values and beliefs fluctuate during different stages of a project life-cycle. However, these two perspectives were irrelevant to this study.

5.2 A FRAMEWORK FOR MEASURING CULTURE

In formulation of a theoretical framework for studying work-related values and beliefs, Parsons' *General Theory of Action*, especially his *pattern variable* scheme, provides a useful prototype (Parsons and Shils, 1951). The interest of the theory is in the organisation of an actor's, either as an individual actor or a collectivity of actors¹⁵, orientation of action to a situation. Action has an orientation when it is guided by the meaning which the actor attaches to it in its relationship to his/her goals and interests.

5.2.1 Three Systems Determining People's Actions

According to Parsons' theory, the elements of action are organised into three interdependent and interpenetrating, but not mutually reducible, systems:

- Firstly, the orientation of action of any *one* individual actor is a differentiated and integrated system – a *personality* system.
- Secondly, the action of a plurality of actors in a common situation is affected by interaction among the member actors, and the interaction is also differentiated and integrated and as such forms a *social system*.
- Finally, the action of a collectivity is guided by a *culture system* – a set of values, norms, and symbols which are shared by individual actors and transmitted among social systems by diffusion and among personalities by learning.

The personality system is organised around an individual's *need dispositions*, the social system is organised around the *role expectations* within a group of people, and the culture system is organised around the *normative patterns* of behaviours within a group of people. The three systems cut across one another. Both the personality and social systems include all of psychological, social, and cultural aspects. Cultural patterns, when internalised, become constitutive elements of personalities and of social systems and play an important role in the system of action. Yet all the three are conceptually independent organisations of the elements of action.

¹⁵ When a collectivity is considered as an acting unit, the interest is not in all the actions of the individuals who are its members but only the actions which they perform in their capacity as members (Parsons and Shils, 1951).

In the theory of action, the personality system, social system, and culture system are all critical subject matters. About the culture system, Parsons and Shils states that:

Analysis of the third kind of system [culture system] is essential to the theory of action because systems of value standards (criteria of selection) and other patterns of culture, when *institutionalized* in social systems and *internalized* in personality systems, guide the actor with respect to both the *orientation to ends* and the *normative regulation* of means and of expressive activities, whenever the need-dispositions of the actor allow choices in these matters (1951: 56).

Parsons and Shils (1951) see the culture system as having the following characteristics:

- It is constituted neither by the organisation of interactions within a group of people nor by the organisation of the actions of a single actor, but rather by the organisation of the values, norms, and symbols which guide actors' choices and limit the type of interaction which may occur among actors.
- It represents a special kind of abstraction of elements from the personality and social systems and it is not an empirical system in the same sense as the personality and social systems.
- Its pattern of regulatory norms has a certain degree of consistency instead of being made up of random or unrelated elements.
- Culture is distinguished from personality and social interaction by the fact that it is intrinsically transmissible from one action system to another – from personality to personality by learning and from social system to social system by diffusion.

A cultural system is a highly complex constellation of elements. Parsons and Shils (1951) distinguish the following three major elements of a culture: (1) a system of ideas or beliefs – solutions of cognitive problems; (2) a system of expressive symbols, for instance, art forms and styles – solutions of problems of how “appropriately” to express feelings; and (3) a system of value-orientations – solutions of problems of evaluation, particularly but not exclusively in social interaction, and here the primary interest is in the evaluation of alternatives from the viewpoint of their consequences or implications for a system of action or one of its subsystems. These three elements respectively in their sequence correspond to “unconscious assumptions”, “artefacts”, and “values and beliefs”, the three levels (elements) of culture mentioned in Section 5.1.1.

Although value orientation is not the whole of a system of cultural orientation, it is strategically the most important part of culture for the organisation of systems of action. When discussing the culture system of action, Parsons and Shils' (1951) major attention was directed to the part of *value-orientation*. Parsons and Shils (1951: 59) state that

Value-orientation refers to those aspects of the actor's orientation which commit him to the observance of certain norms, standards, criteria of selection, whenever he is in a contingent situation which allows (and requires) him to make a choice.

5.2.2 Pattern Variables

Parsons and Shils (1951) see that an individual in a situation is confronted by a series of major dilemmas of orientation, ie., a series of choices that an actor must make before a situation becomes determinately meaningful for him/her and he/she can take action. They also see a group or society as having role expectations of its members, that is, it expects them to choose in a way that is in line with the interest of the group or society. Furthermore, they see a group or society as having cultural (normative) patterns of behaviours to guide its members' choices for their actions.

Parsons and Shils (1951) group the series of major dilemmas into five specific dichotomous choices called *pattern variables*. Any single or collective actor must make a choice between the two sides of each of the pattern variables before the meaning of a situation is determinate for him/her, and thus before he/she can act with respect to the situation. Any specific orientation (and consequently any action) is characterised by a particular pattern of the five choices. A single or collective actor may have a tendency to choose one thing rather than the other for each of the dichotomies in a particular situation.

The five pattern variables are: (1) Affectivity - Affective Neutrality; (2) Self Orientation - Collectivity Orientation; (3) Universalism - Particularism; (4) Ascription - Achievement; and (5) Specificity - Diffuseness. They are defined as follows:

The first is that between accepting an opportunity for gratification without regard for its consequences, on the one hand, and evaluating it with regard to its consequences, on the other. The second is that between considering an act solely with respect to its personal significance, on the one hand, and considering it with respect to its significance for a collectivity or a moral code, on the other. The third is that between evaluating the object of an action in terms of its relations to a

generalized frame of reference, on the one hand, and evaluating it in terms of its relations to the actor and his own specific relations to objects, on the other. The fourth is that between seeing the social object with respect to which an action is oriented as a composite of performances (actions), on the one hand, and seeing it as a composite of ascribed qualities, on the other. The fifth is that between conceding to the social object with respect to which action is oriented an undefined set of rights (to be delimited only by feasibility in the light of other demands), on the one hand, and conceding to that social object only a clearly specified set of rights on the other. (Parsons and Shils, 1951: 48)

The pattern variable scheme is the most important thread of continuity running through Parsons' theory of action. Parsons and Shils (1951) claim that the five pattern variables constitute a system determining an actor's action:

We maintain that there are only five *basic* pattern variables (i.e., pattern variables deriving directly from the frame of reference of the theory of action) and that, in the sense that they are *all* of the pattern variables which so derive [sic], they constitute a system. (Parsons and Shils, 1951: 77)

The five pattern variables are considered to be utilisable at four different levels:

- at the concrete level, as five discrete choices (explicit or implicit) which every actor makes before he/she can act;
- at the personality level, as habits of choice;
- at the social system (collectivity) level, as role expectations; and
- at the cultural level, as value orientations (value standards), that is, as rules or recipes for concrete action.

According to Parsons and Shils (1951), the pattern variables are dichotomies and not continua at the concrete level, that is, no specific choice can be half affective, half neutral, etc. But at the other three levels, they are continua. In a series of concrete actions, a person may be partly “affective” and partly “neutral”. Within a group of people, certain balance must be reached between the two ends of the continua.

This study is interested in the professional culture within the PM community, so the first two levels are irrelevant and they will not be discussed any more in this thesis. At the cultural level and social system level, the five pattern variables are further defined as shown in Table 5-1.

Table 5-1: General Applications of the Pattern Variables

	Affectivity – Affective neutrality	Self – Collectivity-orientation	Universalism – Particularism	Ascription – Achievement	Specificity – Diffusion
Social System Level: the role expecta- tion that ...	the role incumbent may freely express certain affective reactions to objects in the situation and need not attempt to control them in the interest of discipline.	it is permissible for the role incumbent in question should restrain any impulses to certain affective expressions and subordinate them to considerations of discipline.	the role incumbent is obliged to take directly into account the values and the interests of the collectivity of which, in this role, he is a member. When there is a potential conflict with his private interests, he is expected in the particular choice to give priority to the collective interest.	the role incumbent, in orienting to social objects in the relevant choice situation, will give priority to the objects' actual or expected performances, and to their attributes only as directly relevant to these performances, over attributes which are essentially independent of the specific performances in question.	the role incumbent, at the relevant choice point, will accept any potential significance of a social object, including an obligation to it, which is compatible with his other interests and obligations, and that he will give priority to this expectation over any disposition to confine the role-orientation to a specific range of significance of the object not defined in the expectation pattern.
Cultural Level: the norma- tive pattern which ...	grants the permission for an actor, in a given situation, to take advantage of a given opportunity for immediate gratification without regard to evaluative considerations.	prescribes for actors in a given situation renunciation of certain types of immediate gratification for which opportunity exists, in the interest of evaluative considerations regardless of the content of the latter.	prescribes a range of permission for an actor, in a given situation, to take advantage of a given opportunity for pursuing a private interest, regardless of the content of the interest or its direct bearing on the interests of other actors.	obliges an actor in a given situation to be oriented toward objects in the light of general standards rather than in the light of the objects' possession of properties which have particular relation to the actor's own properties.	prescribes that an actor in a given situation should, in his selection and differential treatment of social objects, give priority to their specific performance over their given attributes that they possess over any specific standards.

Source: Adapted from Parsons and Shils (1951: 80-84)

5.2.3 Previous Uses of the Theory

As one of the important theories for studying culture (Hofstede, 1980), Parsons' pattern variable scheme was successfully applied to the investigations of national cultures by Trompenaars (1993) and work-related values of designers of clerical computer systems by Mumford (1981). Also, a similar scheme was used to investigate cultures of capitalism by Hampden-Turner and Trompenaars (1993).

5.2.3.1 Trompenaars' study

Trompenaars (1993) uses the pattern variable scheme to investigate cultural diversity (national) in business. In the study, the pattern variables are used to explain the ways in which human beings deal with each other. Their specific definitions are as follows (in the names and order as given by the author):

- *Universalism versus particularism.* Universalists believe that what is good and right can be defined and should always apply. In particularist cultures far greater attention is given to the obligation of unique relationships and unique circumstances.
- *Individualism versus collectivism.* Do people regard themselves primarily as individuals or primarily as part of a group?
- *Neutral or emotional.* Should the nature of our interactions be objective and detached, or is expressing emotion acceptable?
- *Specific versus diffuse.* Is the whole person involved in a business relationship or just a specific relationship prescribed by a contract?
- *Achievement versus ascription.* Achievement means that you are judged on what you have recently accomplished and on your record. Ascription means that status is attributed to you, by birth, kinship, gender or age, but also by your connections (who you know) and your educational record.

Two noticeable points are:

- Trompenaars limits the use of the pattern variables to people's ways of viewing relationships with other people. This could be regarded as a specific application of the pattern variables. According to Parsons and Shils (1951), the first three variables can be used for either social objects (human beings) or non-social objects,

but the last two are suitable for only social objects and cannot be used for nonsocial objects.

- If its object of action is limited to a human being (as in Trompenaars' study), the variable *universalism-particularism* is to some degree overlapped with the one *specific-diffuse*. They are the two sides of a coin. For example, in the case of the car hitting a pedestrian (for details, see Trompenaars, 1993: 34), if you give a false testimony to protect your friend, you are a particularist rather than a universalist in terms of *universalism-particularism*. But, your action can also be viewed in terms of *specific-diffuse*, that is, you regard the friendship with your friend as being diffusely extended into the area of the case rather than limited to other specific areas.

5.2.3.2 Mumford's study

Mumford (1981) assumes that a factor other than technology has a significant influence on the design process of clerical computer systems. The author hypothesises that the factor is “the philosophy and values of the groups responsible for systems design, particularly their perception of the competence of user staff and their beliefs on the best way of organizing work to achieve maximum efficiency” (Mumford, 1981: 1). Regarding work-related values as the dominant factor influencing people’s attitudes and behaviours within organisations, Mumford (1981) uses Parsons’ pattern variable scheme as the prototype to investigate the work-related values of systems designers, managers and others in the design of clerical computer systems. Mumford (1981) develops the following five variables to describe how work should be organised in organisations: (Each of the variables is a continuum)

- *Ethical values*: between a belief in shared values (agreement on organisational goals and the means to achieve them) (Universalism) and a belief in a situation permitting a multiplicity of values (the pursuit of diverse individual goals) (Particularism).
- *Compliance values*: between a belief in strict discipline with employees required to put company interests first (Affective neutrality) and a belief in loose discipline with employees able to meet their immediate personal needs in work (Affectivity).

- *Conformity values*: between a belief in specified procedures and uniformity of methods (Collectivity-orientation) and a belief in people making their own judgements, working out their own methods (Self-orientation).
- *Performance/person values*: between a belief in an emphasis on efficiency and high production (Achievement) and a belief in an emphasis on personal attributes (Ascription).
- *Task values*: between a belief in tightly structured tasks with few areas of discretion (Specificity) and a belief in unstructured tasks with many areas of discretion (Diffusion).

Mumford's interest in the values of systems designers is comparable to this research's interest in the values of PM professionals. But, the author of this thesis has two ideas, different from Mumford's, about the correspondence of Mumford's variables to Parsons' pattern variables:

- Differently from Mumford, the author of this thesis thinks that (1) the variable of *conformity values* is more appropriate to be viewed as a matter of universalism versus particularism because it is about people's conforming to organisational rules/procedures (universalism) or working out their own methods (particularism) and (2) the variable of *ethical values* is more appropriate to be viewed as a matter of self-orientation versus collectivity-orientation because it is about the pursuit of personal goals or organisational goals.
- In Mumford's study, the variable of *task values* seems confused with that of *conformity values*. According to this thesis author's understanding of Parsons' theory, the pattern variable of *specificity/diffusion* refers to how an actor defines the scope of significance of a *social object* (only a social object, excluding any nonsocial objects) to him/her. Parsons and Shils (1951) refer to social objects as "actors as persons and as collectivities" (p. 57) and nonsocial objects as "any objects which are not actors" (p. 58). On page 87, Parsons and Shils (1951) clearly state that the *specificity/diffusion* variable represents "the alternative modes of delimiting the actor's relationship to a *social object*" (italic added).

5.2.3.3 Hampden-Turner and Trompenaars' study

Hampden-Turner and Trompenaars (1993) adopt a scheme, similar to Parsons' pattern variable scheme, to study seven cultures of capitalism, ie., value systems for creating wealth in United States, Britain, Japan, Germany, France, Sweden, and Netherlands. They use a questionnaire to survey 15,000 managers from around the world.

Hampden-Turner and Trompenaars (1993) assume seven value pairs (dilemmas) as crucial to creating wealth (see Table 5-2). Each pair has a tension within it and that one value in a pair is more extolled than the other is a fact of culture. The cultures which do the best job in balancing the two values in each pair create economic success. To create and maintain a value system is to manage contrasts between the values.

Table 5-2: Seven Value Pairs in Creating Wealth

Value Dilemma	Brief Description
Universalism vs. Particularism:	When no code, rule, or law seems to quite cover an exceptional case, should the most relevant rule be imposed, however imperfectly, on that case, or should the case be considered on its unique merits, regardless of the rule?
Analysing vs. Integrating	Are we more effective as managers when we analyse phenomena into parts, ie., facts, items, tasks, numbers, units, points, specifies, or when we integrate and configure such details into whole patterns, relationships, and wider contexts?
Individualism vs. Communitarianism	Is it more important to focus upon the enhancement of each individual, his or her rights, motivations, rewards, capacities, attitudes, or should more attention be paid to the advancement of the corporation as a community, which all its members are pledged to serve?
Inner-directed vs. Out-directed Orientation	Which are the more important guides to action, our inner-directed judgments, decisions, and commitments, or the signals, demands, and trends in the outside world to which we must adjust?
Time as Sequence vs. Time as Synchronisation	Is it more important to do things fast, in the shortest possible sequence of passing time, or to synchronise efforts so that completion is coordinated?
Achieved Status vs. Ascribed Status	Should the status of employees depend on what they have achieved and how they have performed, or on some other characteristics important to the corporation, ie., age, seniority, gender, education, potential, strategic role?
Equality vs. Hierarchy	Is it more important that we treat employees as equals so as to elicit from them the best they have to give, or to emphasise the judgment and authority of the hierarchy that is coaching and evaluating them?

Source: adapted from Hampden-Turner and Trompenaars (1993: 10-11).

Only the first pair is acknowledged, by the authors, to come from Parsons' pattern variable scheme. However, some other pairs are closely related to respective variables in Parsons' scheme, despite the fact that their acknowledged sources are somewhere else. It is interesting that the authors acknowledge a different source for *each* of the seven pairs, despite the availability of several variables in Parsons' scheme.

5.2.3.4 The studies' relevance to this research

The above three studies are useful references for this research of PM culture because of their ways of using Parsons' pattern variable scheme. Their further relevance to this research is limited because this research's application of the pattern variable scheme in the context of project management would be very different from those of the three studies, and, also, because the survey participants of this research would be essentially different from those of the three studies. When applicable, some results of Trompenaars' (1993) and Hampden-Turner and Trompenaars' (1993) studies will be used for the purpose of comparing PM professionals (Australian) with those Australian surveyed by the two studies. This research's particular application of the pattern variable scheme will be discussed in Section 5.3, and the participants of this research will be discussed in Section 6.3.

5.3 APPLYING PARSONS' SCHEME TO THIS RESEARCH

In order to apply Parsons' pattern variable scheme to this study of PM culture, it is necessary to examine and explain each pattern variable in the situation of project management and the PM community. It must be stressed here that the following is this thesis author's interpretation, which is based on his understanding of both Parsons' theory and project management, unless as particularly specified in the texts.

5.3.1 Affectivity – Affective Neutrality

The pattern variable *affectivity – affective neutrality* is extremely vague and cannot be directly applied to a particular study without a specific operationalisation (Mumford, 1981). In this study, it concerns work-ends values, ie., what work-ends are preferred by PM professionals in performing PM activities. Particularly, in this study, *affectivity – affective neutrality* is defined as a matter between PM professionals' pursuit of immediate gratification from their employing organisations and their pursuit of relatively remote gratification from the PM profession. In many cases, professionals need to deal with the dilemma between conflicting commitment to professions and to organisations¹⁶ (Raelin, 1986; Kerr, Von Glinow and Schriesheim, 1977). PM professionals are not an exception. For example, on a construction project, a project manager¹⁷ paid by the project owner is professionally required to act fairly in treating the owner and the construction contractor; and thus, the potential conflict of interest is one of the most difficult problems (actual or just perceived) faced by the project manager. This research regards PM professionals as not only professionals in the profession but also members in their parent/client organisations. These two roles are in some cases supplementary and in others competing or even in conflict. Working in an organisational context, PM professionals may have to find a balance point between meeting professional requirements and meeting organisational requirements.

¹⁶ The relationship between the two kinds of commitment may be conflicting or supportive of each other, depending on the degree to which an organisation supports the work values and goals of a profession.

¹⁷ PM professionals are often involved in a project as a project manager.

So, in this study, *affectivity* and *affective neutrality* were defined as follows:

- **Affectivity:** PM professionals are in the affective state vis-a-vis PM activities if and only if they perform the activities for obtaining immediate personal gratification from their employing organisations without any considerations of their professional discipline.¹⁸
- **Affective neutrality:** PM professionals are in the affectively neutral state vis-a-vis PM activities if and only if they, in performing the activities, take their professional discipline and reputation as the most important considerations, to which their impulses of obtaining immediate personal gratification are subordinated.

At one side is the organisations. PM professionals are offered payment, hierarchical positions, job security, and immediate work relationships, all of which give them immediate gratification. At the other side is the profession. PM professionals are not directly offered such things but the profession's body of knowledge, qualification, reputation and associations have significant implications for their future payment, positions, and job security. Commitment to the profession (professional commitment) is an area containing some deferred gratification or affective neutrality. For example, PM professionals must invest time and energy to study professional knowledge and skills and to obtain a professional qualification, all of which will bring them greater satisfaction at a later date. Generally defined as "a career focus form of work commitment that emphasizes the importance of a profession in one's total life" (Morrow, 1993: 33), professional commitment is an important factor in determining people's work behaviour and can be used to measure the level of the professionalism of an occupation (Hiremath, Gudagunti, and Kulkarni, 1996). Members of a profession are expected to be committed to their profession.

This division between obtaining gratification from the organisation(s) and the profession is similar to that between *local* and *cosmopolitan* professionals (Gouldner, 1957). Local professionals profess loyalty to their organisations to the point of using an organisational reference for their social and esteem needs; and cosmopolitan

¹⁸ This thesis defines the five pattern variables in the format of "any actor is ... toward any object if and only if the actor views the object ..." which was created by Brownstein (1982).

professionals maintain marginal loyalty to their organisations, preferring instead to align themselves for purposes of recognition and evaluation with their professional colleagues and associations (Raelin, 1986). It is also possible for some professionals to be committed to both profession and organisation, or even to be indifferent to both.

Operationalising this pattern variable into the matter of *organisational commitment* versus *professional commitment*, this research was interested in PM professionals' professional commitment, ie., their commitment to the PM profession. Their organisational commitment (commitment to employing organisations) was not a focus but only used for a comparison purpose.

5.3.2 Self-Orientation – Collectivity-Orientation

On the one hand, project management is an idea born of an individualist culture¹⁹ (Hofstede, 1983). Project management basically aims to set up flexible, temporary systems to deliver a unique product. It is very much task-oriented and people are likely to be motivated largely by their own part of the task for the time they are associated with it. According to Hofstede (1983: 46), in project management, "very clearly, the task comes before the relationship [among people]", and "the task is central, relationships are peripheral and fluctuating". On the other, the PM literature (eg., Kerzner, 2000) abounds with discussions of project team and teamwork, regarding teamwork as necessary for a project success. Involving integration of a variety of complex multi-disciplinary activities, project management is team-based management and is even defined as "managing the visible and invisible team to achieve the objectives of the stakeholders" (Briner, Hastings and Geddes, 1996: 10). These two views reflect project management as a complex situation: teamwork is essential but there are significant obstacles to achieving it (to be discussed later).

If true teamwork is to exist, project team members must be to a high degree collectivity- rather than self-oriented. They are obliged to take directly into account the values and interests of their project team. When there is a potential conflict with their

¹⁹ Measured by Hofstede's four dimensions of culture, the USA scores highest on individualism among all the countries studied (Hostede, 1980), where is the main home of project management.

private interests, they should give priority to the common interests of the team. According to Kinlaw (1998), teamwork is the *behavioural* principle for producing something that could not be achieved by persons pursuing only their personal interests, while teams are the *organising* principle for completing something which cannot be completed by individuals performing independent functions. If team members are highly self-oriented, true teamwork cannot exist even within a *formally constituted* team.

So, in this study, *self-orientation* and *collectivity-orientation* were defined as:

- **Self-orientation:** PM professionals are self-oriented if and only if they give priority, when performing PM activities, to their own personal interests, independently of their bearing on the interests of their project teams.
- **Collectivity-orientation:** PM professionals are collectivity-oriented if and only if they, when performing PM activities, take directly into account the values and the interests of their project teams, and when there is a potential conflict with their personal interests, they give priority to the collective interests of the teams.

In project management, teamwork is widely recognised as essential. But there exist several special obstacles, which do not exist in other situations, to the formation of true teamwork, such as:

- Who constitute the project team? A project usually involves many individuals who are from various organisations, may work for the project for a short period or on a part-time basis. So it is not easy to draw a definite boundary for the project team.
- How can a team identity be developed in a project context? Briner, Hastings, and Geddes (1996) list the characteristics of a project team as follows: (1) project staff are spread throughout the organization, and frequently outside it as well; (2) they may work part-time on the project, and often have other priorities and departmental loyalties which compete for their attention; (3) they are often not under the direct organisational control of the project leader, and may even be higher in the hierarchy than the project leader; and (4) being scattered and lacking visible coherence, they may not think of themselves, nor be seen by the organization, as parts of a project team. These characteristics make it difficult to develop a true sense of team identity.

- How can true teamwork be developed in such a temporary team whose members have little or no experience of working together. A sports team, such as a basketball team, is often used as an analogy to a project team (Culp and Smith, 1992). A project team needs teamwork similar to that a sports team does. The teamwork in a sports team can only be well developed through exercise/rehearsal day after day, but a project team usually lacks this kind of exercise/rehearsal.

Facing such obstacles to teamwork, do PM professionals believe that teamwork is a practicable and effective means of working in a project context? This research was interested in the answer.

5.3.3 Universalism – Particularism

All organisations need to create rules, codes, and procedures for their operations to be systematic enough to add value. But this alone is inadequate. Organisations must also have sufficient flexibility to allow application to a particular case. In project management, the case is the same. PM professionals must find the balance between *universal* application of the organisational rules and *particular* treatment of a case in question. If the universal application of rules is regarded as most important, a case will be firstly classified into a-certain-kind according to the rules; but if the particular treatment of a case is regarded as most important, a case will be firstly examined for its particular characteristics, leaving the rules as a less important consideration. While the universal way can enhance the efficiency of a case treatment (may be with some loss of effectiveness), the particular way can enhance the effectiveness of a case treatment (may be with some loss of efficiency). Closely related to the difference between the two ways is the degree of work formalisation or work flexibility. High work formalisation (low work flexibility) requires a universal way of case treatment, and vice versa. When an exceptional case occurs, high work formalisation requires that the most relevant rule be imposed, however imperfectly, to it; but high work flexibility requires that the case be considered on its unique merits, regardless of the rule.

So in this study, *universalism* and *particularism* were defined as:

- **Universalism:** PM professionals are universalistic toward PM activities if and only if they view the activities as being of-a-certain-kind under relevant rules so that all the activities should be performed in accordance with the rules.
- **Particularism:** PM professionals are particularistic toward PM activities if and only if they view the activities in terms of their particular characteristics so that each of the activities should be performed in accordance with a project team member's own judgments and decisions which are made based on the activity's characteristics.

A project is carried out by an *organisation of people*. In organising and managing a project, emphasis may be put on the *organisation* (structure) or the *people* (Culp and Smith, 1992). If you emphasise the organisation, you are using a structural approach of project management; and if you emphasise the people, you are using a people-centred approach of project management.

According to Culp and Smith (1992), in the structural approach, work is highly formalised and the way to treat an exception must be approved by an authority. There is centralised control of individuals and groups comprising the project team. Every team member has a detailed description of their role, and each individual or group has detailed limits on the activities they are allowed to do. Stability and predictability are valued, and measurement and documentation are emphasised, with well-defined rules and procedures. Deviations from standard procedures must be approved by a central authority. Managers focus on coordination and on seeing that standard procedures are used. Also, the flow of information is controlled and limited.

In the people-centred approach, work formalisation is low and cases will be treated by team members taking directly into account the cases' characteristics. In this way, the relevant properties of the team members have a significant influence on the way they treat the cases. Under the general guide of project mission, there is not a rigid definition of how each individual or group will pursue and conduct work. Flexibility, creativity, and spontaneity are encouraged. Rather than attempting to control people, the emphasis is on inspiring them. There is an open, effective flow of information and participation in decision making (Culp and Smith, 1992).

According to Culp and Smith (1992), any project team is a mix of the structure- and people-centred approaches, and which predominates makes the difference between project teams. Traditionally, project managers are trained to use the structural approach but have little training to deal with people, but it is now the time to shift the emphasis from the structure aspects to the people aspects (Culp and Smith, 1992). Generally speaking, due to (1) the uniqueness of a project and (2) a high degree of flexibility required in project management, the job of project management should be less formalised to allow sufficient work flexibility. For example, as indicated by Bee and Bee (1997), individual job descriptions usually do not exist for project team members in the way they do in stable teams.

This research was interested in the extent to which PM professionals believe that work flexibility to allow particular case treatment is an effective work means in project management.

5.3.4 Ascription – Achievement

This pattern variable refers to two sorts of propositional attitudes that an actor might have toward the features of a social object, ie., the degree of emphasis the actor places on the object's social and character qualities as opposed to its performance. The meaning of "ascription" can be expressed in terms of what the object *is* and "achievement" in terms of what the object *does*.

This study defined the ascription and achievement as follows:

- **Ascription:** PM professionals are ascription-oriented toward project team members if and only if they view the members in terms of who they are rather than what they do.
- **Achievement:** PM professionals are achievement-oriented toward project team members if and only if they view the members in terms of their actual and expected work performance on the project rather than their attributes which are essentially independent of their performance on the project.

Project management is designed to deliver a unique product to specified quality standards, on time, and within budget. This places a very clear emphasis on the *task*

and requires the project leader to be highly task-focused and that people's status comes not from who they are but from what they do (Bee and Bee, 1997; Firth and Krut, 1991). Other factors contributing to the performance-focused view of people may include:

- the project manager's responsibility for project delivery under a less clearly defined and usually insufficient formal authority. It is widely recognised that a project manager often lacks sufficient formal authority to manage the project (eg., Dinsmore, 1990; Briner, Hastings and Geddes, 1996; Frame, 1995). He or she is often required to work through others while possessing minimal legitimate line authority over their actions (Slevin and Pinto, 1988). So, the role of the project manager can be better described in terms of what he/she does than what (authorities) he/she has.
- the highly required cooperation and integration within a project team of high diversity. It is usual that project team members have very different backgrounds. They may come from different specialties, organisations, and even different countries. Also, the members may have various positions in the hierarchy of their home organisations. However, all the members have one common thing, that is, to work together for the successful project delivery. So, to enhance teamwork, emphasis should be placed on what the members do for the project instead of whom they are.
- the need to encourage active participation in managing the project from all the team members. In general, the inherent nature of project work determines that a participative management is effective: (1) project work is multi-disciplinary and a project manager cannot be familiar with all the areas; (2) a project manager is a generalist more than a specialist; and (3) a project manager does not do things himself – he must get the job done through delegation. In a superior team, any person must have the chance to demonstrate his/her competency and must feel confident to demonstrate the competency in order for that person to be perceived as competent (Kinlaw, 1998).
- The temporary nature of project work. A project has a definite start and finish time. Project team members work together for only this definite period when they are associated with the project, and then move to other projects in which they usually

associate with different people. The temporary relationships among people make them less concerned with “who you are” than “what you are doing for the project”.

Do, and to what degree, PM professionals believe in treating people because of what they do rather than who they are? This research was interested in this question.

5.3.5 Specificity – Diffuseness

This pattern variable concerns the scope of significance of a social object to an actor. Specificity indicates a narrow scope, ie., the object is viewed as relevant to the actor only in one or several specific aspect(s); and diffuseness indicates a broad scope, ie., the object is viewed as relevant to the actor not only in one or several specific aspects but also other aspects within a much wider range.

As discussed in Section 5.3.4, the relationships among team members are to a significant degree restricted to aspects of their tasks within the boundaries of the project, and do not go beyond to other aspects irrelevant to the project. In terms of specificity and diffuseness, it can be expressed as: team members view others within only the limited scope of their significance which is relevant to the project, ie., team members are specificity-oriented toward one another. However, if team members’ roles on the project are considered to constitute a super-system rather than a sub-system, then their orientation to other members can be further examined in terms of specificity and diffuseness. People may see others relevant to themselves only in the sense of formal work relationships stated in team’s rules and procedures, or may go further to see others relevant to themselves in the sense of not only the formal relationships but also the informal relationships which are required to enhance teamwork.

So, this study defined the pattern variable *specificity – diffuseness* as follows:

- **Specificity:** PM professionals are specificity-oriented toward project team members if and only if they view the members in terms of only the members’ formal relevance to them which are specified in the team’s formal procedures and rules.
- **Diffuseness:** PM professionals are diffuseness-oriented toward project team members if and only if they view the members in terms of not only the members’

formal relevance to them but also the members' informal relationships to them which are essential to promote teamwork, although not explicitly stated in the team's formal rules and procedures.

In project management, informal processes of interaction among team members are essential for the team to achieve the required high flexibility and rapid response to customers. In a good project team, formal titles, job descriptions, and procedures are of no final significance. Team goals and project success take precedence over any other things. Without the support from the informal processes, the effectiveness of formal rules and procedures could be greatly diminished. Informal processes are even more important in a project context than in a general business context, because:

- With insufficient authority, the project manager must create and nurture his/her informal authority by using informal processes;
- Team members need to work with people from a wide range of backgrounds with whom they often have weak formal relationships; and
- It is essential for members to be proactive, as a result of the loose style of work without close supervision (Bee and Bee, 1997).

This research was interested in PM professionals' beliefs about informal processes for communication within a project team.

5.4 RESEARCH VARIABLES AND QUESTIONS

Based on Parson's pattern variable scheme and its above-discussed application to the area of project management, this research developed the five research variables as shown in Table 5-3. These variables were assumed to constitute a system of work-related values and beliefs determining PM professionals' behaviours in performing professional work (usually in a project team).

Table 5-3: Parsons' Scheme and Research Variables

Parsons' Scheme	Assumptions in this Study	Research Variables
Affectivity vs. Affective neutrality	Commitment to the PM profession is an area containing deferred gratification (such as time and effort put into acquiring PM knowledge and skills), while an employing organisation usually offers immediate gratification (such as payment, positions).	PM professionals' commitment to the PM profession
Self- vs. Collectivity-orientation	PM needs true teamwork which requires team members to be collectivity-oriented instead of self-oriented, that is, when performing PM activities, they take directly into account the values and interests of the project team.	PM professionals' beliefs about teamwork
Universalism vs. Particularism	High work formalisation leads to universal treatment of PM activities (viewing the activities as being of-a-certain-kind under relevant rules so that they should be performed strictly in accordance with the rules), and work low-formalisation (flexibility) leads to particular treatment of PM activities (viewing the activities in terms of their particular characteristics so that they should be performed with flexibility). PM requires high flexibility.	PM professionals' beliefs about work flexibility
Ascription vs. Achievement	PM is highly task-focused and stresses people's performance on the project (what they do) rather than who they are. In a project team, members should be viewed in terms of work performance rather than their attributes which are essentially independent of their work performance on the project.	PM professionals' beliefs about viewing team members in terms of work performance
Specificity vs. Diffuseness	Good team performance requires many informal processes within a project team, which mean team members see one another in terms of diffuseness, that is, they view others relevant to themselves in the sense of not only the formal relationships stipulated by formal team rules but also the informal relationships which are necessary for teamwork.	PM professionals' beliefs about informal processes

On the basis of the literature review, the theoretical framework, and research variables, this research developed the following research questions and hypotheses:

- **Research Question 1:** Could PM culture be described by a model consisting of several discrete dimensions on the basis of PM professionals' answers to written questions about work-related values and beliefs? As discussed in Chapter 2, national and organisational cultures can be described using various dimensions. Many previous studies of organisational culture, eg., Hofstede (1980), Siehl and Martin (1988), and Hofstede *et al* (1990), have been successfully conducted using a written questionnaire as the research instrument. Therefore, recognising PM culture as a special kind of *culture*, this research hypothesised that

Hypothesis 1: PM culture could be described by a model consisting of several discrete dimensions on the basis of PM professionals' answers to a written questionnaire for surveying PM culture.

- **Research Question 2:** What dimensions would empirically emerge? As discussed before, Parsons' pattern variable scheme is a system to determine people's actions. Defining PM culture as a work-related values and beliefs system to determine PM professionals' behaviours in performing professional work, this research hypothesised that:

Hypothesis 2-A: The empirically-emerged dimensions of PM culture would be in general consistent with the themes covered in Parsons' pattern variable scheme.

Based on the literature review about PM culture in Chapter 4 and the particular application of Parsons' pattern variable scheme to the area of project management in this chapter, this research further hypothesised that:

Hypothesis 2-B: The empirically-emerged dimensions of PM culture would in general cover the issues discussed in the literature of PM and professions which were relevant to work-related values and beliefs in the PM profession. (It was unlikely that this research would find work-related values and beliefs that nobody had discussed before.)

Hypothesis 2-C: The empirically-derived model of PM culture would reveal that PM professionals were expected to be (1) committed to the PM profession, (2) teamwork oriented, (3) work flexibility oriented, (4) work performance oriented in viewing project team members, and (5) willing to develop as many informal work relationships with project team members as needed for true teamwork.

- **Research Question 3:** What were PM professionals' current values and beliefs around the to-be-identified dimensions of PM culture? Considering the fact that most PM professionals had been formally educated in the discipline of project management and also practised project management for many years, this research hypothesised that:

Hypothesis 3: PM professionals' current values and beliefs around the dimensions of PM culture would be consistent with the "expected" values and beliefs revealed in the model of PM culture (and also revealed in the PM literature). (But the examination of the current values and beliefs would reveal some potential for improvement to the PM profession.)

5.5 SUMMARY

This study was located within a general framework consisting of phenomena to study, levels of analyses, and analyses perspectives. Taking an integration perspective, this study assumed that a professional culture existed within the PM community in terms of its consistency, profession-wide consensus, and clarity. This study chose the values and beliefs level of the culture of the PM profession as a research focus.

This study assumed that PM professionals had a common work-related behaviour pattern caused by their specific work-end values and work-means beliefs. Parsons' *General Theory of Action*, especially his *pattern variable* scheme, was used as the theoretical framework for this study. The theory concerns the organisation of an actor's, as either an individual actor or a collectivity of actors, orientation of action to a situation. Action has an orientation when it is guided by the meaning which the actor attaches to it in its relationship to his/her goals and interests.

The most important thread of continuity running through Parsons' theory is the *pattern variable scheme*. According to this theory, any course of action by any actor involves a pattern of choices with respect to five dichotomous choices called *pattern variables*. The five pattern variables and their particular applications to this research are: (Particular applications in parentheses)

- Affectivity (organisational commitment) – Affective neutrality (professional commitment);
- Self-orientation (individual orientation) – Collectivity orientation (teamwork orientation);
- Universalism (work formalisation orientation) – Particularism (work flexibility orientation);
- Ascription (viewing others in terms of who they are) – Achievement (viewing others in terms of what they do); and

- Specificity (limiting relationships with others to the formal relationships stipulated in a team's formal rules and procedures) – Diffuseness (extending relationships with others to include as many informal relationships as needed for true teamwork).

On the basis of the literature review and the theoretical framework, this chapter has developed the five research variables as (1) PM professionals' commitment to the PM profession, (2) PM professionals' beliefs about teamwork, (3) PM professionals' beliefs about work flexibility, (4) PM professionals' beliefs about viewing team members in terms of work performance, and (5) PM professionals' beliefs about informal processes.

Finally, this chapter has formed three research hypotheses as (1) PM culture could be described by a model consisting of a set of discrete dimensions, (2) the empirically-emerged dimensions of PM culture would be in general consistent with the themes covered in Parsons' pattern variable scheme and also with the common PM values and beliefs discussed in the literature, and (3) most of PM professionals' current values and beliefs around the dimensions of PM culture would be consistent with the "expected" values and beliefs revealed in the model of PM culture and in the literature.

Chapter 6

Research Methodology

Chapter 6 is about research methodology. This research was a quantitative study, using a written questionnaire to survey selected Australian project management professionals. This chapter discusses the operationalisation of the research variables, the design and pre-test of the questionnaire, the administering of the questionnaire, and the data preparation and analyses. This chapter includes the following major sections:

- 6.1 General Design of the Research
- 6.2 Designing and Pre-testing the Questionnaire
- 6.3 Administering the Questionnaire
- 6.4 Data Preparation
- 6.5 Data Analysis
- 6.6 Summary

6.1 GENERAL DESIGN OF THE RESEARCH

6.1.1 A Quantitative Study

A culture study may require a qualitative or quantitative method or a mixture of the two. Examples of using the three kinds of methodology can be found in the literature of organisational culture, such as,

- Schein (1992) adopts a qualitative method to study underlying assumptions. Schein (1992) argues that the only valid way to decipher organisational culture is that an outsider works directly with a group of motivated insiders. His criticism is that a culture survey can only reach the artefact level of culture.
- Many researchers, such as House (1998), Hofstede (1980, 1998), Hofstede *et al.* (1990), insist on culture can be quantitatively measured on the basis of people's answers to written questions. For example, Hofstede *et al.* (1990) demonstrate that membership in one organization rather than another can explain a significant share of the variance in members' answers to questions dealing with culture-related matters. They argue that a survey method can produce a discrete number of independent dimensions which are operationalisable for culture understanding, comparison, and change.
- Siehl and Martin (1988) use a hybrid approach that combines qualitative and quantitative methods for studying organisational cultures. They use ethnographic observation, in-depth interviews, and archival data as the qualitative way and a written questionnaire as the quantitative way to determine espoused values and values-in-use in organisations.

Qualitative and quantitative methods have their own advantages and disadvantages. A qualitative study by in-depth observation may achieve a depth of description and "feeling for" a culture, but it inevitably trades off some breadth and objectivity (Kabanoff, 1992). Qualitative culture research cannot be effectively repeated and its reliability is relatively low. Consequently, inter-organisational comparisons become difficult or impossible. Siehl and Martin (1988: 80) argue:

The advantages of qualitative approaches have been bought at a cost. It is exceedingly difficult to make analytic comparisons on the basis of the data available. There are many centrally important theoretical questions which cannot be answered until culture can be measured with repeatable, easily administered instruments that permit systematic comparisons.

In contrast, quantitative research can be easily administered and repeated and can lead to several independent dimensions for measuring a culture, but it may be to some degree “superficial”. Culture surveys can be repeated at a number of organisations or at a different time of the same organisation. Therefore, comparisons across organisations or different times are made possible, which can provide important information about cultures for culture management and culture change. As a set of shared values and interpretations, culture cannot be systematically understood without quantitative instruments which measure the extent to which values and interpretations are shared and to which subcultures exist in an organisation (Siehl and Martin, 1988).

The literature provides some studies of organisational culture (e.g., Fitzgerald, 2001; Schein, 1992) using a case study approach. The case study approach emphasises detailed contextual analyses of one or several cases (Soy, 2001). Its major weakness is in its dependence on a single or a very limited number of cases that renders it incapable of providing grounds for establishing reliability or generality of findings (Soy, 2001). Because this research was to identify several key dimensions of PM culture at a *profession-wide* level, this weakness of the case study approach was unacceptable.

Based on the above discussion of advantages and disadvantages of qualitative (case study) and quantitative methods, this research was designed as a quantitative study using a written questionnaire for data collection and descriptive and inferential statistics for data analyses. It was believed that this quantitative research design would lead to the successful identification of several independent dimensions (attributes) of PM culture.

6.1.2 Nature of the Study

From the literature several questions arise about the identification of cultural dimensions. How many dimensions are sufficient to characterise a culture? Two, five

or seven? What dimensions are appropriate to measure a culture? How should the dimensions be developed? The only appropriate suggestion is probably a contingent one: different dimensions may be relevant for different purposes and the dimensions should emerge empirically under the guidance of a sound theoretical framework (Sackmann, 1991). This research followed Sackmann's suggestion in order to identify the key dimensions of PM culture.

Other key points determining the nature of this research were as follows:

- **Type of the Research:** This research was concerned with the cultural pattern of PM professionals. Since no systematic and empirical studies had previously been done in this area and little was known about PM culture at the profession-wide level across organisational and industrial boundaries, this research was an exploratory one. It examined the correlations and covariances among the questionnaire items which were designed to measure the research variables in order to generate several key dimensions (attributes) of PM culture. Thus, this study was a correlational rather than a causal study.
- **Research Setting:** This research examined PM professionals' work-related values and beliefs that were developed in their natural professional work environment. Variables were neither controlled nor manipulated, and no artificial setting was created for the research.
- **Time Horizon:** No previous research had been done by the researcher on this specific population, nor was any subsequent extension of the research contemplated. So, the study was cross-sectional (one-shot) in nature instead of longitudinal. However, some relevant future research will be suggested in Chapter 10 of this thesis.
- **Unit of Analysis:** The unit of analysis was individual PM professionals.

6.2 DESIGNING AND PRE-TESTING THE QUESTIONNAIRE

6.2.1 Introduction

One of major tasks in this research was to develop a questionnaire appropriate for the survey of PM culture. No existing questionnaire was found to be adequate to deal with the content area specific to this research, in which PM culture was defined generally as the professional culture of the PM profession and specifically as the work-related values and beliefs of PM professionals. Previous researchers, such as Hofstede *et al* (1990), have developed some questionnaires to survey organisational cultures. These questionnaires ask questions in such a way that prospective respondents would be preoccupied by the organisational setting in which they work. As the professional culture of the PM profession, PM culture obviously goes beyond organisational settings. So these questionnaires of organisational culture are not directly applicable for this research. The literature also provides some questionnaires for surveying professional commitment, occupational work attitudes, work interests, work values, etc., such as the instruments included in Robinson, Athanasiou and Head's (1969) *Measures of Occupational Attitudes and Occupational Characteristics*. These questionnaires were not suitable for this research because:

- They could not cover the particular content area of this research. For example, Gouldner's (1957) questionnaire measured professional commitment from the perspective of "cosmopolitan-local" professionals. But, the cosmopolitan-local aspect was only one of the concerns of this research.
- They were developed particularly for specific occupations of interest (usually within organisational boundaries) and not applicable for other occupations (especially if the survey would go beyond organisational boundaries). For example, Berger and Grimes's (1973) questionnaire was particularly designed for faculty members from business schools in USA.

6.2.2 Operationalising the Research Variables

The first stage of developing the questionnaire was to operationalise the research variables (see Section 5.4) for the purpose of measurement. According to Cox (1996), operationalising research variables is to identify *observable*, *important*, and *similarly-*

specific characteristics of the variables so that respondents would remain focused, thinking about similar meanings for each variable.

6.2.2.1 Variable 1: Commitment to the PM profession

Commitment to the PM profession is virtually a matter of PM professionals' identification with the profession, which in turn is a matter of their willingness to promote the interests of the profession. Although its precise meaning has not been well articulated, professional commitment can be regarded as "a career focus form of work commitment that emphasizes the importance of a profession in one's total life" (Morrow, 1993: 33). According to Hiremath, Gudagunti, and Kulkarni (1996: 80),

Professional commitment refers to how strongly one feels obliged to pursue the principles, values, and goals of a particular profession. How closely one identifies oneself with the profession and at what cost to oneself and to ones family one would pursue the profession are taken as the indices of commitment to profession.

Based on the above themes and Salaman's (1974) key components of an occupational community (see Chapter 3), this research operationalised PM professionals' commitment to their profession into the three aspects: PM professionals' self-identification with the profession, their use of PM peers as a major reference group for evaluating their work performance, and their willingness to bring professional activities/interests into leisure time.

As most of PM professionals worked within organisations, this research considered PM professionals' commitment to the profession in comparison with their commitment to their employing organisations.

6.2.2.2 Variable 2: Beliefs about teamwork

Teamwork is a *behavioural* principle for people working on a common task or pursuing a common goal, while teams are an *organising* principle (Kinlaw, 1998). Teamwork exists if people engage collaboratively and co-operatively in undertaking a common task. A formally constituted team can provide a good basis for teamwork, but it cannot ensure the existence of true teamwork. According to Kinlaw (1998), teamwork minimally requires that: (1) people pursue a common goal; (2) people identify themselves with the team (team identity); (3) people co-operate with each

other in the group situation; (4) people share authority and responsibility for achieving the common goal; and (5) people share information as much as necessary for work performance. The operationalisation of Variable 2 was based on these five aspects.

In the area of project management, a project team is widely accepted as the organisational structure for implementing a project. So, PM professionals' teamwork orientation was, in this research, considered in the typical context of a project team, relative to their self (individual) orientation.

6.2.2.3 Variable 3: Beliefs about work flexibility

Work flexibility is opposed to work formalisation. Low formalisation means high flexibility, and high formalisation means low flexibility. Two major matters identified by Miller (1991) for measuring work formalisation were used to operationalise this research variable. According to Miller (1991: 407),

the two dimensions of formalization may be specified as job codification, or the degree of work standardization, and rule leniency, or the measure of the latitude of behavior that is tolerated from standards.

Assuming project management required high work flexibility, this research thus operationalised Variable 3 into these two aspects: job de-codification and work autonomy, to measure the extent to which PM professionals preferred work flexibility. This research considered PM professionals' beliefs about work flexibility in the typical context of project management as perceived by the professionals.

6.2.2.4 Variable 4: Beliefs about viewing team members in terms of work performance

According to the literature, project management is assumed to be task-oriented, and consequently project team members' status comes from what they do on the project instead of who they are. To reveal PM professionals' beliefs about viewing team members in terms of work performance, this research considered "work performance" relative to the three types of status: age, position in a hierarchical structure, and professional qualification in project management. In previous similar research, Trompenaars (1993) used *family background* and Hampden-Turner and Trompenaars (1993) used *age* as the status for comparison with *achievement* (performance).

6.2.2.5 Variable 5: Beliefs about informal processes

As discussed in Chapter 5, Section 5.3.5, in a good project team, formal titles, job descriptions, and procedures are of little final significance. In such a team, work relationships among members are not limited to those specified in the formal rules and procedures but go beyond to informal work relationships as far as required by teamwork. Informal acts and behaviours of team members are of value to turn their team into one that pulsed with life and energy (Kinlaw, 1998). To reveal PM professionals' beliefs about developing informal relationships within a project team, Variable 5 was operationalised into the four aspects as follows: (1) informal communication; (2) mutual assistance/help; (3) team members' influence on every aspect of team performance, and (4) informal rewards. These four aspects were adapted from Kinlaw's (1998) four informal processes of a superior team.

This variable was considered in a typical PM context (as perceived by PM professionals) and measured to know if PM professionals preferred to limit their relationships with fellow team members to the formal relationships specified in the team's rules and procedures, or if they preferred to go beyond the formal relationships to develop informal relationships as necessary for true teamwork.

6.2.2.6 Summary of the operationalisation

Table 6-1 summarises the above-discussed operationalisation of the research variables.

Table 6-1: Operationalisation of the Research Variables

Variables	Operationalisation
Professional Commitment	Identifying self with the PM profession; Using PM peers as a reference group; Extending professional activities into leisure time.
Teamwork	Pursuing common goals; Identifying with the team; Cooperation among team members; Sharing authority and responsibility among members; Sharing information among members.
Work Flexibility	Job de-codification; Work autonomy.
Work Performance	Work performance relative to the three types of status: age, position in a hierarchical structure, and PM professional qualification.
Informal Process	Informal communication; Mutual assistance/help; Members' influence on every aspect of team performance; Informal award.

6.2.3 Developing Questionnaire Items

Under the guidance of the above operationalisation of the variables, an item pool consisting of 200 items was developed by reference to existing questionnaires and literature, such as,

- Hampden-Turner and Trompenaars' (1993) questionnaire for surveying the seven cultures of capitalism;
- Hofstede's (1980) *Value Survey*;
- Hofstede *et al*'s (1990) questionnaire for organisational culture survey;
- Lansbury's (1978) questionnaire used in his research *Professionals in Industry*;
- Kinlaw's (1998) *Superior Team Development Inventory*;
- Glaser's (1963) questionnaire for surveying local-cosmopolitan scientists;
- Perrucci and Gerstl's (1969) questionnaire for surveying engineers' professional values;
- Hage and Aiken's (cited in Miller, 1991) *Formalisation Inventory*;
- Kerzner's (1998) *Project Management: A Systems Approach to Planning, Scheduling, and Controlling* (6th ed.);
- Turner's (1993) *The Handbook of Project-Based Management*;
- Robinson, Athanasiou and Head's (1969) *Measures of Occupational Attitudes and Occupational Characteristics*.

The selection of the final items was based on the following criteria (according to the researcher's judgment):

- An item's relevance to the typical context of project management (project teams);
- An item's suitability to the survey of PM culture at the profession-wide level across organisational and industrial boundaries; and
- An item's simplicity and clarity in measuring the research variables

The selected final items were then further reviewed by the researcher, his supervisors, and other experts in questionnaire development, using the *Questionnaire Evaluation Form* which asked them to review each item in terms of its meeting the criteria (Cox, 1996) as follows:

- Alignment: An item is relevant to the guiding question.

- Ask what respondents know: An item asks only what the respondents know.
- Simple sentence: An item uses simple sentence construction and order.
- Single question: An item asks only one question.
- Respondent not led: An item must not lead a respondent to give a particular answer.
- No social desirability: An item does not include sensitive words or phrases which may lead a respondent to give a socially desirable response.
- No jargon: An item does not include uncommon terminology, jargon, or words or phrases with ambiguous meaning.

Feedback from the reviews was used to finalise the items.

6.2.4 Structure and Format of the Final Questionnaire

The final questionnaire, titled *Project Management Culture Survey* (see Appendix 5) consisted of four parts:

1. Background information

This part asked the respondents for some general information about themselves.

2. Aspects of Job Satisfaction

This part was aimed to measuring Variable 1. It consisted of 14 aspects of job satisfaction relevant to a respondent's roles as a member of the PM profession and as a member (employee) of his/her employing organisation. The items were measured by a five point scale: 1 = Very Unimportant, 2 = Unimportant, 3 = Neutral (Neither important nor unimportant), 4 = Important, and 5 = Very Important.

3. Work-related Values and Beliefs

This part had 43 items intended to measure the research variables:

- items no. 1 – 3 for Variable 1 (Commitment to the PM profession);
- items no. 4 – 13 for Variable 2 (Beliefs about teamwork);
- items no. 14 – 24 for Variable 3 (Beliefs about work flexibility);
- items no. 25 – 34 for Variable 4 (Beliefs about viewing team members in term of work performance); and
- items no. 35 – 43 for Variable 5 (Beliefs about informal processes).

Each of the items consisted of two statements, A and B, which were logically opposite to some extent. It required a respondent to show his/her value/belief leaning on each item by circling one of the following indicators for each item:

- A = I agree with A much more than with B;
- a = I agree with A somewhat more than with B;
- ? = I cannot choose between A and B;
- b = I agree with B somewhat more than with A;
- B = I agree with B much more than with A.

4. Comments (Optional)

This part asked a respondent to give his/her comments about the survey and/or any aspects about project management.

6.2.5 Pilot Tests for Developing the Questionnaire

Two pilot tests were conducted during the process of developing the questionnaire. The first one was conducted among Master students (coursework) in project management at RMIT University and Victoria University (VU), Melbourne, Australia. The second one was conducted within a small sample of the survey population (AIPM members).

6.2.5.1 The first pilot test

The draft questionnaire used in the first pilot study was of a five-point agree-disagree format, different from the format of the final questionnaire. Fifty-four copies of the draft questionnaire were handed out to all the students who were in the classes on May 17, 2000 at RMIT and May 25, 2000 at VU. The students were asked to complete the questionnaire on the spot. Fifty-one completed questionnaires were returned, with a response rate of 94 percent. Among the respondents, forty-five (representing 85 percent) were currently employed across various industries, such as construction, services and manufacturing.

The findings and the relevant modifications to the questionnaire are summarised as follows:

- Most respondents *circled* the answers in the main part of the questionnaire. They did not *tick* them as required by the instruction. One respondent expressed the opinion: to circle is clearer than to tick. Therefore, in the final version of the questionnaire, respondents were required to *circle* the answers.
- Several confusing words were changed. For example, in the item “It is necessary to retain information for an individual’s personal power”, the word “retain” was understood as “withhold” by some respondents and as “have” by other respondents, and the word “retain” was then changed into “withhold” in the final version of the questionnaire.
- The most significant finding was the inconsistency in the responses to those items that required respondents to make a choice in a dilemma between two *favourite* things, such as professional reputation and organisational advancement. The respondents had an tendency to agree to both of two contradictory items, such as the two items as follows:
 - (1) I prefer the job which leads to an advancement in my organisation to what builds my professional reputation in project management, and
 - (2) Professional reputation is more important for me than a higher hierarchical position in my organisation,

instead of, as expected, agreeing to one item and disagreeing to the other. So it is necessary to deal with this problem.

6.2.5.2 The treatment of the response inconsistency

The problem of response inconsistency was probably linked to what was referred to by such varying terms as *agreeing-response bias*, *acquiescence*, or *yeasaying*. Agreeing-response bias refers to “a presumed tendency for respondents to agree with attitude statements presented to them” (Schuman and Presser, 1981: 203). According to Schuman and Presser (1981), the response bias, which an agree-disagree item often involves, can be mainly interpreted by the following three reasons:

- It is inherent as a personality trait when people answer questions of the agree-disagree format.
- The bias is frequently assumed to be a way for a respondent to handle a question to which he or she has no real answer. In the case of this pilot study, the students may have not yet clearly formed their own values/beliefs in the relevant aspects.

- The bias is greatest on items that are vague, ambiguous, or otherwise difficult to answer and will therefore decrease or even disappear entirely as questions are seen by respondents to be clear and meaningful.

To partly reveal how the three factors contributed to the problem in the pilot study of this research, five project managers from a project management company were asked to complete the draft questionnaire. The inconsistency problem still existed, although to a lower degree, in their responses. Therefore, it appeared that the second factor was not the full reason for the inconsistency problem, and that the first and third factors must be addressed.

The main part of the draft questionnaire was then re-organised to minimise the response bias problem. It was divided into two parts, one was about aspects of job satisfaction (Part 2 in the final questionnaire), and the other was about work-related values and beliefs (Part 3 in the final questionnaire). The first part used a five-point scale from “Very Unimportant” to “Very Important”. The second part adopted the format which was a combination of a five point agree-disagree format and a forced-choice format (for the format, see Part 3 of the final questionnaire, Appendix 5). The main reasons for adopting this combined format were as follows:

- It kept not only the advantage of the scoring method of a five-point agree-disagree format but also the advantage of avoiding the response bias of a forced-choice format. de Vaus (1991) and Schuman and Presser (1981) have suggested the forced-choice format as a way to avoid the response bias. According to de Vaus (1991: 101), “if there is evidence of a [acquiescent] response set, it is best to replace the agree-disagree format with another type of question.” According to Schuman and Presser (1981: 230), “Unless counterevidence can be produced, there seems good reason to prefer forced-choice over agree-disagree versions of items where possible”.
- It was consistent with the theoretical framework of this research which was of a dilemma format.
- This format and its alternated formats were successfully used in some previous studies in sociology and psychology, such as

- ◆ Verbeke's (2000) *Revised Organisational Practices Scale* which was a revision of Hofstede *et al*'s (1990) organisational culture scale.
 - ◆ Campbell's various social attitude scales (in Robinson and Shaver , 1973);
 - ◆ Berkowitz and Wolkon's (1964) forced-choice F scale (Also available in Robinson and Shaver, 1973);
 - ◆ Schuman and Harding's (1964) rationality questionnaire (Also available in Lake, Miles and Earle, 1973);
 - ◆ Schuman and Harding's forced choice F scale (Available in Robinson and Shaver, 1973); and
 - ◆ Kassarjian's (1962) inner-other social preference scale (Also available in Robinson, Athanasiou, and Head, 1969).
- The same format of questionnaire was suggested by Kerzner (1998) for his project management leadership survey.
 - According to Hampden-Turner and Trompenaars (1993), it was a valid methodology for research to pose respondents dilemmas so as to *force* them to take a side to reveal which of the two values in each of the dilemmas they regarded as most fundamental.

The format change was originally intended to be only applied to those items that suffered the response bias problem. However, it was then found that these items in the new format were more specific than others in the old format. The former items asked about a respondent's value/belief about one thing relative to his/her value/belief about another *designated* thing, and the latter items asked about a respondent's value/belief about one thing relative to his/her value/belief about its many *logically opposite* things, among which the respondent may intentionally or unintentionally choose any one or several as a comparison basis for answering the items. To avoid this problem of unequal levels of specificity, the format change was finally done to all the items of the draft questionnaire.

To obtain a questionnaire in the new format, the items in the draft questionnaire were re-organised. For some items, two relevant but logically opposite items were combined into one item consisting of two opposite statements, and for other items involving a

choice between two things, each of the items was kept as one item but the two things were separated as two opposite statements.

As Schuman and Presser (1981) state, when agree-disagree items are transformed into forced-choice questions, there may be a problem of a response-order effect on the forced-choice questions. To minimise this kind of problem, this research *randomly* arranged the order of two statements (choices), one supporting and the other rejecting the hypothesised PM values and beliefs, for each item. This arrangement caused about half of the items to use a “supporting” statement as the first choice, and the other half to use a “rejecting” statement as the first choice.

As mentioned previously, the new format also made the items more specific and consequently easier for respondents to answer. So the process of format change had also addressed the third factor contributing to the response bias problem.

All the above work resulted in a new draft questionnaire for testing.

6.2.5.3 The second pilot test

The new draft questionnaire was electronically sent to a small sample (30) of the survey population (AIPM members). These members were randomly selected from the members with e-mail addresses listed in the *Project Management Handbook 1999* (AIPM, 1999). Ten responses came in through e-mail, fax, or postal mail. Of which, three respondents gave their valuable comments on the questionnaire. The review and analysis of the responses showed that the new version of the questionnaire was satisfactory and also significantly reduced the problem of response inconsistency.

Based on the responses to and comments on the new draft questionnaire, several minor changes were made in the part of *Background Information* so that responses to the main part of the questionnaire could be better discriminated and analysed. This effort produced the final questionnaire as shown in Appendix 5.

6.3 ADMINISTERING THE QUESTIONNAIRE

With the assistance of the *Australian Institute of Project Management* (AIPM) in Sydney, Australia, the questionnaire was mailed to prospective respondents on August 1, 2000. Together with the questionnaire were a cover letter (see Appendix 4) signed by the researcher and his supervisors and a self-addressed reply-paid envelope. This research and its survey had been previously approved by the *Human Research Ethics Committee, Victoria University*. In the cover letter, the respondents were ensured that their responses would be kept confidential and only summaries for groups of people would be reported in the final thesis.

The prospective respondents were all Australia-based AIPM members with the membership grades of *Member* and *Fellow* who had valid postal addresses at AIPM on July 31, 2000. Overseas members were excluded. Also excluded were the members with the grades of *Student Member* and *Associate Member*, who might not meet the educational and experience requirements which AIPM imposed on its *Members* and *Fellows*. The main reason for selecting the survey participants was to ensure that the participants formed a homogeneous professional group and had certain PM educational and practical experiences. AIPM's representation of the PM profession (in Australia) made its membership a reasonable criterion for defining such a homogeneous professional group. AIPM enforced minimum membership requirements of educational and practical experiences for the grades of *Member* and *Fellow*. It was assumed that a certain level of PM education and practical experience was essential for PM professionals to form their work-related values and beliefs.

In order to increase the response rate, a follow-up letter (see Appendix 6) was sent out on August 11, 2000, 10 days after the questionnaire was sent out. By September 15, 2000, 327 responses were received. Table 6-2 shows the sample size and response rate.

Table 6-2: Sample Size and Response Rate

Questionnaires mailed out	Questionnaires undelivered	Responses Received	Response Rate (Percent)
790	15	327	42.2

6.4 DATA PREPARATION

The data preparation was conducted through the steps from assigning numbers, responsiveness examination, data input, and data coding.

6.4.1 Assigning Numbers

Each of the received questionnaires was assigned a unique number continuously from 1 to 327.

6.4.2 Responsiveness Examination

All the received responses were examined to exclude the cases which were not substantially responsive to the requirements of the questionnaire. Four cases were classified as invalid as the respondents either chose two answers for each of many items or had too many missing data.

6.4.3 Data Input

The data from all the valid cases were input into a computer by using the software SPSS 10.0. For convenience of data analysis, each item from the questionnaire was assigned a unique name. The 14 aspects of satisfaction were named respectively as SAT1, SAT2, ... and SAT14, and the 43 items of values/beliefs were named respectively as Value1, Value2, ... Value43.

6.4.4 Coding

All items were coded to ensure that they were scored in the same direction so that their scores could be compared and summed up. It was decided that all items be coded in such a way that the highest score (5) indicated a response strongly supporting the hypothetical values/beliefs of project management, and the lowest score (1) indicated a response strongly denying those hypothetical values/beliefs. Between the score 1 and 5 were 2, 3, and 4, indicating the different degrees to which the responses supported or denied the hypothetical values/beliefs. From this criterion, a coding scheme was established as Table 6-3.

Table 6-3: Coding Scheme

Items*	Original Answers	Scores used for analysis
SAT2, SAT3, SAT5, SAT7, SAT9, SAT11, and SAT14	1 2 3 4 5	1 2 3 4 5
Value1, Value4, Value6, Value13, Value14, Value15, Value17, Value18, Value19, Value20, Value23, Value24, Value27, Value28, Value29, Value31, Value33, Value34, Value36, and Value37	A a ? b B	1 2 3 4 5
Value2, Value3, Value5, Value7, Value8, Value9, Value10, Value11, Value12, Value16, Value21, Value22, Value25, Value26, Value30, Value32, Value35, Value38, Value39, Value40, Value41, Value42, and Value37	A a ? b B	5 4 3 2 1

* Note: Those items (SAT1, SAT4, SAT6, SAT8, SAT10, SAT12, and SAT13) which were designed to measure organisational commitment were coded separately. Their coding will be discussed in Chapter 8, Section 8.1.1.3.

6.5 DATA ANALYSIS

This research conducted the following statistical analyses on the softwares SPSS 10.0 for social science statistics and AMOS 4.0 for structural equation modeling:

- Factor analyses: (1) exploratory factor analysis (EFA) to determine the key dimensions of PM culture and (2) confirmatory factor analysis (CFA) to test the expected sub-dimension structure for each of the dimensions and the expected dimensionality of the construct *PM culture*; and
- Descriptive statistics and t-tests to explore PM professionals' current values and beliefs around the dimensions and sub-dimensions.

6.5.1 Purpose of Factor Analysis

Factor analysis has become a wide used data reduction technique in social science research to help people gain a better understanding of complex and poorly defined interrelationships among large numbers of variables (Lewis-Beck, 1994). Several typical definitions of factor analysis are as follows:

Factor analysis is a data reduction technique used to reduce a large number of variables to a smaller set of underlying factors that summarise the essential information contained in the variables. (Coakes and Steed, 1999: 155)

Factor analysis is a statistical technique used to identify a relatively small number of factors that can be used to represent relationships among sets of many interrelated variables. (Norusis, 1993: 47)

Usually the aim [of factor analysis] is to summarize the interrelationships among the variables in a concise but accurate manner as an aid in conceptualization. (Gorsuch, 1983: 2)

Factor analysis can be used as an exploratory method or confirmatory method. The exploratory factor analysis (EFA) is to explore the underlying factor structure without prior specification of number of factors and their loadings; and the confirmatory factor analysis (CFA) is to test specific expectations concerning the number of factors and their loadings (Lewis-Beck, 1994).

This research conducted both EFA and CFA. As no existing dimensions and measuring instruments were available for PM culture in the literature, this research

used EFA to explore key dimensions of PM culture. With the expectation that each EFA-extracted factor might include two or three theoretically-identifiable sub-factors, this research used CFA to confirm such sub-factor structure. Also, CFA was used to confirm the expected relationships between the factors/sub-factors and the construct of *PM culture*.

In the questionnaire, seven items, ie., SAT1, SAT4, SAT6, SAT8, SAT10, SAT12, and SAT13, were designed to measure PM professionals' commitment to employing organisations. These items were used only as a comparison basis for the commitment to the PM profession. So they were excluded from factor analysis. All other items were used for the factor analysis.

6.5.2 Exploratory Factor Analysis

6.5.2.1 Data examination

The literature review revealed two essential assumptions underlying exploratory factor analysis as a sufficiently large sample size and appropriate factorability of the data.

It is essential that sample should be sufficiently large to enable a factor analysis to be done reliably. However, there is no consensus on what the sample size should be. Kline (1994) proposes a minimum 2:1 ratio of subjects to variables (items) and a minimum total subjects of 100. Gorsuch (1983) proposes a minimum 5:1 ratio of subjects to variables and a total subjects of 100 for per analysis. Tinsley and Tinsley (1987) suggest a ratio of about 5 to 10 subjects per item, up to about 300 subjects. They suggest that when the sample is as large as 300, the ratio can be relaxed. This research had 323 responses and 50 items, with a 6.5:1 ratio of subjects to variables and a sample size much bigger than 100. So the sample size was large enough for EFA. To avoid the loss of sample size, a very small number of missing data were replaced by item means.

Factor analysis is based on correlations between variables. If the correlations are small, the data are inappropriate for factor analysis. To test the factorability of variables, three kinds of tests are frequently used (Coakes and Steed, 1999; Norusis, 1993):

- **Bartlett's test of sphericity:** testing if the correlation matrix of data is an identity matrix (Coakes and Steed, 1999; Norusis, 1993). If the Bartlett's test rejects the hypothesis that the correlation matrix is an identity one, then the factorability is assumed, that is, there exist significant correlations among variables (items) for EFA. The Bartlett's test shown in Table 6-4 shows the appropriate factorability of the data of this research, ie., the hypothesis of an identity matrix can be rejected.
- **Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy:** comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients (Coakes and Steed, 1999; Norusis, 1993). If the KMO measure is greater than 0.6, then the factorability is assumed. Having a KMO measure of 0.73 (See Table 6-4), bigger than 0.6, the data was appropriate for EFA.

Table 6-4: KMO and Bartlett's Test

		All Items	After excluding Value6
KMO Measure of Sampling Adequacy		0.727	0.733
Bartlett's Test of Sphericity	Approx. Chi-Square	3415.168	3341.741
	df	1225	1176
	Sig.	0.000 ²⁰	0.000

- **Measures of sampling adequacy (MSA)** for each individual variable (Coakes and Steed, 1999; Norusis, 1993). The MSA has the same meaning as the KMO but is measured for each individual variable instead of the whole matrix. Variables with a MSA measure below the acceptable level of 0.5 should be excluded from factor analysis. The MSA measure of the data of this research revealed that the item Value6 had a value 0.428, lower than 0.5. So the item Value6 was excluded.

6.5.2.2 Method for factor extraction

Among methods for factor extraction, the most frequently used ones are *Principal Components Analysis* (PCA) and *Principal Axis Factoring*²¹ (PAF) (Coakes and Steed, 1999; Hair *et al.*, 1998). There is much debate in the literature as to which method is the most appropriate. The major difference between them is that PCA carries the total variances of variables and PAF carries only the common variances into the factor

²⁰ Some people do not think that the expression “ $p=0.000$ ” is a good practice. Because the software SPSS and AMOS produce this kind of expression, it is used in this thesis. However, it must be understood as “ $0 < p < 0.001$ ”.

²¹ Principle Axis Factoring is also known as Principle Factors Analysis or Common Factors Analysis.

matrix. However, in most applications, PCA and PAF arrive at essentially identical results if the number of variables exceeds 30 (Hair *et al.*, 1998). This research used PCA as the extraction method. One of the major advantages of PCA is that it is less complicated than PAF (Hair *et al.*, 1998). In addition, it does not require the assumption of multivariate normality of data as the Maximum Likelihood method does (Lewis-Beck, 1994). A major weakness of PCA is that it requires prior knowledge that “suggests that specific and error variance represent a relatively small proportion of the total variance” (Hair *et al.*, 1998: 102). According to Hair *et al.* (1998), if a researcher is concerned with this requirement, then PAF should also be applied to assess the factor structure obtained under PCA. Following this suggestion, this research, as an exploratory study, used PAF to assess/confirm the PCA-extracted factor structure.

It is possible to extract as many factors as the number of variables, but this is not the purpose of EFA. One widely used criterion is an “eigenvalue greater than 1”, that is, only the factors that account for variances greater than 1 should be extracted (Norusis, 1993). Factors with an eigenvalue less than 1 are no better than a single variable. This research used the “eigenvalue greater than 1” criterion for the initial factor extraction.

6.5.2.3 Number of factor and factor rotation

After the initial factor extraction, this research used the scree test (Cattell, 1978) to select the correct number of factors for factor rotation. According to Kline (1994) and Cattell (1978), in large matrices, the “eigenvalue greater than 1” criterion greatly overestimates the number of factors and may split a major factor into several trivial factors. Many authors, such as Kline (1994), Norusis (1993), and Devellis (1991), propose Cattell’s (1978) scree test as a good solution to selecting the correct number of factors. In a scree plot, the cutoff point for selecting the correct number of factors is where the line suddenly changes slope (where a distinct break is between the steep slope of the large factors and the gradual trailing off of the rest of the factors). If slope change begins at the k th factor, then k is the true number of factors. According to Kline (1994), the scree test must be performed on PCA.

It is usual that an initial solution of factor analysis does not make it clear which items belong to which factors, because each of many items load significantly on several or

even all factors (Kline, 1994). Factor rotation is to transform the initial factor solution into a simple structure in which each item will load significantly on only one factor so that the factor structure is easier to interpret. In an orthogonal rotation, rotated factors are uncorrelated, but in an oblique rotation, rotated factors may be correlated to each other. The selection of them is dependent on which rotation can result in a simpler, more interpretable resolution (Gorsuch, 1983):

- For the cases in which an orthogonal rotation cannot result in a simple, interpretable resolution but an oblique rotation can, an oblique rotation is preferred.
- For the cases in which an oblique rotation obtains a factor structure with trivial correlations between rotated factors, an orthogonal rotation is preferred.

This research used the orthogonal rotation firstly and then the oblique rotation to cross-validate the rotated factor structure. The varimax (for orthogonal rotation) and oblimin ($\delta=0$, for oblique rotation) methods were selected due to their common uses in the literature and their abilities in simplifying a factor structure.

6.5.2.4 Significance of factor loadings

There is no absolute rule for judging the significance of factor loadings. While loadings as low as 0.15 can be regarded as salient with a large sample of 300 or more, it is preferred that a factor loading of 0.3 is taken as large enough to indicate the significance of the loading (Kline, 1994). As a rule of thumb, factor loadings greater than 0.3 are considered to meet the minimal level; loadings of 0.4 are considered more important; and if the loadings are 0.5 or greater, they are considered practically significant (Hair *et al*, 1998). This research regarded as salient loadings 0.3 or greater. This criterion nearly met the statistics-based, quite conservative guidelines²² which take a loading of 0.30 significant for a sample size of 350 or greater (Hair *et al*, 1998).

It is possible that some items load weakly (with loadings less than 0.3) on all factors. These items should be dropped from the analysis (de Vaus, 1991). Also, some items may load significantly (with loadings of 0.3 and above) on more than one factor. These

²² With the objective of obtaining a power level of 80 percent, the use of a 0.5 significance level, and the proposed inflation of the standard errors of factor loadings, the guidelines state the sample sizes necessary for each factor loading value to be considered significant. For details, see Hair, *et al* (1998: 111-112).

items may be left as they are, but to form factor-based scales, they should *only* be included in the *one* factor on which they load most highly (de Vaus, 1991). This research followed these suggestions.

6.5.3 Confirmatory Factor Analysis

According to their contents, all items comprising an extracted factor from EFA were examined, in accordance with relevant theories, to identify sub-factors (sub-scales) under the factor. In order to know if the theoretically-inferred sub-factors were statistically reliable and significant or not, confirmatory factor analyses (CFA) were conducted among the items of an EFA-extracted factor.

AMOS' diagnostics did not encourage the researcher to believe that the sample came from a multivariate normal population. So this research used the “asymptotically distribution free” (ADF) estimation method instead of the most-frequently used “maximum likelihood”. According to Hair, et al. (1998: 606),

The ADF technique has received particular attention recently due to its insensitivity to nonnormality of the data. Its primary drawback is the increased sample size required.

This research used the following steps to conduct the CFA:

Step 1: Initial model: To specify a theory-based (initial) model consisting of two or three sub-factors for each factor.

Step 2: Path diagram and model estimates: To construct a path diagram of the model and obtaining model estimates using the survey data. Missing data were replaced by item means. Because of the small number of them, this kind of simple treatment of the missing data was acceptable.

Step 3: Model-data fit examination: Were the parameter estimates in the model consistent with the theory-based expectations? Did the estimates statistically imply “goodness of fit”? Among the goodness-of-fit measures available in AMOS output, this research adopted the measures recommended by Hair *et al* (1998: 660-661) except

those measures used only in comparison between alternative (competing) models²³. Table 6-5 shows the types of measures used in this research.

Table 6-5: Goodness-of-Fit Measures

MEASURES	LEVEL OF ACCEPTABLE FIT
ABSOLUTE FIT MEASURES:	
Likelihood ratio Chi-square statistic (p)	Statistical test of significance provided. Usually greater than 0.05 or 0.01.
Goodness-of-fit index (GFI)	Higher values (close to 1.0) indicate better fit, no established thresholds
Root mean square residual (RMSR)	The smaller, the better. An RMSR of zero indicates a perfect fit. Acceptable level is to be set by analyst.
Root mean square error of approximation (RMSEA)	Under 0.08; preferably under 0.05; not greater than 0.1.
INCREMENTAL FIT MEASURES:	
Tucker-Lewis index (TLI)	The closer it is to 1.0 the better. Recommended level: 0.90
Normed fit index (NFI)	The closer it is to 1.0 the better. Recommended level: 0.90
Adjusted goodness-of-fit index (AGFI)	The closer it is to 1.0 the better. Recommended level: 0.90
PARSIMONIOUS FIT MEASURE:	
Normed Chi-square (CMIN/DF)	Recommended level: lower limit: 1.0; upper limit: 2.0/3.0

Source: Adapted from Table 11B.1 in Hair *et al*'s (1998: 660-661), with some input from Appendix C in Arbuckle (1997: 551-572).

It should be noticed that, among these measures,

- The likelihood-ratio chi-square is quite sensitive to sample size. When the sample size is above 200, it tends to indicate a poor fit of a model which is virtually good enough; and when below 100, it tends to indicate a good fit of a virtually poor model (Hair *et al*, 1998).
- The Normed Fit Index (NFI) often leads to excessive rejection of models with moderate sample sizes when ADF estimation is used (Hu and Bentler, 1995).

²³ The CFA in this research did not involve a comparison between alternative models.

Step 4: Model modification: Based on the findings from step 3, the initial model was modified and tested again using the same data. Bearing in the mind that any modification must be theoretically justifiable, this step was to find a model that not only fitted the data well from a statistical point of view, but also had the property that every parameter of the model could be given a substantively meaningful interpretation.

Step 5: Final model: To draw conclusions about accepting the “best” model or rejecting all the models.

Step 6: Significance test: After the successful establishment of the models, significance tests of the relationships between variables were conducted to see if the relationships could be reliably distinguished from zero. For example, a critical ratio (*t* value) greater than 1.96 indicated that the null hypothesis of a zero relationship could be rejected at the significance level of 0.05.

6.5.4 Descriptive and Inferential Statistics

6.5.4.1 Profile of survey respondents

Early analyses focused on the demographic information provided by the respondents. A profile of the survey respondents was developed using traditional descriptive statistics.

6.5.4.2 Calculating factor scores

To evaluate PM professionals’ current values and beliefs around the factors/sub-factors (dimensions/sub-dimensions), factor scores²⁴ were calculated for the whole survey sample and also several different demographic sub-samples. The factors/sub-factors were created as new variables and their scores were computed by the method of summated scales (Hair *et al*, 1998), that is, raw scores on the items which *significantly* loaded on a factor were summed and then their average score was used in the further analysis.

²⁴ In the literature, many authors (e.g. Hair *et al*, 1998) use the term “*summated scale*” rather than “*factor score*” to refer to the scores computed in a unweighted method. They use the term “*factor score*” for *only* those scores computed on the basis of the factor loadings of *all* items on the factor. For the sake of convenience, this thesis uses “*factor score*” as the same as “*summated scale*”.

Compared to the method of calculating factor scores on the basis of factor loadings of *all* items on the factors²⁵, the summated scale method is simple and provides convenience for further statistical analysis, such as frequencies of each item, but its factor scores would be less discriminative among various groups of respondents. Particularly, the summated scale method is more appropriate when generalizability of research findings is desirable (Hair et al, 1998).

On the basis of the factor scores, the factors/sub-factors were then analysed by the use of traditional descriptive and inferential statistical methods.

6.5.4.3 Statistical analyses of factor scores

The analyses of factor scores were conducted for each EFA-extracted and its CFA-confirmed sub-factors, adopting a method of *from forest to tree*. This research firstly obtained an overview of the factor/sub-factor scores and then examined them in details to reveal their significance levels, demographic effects on them, and the item frequencies.

The process of analysis can be briefly summarised as follows:

- Obtaining an overview of the scores of a factor and its sub-factors. Two questions guided this step: (1) What scores did the respondents obtain on the factor and its sub-factors? (2) Were the scores on the sub-factors significantly different from each other?
- Conducting ANOVA analyses for demographic groups of respondents. The guiding question was: Did the respondents with different demographics obtain significantly different scores on the factors (sub-factors)? This step identified the demographic categories which potentially accounted for the difference in factors/sub-factors scores.
- Exploring significant differences between demographic groups of the respondents by the use of independent samples *t* tests.²⁶ The demographic categories identified

²⁵ A potential disadvantage of this method is that *all* items have some degree of influence in computing the factor scores and this makes interpretation more difficult (Hair et al, 1998).

²⁶ As reported by many authors, such as Harris (1995), ANOVA and *t* test are quite robust to the violation of data normality assumption, especially when the sample size is large. Therefore, despite the survey data were somewhat deviated from normality, this research adopted ANOVA and *t* test.

from the Step 2 were further examined for their accountability for the factor/sub-factor scores. The guiding question was: What demographic characteristics accounted for the scores of what factors/sub-factors?

- Obtaining item frequencies. All questionnaire items comprising a factor and its sub-factors were examined for their response frequencies, means, and standard deviations. The guiding question was: What percentage of the respondents agreed or strongly agreed to each of the items?

6.6 SUMMARY

The methodology of this research could be summarised as:

- This research was mainly a quantitative study, using a closed written questionnaire;
- The questionnaire was developed on the basis of a broad literature review, operationalisation of research variables, and two pilot tests;
- The questionnaire was mailed to 790 AIPM members with the memberships grades of *Member* and *Fellow*;
- Data from the survey were input into a computer by the software SPSS 10.0 and then coded in accordance with the coding scheme;
- The coded data were examined for their appropriateness for exploratory factor analysis;
- Exploratory factor analysis was used to identify the key dimensions of PM culture;
- Principle components analysis with a varimax rotation was the main extraction method used in the exploratory factor analysis, and principle axis factoring and an oblique rotation were used to help assess the factor structure obtained by the main method;
- Confirmatory factor analysis was conducted to confirm the sub-factor structure of each of the factors extracted from the exploratory factor analysis and also to confirm the expected relationships between the factors/sub-factors and the construct of *PM culture*;
- The confirmatory factor analysis was conducted by the estimation method of Asymptotically Distribution Free (ADF) on the software AMOS 4.0; and
- Traditional descriptive and inferential statistical methods were used, on the basis of factor scores calculated by the way of summated scale, to evaluate PM professionals' current values and beliefs around the factors and sub-factors.

Chapter 7

Result: Dimensions of PM Culture

Chapter 7 firstly presents a review of the demographic characteristics of the survey participants and the comments made by some of the participants about this research. It then presents the results from exploratory and confirmatory factor analyses, ie, the identified key dimensions and sub-dimensions of PM culture. Finally, this chapter establishes a full structural model of PM culture in which all the dimensions, sub-dimensions, and the *PM culture* construct are integrated. This chapter includes the following major sections:

- 7.1 Demographic Profile of Survey Respondents
- 7.2 Comments from Survey Respondents
- 7.3 Dimensions of PM Culture
- 7.4 Sub-Dimensions of PM Culture
- 7.5 A Full Model of PM Culture
- 7.6 Summary

7.1 DEMOGRAPHIC PROFILE OF SURVEY RESPONDENTS

An important way of understanding any population is to identify the demographic profile of its members through a survey. This section reviews the demographic data from the survey of this research.

The survey respondents were grouped by the nine demographic characteristics, ie., gender, age, first language, PM experience, highest education, PM training, current PM position, PM qualification, and industry.

GENDER: Ninety-six percent of the respondents were male, and four percent of them were female (see Figure 7-1).

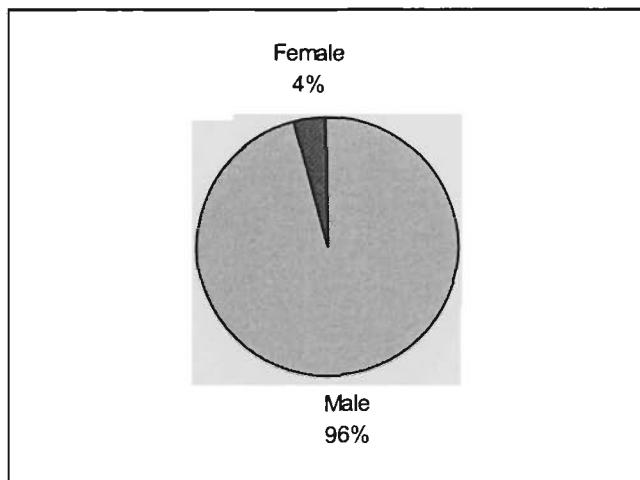


Figure 7-1: Genders of Respondents

AGE: As shown in Figure 7-2, about forty-nine percent of the respondents were between 41 and 50 and about thirty percent were between 51 and 65. The other three age groups together accounted for about 21% of the respondents, of which the respondents aged 31-40 were 18%, above 65 were 2%, and below 30 were 1%.

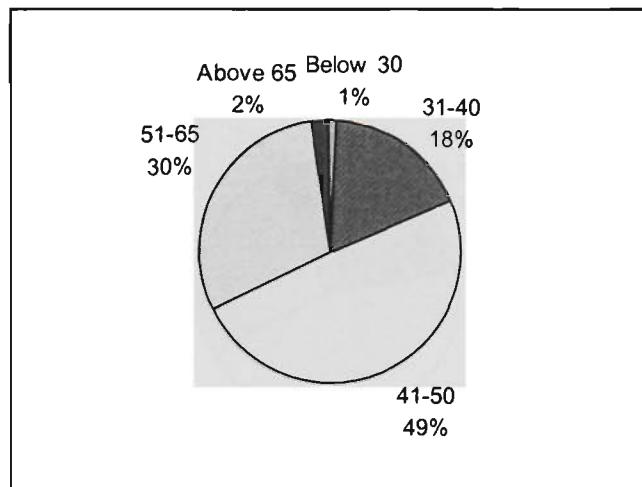


Figure 7-2: Ages of the Respondents

FIRST LANGUAGE: English was the first language of nearly 90 percent of the respondents, and the other 10 percent used other languages, such as, French, Chinese, Romanian, Hungarian, etc., as their first languages (see Figure 7-3).

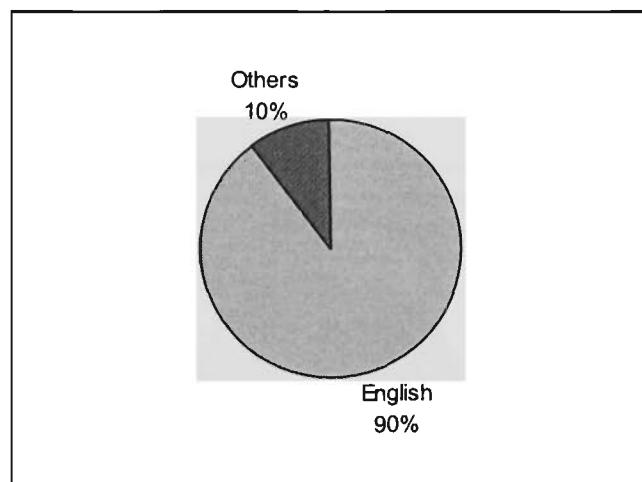


Figure 7-3: First Languages of the Respondents

EXPERIENCE IN PROJECT MANAGEMENT: About forty-four percent of the respondents had been involved in project management for 11-20 years, twenty-six percent fell in the group of 21-30 years, and nineteen percent fell in the group of 6-10 years (see Figure 7-4). The other two groups accounted for about 7% (more than 30 years) and 4% (less than 6 years) respectively.

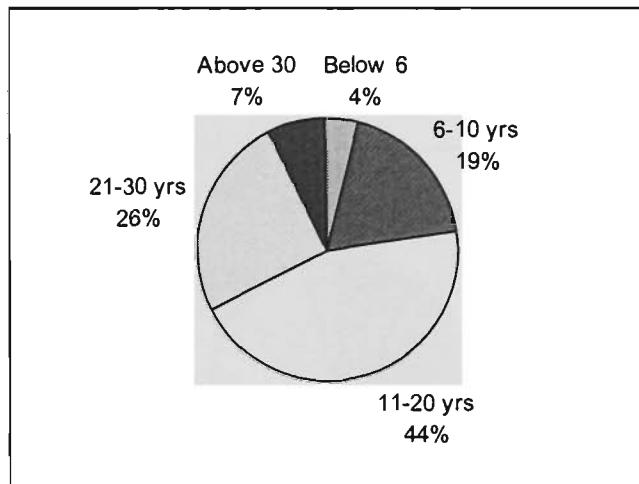


Figure 7-4: PM Experience of the Respondents

HIGHEST EDUCATION: About thirty-five percent of the respondents held a Master degree, thirty-two percent held a Bachelor degree, and twenty-four percent held a Graduate Certificate (Diploma) (see Figure 7-5). The respondents below Bachelors were about 8% and those with a doctorate degree were about 1%.

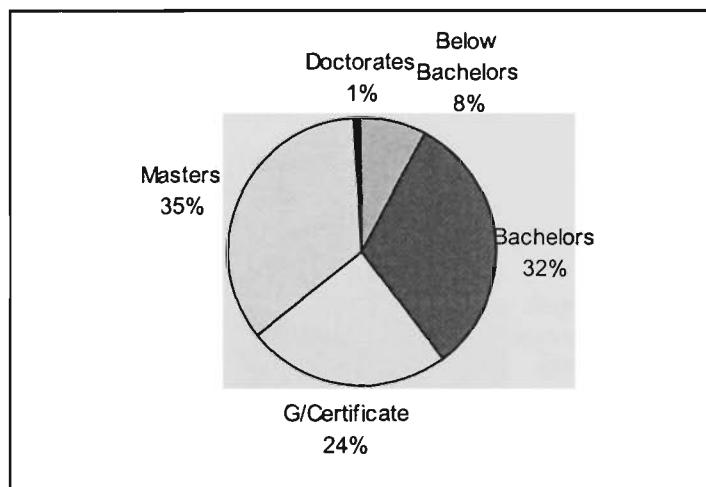


Figure 7-5: Education of the Respondents

Highest Training in Project Management: About forty-three percent of the respondents were trained in project management at the level of postgraduate courses, thirty-one percent were at the level of short courses, and five percent had completed a

preparation training for PMP® examination (see Figure 7-6). About twenty-one percent of the respondents had no formal training in project management.

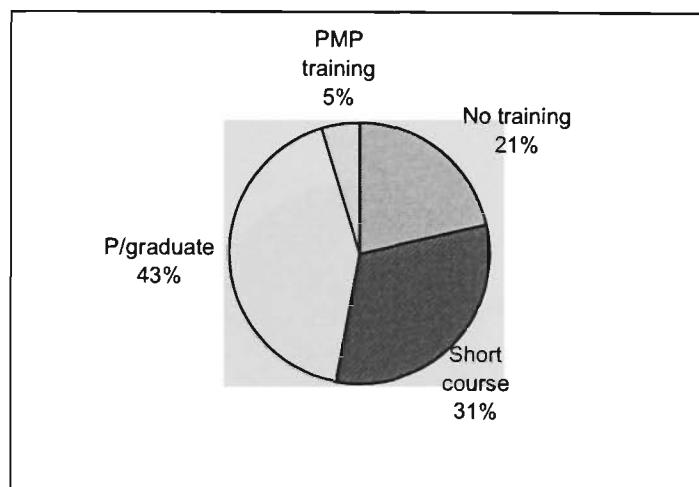


Figure 7-6: PM Training of the Respondents

CURRENT PM POSITION: About forty-five percent of the respondents were senior managers, and thirty-six percent were project managers (see Figure 7-7). Project team members accounted for 7%, and others (university lecturers, researchers, and consultants) accounted for 12%.

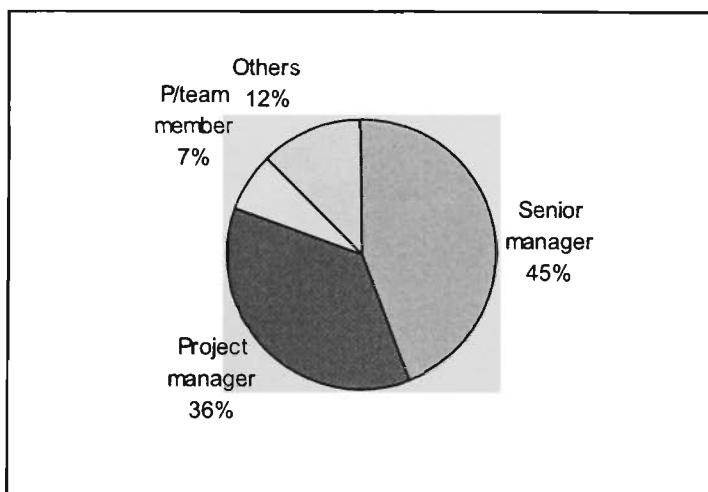


Figure 7-7: Current PM Positions of the Respondents

Note: Included in the “Other” category were researchers, university lecturers, and independent consultants.

PM PROFESSIONAL QUALIFICATION: Nearly half (48.6%) of the respondents held PM professional qualifications, and the other half (51.4%) did not (see Figure 7-8).

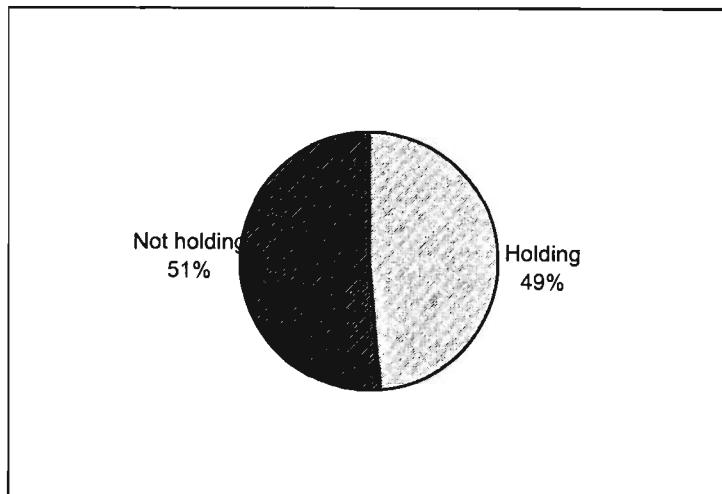


Figure 7-8: PM Qualification of the Respondents

INDUSTRY: Two dominant industries were the construction (52%) and the services (32%). They together had 84% of the respondents (see Figure 7-9). The IT industry had about 8%, and the resources and manufacturing industry received about 5% and 3% respectively.

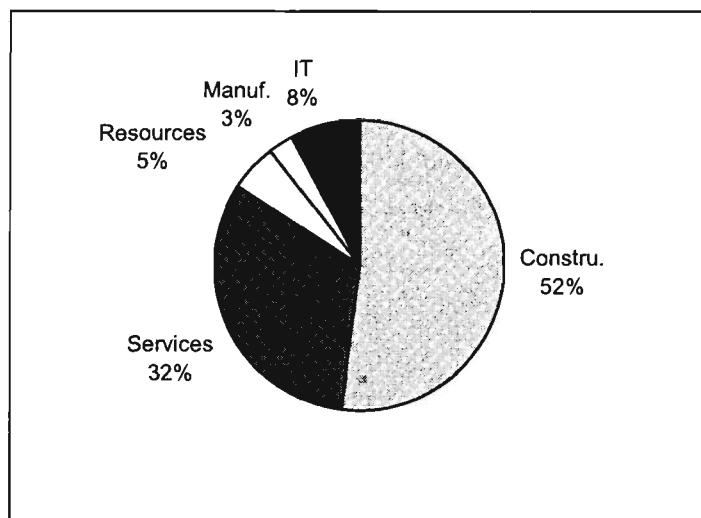


Figure 7-9: Industries of the Respondents

Table 7-1 shows the summary of such data.

Table 7-1: Respondents' Demographic Profile

	Frequency	Percent		Frequency	Percent
BY GENDER:			BY TRAINING IN PM:		
• Male	310	96.0	• No formal training	69	21.4
• Female	13	4.0	• Short course	101	31.3
BY AGE:			• Postgraduate course	138	42.7
• Below 30	4	1.3	• Other ²⁷	15	4.6
• 31-40	57	17.6	BY CURRENT POSITION IN PM:		
• 41-50	157	48.6	• Senior manager	143	44.3
• 51-65	98	30.3	• Project manager	116	35.9
• Above 65	7	2.2	• P/team member	24	7.4
BY LANGUAGE:			• Others ²⁸	40	12.4
• English	290	89.8	BY PM QUALIFICATION:		
• Others	33	10.2	• Holding	157	48.6
BY YEARS IN PM:			• Not yet holding	166	51.4
• < 6 years	14	4.3	BY INDUSTRY²⁹:		
• 6-10 years	60	18.6	• Construction	168	52.0
• 11-20 years	143	44.3	• Services	104	32.2
• 21-30 years	83	25.7	• Resources	17	5.3
• > 30 years	23	7.1	• Manufacturing	9	2.8
BY EDUCATION:			• IT	25	7.7
• Below Bachelors	26	8.0			
• Bachelors	102	31.6			
• Graduate Certificates	78	24.2			
• Masters	114	35.3			
• Doctorates	3	0.9			

²⁷ The preparation courses for PMI's PMP® examination. Although these courses were of short term, the respondents distinguished them from other short courses.

²⁸ Including researchers, university lecturers, and independent consultants.

²⁹ The category "Others" has been assigned into "Services" and "IT".

7.2 COMMENTS FROM SURVEY RESPONDENTS

Twenty-one respondents (representing 6.5 percent) gave their additional comments on the survey or aspects of project management. Of which,

- Thirteen respondents gave positive comments on this survey. Some of them also indicated that answers to some questions might depend on particular circumstances such as project types and stages of team maturity. In addition, several respondents required the researcher to send them or publish the survey results when available.

Listed below are excerpts from the comments:

Thank you for undertaking this research – which is important if PM is to be considered a profession.

I usually don't do these surveys. I was [did] this time, given the focus on meaningful questions.

I am very interested in the social psychology of project management. This seems to be an effective survey for such a work.

Not a bad survey because I think the outcomes [are] likely to be a good reflection of how it is. However, I don't think that the questions really cover some of the alternate cultures I have seen (and don't like). Please publish an article in AIPM journal when results collated.

This survey make me think about a couple of topics that I don't often think about. As a general comment, I don't think formal "rules and procedures" about issues such as communication are common in Australia.

In a number of questions the answers could be influenced by the type of project and the personnel involved as well as the organisational structure. I have answered generally from a generic perspective of how I believe an ideal project team should work and not necessarily how the project team will work.

Communicating information successfully is difficult at the best of times; doing this in writing adds to this difficulty and widens the angle of distortion and ambiguity of its perception. This should be taken into careful consideration when forming conclusions, trends and profiles as a result of this survey.

Some of the questions are relevant truly to differing stages of team maturity.

- Four of the comments were about the human side of project management (in Australia). Listed below are excerpts from each of them:

In Australia it is a very great pity many, many people in project teams too often appear to be interested only in “feathering their own nest” or “watching their back in case someone might stab him”. I find so many people think “small” and “narrow” or with tunnel vision.

An interesting aspect would be to differentiate between people management skills and project management technical skills, tools and techniques. The reason I say this is because a lot of literature is focusing on people skills – so if people skills are paramount, then maybe there is no project management profession because people management applies to all disciplines.

The term “project manager” has become so pervasive and banal as to be almost meaningless. Work practices are such as to treat everything as a project and so most office workers describe themselves as project managers or, at least, performing this function.

At project team level, the communication between members, other stakeholders and the organisations have to be always open, positive and honest. This brings cohesiveness and a “feeling of togetherness” in issues/problems. Also the project managers should try to lead people by setting examples.

- Three respondents clarified their current positions relevant to project management.
For example, one respondent wrote:

I am no longer directly involved in projects but have indirect involvement in a mentoring/consulting/problem solving role [on projects].

- One respondent wrote a letter to express his concern that “project management may not have a recognisable culture”.

7.3 DIMENSIONS OF PM CULTURE

In accordance with the methodology stated in Chapter 6, Section 6.5.2, exploratory factor analysis was conducted on the software SPSS 10.0 to extract several key dimensions (factors) of PM culture.

7.3.1 Initial Solution from Exploratory Factor Analysis

The initial exploratory factor analysis was conducted among the 49 items using the principle component analysis for factor extraction and the criterion “eigenvalue greater than 1” for determining the number of factors. This process produced 17 factors with an eigenvalue greater than 1. This number of factors were obviously too many to appropriately serve the purpose of data reduction. A scree test was then used to determine an appropriate number of factors. The scree plot (Figure 7-10) showed that a sudden change of the curve slope occurred at the fourth factor. So a four factors solution was used for factor rotation. Using an orthogonal method (varimax), the factor rotation produced the factor structure shown as Table 7-2.

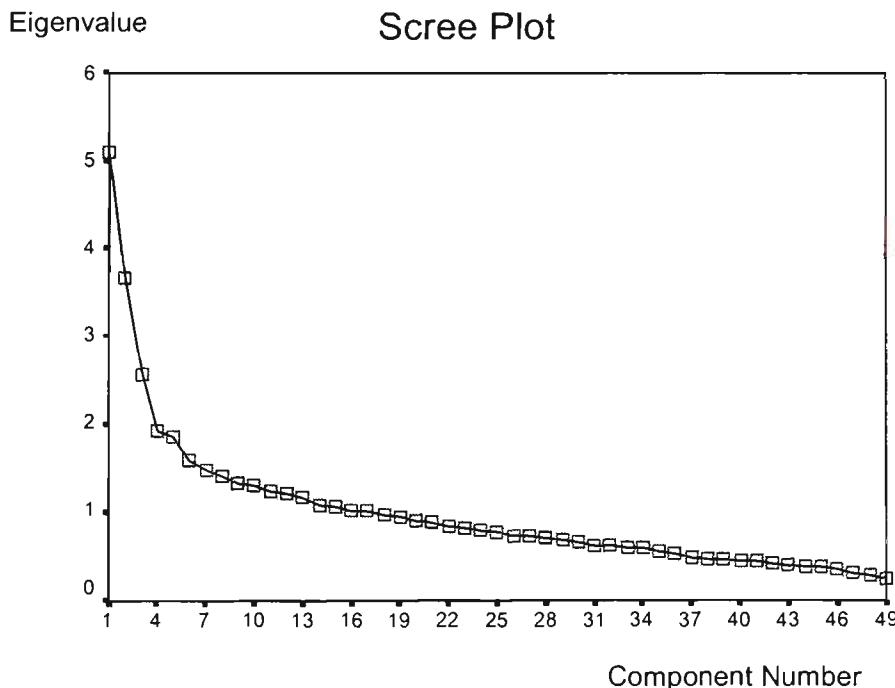


Figure 7-10: Scree Plot of Initial Factor Solution

Table 7-2: Initial Factor Solution (Rotated)

	Component			
	1	2	3	4
SAT5	.786			
SAT9	.762			
SAT2	.754			
SAT3	.746			
SAT11	.689			
SAT7	.642			
SAT14	.564			
VALUE3	.408			
VALUE2	.342			
VALUE36				
VALUE39		.551		
VALUE40		.540	.268	
VALUE43		.538		
VALUE41		.521		
VALUE38		.495		
VALUE10		.471	-.360	
VALUE11		.440		.261
VALUE35		.418		
VALUE26		.411		.254
VALUE12		.406	-.298	
VALUE9		.404		
VALUE37		.400		
VALUE21		.391		
VALUE22		.389	.385	
VALUE32		.353		
VALUE24		.267		
VALUE7				
VALUE15			.622	
VALUE16			.587	
VALUE14			.569	
VALUE18			.505	
VALUE20			.421	
VALUE19			.402	
VALUE17			.358	
VALUE29		.266	.293	
VALUE25				
VALUE4				.635
VALUE28				.624
VALUE27				-.395
VALUE42				.391
VALUE31				.387
VALUE23			.257	.372
VALUE34				-.342
VALUE5		.264		.338
VALUE30		.328		.260
VALUE33				
VALUE13				
VALUE8				
VALUE1				

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

* Loadings under 0.25 are suppressed.

The four factors solution had a quite clean factor structure. However, there were 10 items which did not have a loading over 0.3 on any of the factors. After examining the words of these items, it was decided that

- The seven items with loadings below 0.25 were eliminated from further analysis so that the correlation matrix for factor analysis would not be inappropriately affected by them. They were: Value1, Value4, Value7, Value8, Value13, Value25, and Value36. These items appeared to have problems of themselves, for example,
Value13: It is necessary to share information with other team members for true teamwork (It is necessary to withhold information from other team members for an individual's personal power)³⁰
- **Problem:** This item suffered a problem of social desirability.
- The three items (Value24, Value29, and Value33) with loadings of above 0.25 were kept because they did not have obvious problems of themselves and, in the sample size of 323, it was not unreasonable to consider their loadings as significant.

7.3.2 Intermediate Solution from Exploratory Factor Analysis

After deleting the seven inappropriate items, the KMO measure increased to 0.757, representing higher factorability of the data. The analysis of the remaining 42 items produced 13 factors with eigenvalue greater than 1. But the scree plot (Figure 7-11) indicated only five major factors. This five factors solution was the intermediate solution of exploratory factor analysis (see Table 7-3).

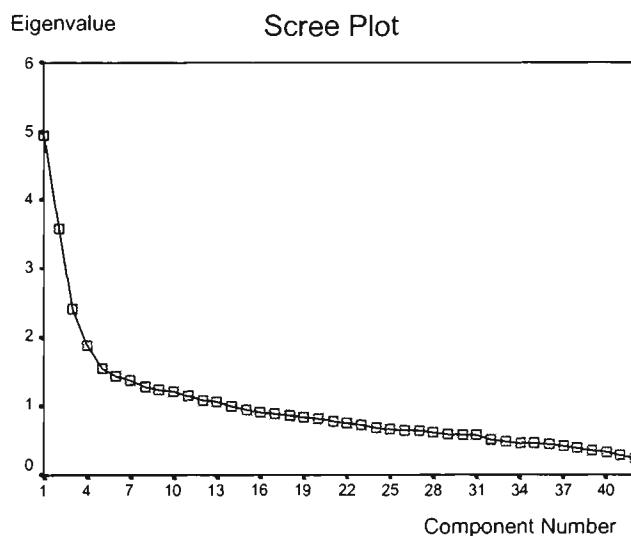


Figure 7-11: Scree Plot of Intermediate Solution

³⁰ In this thesis, the two logically-opposite statements of each of the items used in Part 3 of the questionnaire are re-organised in such a way that the statement that is *for* the hypothetical PM values/beliefs appears firstly (outside parentheses) and the statement that is *against* the hypothetical PM values/beliefs appears secondly (in parentheses).

Table 7-3: Intermediate Factor Solution (Rotated)

	Component				
	1	2	3	4	5
SAT2	.776				
SAT5	.772				
SAT7	.712				
SAT9	.699				.322
SAT3	.692				
SAT11	.684				
SAT14	.642				
VALUE39		.546			
VALUE43		.541			
VALUE40		.521	.331		
VALUE10		.513	-.322		
VALUE41		.510			
VALUE35		.465			
VALUE26		.463			
VALUE38		.455			
VALUE11		.442			
VALUE21		.434			
VALUE12		.424			
VALUE9		.419			
VALUE30		.348		.318	
VALUE37		.326			
VALUE32					
VALUE24					
VALUE15			.606		-.302
VALUE16			.597		
VALUE14			.576		
VALUE18			.492		
VALUE20			.451		
VALUE22		.351	.443		
VALUE19			.417		
VALUE17			.377		
VALUE29			.329		
VALUE28				.690	
VALUE27				.678	
VALUE34				.440	
VALUE31				.423	
VALUE23				.412	
VALUE5				-.351	
VALUE33				.309	
VALUE42				-.301	
VALUE3					.666
VALUE2					.642

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

* Loadings below 0.30 are suppressed.

As shown in Table 7-3, two items had loadings below 0.3. Value24 and Value32 had a loading of 0.236 and 0.298 respectively. Value24 was then deleted because of its loading below 0.25, but Value32 kept because of its loading above 0.25 and very near to 0.3. The remaining items were analysed again using principle component analysis, scree test, and orthogonal rotation. This analysis obtained the five factors solution as

shown in Table 7-4 (its scree plot was omitted because it looked the same as that shown in Figure 7-11). The factor structure of this solution was exactly the same as that shown in Table 7-3, except for the deleted item Value24. This five factors solution was used as the final solution of exploratory factor analysis.

Table 7-4: Final Factor Solution (Rotated)

	Component				
	1	2	3	4	5
SAT2	.782				
SAT5	.768				
SAT7	.715				
SAT3	.692				.300
SAT9	.690				.338
SAT11	.687				
SAT14	.643				
VALUE39		.550			
VALUE43		.543			
VALUE10		.517	-.315		
VALUE40		.517	.338		
VALUE41		.509			
VALUE35		.464			
VALUE26		.461			
VALUE38		.454			
VALUE11		.449			
VALUE21		.435			
VALUE12		.429			
VALUE9		.419			
VALUE30		.349		.306	
VALUE37		.329			
VALUE32		.297			
VALUE15			.603		-.306
VALUE16			.599		
VALUE14			.573		
VALUE18			.500		
VALUE20			.452		
VALUE22		.346	.447		
VALUE19			.423		
VALUE17			.373		
VALUE29			.334		
VALUE28				.685	
VALUE27				.669	
VALUE34				.440	
VALUE31				.425	
VALUE23				.389	
VALUE5				-.380	
VALUE42				-.319	
VALUE33				.314	
VALUE3					.679
VALUE2					.664

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

* Loadings under 0.29 suppressed.

The factor structure of Table 7-4 was then assessed using the principle axis factoring method of extraction. This assessment produced the factor structure (see Table 7-5) as the same as that obtained by principle component analysis. This was further evidence that the factor structure obtained by principle component analysis was valid and acceptable.

Table 7-5: Rotated Factor Structure (Principle Axis Factoring)

	Factor				
	1	2	3	4	5
SAT2	.760				
SAT5	.729				.224
SAT7	.678				
SAT3	.615				.376
SAT9	.614				.420
SAT11	.607				
SAT14	.581				
VALUE39		.507			
VALUE43		.491			
VALUE40		.477	.302		
VALUE41		.455			
VALUE10		.453	-.259		
VALUE26		.412			
VALUE11		.411		.193	
VALUE38		.409			
VALUE35		.402			
VALUE21		.356			
VALUE12		.356			
VALUE30		.328		.237	
VALUE9		.325			
VALUE37		.310			
VALUE32		.283	.197		
VALUE15			.545		-.231
VALUE16			.519		
VALUE14			.494		
VALUE18			.424		
VALUE22		.310	.388		
VALUE20			.375		
VALUE19			.335		
VALUE17			.281		
VALUE29		.206	.279		
VALUE27		.212		.615	
VALUE28				.610	
VALUE34		.195		.340	
VALUE31				.290	
VALUE23			.246	.290	
VALUE5				-.233	
VALUE42				-.217	
VALUE33				.197	
VALUE3					.541
VALUE2					.530

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

* Loadings under 0.19 suppressed.

Furthermore, this research used oblique rotation (oblimin, with $\delta=0$) to see if it could lead to a better (cleaner) factor structure. This rotation resulted in the same grouping of the items (see Table 7-6 and Table 7-7) as did the orthogonal rotation. The check of the correlation matrix of the factors (see Table 7-8) revealed that only weak correlations existed between the factors. As the oblique rotation did not change the factor structure and no strong correlations existed between the factors, it was appropriate to accept the orthogonally-rotated factor solution as the final solution of exploratory factor analysis.

Table 7-6: Pattern Matrix of Oblique Rotation

	Component				
	1	2	3	4	5
VALUE10	.540		-.344		
VALUE39	.540				
VALUE43	.530				
VALUE40	.511		.325		
VALUE41	.498				
VALUE35	.461				
VALUE26	.452				
VALUE21	.447				
VALUE9	.443				
VALUE12	.441				
VALUE38	.432				
VALUE11	.429				
VALUE30	.315				
VALUE37					
VALUE32					
SAT2		-.783			
SAT5		-.763			
SAT7		-.725			
SAT11		-.691			
SAT3		-.691			
SAT9		-.683			.317
SAT14		-.653			
VALUE15			.624		-.307
VALUE16			.607		
VALUE14			.593		
VALUE18			.500		
VALUE22	.319		.440		
VALUE20			.436		
VALUE19			.420		
VALUE17			.370		
VALUE29			.319		
VALUE28				.693	
VALUE27				-.670	
VALUE34				-.434	
VALUE31				-.419	
VALUE5				.401	
VALUE23				-.381	
VALUE42				.325	
VALUE33				-.309	
VALUE3					.676
VALUE2					.665

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 14 iterations.

* Loadings under 0.30 suppressed.

Table 7-7: Structure Matrix of Oblique Rotation

	Component				
	1	2	3	4	5
VALUE39	.560				
VALUE43	.556				
VALUE40	.528		.370		
VALUE41	.520				
VALUE10	.504				
VALUE26	.471				
VALUE35	.470				
VALUE38	.469				.321
VALUE11	.464				
VALUE21	.431				
VALUE12	.422				
VALUE9	.405				
VALUE30	.374			-.349	
VALUE37	.351				
VALUE32	.318				
SAT2		-.787			
SAT5		-.786			
SAT7		-.710			
SAT9		-.708			.360
SAT3		-.703			.323
SAT11		-.690			
SAT14		-.638			
VALUE15			.608		
VALUE16			.600		
VALUE14			.563		
VALUE18			.500		
VALUE22	.368		.465		
VALUE20			.458		
VALUE19			.425		
VALUE17			.366		
VALUE29			.352		
VALUE28				-.686	
VALUE27				-.682	
VALUE34				-.458	
VALUE31				-.441	
VALUE23			.309	-.405	
VALUE5				.352	
VALUE33				-.324	
VALUE42				.311	
VALUE3					.680
VALUE2					.660

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

* Loadings under 0.30 suppressed.

Table 7-8: Factor Correlation Matrix

Component	1	2	3	4	5
1	1.000	-.128	.108	-.147	.080
2	-.128	1.000	.016	.095	-.062
3	.108	.016	1.000	-.102	.071
4	-.147	.095	-.102	1.000	.021
5	.080	-.062	.071	.021	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

The descriptions of the items of the five factors are as follows:

Factor 1: (Cronbach's $\alpha = 0.85$; Standardised $\alpha = 0.85^{31}$)

- SAT2 Build my professional reputation in project management
- SAT5 Improve my knowledge in project management
- SAT7 Have adequate career prospects within the project management profession
- SAT3 Belong to the professional community of project management
- SAT9 Keep contact with others in the project management profession
- SAT11 Earn excellence in the eyes of project management colleagues outside my parent organization
- SAT14 Have an adequate level of salary relative to other project management professionals outside my parent organisation

Factor 2: (Cronbach's $\alpha = 0.72$; Standardised $\alpha = 0.75$)

- VALUE39 In a project team, team members should be encouraged to make improvement suggestions for every aspect of team performance, not just for their own parts of the project task. (it is best for team members to avoid intruding themselves into the areas of other members.)
- VALUE43 In a project team, whenever a team member has a work problem, he/she should have ready access to any fellow members who can help to resolve it. (he/she is supposed to go to the same person for an answer.)
- VALUE10 Better decisions can usually be made by group discussions. (by individuals alone.)
- VALUE40 In a project team, informal communication is important for enhancing team performance. (causes authority/responsibility confusion.)
- VALUE41 Generally speaking, team performance can be enhanced if team members show informal appreciation to each other of their peers' work performance. (people do not care much about other people's informal appreciation of their work performance.)

³¹ Cronbach's alpha is a coefficient of reliability of a scale. It measures how well a set of items measures a single unidimensional construct. Nunnally (1978) indicates 0.7 to be an acceptable reliability coefficient, but lower thresholds (e.g. 0.6) are sometimes used in the literature. Standardised alpha is computed on the basis of standardised scores (z-scores) of items.

- VALUE35 In a project team, whenever a fellow member asks for my help, I usually go out of my way to help him/her. (regard his/her job as irrelevant to me.)
- VALUE26 A boss should be characterised by his/her relevant knowledge and skills. (by his/her position power.)
- VALUE38 If a team member has a personal problem that comes up, he/she can expect the special consideration he/she might need to solve it from the project team. (he/she must not bring the problem into the project team.)
- VALUE11 Working on a project, I see myself as part of the project team. (I am only concerned with my own part of the project task.)
- VALUE21 Communications should be encouraged between all levels of hierarchical structure. (limited to between two immediate levels as specified in organisational rules.)
- VALUE12 In a project team, each member should be equally responsible for the successful completion of the whole project. (an individual member should be responsible only for his/her own part of the project task.)
- VALUE9 A project team is a group of people working together. (a place where individual members perform their own part of project tasks.)
- VALUE30 Team members should have more influence based on what they know. (What positions they have.)
- VALUE37 Relationships between fellow project team members should be extended to beyond the formal relationships that are specified in formal rules and procedures. (limited to the formal relationships as specified in formal rules and procedures.)
- VALUE32 To solve a problem, potential sources of information and solutions from top managers and middle/low managers should be treated as if they were equal, pending the outcome of evaluation of them. (from higher managers should be given priority for consideration.)

Factor 3: (Cronbach's $\alpha = 0.64$; Standardised $\alpha = 0.64$)

- VALUE15 In a project team, a written team rule manual usually causes an unnecessary loss of flexibility in the team's day-to-day work. (there should be a written team rule manual.)
- VALUE16 Jobs should be defined and structured in such a way that staff have a great deal of individual discretion in doing things. (standardised methods and procedures are used.)
- VALUE14 In a project team, written job descriptions are unnecessary for some members. (should be available for every member.)
- VALUE18 In a project team, pre-designs of communication paths are unnecessary, and the communication paths should be left to be decided as necessary. (communication paths should be written specified in detail.)
- VALUE20 An organisation's written rules and procedures can be broken when necessary. (must not be broken for any reason.)
- VALUE22 For handling problems occurring on their jobs, staff should have a high level of autonomy. (strictly follow job descriptions and other written rules/procedures.)
- VALUE19 When an exceptional case occurs, it should be treated in the first place by team members making their own decisions. (referred to someone higher up for review before any action can be taken.)

- VALUE17 For the best result, jobs should be adjusted to the people. (people should be fitted to the necessary jobs.)
- VALUE29 The most important reward for a person's excellent work performance is to offer him/her interesting and challenging work opportunities. (promote him/her to a higher position in organisational status.)

Factor 4: (Cronbach's $\alpha = 0.50$; Standardised $\alpha = 0.53$)

- VALUE28 In a project team, older people and younger people should be equally respected on the basis of their work performance. (older people should be more respected than younger people.)
- VALUE27 In a project team, "work capability" instead of "age" is the consideration in the recruitment of a manager. (a manager should be older than his/her subordinates.)
- VALUE34 In a project team, it is work performance instead of a PM professional qualification that counts. (members with a professional qualification in project management should be more respected than those without it.)
- VALUE31 For resolving conflicts, relevant knowledge is of value. (hierarchical authority is of value.)
- VALUE23 In a project team, members should be evaluated only on the basis of their work results, regardless of rule violations. (constantly checked on for rule violations.)
- VALUES5 The most important consideration for selecting a new member is his/her fitting into the project team. (his/her technical knowledge and skills.)
- VALUE42 Team performance can be enhanced by members knowing and accepting each other personally. (respecting each other's work, regardless of friendship.)
- VALUE33 If my superior issues an instruction I think is wrong, I will not do as it requires but question it. (do as it requires.)

Factor 5: (Cronbach's $\alpha = 0.55$; Standardised $\alpha = 0.55$)

- VALUE3 In my leisure time, I like to participate in professional activities (such as seminars, discussions, conference, etc.) in project management. (I do not like to participate in professional activities in project management.)
- VALUE2 In my leisure time, project management is one of my favourite topics to talk about. (I do not like to talk about project management).

Accepted as the final solution of the exploratory factor analysis, these five factors were further subject to factor interpretation and other treatments.

7.3.3 Preliminary Interpretation of the Factors

The examination of the final factor solution shown in Table 7-4 revealed that the factor structure was quite clean. Although seven items had significant loadings (over 0.3) on two factors, these items (except Value30) met the minimum gap requirement of 0.1

between the loadings to demonstrate an appropriate discriminative validity (Nunnally, 1978).

The combination (Cronbach's $\alpha = 0.80$) of Factor 1 and Factor 5 was about PM professionals' commitment to the PM profession.³² All their items were originally intended to measure the research variable *Professional Commitment*. So the combination of the two factors was regarded as the *first dimension* of PM culture and named ***Professional Commitment*** (PC).

Factor 2 comprised 11 items from the research variables of *Teamwork* and *Informal Process* and 4 other items. A careful check revealed that all the items were closely relevant to the matter of internal integration within a project team. This factor was a combination of the variables *Teamwork* and *Informal Process* and some items about knowledge-based influence. This factor was about PM professionals' beliefs about project team integration. It was regarded as the *second dimension* of PM culture and named ***Project Team Integration*** (PTI).

Factor 3 was about PM professionals' beliefs about work flexibility. It comprised 8 items that were intended to measure the variable *Work Flexibility* and 1 other item. This factor was regarded as the *third dimension* of PM culture and named ***Work Flexibility*** (WF).

Factor 4 was about PM professionals' beliefs about seeing others in terms of their work performance and was regarded as the forth dimension of PM culture and named ***Work Performance*** (WP). It comprised 5 items from the variable *Work Performance* and 3 other items.

³² If only four factors were extracted, Factor 5 joined Factor 1 in the similar way as shown in Table 7-2, while all other factors and their items remained unchanged.

7.4 SUB-DIMENSIONS OF PM CULTURE

For each of the EFA-extracted dimensions (factors) of PM culture, two or three theoretically-identifiable sub-dimensions (sub-factors) were tested using confirmatory factor analysis on the software AMOS 4.0 for structural equation modeling.

The sub-factor structures were established as first-order factor models, in which each of the variances of the sub-factors (latent variables) was set to unity, sub-factors were allowed to be correlated, and each indicator item was linked to a single sub-factor. In the initial specification of the models, no measurement errors³³ were allowed to be correlated. However, in the re-specification of the models caused by model modifications, several measurement errors might be allowed to be correlated on condition that the correlations were not likely to mask the possible true structures of the models and were in general theoretically justifiable.

7.4.1 Dimension 1: Professional Commitment

Based on their contents, the items comprising this dimension could be theoretically grouped into three sub-scales as follows:

- Identification with the PM profession (IDP): Sat2, Sat3, Sat 5, and Sat7. It was about PM professionals' self-identification with the PM profession.
- PM Reference Group (PRG): Sat9, Sat11, and Sat14. It was about PM professionals' use of PM peers as their primary reference group.
- Leisure Time for PM (LTP): Value2 and Value3. It was about PM professionals' willingness to contribute some leisure time to PM professional activities.

Figure 7-12 is the standardised estimation³⁴ of the initial model reflecting the above theoretical grouping of the items. In the model, the values of GFI and AGFI were

³³ In this thesis, measurement errors are represented by e1, e2, e3... in all the CFA models.

³⁴ In this thesis, all the CFA models are standardised estimations. In the models, values on single-arrow lines are standardised factor loadings, similar to those in EFA; values on double-arrow lines are standardised correlations between latent constructs. All the values can be assessed on the basis of their values and significance (*p*) tests. For example, a factor loading above 0.30 with *p* < 0.05 can usually be regarded as significant.

acceptable, but other goodness-of-fit measures were not satisfactory, representing some potential for model modification.

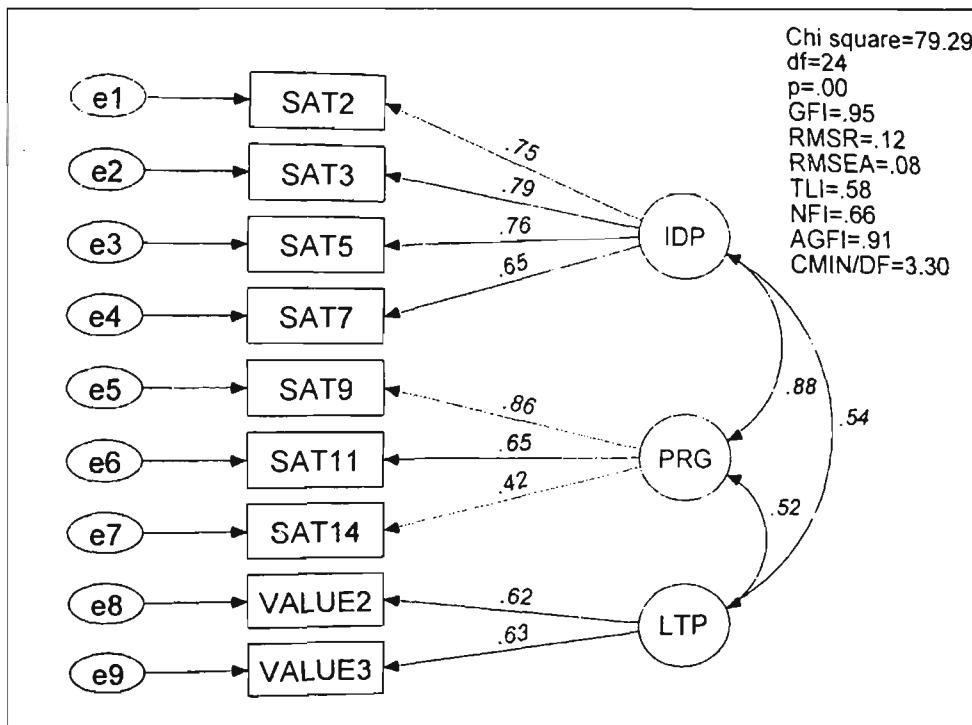


Figure 7-12: Initial Model of Professional Commitment

The first modification was to change the paths for items Sat3 and Sat14 (Figure 7-13). These path changes were recommended by an EFA of all the 9 items of PC factor. According to Maclean and Gray (1999), EFA may be used to help define the factor structure of a confirmatory factor analysis.

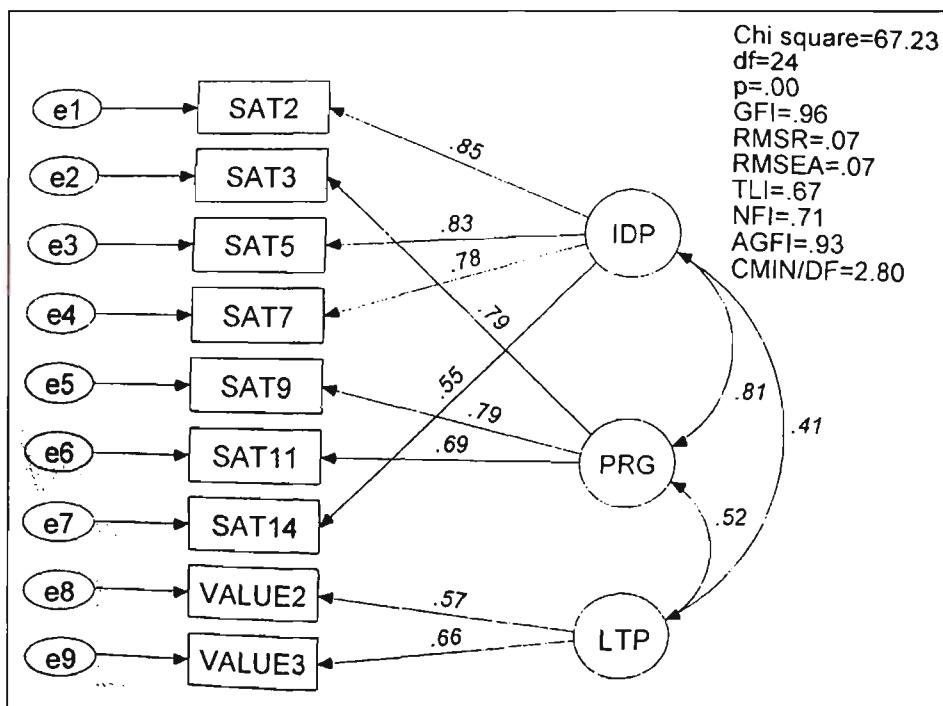


Figure 7-13: First Revised Model of Professional Commitment

Was this modification justifiable? According to Shibutani (1955), a reference group is such a group to which people aspire to maintain acceptance. So, the item Sat3 was theoretically appropriate as an indicator of the PRG sub-factor. With the item Sat14, the first sub-factor appeared to represent PM professionals' career pursuit in PM, ie, regarding PM as their permanent career. The literature supports the point that a professional career pursuit is the most important representation of people's identification with their profession. For example, (1) Morrow (1993) defines professional commitment as a profession's central position in one's career focus; and (2) Goode (1957) stresses that it is essential for any profession that its members view it as a permanent career instead of a stepping stone to another occupation. So the modification to the first sub-factor was theoretically-justifiable. The first sub-factor was thus renamed to *PM Career Pursuit* (PCP).

The paths change improved the model-data fit. In the revised model, the values of most goodness-of-fit measures indicated an acceptable model-data fit. However, the values of the three fit measures, ie., p , TLI, and NFI, were not satisfactory, and this meant potential for improvement of the model. The model was then again modified according to the modification indices produced by AMOS, that is, several measurement errors were allowed to be correlated (see Figure 7-14). With this modification, all the fit indices improved and the values of p , TLI and NFI became marginal.

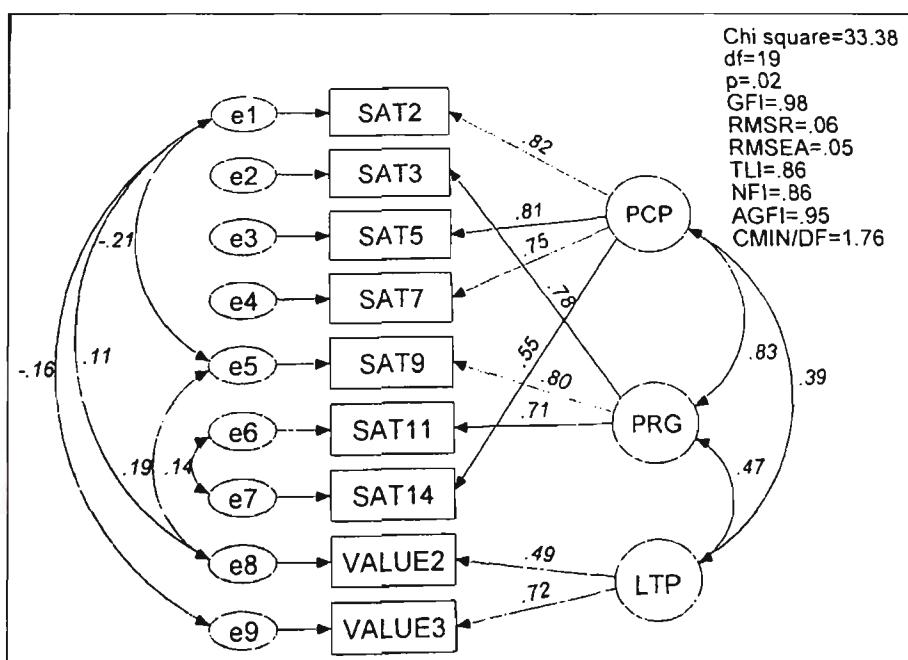


Figure 7-14: Second Revised Model of Professional Commitment

CFA permits specification of a correlation among measurement errors when there is sufficient reason to believe that a factor not explicitly-identified in the model influences responses to two or more indicator variables (Mueller, 1996). However, the model improvement caused by the addition of this correlation may mask a true underlying model structure (Gerbing and Anderson, 1984). For this reason, an error correlation must be carefully examined from the perspective of a theoretical rationale. On the basis of this examination, an error correlation may be treated in the following ways:³⁵

- If a reasonable explanation and a meaningful name can be given to the unidentified factor, a new latent variable should be introduced to replace the error correlation;
- If a new latent variable cannot be added but there is a good reason to believe the existence of the error correlation, the correlation could be accepted as it is; otherwise,
- The error correlation is unacceptable and must not be allowed and a true underlying structure of the model must be sought through other ways.

The most important consideration is that the model improvement caused by error correlations must not mask a possible *true* structure of the model.

In the case of this study, the three positive error correlations were justifiable, but the negative correlations needed further examination. From the positive correlations among the three constructs (PCP, PRG, and LTP), it was clear that PC caused people, in the same direction, to establish their professional reputation and to conduct professional activities in leisure time. But the negative error correlations implied a factor with opposite influences on Sat2 and Sat9/Value3. This factor must represent something that was irrespective of PC. It could be a general attitude towards “working in leisure time”. This general attitude could make an individual contribute his/her leisure time to PM activities even though his/her commitment to the profession was low and vice versa. According to Parker’s (1972) theory of work-leisure relationships, people’s attitudes to work-leisure relationships are connected with their general philosophies of life (segmentalism or holism). Segmentalists tend to see work and leisure as separate or even contrasting activities, but holists tend to extend their work

³⁵ The author of this thesis obtained these ideas from the archives of the SEMNET electronic discussion network for structural equation modeling at www.gsu.edu/~mkteer/seminet.html.

into leisure even though they may not see work as one of their central life interests. Due to differences in their general philosophy, people equally committed to the PM profession could be different in their willingness to contribute leisure time to professional activities. A careful examination of the items revealed that the five items, ie., Sat3 (*Belong to project management community*), Sat5 (*Improving PM knowledge*), Sat9 (*Keep contact with other PM professionals*), Value2 (*Talking about PM in leisure time*), and Value3 (*Participating in PM activities in leisure time*), might be significantly affected by the general philosophy. Therefore, an error factor, *General Attitude towards Working in Leisure* (GA) was added into the model. As an error factor, GA was not allowed to be correlated with any of the three sub-factors (PCP, PRG, and LTP). As shown in Figure 7-15, the addition of the GA error factor significantly improved the model-data fit.

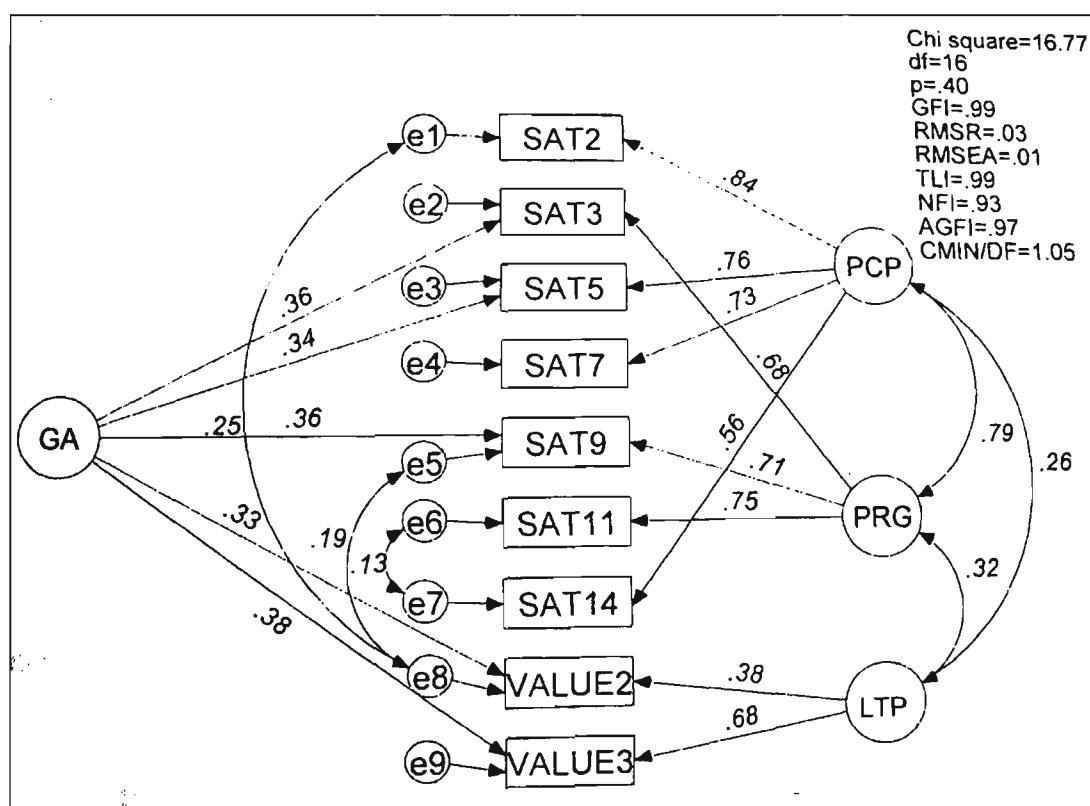


Figure 7-15: Final Model of Professional Commitment

All the parameter estimates in Figure 7-15 were in the direction as expected and there were no offending estimates. They (except correlations between measurement errors)

were significant at 0.01 level.³⁶ Actually, the majority of the parameters had a *p* value below 0.001. The significance levels of error correlations ranged from 0.01 to 0.06.

7.4.2 Dimension 2: Project Team Integration

Based on their contents, all the items comprising the PTI factor were theoretically grouped into the three sub-scales as follows:

- Consciousness of Team Identity (CTI): Value9, Value10, Value11, Value12, and Value39. It was about the extent to which PM professionals, when working on a project, regarded themselves as an integral part of the project team and consequently would like to promote the performance of the *whole* project team rather than only of themselves as individuals or their immediate work groups within the project team.
- Knowledge Based Influence (KBI): Value26, Value30, and Value32. The KBI sub-scale was about the extent to which PM professionals believed that people's influence within a project team should be based on their relevant knowledge and skills rather than the hierarchical positions they were on.
- Informal Processes (IFP): Value21, Value35, Value37, Value38, Value40, Value41, and Value43. The IFP sub-scale was about the extent to which PM professionals believed that informal processes within a project team were important for enhancing true teamwork.

A model reflecting the above theoretical grouping of the items was established and estimated (see Figure 7-16). In the model, most of the fit measures, ie., GFI = 0.92, RMSR = 0.08, RMSEA = 0.04, TLI = 0.85, AGFI = 0.90, and CMIN/DF = 1.59, showed an acceptable model-data fit.³⁷ Two fit measures, ie., *p*=0.00 and NFI=0.73, were not satisfactory. However, as discussed in Chapter 6, these two measures were

³⁶ In this research, all significance tests are of two-tails.

³⁷ As suggested by Hair *et al* (1998), TLI = 0.85 is marginal (minimally acceptable).

respectively sample size sensitive and problematic in an ADF estimation. Therefore, it was appropriate to accept the model.

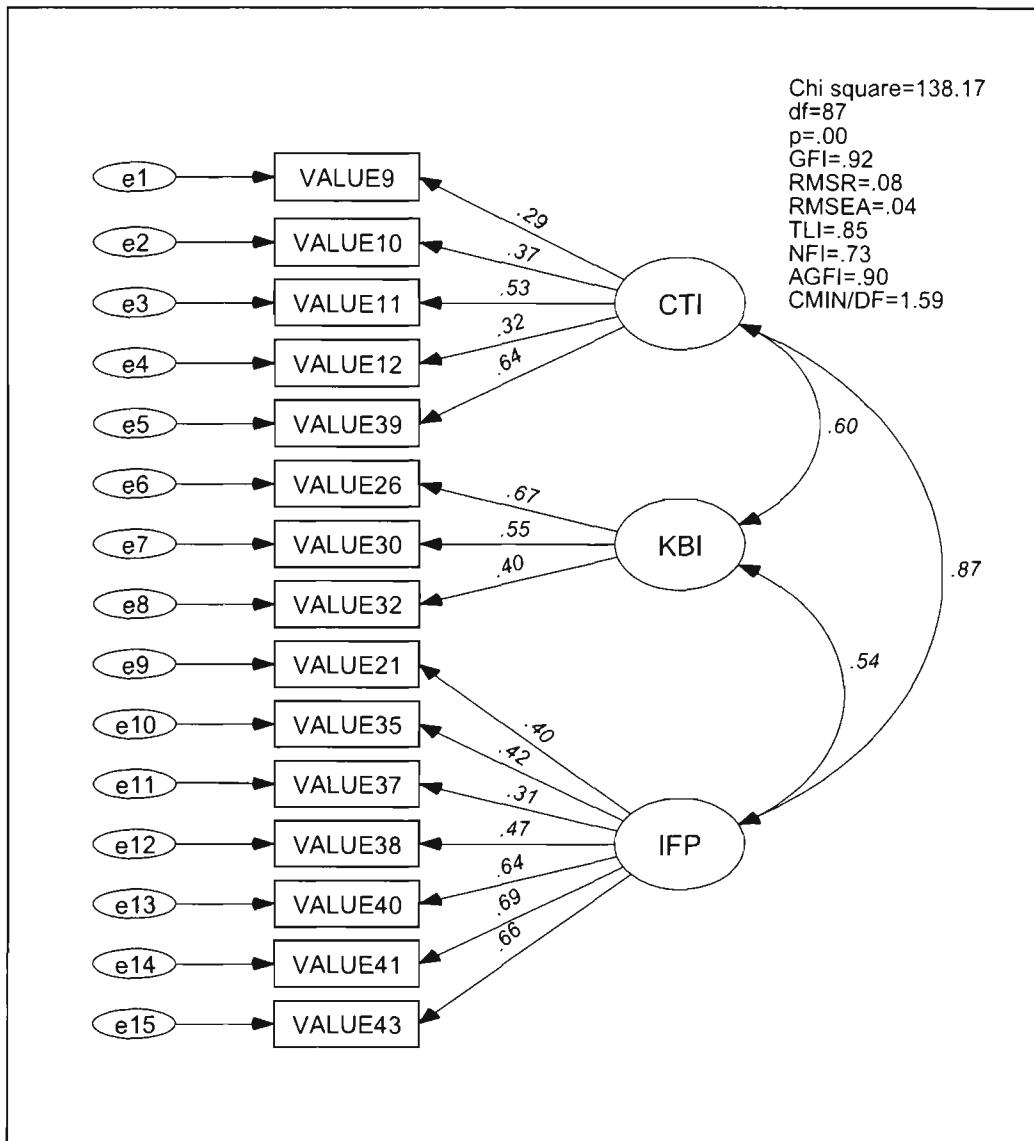


Figure 7-16: Model of Project Team Integration

In the PTI model, the correlation between CTI and IFP was high (0.87). From the technical perspective of structural equation modeling, it meant that the two variables could be combined into a single one (Hair *et al*, 1998). However, they were kept as two concepts on the basis of theoretical considerations. Theoretically, it was more appropriate to consider CTI and IFP as two correlated but separate concepts.

All the estimated parameters in the model were in the expected direction and significant at 0.001 level. Actually, these parameters had a very small *p* value (nearly zero). There were no offending estimates.

7.4.3 Dimension 3: Work Flexibility

Based on their contents, all the items comprising the WF factor were theoretically grouped into the two sub-scales as follows:

- Job De-Codification (JDC): Value14, Value15, Value17, and Value18. These items were about the degree to which PM professionals believed that jobs should be less formalised by loose written job descriptions and team rules.
- Work Autonomy (WKA): Value16, Value19, Value20, Value22, and Value29. These items were about the degree to which PM professionals believed that project team members should have a sufficient level of autonomy in doing their jobs.

A model shown as Figure 7-17 was established to test the above theoretical grouping of the items. In the model, most of the goodness-of-fit measure, ie., GFI = 0.97, RMSR = 0.08, RMSEA = 0.05, TLI = 0.83, AGFI = 0.95, and CMIN/DF = 1.71, were acceptable, but the two measure $p = 0.01$ and NFI = 0.76 were a little low.

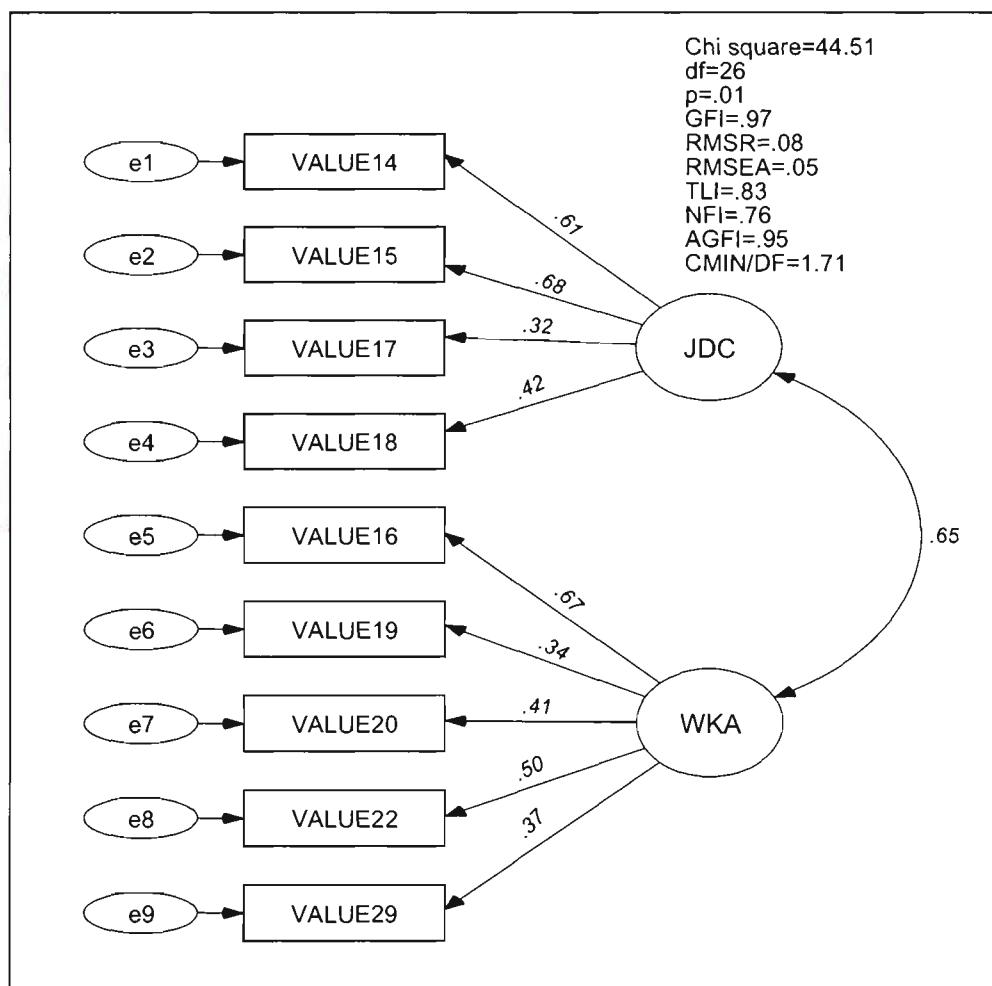


Figure 7-17: Initial Model of Work Flexibility

As indicated by the modification indices produced by AMOS, if two pairs of measurement errors were allowed to be correlated, the model-data fit would be further improved and all the goodness-of-fit measures reached an acceptable level (Figure 7-18). These weak correlations between the measurement errors could be assumed to be true. But the interpretation of them was obviously beyond the scope and capability of this research.

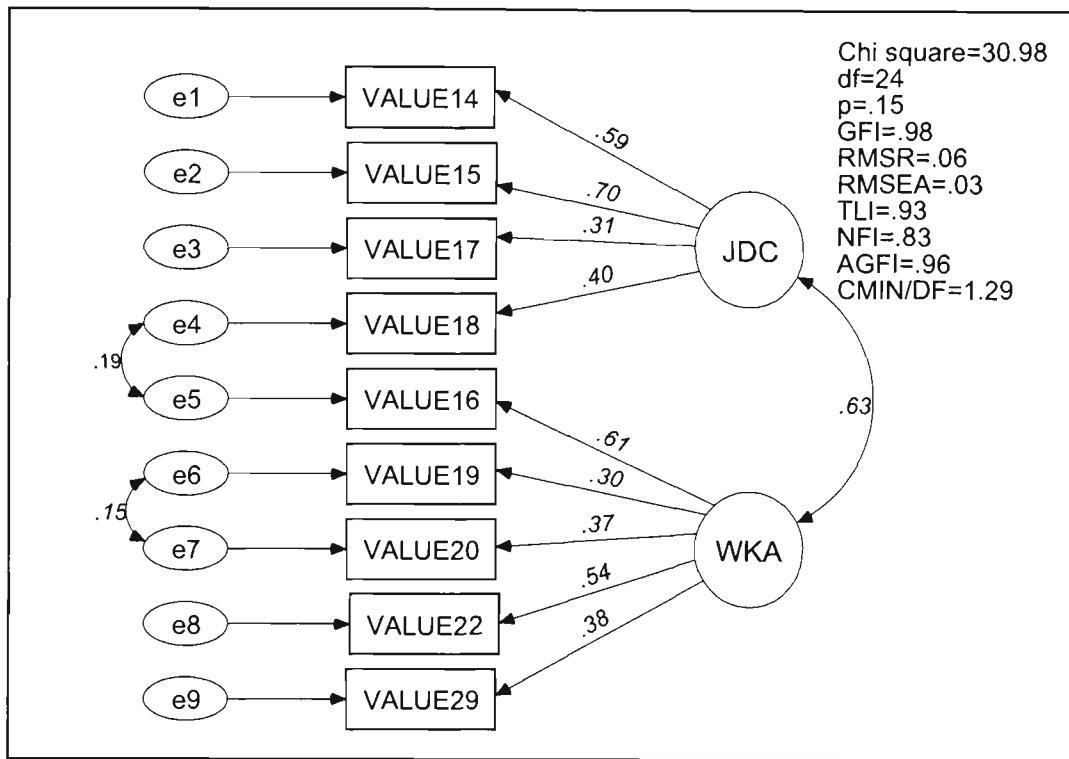


Figure 7- 18: Final Model of Work Flexibility

All the estimated parameters in the final model were in the expected direction and there were no offending estimate. All of the parameters (except the error correlations) were significant at 0.001 level (with a *p* value very near to zero). The error correlations were significant at 0.01 (e4 and e5) and 0.05 (e6 and e7) level respectively.

7.4.4 Dimension 4: Work Performance

According to their contents, all the items comprising the WP factor were theoretically grouped into the two sub-scales as follows:

- Work Performance Itself (WPI): Value 23, Value27, Value28, Value31, Value33, and Value34. These items measured the degree to which PM professionals believed

that project team members should be viewed in terms of their work performance rather than who they are, such as their ages and positions.

- Personal Relation sub-scale (PSR): Value 5 and Value 42. These two items included a component of “personal relationships” in viewing other team members. They were negative to work performance. A high score on this sub-scale meant that a respondent viewed people in terms of his/her personal relationships with them rather than their work performance.

A model shown as Figure 7-19 was established to test the above theoretical grouping of the items. In this model, most of the goodness-of-fit measures (GFI, RMSR, RMSEA, AGFI, and CMIN/DF) were acceptable, but the two incremental fit measures (TLI and NFI) were low. There was some potential for improvement of the model.

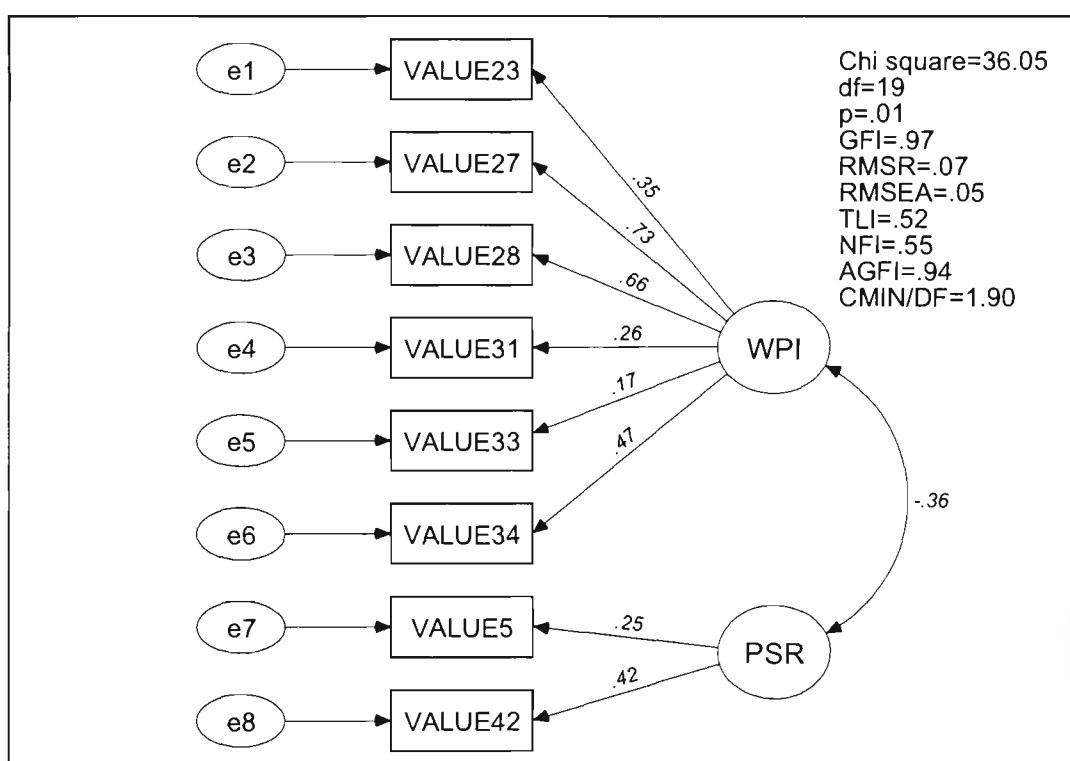


Figure 7-19: Initial Model of Work Performance

As indicated by the modification indices produced by AMOS, the PSR sub-factor had a significant effect on the item Value31. This implied a possible path change for the item Value31. An exploratory factor analysis of all the eight items of the WP factor also indicated that the item Value31 fell into the PSR sub-factor. With its two

statements as “*For solving conflicts, relevant knowledge is of value*” and “*For solving conflict, hierarchical power is of value*”, the item Value31 did have a component of personal relationships implied by the “hierarchical power”. So the path change was theoretically acceptable. The score of Value31 was then reversely-coded to reflect its “hierarchical power” statement. The path change and re-coding produced the final model of the WP factor as shown in Figure 7-20. In the final model, all the fit indices except NFI were acceptable. Although the value of NFI was low, it was reasonable to accept the model on the basis of the other indices. As discussed in Chapter 6, NFI often over-rejects a model which is good enough under the ADF estimation method.

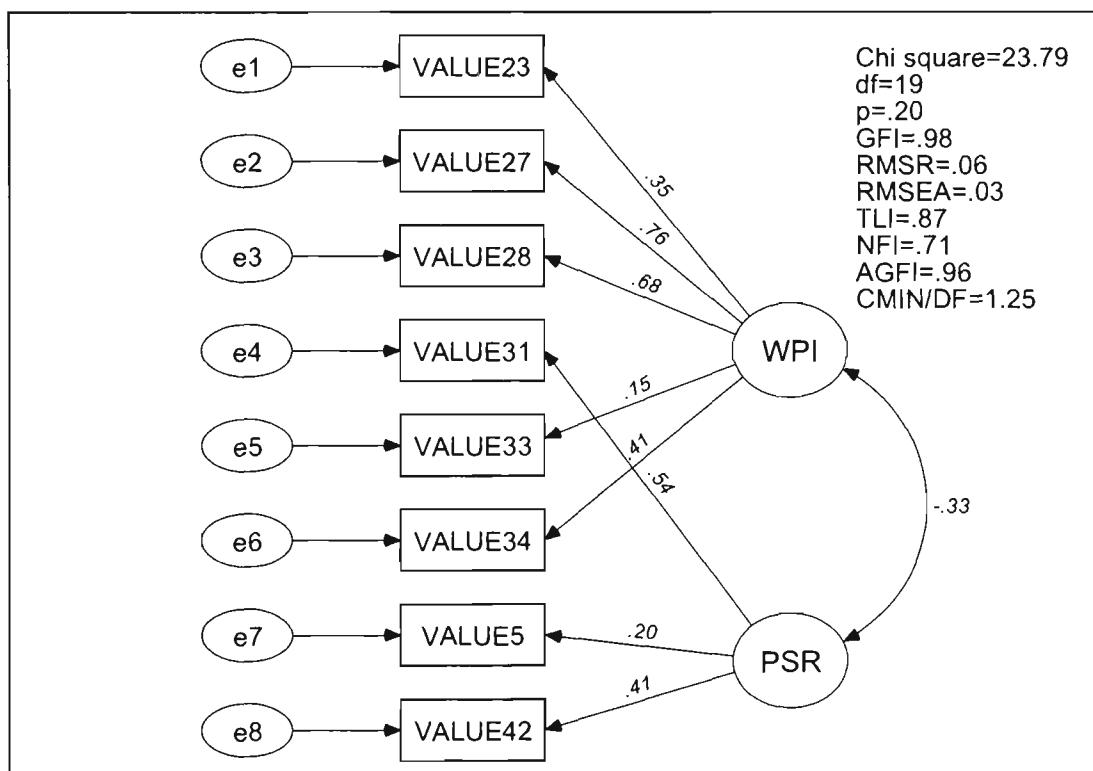


Figure 7-20: Final Model of Work Performance

All the estimated parameters in the final model were in the expected directions (positive or negative) and there were no offending estimates. Most of the parameters were significant at 0.001 level and several of them were significant at 0.01 or 0.05 level.

7.5 A FULL MODEL OF PM CULTURE

It was theoretically expected that all the factors and sub-factors were related to the single construct of *PM culture*. If this expectation was correct, the process of confirmatory factor analysis would successfully establish a *second-order factor model* in which the first-order factors estimated were actually dimensions of the second-order factor (Hair, et al, 1998). Theoretically, this research had a second-order factor, *PM Culture*, and four EFA-extracted first-order factors, PC, PTI, WF, and WP. These first-order factors each had 2 or 3 sub-factors, whose structures were confirmed by confirmatory factor analyses in Section 7.4.

Using summed item scores as the input materials of the sub-factors, the CFA obtained the estimation of the initial model shown in Figure 7-21.

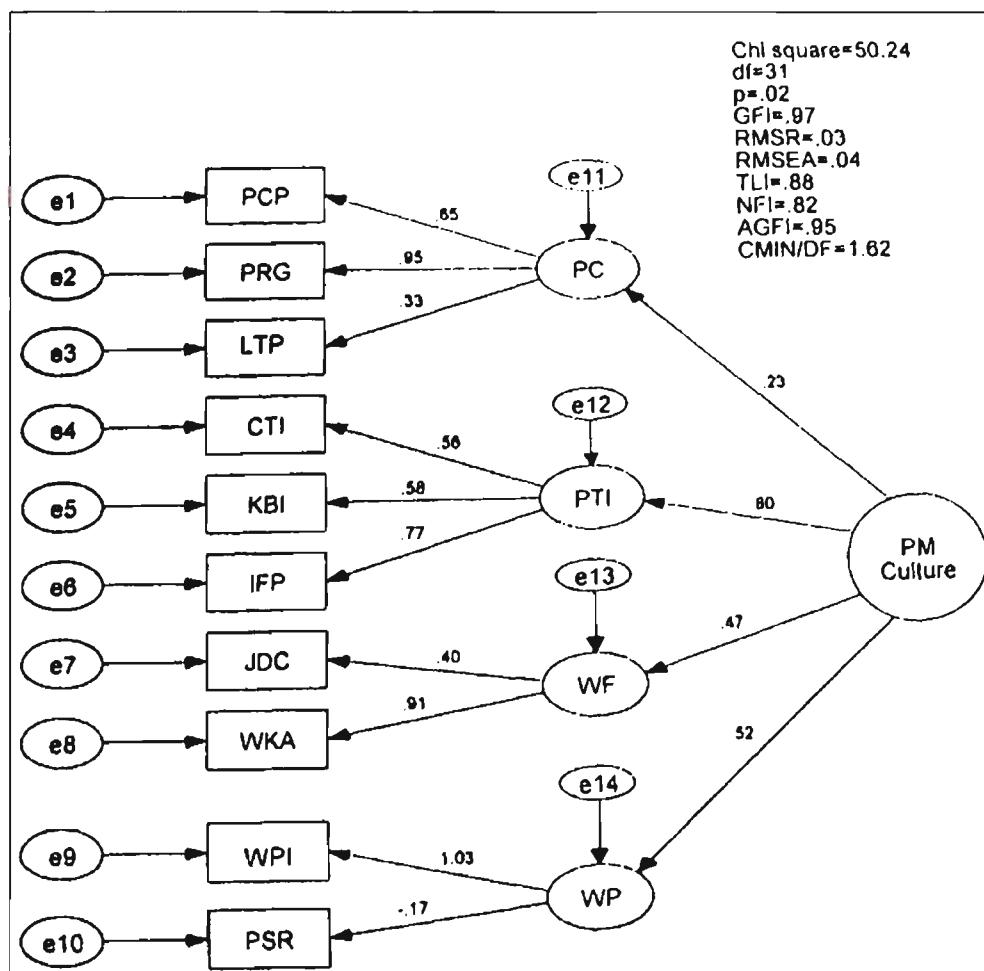


Figure 7-21: Initial Second Order Factor Model

In this model, one of the loadings was bigger than 1.0, ie., a *Heywood case* (Hair *et al*, 1998). To deal with it, the variance of e9 was constrained to a very small level of 0.005 as suggested by Hair *et al* (1998). Then the CFA obtained the final model shown as in Figure 7-22. In the final model, all the goodness-of-fit measures were acceptable (The values of p , TLI, and NFI were marginal).

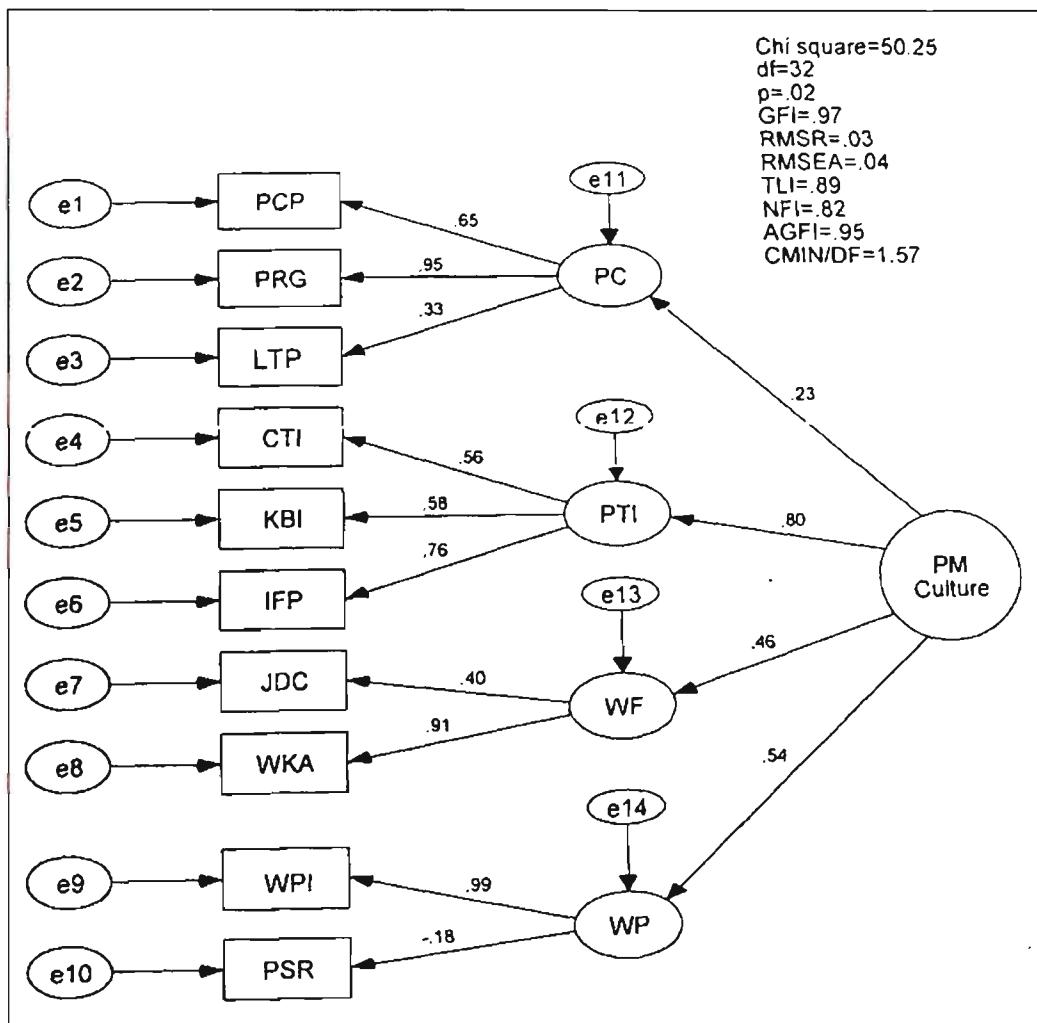


Figure 7-22: Final Second Order Factor Model

In the final model, all the parameters (factor loadings) were in the expected directions (positive or negative) and there were no offending estimates. The parameters had p values as follows:

- PMCulture's effect on PC: $p = 0.001$;
- PM Culture's effect on PTI: $p = 0.000$;
- PM Culture's effect on WF: $p = 0.010$;

- PM Culture's effect on WP: $p = 0.000$;
- PC's effect on PCP: $p = 0.000$;
- PC's effect on PRG: No significance test available because it was fixed for model specification;³⁸
- PC's effect on LEP: $p = 0.000$;
- PTI's effect on CTI: $p = 0.000$;
- PTI's effect on KBI: $p = 0.000$;
- PTI's effect on IFP: No significance test available because it was fixed for model specification;
- WF's effect on JDC: $p = 0.006$;
- WF's effect on WKA: No significance test available because it was fixed for model specification;
- WP's effect on WPI: No significance test available because it was fixed for model specification;
- WP's effect on PSR: $p = 0.001$.

The final model confirmed the researcher's expectation of the dimensionality of the concept of PM culture. It showed clearly that PM culture could be expressed using four dimensions, and which in turn had their own sub-dimensions.

³⁸ To specify the model, the path between a first-order factor and its best indicator was assigned a fixed value of 1.0. So the significance test is not available for this path.

7.6 SUMMARY

This chapter showed the demographic profile of the survey participants, the processes and results of exploratory and confirmatory factor analyses.

The survey participants were grouped in accordance the nine demographic characteristics, ie., gender, age, first language, PM experience, highest education, PM training, PM position, PM qualification, and industry.

The exploratory factor analysis produced four dimensions of PM culture. They were

- Professional Commitment: PM professionals' commitment to the PM profession;
- Project Team Integration: PM professionals' beliefs about project team integration;
- Work Flexibility: PM professionals' beliefs about work flexibility; and
- Work Performance: PM professionals' beliefs about viewing colleagues in terms of what they do rather than who they are.

Theoretically, two or three sub-dimensions were identifiable for each of the above dimensions on the basis of the contents of their items. The structures of the sub-dimensions were confirmed by confirmatory factor analyses. During the processes of confirmatory factor analyses, minor modifications were, when necessary, made to the initially expected models. All the modifications did not distort the expected structures of the models and were theoretically justifiable.

All the dimensions and sub-dimensions of PM culture were successfully connected to the single construct of *PM culture* by a second order factor model of confirmatory factor analysis. This model clearly showed that PM culture could be expressed by the four dimensions which in turn had their sub-dimensions.

Chapter 8

Result: Current Status of PM Culture

This chapter reports the results of the analyses of PM professionals' current values and beliefs around the identified dimensions and sub-dimensions of PM culture. Based on the factor analysis results stated in Chapter 7, this chapter calculates factor scores for all the factors (dimensions) and sub-factors (sub-dimensions) using the method of summated scales (Hair *et al*, 1998). The factor scores are then analysed by traditional descriptive (mean scores, standard deviations, item frequencies) and inferential statistics (paired sample *t*-tests and independent samples *t*-tests). This chapter includes the following major sections:

- 8.1 Values about Professional Commitment
- 8.2 Beliefs about Project Team Integration
- 8.3 Beliefs about Work Flexibility
- 8.4 Beliefs about Work Performance

8.1 VALUES ABOUT PROFESSIONAL COMMITMENT

8.1.1 Overview

This research used the method of summated scales (Hair *et al*, 1998) to calculate factor scores for the identified factors (dimensions) and sub-factors (sub-dimensions), that is, raw scores of the items which *significantly* loaded on a factor/sub-factor were summed and averaged by the number of the items. This research obtained the factor scores for the *Professional Commitment* factor and its sub-factors as shown in Table 8-1.

Table 8-1: Mean Scores of Professional Commitment

(All Respondents Averaged)

	N	Min.	Max.	Mean	Std. Dev.
Factor:					
• Professional Commitment	320	1.44	5.00	3.65	0.63
Sub-factors:					
• PM Career Pursuit	320	1.00	5.00	4.06	0.71
• PM Reference Group	323	1.00	5.00	3.72	0.80
• Leisure Time for PM	323	1.00	5.00	2.68	1.11

The above table shows that, on the scale from the minimum 1 (do not commit themselves to the PM profession) and the maximum 5 (very highly commit themselves to the PM profession), the respondents obtained a score of 3.65 on the PC factor, and respectively 4.06, 3.72, and 2.68 on the three sub-factors.

8.1.1.1 Difference among sub-factors

Were the scores on the sub-factors significantly different from each other? The paired samples *t* tests obtained the results as follows:

- Between PCP and PRG, t (319)=8.71, p (2 tailed)=0.000;
- Between PCP and LTP, t (319)=20.45, p (2 tailed)=0.000; and
- Between PRG and LTP, t (322)=16.37, p (2 tailed)=0.000.

Therefore, with an alpha level of 0.05, the scores on the three sub-factors were significantly different from each other.

8.1.1.2 Difference among respondents with different demographic characteristics

What scores did each group with different demographic characteristics obtain on the PC factor and its sub-factors? Table 8-2 shows the scores of demographic-grouped respondents. All these groups, except the group of Doctorate education (N=3), obtained higher scores on the PCP sub-factor than on the PRG sub-factor, which in turn were higher than the scores on the LTP sub-factor.

**Table 8-2: Mean Scores of Professional Commitment
(Demographic-Grouped)**

		PC	PCP	PRG	LTP
GENDER	Male	3.48	4.04	3.70	2.68
	Female	3.73	4.38	4.03	2.77
AGE	30 & below	3.17	4.31	3.33	1.88
	31-40	3.52	4.11	3.67	2.77
	41-50	3.54	4.14	3.79	2.68
	51-65	3.39	3.89	3.63	2.66
	Above 65	3.49	3.96	3.86	2.64
LANGUAGE	English	3.48	4.07	3.71	2.65
	Other	3.58	3.98	3.80	2.97
EXPERIENCE	Less than 6	3.26	3.77	3.45	2.57
	6-10 yrs	3.67	4.25	3.79	2.97
	11-20 yrs	3.46	4.06	3.72	2.59
	21-30 yrs	3.43	3.96	3.69	2.63
	More than 30	3.53	4.08	3.75	2.76
EDUCATION	Below Bachelor	3.28	3.97	3.58	2.29
	Bachelor	3.35	4.02	3.61	2.43
	G/certificate	3.56	4.11	3.82	2.76
	Master	3.61	4.09	3.77	2.97
	Doctorate	3.09	3.67	3.78	1.83
TRAINING	No formal	3.38	4.04	3.62	2.50
	Short course	3.35	3.93	3.64	2.48
	P/graduate	3.62	4.15	3.79	2.91
	Other	3.69	4.23	4.04	2.80
PM POSITION	Senior Manager	3.43	4.02	3.68	2.57
	Project Manager	3.60	4.19	3.80	2.80
	P/team member	3.26	3.88	3.29	2.60
	Other	3.52	3.91	3.87	2.78
PM QUALIFCTN	Holding	3.52	4.11	3.76	2.68
	Not holding	3.46	4.01	3.67	2.69
INDUSTRY	Construction	3.44	4.03	3.66	2.63
	Services	3.54	4.05	3.85	2.71
	Resources	3.47	3.88	3.61	2.91
	Manufacturing	3.70	4.22	3.70	3.17
	IT	3.57	4.29	3.72	2.70

8.1.1.3 Compared to organisational commitment

As most PM professionals worked as employees within organisations, it would be helpful to review their commitment to the PM profession relative to their commitment to the organisations. In Part 2 of the questionnaire, half (seven) of the items were designed to measure organisational commitment. They were:

- Sat1: Have an opportunity for advancement to a high position in my parent organisation;
- Sat4: Belong to my parent organisation;
- Sat6: Improve my knowledge of my parent organisation;
- Sat8: Have adequate career prospects within my parent organisation;
- Sat10: Keep contact with others in my parent organisation;
- Sat12: Earn excellence in the eyes of organisational colleagues outside the PM profession; and
- Sat13: Have an adequate level of salary relative to other staff within my parent organisation.

Each of these items was intended to match one of the other seven items measuring professional commitment so as to enhance the comparability between professional commitment and organisational commitment. The seven matches were: Sat1 and Sat2, Sat4 and Sat3, Sat6 and Sat5, Sat8 and Sat7, Sat10 and Sat9, Sat12 and Sat11, and Sat13 and Sat14.

The items for organisational commitment were organised into two groups, *Organisational Career Pursuit* (OCP) and *Organisational Reference Group* (ORG), in the same way in which their matching items for professional commitment were organised. Thus, the items Sat1, Sat6, Sat8, and Sat13 were grouped into OCP, and Sat4, Sat10, and Sat12 were grouped into ORG. All the seven items together constituted the big group of *Organisational Commitment* (OC). The responses to these items were coded in such a way that “1” represented the lowest commitment, “5” the highest commitment, and between 1 and 5 were 2, 3, and 4 representing different levels of organisational commitment.

Before conducting the comparison, the following two adjustments were made:

- As the questionnaire did not include any item intended to measure the organisations' impact on the respondents' leisure life, a new score (named PC1) was computed for the PC factor after excluding the score of the LTP sub-factor.
- The respondents who were self-employed were excluded from the comparison, because they were unable to answer the questionnaire items about organisational commitment.

Table 8-3 shows the results of descriptive statistics and paired sample *t* tests. With an alpha level of 0.05, the respondents' commitment to the PM profession and to their organisations were significantly different. They obtained higher scores on professional commitment than on organisational commitment.

Table 8-3: Mean Scores of Professional Commitment Compared with Organisational Commitment

(All respondents averaged)

		Mean	N	S.D.	S.E.	<i>t</i> (307)	<i>p</i> (2-tailed)
Pair 1	PC1	3.91	308	0.65	0.04	8.52	0.000
	OC	3.57	308	0.72	0.04		
Pair 2	PCP	4.05	308	0.70	0.04	10.97	0.000
	OCP	3.59	308	0.82	0.05		
Pair3	PRG	3.72	308	0.76	0.04	3.61	0.000
	ORG	3.55	308	0.74	0.04		

Note: N = Number of respondents; S.D. = Standard Deviation; S.E. = Standard Error

How was each group with different demographic characteristics committed to the PM profession relative to their parent organisations? Table 8-4 shows the comparison of the demographic groups' scores on professional commitment and organisational commitment. All the groups obtained higher scores on PC1, PCP, and PRG than respectively on OC, OCP, and ORG.

Table 8-4: Mean Scores of Professional Commitment Compared with Organisational Commitment
(Demographic-grouped)

		PC1	OC	PCP	OCP	PRG	ORG
GENDER	Male	3.91	3.56	4.04	3.57	3.70	3.55
	Female	4.23	3.84	4.38	4.00	4.03	3.62
AGE	30 & below	3.89	3.57	4.31	3.88	3.33	3.17
	31-40	3.92	3.67	4.11	3.76	3.67	3.55
	41-50	3.99	3.65	4.14	3.69	3.79	3.61
	51-65	3.80	3.38	3.89	3.32	3.63	3.45
	Above 65	3.92	3.69	3.96	3.55	3.86	3.87
LANGUAGE	English	3.92	3.57	4.07	3.59	3.71	3.55
	Other	3.90	3.56	3.98	3.56	3.80	3.60
EXPERIENCE	Less than 6	3.63	3.55	3.77	3.68	3.45	3.38
	6-10 yrs	4.05	3.62	4.25	3.67	3.79	3.56
	11-20 yrs	3.93	3.59	4.06	3.60	3.72	3.58
	21-30 yrs	3.85	3.58	3.96	3.59	3.69	3.57
	More than 30	3.94	3.30	4.08	3.21	3.75	3.42
EDUCATION	Below Bachelor	3.85	3.32	3.97	3.34	3.58	3.30
	Bachelor	3.85	3.61	4.02	3.63	3.61	3.60
	G/certificate	3.98	3.56	4.11	3.55	3.82	3.58
	Master	3.96	3.60	4.09	3.64	3.77	3.55
	Doctorate	3.71	3.48	3.67	3.75	3.78	3.11
PM TRAINING	No formal	3.86	3.50	4.04	3.48	3.62	3.54
	Short course	3.82	3.48	3.93	3.46	3.64	3.52
	P/graduate	4.00	3.64	4.15	3.71	3.79	3.55
	Other	4.15	3.88	4.23	3.93	4.04	3.81
PM POSITION	Senior manager	3.88	3.64	4.02	3.68	3.68	3.60
	Project manager	4.03	3.56	4.19	3.59	3.80	3.54
	P/team member	3.63	3.29	3.88	3.36	3.29	3.20
	Other	3.89	3.51	3.91	3.44	3.87	3.64
PM QUALIFCTN	Holding	3.97	3.64	4.11	3.70	3.76	3.57
	Not holding	3.87	3.51	4.01	3.49	3.67	3.53
INDUSTRY	Construction	3.88	3.58	4.03	3.59	3.66	3.57
	Services	3.96	3.61	4.05	3.62	3.84	3.61
	Resources	3.76	3.40	3.88	3.49	3.61	3.29
	Manufacturing	4.00	3.63	4.22	3.72	3.70	3.52
	IT	4.05	3.45	4.29	3.53	3.72	3.35

8.1.2 An Overview of the Effects of Demographics

Did the groups of respondents with different demographic characteristics obtain different scores on the PC factor and its sub-factors? Table 8-5 shows the ANOVA results of the mean scores, dividing the respondents into various demographic groups.

Table 8-5: ANOVA Tests of Mean Scores of Professional Commitment
(Demographic-grouped)

Grouped By	Test Variables	Test Results
Gender	PC	F(1,318)=2.285; sig.=0.132
	PCP	F(1,318)=2.871; sig.=0.091
	PRG	F(1,321)=2.001; sig.=0.158
	LTP	F(1,321)=0.082; sig.=0.775
Age	PC	F(4,315)=0.896; sig.=0.467
	PCP	F(4,315)=2.061; sig.=0.086
	PRG	F(4,318)=0.958; sig.=0.431
	LTP	F(4,318)=0.627; sig.=0.644
Language	PC	F(1,318)=0.236; sig.=0.628
	PCP	F(1,318)=0.396; sig.=0.530
	PRG	F(1,321)=0.370; sig.=0.543
	LTP	F(1,321)=2.463; sig.=0.118
PM Experience	PC	F(4,315)=1.800; sig.=0.129
	PCP	F(4,315)=2.052; sig.=0.087
	PRG	F(4,318)=0.532; sig.=0.712
	LTP	F(1,318)=1.327; sig.=0.260
Education	PC	F(4,315)=2.185; sig.=0.071
	PCP	F(4,315)=0.560; sig.=0.692
	PRG	F(4,318)=1.049; sig.=0.382
	LTP	F(4,318)=4.827; sig.=0.001
PM Training	PC	F(3,316)=3.721; sig.=0.012
	PCP	F(3,316)=2.177; sig.=0.091
	PRG	F(3,319)=1.905; sig.=0.129
	LTP	F(3,319)=3.931; sig.=0.009
PM Position	PC	F(3,316)=2.878; sig.=0.036
	PCP	F(3,316)=2.535; sig.=0.057
	PRG	F(3,319)=3.314; sig.=0.020
	LTP	F(3,319)=1.037; sig.=0.377
PM Qualification	PC	F(1,318)=1.023; sig.=0.313
	PCP	F(1,318)=1.460; sig.=0.228
	PRG	F(1,321)=1.049; sig.=0.306
	LTP	F(1,321)=0.005; sig.=0.946
Industry	PC	F(4,315)=0.587; sig.=0.672
	PCP	F(4,315)=1.104; sig.=0.354
	PRG	F(4,318)=0.859; sig.=0.489
	LTP	F(4,318)=0.708; sig.=0.587

The above table shows that, with an alpha level of 0.05,

- There was no significant difference between male and female respondents.
- There was no significant difference among the groups of different ages.
- There was no significant difference between the English language group and the other language group.
- There was no significant difference among the groups of different years of PM experience.
- There was a significant difference of the LTP sub-factor scores ($p = 0.001$) within at least one pair of groups with different educational levels.
- There was significant difference within at least one pair of groups with different levels of PM training. For the PC factor, $p = 0.012$, and for the LTP sub-factor, $p = 0.009$.
- There was a significant difference within at least one pair of groups with different positions in project management. For the PC factor, $p = 0.036$, and for the PRG sub-factor, $p = 0.020$. In addition, for the PCP sub-factor, $p = 0.057$, a little above 0.05.
- There was no significant difference between the two groups of respondents holding or not holding a professional qualification.
- There was no significant difference among the groups of respondents from various industries.

8.1.3 Exploring the Effects of Demographics

From the ANOVA results above, it is known that some demographic characteristics, such as, age, PM experience, education, PM training, and PM position, may to some extent account for the respondents' differences in their scores on the PC factor and its sub-factors. Therefore, it is needed to go further to examine the possible connections between the scores and the demographic characteristics.

8.1.3.1 Age

Because of their similarity, the two groups of 31-40 and 41-50 were combined into one single group. For the same reason, the two groups of 51-65 and *Above 65* were also combined into one single group. Thus, all the respondents were re-grouped into the

three groups: (1) a group of *30 and below*, (2) a group of *31-50*, and (3) a group of *above 50*. Table 8-6 shows the descriptive statistics for the three groups.

**Table 8-6: Mean Scores of Professional Commitment
(Age-Grouped)**

Variable	Age	Number of respondents	Average Score	Standard Deviation
Professional Commitment	30 and below	4	3.44	0.16
	31-50	214	3.69	0.62
	Above 50	102	3.56	0.66
PM Career Pursuit	30 and below	4	4.31	0.55
	31-50	214	4.13	0.67
	Above 50	102	3.89	0.78
PM Reference Group	30 and below	4	3.33	0.00
	31-50	214	3.76	0.78
	Above 50	105	3.64	0.86
Leisure Time for PM	30 and below	4	1.88	1.11
	31-50	214	2.71	1.11
	Above 50	105	2.66	1.11

The independent samples *t* tests obtained the results as shown in Table 8-7 for each pair of the three new-formed groups.

**Table 8-7: Independent Samples *t*-Test of Professional Commitment
(Age-Grouped)**

Groups	Variable	t	df	Sig.(2 tails)
30 & Below VS 31-50	Professional Commitment	-0.791	216	0.430
	PM Career Pursuit	0.540	216	0.590
	PM Reference Group	-8.008*	213	0.000
	Leisure Time for PM	-1.483	216	0.140
30 & Below VS Above 50	Professional Commitment	-0.346	104	0.730
	PM Career Pursuit	1.058	104	0.292
	PM Reference Group	-3.706*	104	0.000
	Leisure Time for PM	-1.396	107	0.165
31-50 VS Above 50	Professional Commitment	1.716	314	0.087
	PM Career Pursuit	2.757	314	0.006
	PM Reference Group	1.203	317	0.230
	Leisure Time for PM	0.348	317	0.728

* Equal variance between the groups not assumed at 0.05 level of significance.

With an alpha level of 0.05, the results of significant difference were:

- compared with the scores of the other two groups, the group of *30 and below* obtained a significantly lower score on the PRG sub-factor ($p = 0.000$);
- compared with the score of the group of *31-50*, the group of *above 50* obtained a significantly lower score on the PCP sub-factor ($p = 0.006$).

8.1.3.2 Years of experience in project management

The independent samples t tests for each pair of the five experience groups found that the three groups of respondents of *11-20 years*, *21-30 years*, and *more than 30 years* obtained very similar scores on the PC factor and all the three sub-factors. So, the respondents of these three groups were re-organised into one single group with experience *above 10 years*. Table 8-8 shows the descriptive statistics for the groups with PM experience of *less than 6 years*, *6-10 years*, and *above 10 years*.

**Table 8-8: Mean Scores of Professional Commitment
(PM Experience-Grouped)**

Variable	Experience	Number of respondents	Average Score	Standard Deviation
Professional Commitment	Less than 6 yrs	14	3.40	0.96
	6-10 years	60	3.81	0.53
	Above 10 yrs	246	3.62	0.63
PM Career Pursuit	Less than 6 yrs	14	3.77	1.18
	6-10 years	60	4.25	0.56
	Above 10 yrs	246	4.03	0.70
PM Reference Group	Less than 6 yrs	14	3.45	1.07
	6-10 years	60	3.79	0.66
	Above 10 yrs	249	3.71	0.82
Leisure Time for PM	Less than 6 yrs	14	2.57	1.19
	6-10 years	60	2.97	1.14
	Above 10 yrs	249	2.62	1.09

Table 8-9 shows the results of the independent samples t tests for each pair of the three groups.

**Table 8-9: Independent Samples *t*-Test of Professional Commitment
(PM Experience-Grouped)**

Groups	Variable	t	df	Sig.(2 tails)
Less than 6 yrs VS 6-10 yrs	Professional Commitment	-1.560*	14.916	0.140
	PM Career Pursuit	-1.479*	14.401	0.161
	PM Reference Group	-1.510	72	0.135
	Leisure Time for PM	-1.157	72	0.251
Less than 6 yrs VS Above 10 yrs	Professional Commitment	-1.253	258	0.211
	PM Career Pursuit	-0.822*	13.530	0.425
	PM Reference Group	-1.148	261	0.252
	Leisure Time for PM	-0.163	261	0.871
6-10 yrs VS Above 10 yrs	Professional Commitment	2.143	304	0.033
	PM Career Pursuit	2.541*	108.917	0.012
	PM Reference Group	0.651	307	0.515
	Leisure Time for PM	2.183	307	0.030

* Equal variance between the groups not assumed at 0.05 level of significance.

Two noticeable results from the *t* tests were:

- With an alpha level of 0.05, the group of *6-10 years* and the one of *above 10 years* obtained significantly different scores on the PC factor ($p = 0.033$) and its PCP ($p = 0.012$) and LTP ($p = 0.030$) sub-factors. The former group obtained higher scores than the latter one.
- No statistically significant difference could be claimed between the two groups of *less than 6 years* and *6-10 years*, but the descriptive statistics showed that the latter group obtained higher scores on the PC factors and its all sub-factors.

8.1.3.3 Education

The independent *t* tests for each pair of the five education groups revealed that

- the two groups of *below Bachelors* and *Bachelors* obtained very similar scores on the PC factor and all the three sub-factors,
- also, the two groups of *Graduate Certificates (Diploma)* and *Masters* obtained very similar scores on the PC factor and its all sub-factors, and
- the group of *Doctorates* was special: they were the lowest in commitment to the PM profession (their scores on PC, PCP and LTP were the lowest).

So, the respondents of the first four groups were re-organised into two groups: *Graduate and Below Group* and *Postgraduate Group*. With only three respondents, the doctorate group was excluded from further analysis.

Table 8-10 shows the descriptive statistics for the *Graduate & Below* and *Postgraduate* groups.

Table 8-10: Mean Scores of Professional Commitment
(Education-Grouped)

Variable	Education	Number of respondents	Average Score	Standard Deviation
Professional Commitment	Graduate & below	126	3.53	0.58
	Postgraduate	191	3.73	0.66
PM Career Pursuit	Graduate & below	126	4.01	0.71
	Postgraduate	191	4.10	0.71
PM Reference Group	Graduate & below	128	3.61	0.77
	Postgraduate	192	3.79	0.82
Leisure Time for PM	Graduate & below	128	2.40	0.99
	Postgraduate	192	2.89	1.15

Table 8-11 shows the results of independent samples *t* tests between the two groups.

Table 8-11: Independent Samples *t*-Test of Professional Commitment
(Education-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
Graduate & below VS Postgraduate	Professional Commitment	-2.837*	288.205	0.005
	PM Career Pursuit	-1.107	315	0.269
	PM Reference Group	-2.003	318	0.046
	Leisure Time for PM	-3.929	318	0.000

* Equal variance between the groups not assumed at 0.05 level of significance.

Two noticeable results were:

- With an alpha level of 0.05, the two groups obtained significantly different scores on the PC factor ($p=0.005$) and its PRG ($p=0.046$) and LTP ($p = 0.000$) sub-factors. The *postgraduate* group obtained higher scores than did the other one.

- No statistically significant difference could be claimed between the scores on the PCP sub-factor of the two groups, but the descriptive statistics showed that the *Postgraduate* group obtained a little higher score than did the other one.

8.1.3.4 PM training

The independent *t* tests for each pair of the four training groups revealed that

- the two groups of *No formal training* and *Short Courses* obtained very similar scores on the PC factor and all the three sub-factors, and also
- the two groups of *Postgraduate* and *Other (PMP® Exam Preparation)* obtained very similar scores on the PC factor and its all sub-factors.

So, the respondents of the four groups were re-organised into two groups: *Short Course & Below* and *Postgraduate & Other*. Table 8-12 shows the descriptive statistics for the training groups, and Table 8-13 shows the results of the independent samples *t* tests.

**Table 8-12: Mean Scores of Professional Commitment
(PM Training-Grouped)**

Variable	Training	Number of respondents	Average Score	Standard Deviation
Professional Commitment	P/graduate	152	3.77	0.61
	Short Course	168	3.53	0.63
PM Career Pursuit	P/graduate	152	4.15	0.69
	Short Course	168	3.97	0.72
PM Reference Group	P/graduate	153	3.81	0.79
	Short Course	170	3.63	0.81
Leisure Time for PM	P/graduate	153	2.90	1.15
	Short Course	170	2.49	1.04

**Table 8-13: Independent Samples *t*-Test of Professional Commitment
(PM Training-Grouped)**

Groups	Variable	t	Df	Sig.(2 tails)
P/graduate VS Short course	Professional Commitment	3.288	318	0.001
	PM Career Pursuit	2.316	318	0.021
	PM Reference Group	2.081	321	0.038
	Leisure Time for PM	3.420	321	0.001

With an alpha level of 0.05, the two groups obtained significantly different scores on the PC factor ($p = 0.001$) and its all sub-factors: PCP ($p = 0.021$), PRG ($p = 0.038$), and LTP($p = 0.001$). The *postgraduate* group obtained higher scores than did the other one.

8.1.3.5 Position in project management

Due to the central status of project managers in the PM profession, it would be helpful to compare project managers' to non-project-managers' commitment to the PM profession. In this research, non-project-managers consisted of senior managers, project team members, and others. The comparison was made firstly between the group of *project managers* and the group of *non-project-managers*, then between the group of *project managers* and respectively each of the groups of *senior managers*, *team members*, and *others*. Table 8-14 shows the descriptive statistics for the groups.

**Table 8-14: Mean Scores of Professional Commitment
(PM Position-Grouped)**

Variable	Training	No. of respondents	Average Score	Std. Dev.
Professional Commitment	P/Manager	115	3.76	0.60
	Non P/manager*	205	3.58	0.65
	S/Manager	141	3.59	0.58
	T/Member	24	3.40	0.84
	Other	40	3.64	0.72
PM Career Pursuit	P/Manager	115	4.19	0.69
	Non P/manager	205	3.99	0.71
	S/Manager	141	4.02	0.68
	T/Member	24	3.88	0.96
	Other	40	3.91	0.68
PM Reference Group	P/Manager	116	3.80	0.77
	Non P/manager	207	3.67	0.82
	S/Manager	143	3.68	0.77
	T/Member	24	3.29	0.96
	Other	40	3.87	0.83
Leisure Time for PM	P/Manager	116	2.80	1.15
	Non P/manager	207	2.62	1.09
	S/Manager	143	2.57	1.05
	T/Member	24	2.60	1.09
	Other	40	2.78	1.22

* This group includes the respondents who were senior managers, project team members, and others.

The independent samples t tests obtained the results as shown in Table 8-15 for each pair of the position groups.

Table 8-15: Independent Samples t-Test of Professional Commitment
(PM Position-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
P/manager VS Non P/manager	Professional Commitment	2.474	318	0.014
	PM Career Pursuit	2.482	318	0.014
	PM Reference Group	1.417	321	0.158
	Leisure Time for PM	1.444	321	0.150
P/manager VS S/manager	Professional Commitment	2.270	254	0.024
	PM Career Pursuit	1.919	254	0.056
	PM Reference Group	1.278	257	0.202
	Leisure Time for PM	1.669	257	0.096
P/manager VS Team member	Professional Commitment	2.016*	28.038	0.053
	PM Career Pursuit	1.518*	28.060	0.140
	PM Reference Group	2.882	138	0.005
	Leisure Time for PM	0.772	138	0.442
P/manager VS Other	Professional Commitment	0.930*	58.816	0.356
	PM Career Pursuit	2.204	153	0.029
	PM Reference Group	-0.450	154	0.654
	Leisure Time for PM	0.125	154	0.901

* Equal variance between the groups not assumed at 0.05 level of significance.

With an alpha level of 0.05, the results of significant difference were:

- The groups of *project managers* and *non-project-managers* obtained significantly different scores on the PC factor ($p = 0.014$) and its PCP sub-factor ($p = 0.014$). The former group obtained higher scores than did the latter one.
- The groups of *project managers* and *senior managers* obtained significantly different scores on the PC factor ($p = 0.024$). The former group obtained a higher scores than did the latter one.
- The groups of *project managers* and *project team members* obtained significantly different scores on the PRG sub-factor ($p = 0.005$). The former group obtained higher scores than did the latter one.

- The groups of *project managers* and *others* obtained significantly different scores on the PCP sub-factor ($p = 0.029$). The former group obtained higher scores than did the latter one.

In addition, the results of descriptive statistics showed that the group of *project managers* obtained higher scores on the PC factor and all its sub-factors than did almost all the other groups.

8.1.4 Item Frequency

As shown in Table 8-16, four items of job satisfaction were supported by more than 70% of the respondents. These items reflected the respondents' values about career pursuits in project management. These highest rated items were

- Sat5 – *Improving PM knowledge* (84.8%),
- Sat2 – *Professional reputation* (83.6%),
- Sat7 – *Career prospects in PM* (74.1%), and
- Sat14 – *Relative salaries to PM professionals* (72.0%).

At least 60% of the respondents rated as very important or important the three items about using PM professionals as a reference group. The items included

- Sat9 – *Contact with PM professionals* (65.9%),
- Sat11 – *Excellence in eyes of PM professionals* (62.5%), and
- Sat3 – *Belong to professional community* (62.2%).

Less than 50% of the respondents rated as strongly agree or agree the two items about contributing their leisure time to PM activities, or in other words, at least 50% of them rated the items as strongly disagree or disagree. The two items showed large standard deviations (over 1.0), demonstrating wide discrepancies in the respondents' support for the items. The items included

- Value3 – *Like to participate in PM activities* (40.9%) and
- Value2 – *Like to talk about project management* (29.7%).

Relative to the item frequencies of professional commitment, all the items except Sat13 and Sat12 of organisational commitment obtained much lower support rates from the respondents. But the items Sat13 and Sat12 obtained the similar support rates as did their matching items of professional commitment.

Table 8-16: Item Frequencies of Professional Commitment

Item	Rated 4 or 5+ (%)	Rated 3 (%)	Rated 1 or 2 (%)	Mean	Std. Dev.
PM Career Pursuit: (Organisational Career Pursuit) *					
Sat2: Professional reputation (Sat1: Opportunity for advancement)	83.6 (62.7)	12.1 (23.1)	4.3 (14.3)	4.26 (3.68)	0.90 (1.17)
Sat5: Improving PM knowledge (Sat6: Improving organisational knowledge)	84.8 (45.3)	12.7 (38.2)	2.5 (16.5)	4.20 (3.30)	0.79 (0.98)
Sat7: Career prospective in PM (Sat8: Career prospective in organisation)	74.1 (58.9)	18.8 (25.6)	7.2 (15.5)	3.91 (3.52)	0.95 (1.06)
Sat14: Salary relative to PM professionals (Sat13: Salary relative to organisational colleagues)	72.0 (72.8)	19.6 (20.1)	8.4 (7.1)	3.85 (3.86)	0.98 (0.97)
PM Reference Group: (Organisational Reference Group)					
Sat3: Belong to professional community (Sat4: Belong to organisation)	62.2 (47.2)	28.5 (38.5)	9.3 (14.2)	3.72 (3.42)	0.96 (1.02)
Sat9: Contact with PM professionals (Sat10: Contact with organisational colleagues)	65.9 (56.1)	25.7 (30.0)	8.4 (13.9)	3.74 (3.52)	0.90 (1.06)
Sat11: Excellence in eyes of PM professionals (Sat12: Excellence in eyes of organisational colleagues)	62.5 (63.9)	25.1 (25.6)	12.4 (10.5)	3.69 (3.72)	1.02 (0.99)
Leisure for PM:					
Value2: Like to talk about PM	29.7	17.0	53.3	2.61	1.22
Value3: Like to participate in professional activities	40.9	9.0	50.2	2.76	1.45

Note:

+ Rated 4 or 5: Important (Agree) or Very important (Strongly agree); Rated 3: Neutral; Rated 1 or 2: Very unimportant (Strongly disagree) or Unimportant (Disagree).

* Items in parentheses are for organisational commitment. For these items, self-employed respondents (N=15) have been excluded from the calculation.

8.2 BELIEFS ABOUT PROJECT TEAM INTEGRATION

8.2.1 Overview

Using the method of summated scales (Hair *et al*, 1998), this research obtained the factor scores as shown in Table 8-17 for the *Project Team Integration* factor and its sub-factors. The table shows that, on the scale from the minimum 1 (do not believe in project team integration) and the maximum 5 (very highly believe in project team integration), PM professionals obtained a score of 4.34 on the PTI factor, and respectively 4.38, 4.11, and 4.41 on the three sub-factors.

Table 8-17: Mean Scores of Project Team Integration
(All Respondents Averaged)

	N	Min.	Max.	Mean	Std. Dev.
Factor:					
• Project Team Integration	316	2.73	5.00	4.34	0.38
Sub-factors:					
• Consciousness of Team Identity	322	2.20	5.00	4.38	0.52
• Knowledge-Based Influence	321	1.67	5.00	4.11	0.64
• Informal Processes	319	2.71	5.00	4.41	0.43

Were the scores on the sub-factors significantly different from each other? The paired sample *t* tests obtained the results as follows:

- Between CTI and KBI, t (319)=6.928, p (2 tailed)=0.000;
- Between CTI and IFP, t (317)=-1.197, p (2 tailed)=0.232; and
- Between KBI and IFP, t (316)=-9.001, p (2 tailed)=0.000.

With an alpha level of 0.05, the score of the KBI sub-factor was significantly lower than those of the other two sub-factors (CTI and IFP), and the difference between the scores of CTI and IFP was not significant.

What scores did each group with different demographic characteristics obtain on the PTI factor and its sub-factors? Table 8-18 shows the scores of the demographic-grouped respondents. All the demographic groups obtained lower scores on the KBI sub-factor than on either the CTI or IFP sub-factor.

Table 8-18: Mean Scores of Project Team Integration
(Demographic-Grouped)

		PTI	CTI	KBI	IFP
GENDER	Male	4.34	4.38	4.11	4.42
	Female	4.34	4.43	4.10	4.36
AGE	30 & below	4.45	4.50	3.92	4.64
	31-40	4.31	4.42	3.96	4.39
	41-50	4.37	4.41	4.17	4.42
	51-65	4.29	4.29	4.10	4.39
	Above 65	4.49	4.54	4.14	4.59
LANGUAGE	English	4.34	4.38	4.11	4.43
	Other	4.28	4.38	4.05	4.31
EXPERIENCE	Less than 6	4.17	4.35	3.67	4.26
	6-10 yrs	4.33	4.36	4.09	4.41
	11-20 yrs	4.33	4.35	4.12	4.40
	21-30 yrs	4.39	4.43	4.15	4.47
	More than 30	4.34	4.43	4.14	4.40
EDUCATION	Below Bachelor	4.38	4.28	4.14	4.55
	Bachelor	4.28	4.31	4.01	4.39
	G/certificate	4.37	4.41	4.19	4.42
	Master	4.35	4.43	4.12	4.41
	Doctorate	4.44	4.73	4.44	4.24
PM TRAINING	No formal	4.30	4.25	4.08	4.42
	Short course	4.34	4.41	4.13	4.38
	P/graduate	4.36	4.41	4.11	4.44
	Other	4.35	4.51	4.04	4.37
PM POSITION	Senior manager	4.33	4.35	4.12	4.41
	Project manager	4.34	4.38	4.06	4.43
	P/team member	4.35	4.47	4.14	4.36
	Other	4.35	4.42	4.18	4.40
PM QUALIFCTN	Holding	4.31	4.35	4.08	4.39
	Not holding	4.36	4.41	4.13	4.44
INDUSTRY	Construction	4.31	4.40	4.05	4.36
	Services	4.39	4.38	4.17	4.50
	Resources	4.35	4.39	4.25	4.35
	Manufacturing	4.47	4.49	4.04	4.63
	IT	4.27	4.29	4.09	4.34

8.2.2 An Overview of the Effects of Demographics

Did the groups of respondents with different demographic characteristics obtain different scores on the PTI factor and its sub-factors? Table 8-18 shows the ANOVA results of the mean scores, dividing the respondents into various groups with different demographic characteristics.

**Table 8-19: ANOVA Test of Mean Scores of Project Team Integration
(Demographic-Grouped)**

Grouped By	Test Variables	Test Results
Gender	PTI	F(1,314)=0.000; sig.=0.986
	CTI	F(1,320)=0.134; sig.=0.714
	KBI	F(1,319)=0.000; sig.=0.985
	IFP	F(1,317)=0.217; sig.=0.642
Age	PTI	F(4,311)=1.125; sig.=0.345
	CTI	F(4,317)=1.219; sig.=0.302
	KBI	F(4,316)=1.119; sig.=0.347
	IFP	F(4,314)=0.751; sig.=0.558
Language	PTI	F(1,314)=0.700; sig.=0.403
	CTI	F(1,320)=0.001; sig.=0.973
	KBI	F(1,319)=0.272; sig.=0.602
	IFP	F(1,317)=2.183; sig.=0.141
PM Experience	PTI	F(4,311)=1.080; sig.=0.366
	CTI	F(4,317)=0.389; sig.=0.817
	KBI	F(4,316)=1.809; sig.=0.127
	IFP	F(1,314)=0.890; sig.=0.470
Education	PTI	F(4,311)=0.795; sig.=0.529
	CTI	F(4,317)=1.383; sig.=0.240
	KBI	F(4,316)=1.067; sig.=0.373
	IFP	F(4,314)=0.894; sig.=0.468
PM Training	PTI	F(3,312)=0.383; sig.=0.765
	CTI	F(3,318)=2.008; sig.=0.113
	KBI	F(3,317)=0.131; sig.=0.941
	IFP	F(3,315)=0.491; sig.=0.689
PM Position	PTI	F(3,312)=0.039; sig.=0.990
	CTI	F(3,318)=0.462; sig.=0.709
	KBI	F(3,317)=0.420; sig.=0.738
	IFP	F(3,315)=0.226; sig.=0.878
PM Qualification	PTI	F(1,314)=1.649; sig.=0.200
	CTI	F(1,320)=1.189; sig.=0.276
	KBI	F(1,319)=0.528; sig.=0.468
	IFP	F(1,317)=1.146; sig.=0.285
Industry	PTI	F(4,311)=1.119; sig.=0.347
	CTI	F(4,317)=0.415; sig.=0.798
	KBI	F(4,316)=0.804; sig.=0.523
	IFP	F(4,314)=2.505; sig.=0.042

The above table shows that, with an alpha level of 0.05, only the IFP sub-factor had significantly different scores within at least one pair of groups from different industries ($p = 0.042$). No other significant difference was revealed by the ANOVA results.

8.2.3 Exploring the Effects of Demographics

From the ANOVA results, it was known that respondents' membership in one industry rather than another might be able to account for the variation of their scores on the IFP sub-factor. Although no other significant difference was revealed by the ANOVA results, several demographic characteristics, such as, PM experience, education, and PM training, were worth further examination. Based on the literature review, education (training) and practical experience play an important role in the formation of people's work-related values and beliefs.

8.2.3.1 Years of experience in project management

The respondents were re-organised into three groups, one with experience of *less than 6 years*, one with *6-20 years*, and the other with *above 20 years*. Table 8-20 shows the descriptive statistics for the experience groups.

**Table 8-20: Mean Scores of Project Team Integration
(PM Experience-Grouped)**

Variable	Experience	Number of respondents	Average Score	Standard Deviation
Project Team Integration	Less than 6 yrs	14	4.17	0.53
	6 -20 yrs	198	4.33	0.39
	Above 20 yrs	104	4.38	0.33
Consciousness of Team Identity	Less than 6 yrs	14	4.35	0.53
	6 -20 yrs	202	4.35	0.52
	Above 20 yrs	106	4.43	0.53
Knowledge-Based Influence	Less than 6 yrs	14	3.67	0.70
	6 -20 yrs	202	4.11	0.67
	Above 20 yrs	105	4.15	0.57
Informal Processes	Less than 6 yrs	14	4.26	0.60
	6 -20 yrs	200	4.40	0.43
	Above 20 yrs	105	4.45	0.38

The independent samples t tests obtained the results between the experience groups as shown in Table 8-21.

**Table 8-21: Independent Samples t -Test of Project Team Integration
(PM Experience-Grouped)**

Groups	Variable	t	df	Sig.(2 tails)
Less than 6 yrs VS 6-20 years	Project Team Integration	-1.398	210	0.164
	Consciousness of Team Identity	0.026	214	0.979
	Knowledge-Based Influence	-2.411	214	0.017
	Informal Processes	-1.199	212	0.232
Less than 6 yrs VS Above 20 yrs	Project Team Integration	-1.421*	14.404	0.177
	Consciousness of Team Identity	-0.485	118	0.628
	Knowledge-Based Influence	-2.909	117	0.004
	Informal Processes	-1.203*	14.403	0.248
6-20 yrs VS Above 20 yrs	Project Team Integration	-1.136	300	0.257
	Consciousness of Team Identity	-1.230	306	0.220
	Knowledge-Based Influence	-0.462	305	0.644
	Informal Processes	-1.029	303	0.304

* Equal variance between the groups not assumed at 0.05 level of significance.

Two noticeable results from the t tests were:

- With an alpha level of 0.05, the group of *less than 6 years* obtained significantly lower score on the KBI sub-factor than either the group of *6-20 years* ($p = 0.017$) or the group of *above 20 years* ($p = 0.004$).
- No other significant difference could be claimed among the three groups, but the descriptive statistics showed that a group with longer experience obtained higher scores (and smaller standard deviations) on the PTI factor and its all sub-factors than did a group with shorter experience.

8.2.3.2 Education

The respondents were re-organised into two groups: *Graduate & Below* and *Postgraduate*. Table 8-22 shows the descriptive statistics for the education groups.

Table 8-22: Mean Scores of Project Team Integration
 (Education-Grouped)

Variable	Education	Number of respondents	Average Score	Standard Deviation
Project Team Integration	Graduate & Below	125	4.30	0.37
	Postgraduate	191	4.36	0.39
Consciousness of Team Identity	Graduate & Below	128	4.30	0.51
	Postgraduate	194	4.43	0.52
Knowledge-Based Influence	Graduate & Below	128	4.04	0.62
	Postgraduate	193	4.15	0.66
Informal Processes	Graduate & Below	125	4.42	0.42
	Postgraduate	194	4.41	0.43

The independent samples t tests obtained the results as shown in Table 8-23 for the two groups of respondents.

Table 8-23: Independent Samples t -Test of Project Team Integration
 (Education-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
Graduate & Below VS Postgraduate	Project Team Integration)	-1.281	314	0.201
	Consciousness of Team Identity	-2.090	320	0.037
	Knowledge-Based Influence	-1.518	319	0.130
	Informal Processes	0.243	317	0.808

Two noticeable results were:

- With an alpha level of 0.05, the group of *Postgraduate* obtained significantly higher score on the CTI sub-factor than did the group of *Graduate & Below* ($p = 0.037$).
- No statistically significant difference could be claimed for the PTI factor and the KBI and IFP sub-factors between the two groups, but the descriptive statistics showed that the *postgraduate* group obtained higher scores on the PTI factor and the KBI sub-factor. The two groups obtained nearly equal scores on the IFP sub-factor.

8.2.3.3 PM Training

The respondents were re-organised into two groups:

- *Not trained*: consisting of those respondents with no formal PM training; and
- *Trained*: consisting of those respondents with any PM training (short courses, postgraduate courses or PMP® Exam Preparation).

Table 8-24 shows the descriptive statistics for the training groups, and Table 8-25 shows the results of the independent samples *t* test for the two groups.

**Table 8-24: Mean Scores of Project Team Integration
(PM Training-Grouped)**

Variable	Training	Number of respondents	Average Score	Standard Deviation
Project Team Integration	Not trained	68	4.30	0.37
	Trained	248	4.35	0.39
Consciousness of Team Identity	Not trained	69	4.25	0.54
	Trained	253	4.41	0.51
Knowledge-Based Influence	Not trained	69	4.08	0.60
	Trained	252	4.11	0.66
Informal Processes	Not trained	68	4.42	0.40
	Trained	251	4.41	0.43

**Table 8-25: Independent Samples *t*-Test of Project Team Integration
(PM Training-Grouped)**

Groups	Variable	t	df	Sig.(2 tails)
Not trained VS Trained	Project Team Integration	-0.995	314	0.320
	Consciousness of Team Identity	-2.352	320	0.019
	Knowledge-Based Influence	-0.346	319	0.730
	Informal Processes	0.149	317	0.882

Two noticeable findings were:

- With an alpha level of 0.05, the two groups obtained significantly different ($p = 0.019$) scores on the CTI sub-factor. The trained group obtains a higher score than did the other one.
- No statistically significant difference could be claimed for the PTI factor and the KBI and IFP sub-factors between the two groups, but the descriptive statistics

showed that the trained group obtained higher scores on the PTI factor and the KBI sub-factor. The two groups had nearly equal scores on the IFP sub-factor.

8.2.3.4 Industry

Independent samples *t* tests for each pair of the four industrial groups showed that the respondents from the construction industry and the services industry obtained significantly different scores on the IFP sub-factor ($p = 0.01$). The latter group obtained a higher score than did the former group. The descriptive statistics and the *t*-test results for these two industrial groups are shown as in Table 8-26 and Table 8-27.

Table 8-26: Mean Scores of Project Team Integration
(Industry-Grouped)

Variable	Industry	Number of respondents	Average Score	Standard Deviation
Project Team Integration	Construction	164	4.31	0.39
	Services	102	4.39	0.33
Consciousness of Team Identity	Construction	168	4.41	0.53
	Services	104	4.35	0.49
Knowledge-Based Influence	Construction	166	4.05	0.64
	Services	104	4.17	0.63
Informal Processes	Construction	166	4.36	0.44
	Services	102	4.50	0.37

Table 8-27: Independent Samples *t*-Test of Project Team Integration
(Industry-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
Construction VS Services	Project Team Integration	-1.724	264	0.086
	Consciousness of Team Identity	0.765	270	0.445
	Knowledge-Based Influence	-1.498	268	0.135
	Informal Processes	-2.706	266	0.010

8.2.4 Item Frequency

The information in Table 8-28 indicates a range of agreement in responses to the items about project team integration from a high of 98.5 percent to a low of 64.5 percent.

Table 8-28: Item Frequencies of Project Team Integration

Item	Rated 4 or 5* (%)	Rated 3 (%)	Rated 1 or 2 (%)	Mean	Std. Dev.
Consciousness of Team Identity (CTI):					
Value9: Project team is where people working together	89.8	3.4	6.8	4.48	0.92
Value10: Group discussions lead to better decisions	83.6	10.5	5.9	4.24	0.92
Value11: See self as part of project team	98.5	0.9	0.6	4.78	0.50
Value12: Members equally responsible for whole project	74.0	6.8	19.2	3.90	1.21
Value39: Members making suggestions for every aspect of team performance	93.8	4.0	2.2	4.48	0.71
Knowledge Based influence (KBI):					
Value26: Boss characterised by knowledge/skills	91.0	7.1	1.9	4.44	0.73
Value30: Members' influence by what they know	86.4	9.0	4.6	4.25	0.85
Value32: Different sources of information equally treated	64.5	12.1	23.4	3.63	1.18
Informal processes (IFP):					
Value21: Communications between all levels	91.0	0.9	8.1	4.43	0.94
Value35: Helping other members	99.1	0.3	0.6	4.66	0.54
Value37: Relationships go beyond formal ones	79.9	13.9	6.2	4.06	0.91
Value38: Special consideration for personal problems	78.0	8.0	13.9	3.91	1.03
Value40: Informal communications enhance team performance	94.4	2.5	3.1	4.53	0.72
Value41: Members show informal appreciation to each other	98.1	1.2	0.6	4.68	0.55
Value43: Members have access to any other members for problem solving	95.3	4.0	0.6	4.60	0.62

* Rated 4 or 5: Agree or Strongly agree; Rated 3: Neutral; Rated 1 or 2: Strongly disagree or Disagree.

At least 74% of the respondents agreed or strongly agreed to the items about consciousness of team identity:

- 98.5% for *See self as part of project team*,
- 93.8% for *Members making suggestions for every aspect of team performance*,
- 89.8% for *Project team is where people working together*,
- 83.6% for *Group discussions lead to better decisions*, and
- 74.0% for *Members equally responsible for whole project*.

About the items of knowledge based influence,

- 91.0% of the respondents agreed or strongly agreed to *Boss characterised by knowledge/skills*,
- 86.4% to *Members' influence by what they know*, and
- 64.5% to *Different sources of information equally treated*.

About the items of informal processes, more than 90% of the respondents agreed or strongly agreed to

- *Helping other members* (99.1%),
- *Members show informal appreciation to each other* (98.1%),
- *Members have access to any other members for problem solving* (95.3%),
- *Informal communications enhance team performance* (94.4%), and
- *Communications between all levels* (91.0%).

8.3 BELIEFS ABOUT WORK FLEXIBILITY

8.3.1 Overview

Using the method of summated scales (Hair *et al*, 1998), this research obtained the factor scores as shown in Table 8-29 for the *Work Flexibility* factor and its two sub-factors.

Table 8-29: Mean Scores of Work Flexibility
(All Respondents Averaged)

	N	Min.	Max.	Mean	Std. Dev.
Factor:					
• Work Flexibility	322	1.44	4.67	3.07	0.60
Sub-factors:					
• Job De-Codification	322	1.00	4.75	2.44	0.79
• Work Autonomy	323	1.80	5.00	3.58	0.64

The above table shows that, on the scale from the minimum 1 (prefer low work flexibility) and the maximum 5 (prefer high work flexibility), the respondents obtained a score of 3.07 on the WF factor, and respectively 2.44 and 3.56 on the two sub-factors, which were, with an alpha level of 0.05, significantly different ($p = 0.000$) from each other. The respondents' score on the JDC sub-factor was significantly lower than that on the WKA sub-factor. The result of a paired sample t test between the mean scores on JDC and WKA was $t (321)=-25.561, p(2 \text{ tailed}) = 0.000$.

What scores did each group with different demographic characteristics obtain on the WF factor and its sub-factors? Table 8-30 shows the scores of the demographic-grouped respondents. All the demographic groups obtained lower scores on the JDC sub-factor than on the WKA sub-factor.

Table 8-30: Mean Scores of Work Flexibility
(Demographic-Grouped)

		WLF	JDC	WKA
GENDER	Male	3.08	2.45	3.57
	Female	3.03	2.19	3.69
AGE	30 & below	3.00	2.38	3.50
	31-40	2.90	2.21	3.46
	41-50	3.07	2.47	3.56
	51-65	3.17	2.53	3.68
	Above 65	3.19	2.61	3.66
LANGUAGE	English	3.08	2.47	3.58
	Other	2.98	2.23	3.58
EXPERIENCE	Less than 6	2.81	2.30	3.21
	6-10 yrs	3.04	2.37	3.58
	11-20 yrs	3.07	2.46	3.55
	21-30 yrs	3.14	2.50	3.66
	More than 30	3.11	2.40	3.68
EDUCATION	Below Bachelor	3.00	2.31	3.56
	Bachelor	3.06	2.48	3.53
	G/certificate	3.07	2.43	3.57
	Master	3.11	2.47	3.62
	Doctorate	2.85	1.58	3.87
PM TRAINING	No formal	3.14	2.54	3.61
	Short course	3.08	2.40	3.63
	P/graduate	3.04	2.42	3.53
	Other	3.04	2.47	3.49
PM POSITION	Senior manager	3.11	2.51	3.59
	Project manager	3.05	2.40	3.57
	P/team member	3.06	2.42	3.58
	Other	3.01	2.37	3.54
PM QUALIFCTN	Holding	3.06	2.44	3.55
	Not holding	3.09	2.45	3.60
INDUSTRY	Construction	3.06	2.45	3.56
	Services	3.09	2.48	3.58
	Resources	2.96	2.31	3.48
	Manufacturing	3.16	2.22	3.91
	IT	3.11	2.44	3.65

8.3.2 An Overview of the Effects of Demographics

Table 8-31 shows the ANOVA results of the scores of the WF factor and its sub-factors, dividing PM professionals into various groups with different demographic characteristics. No significant difference was revealed by the ANOVA results.

Table 8-31: ANOVA Test of Mean Scores of Work Flexibility
(Demographic-Grouped)

Grouped By	Test Variables	Test Results
Gender	WF	F(1,320)=0.088; sig.=0.767
	JDC	F(1,320)=1.361; sig.=0.244
	WKA	F(1,321)=0.423; sig.=0.516
Age	WF	F(4,317)=1.919; sig.=0.107
	JDC	F(4,317)=1.644; sig.=0.163
	WKA	F(4,318)=1.263; sig.=0.284
Language	WF	F(1,320)=0.915; sig.=0.340
	JDC	F(1,320)=2.561; sig.=0.110
	WKA	F(1,321)=0.001; sig.=0.981
PM Experience	WF	F(4,317)=1.047; sig.=0.383
	JDC	F(4,317)=0.392; sig.=0.815
	WKA	F(4,318)=1.644; sig.=0.163
Education	WF	F(4,317)=0.314; sig.=0.869
	JDC	F(4,317)=1.169; sig.=0.324
	WKA	F(4,318)=0.415; sig.=0.798
PM Training	WF	F(3,318)=0.418; sig.=0.740
	JDC	F(3,318)=0.489; sig.=0.690
	WKA	F(3,319)=0.550; sig.=0.648
PM Position	WF	F(3,318)=0.399; sig.=0.754
	JDC	F(3,318)=0.589; sig.=0.623
	WKA	F(3,319)=0.093; sig.=0.964
PM Qualification	WF	F(1,320)=0.196; sig.=0.658
	JDC	F(1,320)=0.001; sig.=0.975
	WKA	F(1,321)=0.526; sig.=0.469
Industry	WF	F(4,317)=0.267; sig.=0.899
	JDC	F(4,317)=0.352; sig.=0.843
	WKA	F(4,318)=0.820; sig.=0.513

8.3.3 Exploring the Effects of Demographics

Although no significant difference was revealed by the ANOVA results, the effects of several demographic characteristics, such as, PM experience, education, and PM training, were worth further examination. As mentioned before, these demographic characteristics might have significant efforts on the formation of people's work-related values and beliefs.

8.3.3.1 Years of experience in project management

The respondents were re-organised into three groups, one with experience of *less than 6 years*, one with *6-20 years*, and the other with *above 20 years*. Table 8-32 shows the descriptive statistics for the experience groups.

Table 8-32: Mean Scores of Work Flexibility
(PM Experience-Grouped)

Variable	Experience	Number of respondents	Average Score	Standard Deviation
Work Flexibility	Less than 6 yrs	14	2.81	0.56
	6 -20 yrs	202	3.06	0.58
	Above 20 yrs	106	3.14	0.63
Job De-Codification	Less than 6 yrs	14	2.30	0.63
	6 -20 yrs	202	2.44	0.76
	Above 20 yrs	106	2.48	0.87
Work Autonomy	Less than 6 yrs	14	3.21	0.73
	6 -20 yrs	203	3.56	0.64
	Above 20 yrs	106	3.66	0.62

The independent samples *t* tests obtained the results as shown in Table 8-33 for the two groups of respondents.

Table 8-33: Independent Samples *t*-Test of Work Flexibility
(PM Experience-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
Less than 6 yrs VS 6-20 years	Work Flexibility	-1.574	214	0.117
	Job De-Codification	-0.633	214	0.527
	Work Autonomy	-1.926	215	0.055
Less than 6 yrs VS Above 20 yrs	Work Flexibility	-1.838	118	0.069
	Job De-Codification	-0.723	118	0.471
	Work Autonomy	-2.489	118	0.014
6-20 yrs VS Above 20 yrs	Work Flexibility	-1.076	306	0.283
	Job De-Codification	-0.429*	189.370	0.668
	Work Autonomy	-1.348	307	0.179

* Equal variance between the groups not assumed at 0.05 level of significance.

Two noticeable results were:

- With an alpha level of 0.05, the group of *less than 6 years* and the one of *above 20 years* obtained significantly different ($p = 0.014$) scores on the WKA sub-factor. The latter group obtained a higher score than did the former one.
- No other significant difference could be claimed among the three groups, but the descriptive statistics showed that a group with longer experience obtained higher scores on the WF factor and its all sub-factors than did a group with shorter experience.

8.3.3.2 Education

The respondents were re-organised into two groups: *Graduate & Below* group and *Postgraduate* group. Table 8-34 shows the descriptive statistics for the education groups.

Table 8-34: Mean Scores of Work Flexibility
(Education-Grouped)

Variable	Education	Number of respondents	Average Score	Standard Deviation
Work Flexibility	Graduate & Below	127	3.05	0.60
	Postgraduate	195	3.09	0.59
Job De-Codification	Graduate & Below	127	2.44	0.80
	Postgraduate	195	2.44	0.80
Work Autonomy	Graduate & Below	128	3.54	0.63
	Postgraduate	195	3.61	0.66

The independent samples t tests obtained the results as shown in Table 8-35 for the two groups of respondents.

Table 8-35: Independent Samples t -Test of Work Flexibility
(Education-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
Graduate & Below VS Postgraduate	Work Flexibility	-0.561	320	0.576
	Job De-Codification	0.014	320	0.989
	Work Autonomy	-0.923	321	0.357

With an alpha level of 0.05, the two groups did not obtain significantly different scores on the WF factor and its sub-factors. But the descriptive statistics showed that the *postgraduate* group obtained a little higher scores on the WF factor and the WKA sub-factor. The two groups had equal scores on the JDC sub-factor.

8.3.3.3 PM Training

The respondents were re-organised into two groups:

- *Not trained*: consisting of those respondents with no formal PM training; and
- *Trained*: consisting of those respondents with any PM training (short courses, postgraduate courses or other courses).

Table 8-36 shows the descriptive statistics for the training groups.

Table 8-36: Mean Scores of Work Flexibility
(PM Training-Grouped)

Variable	Training	Number of respondents	Average Score	Standard Deviation
Work Flexibility	Not trained	68	3.14	0.64
	Trained	254	3.06	0.58
Job De-Codification	Not trained	69	2.54	0.84
	Trained	254	2.42	0.78
Work Autonomy	Not trained	69	3.61	0.63
	Trained	254	3.57	0.65

The independent samples *t* tests obtained the results as shown in Table 8-37 for the two groups of respondents.

Table 8-37: Independent Samples t-Test of Work Flexibility
(PM Training-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
Not trained VS Trained	Work Flexibility	0.987	320	0.324
	Job De-Codification	1.169	320	0.243
	Work Autonomy	0.525	321	0.600

With an alpha level of 0.05, no statistically significant difference could be claimed for the WF factor and its two sub-factors between the two groups.

8.3.4 Item Frequency

Less than 50% of the respondents believed in job de-codification: *Pre-design of communication paths unnecessary* (17.4%), *Written team manual unnecessary* (19.8%), *Jobs adjusted to people* (26.3%), and *Written job descriptions unnecessary* (48.3%).

About 50% and above of the respondents believed in work autonomy: *Staff's autonomy in handling work problems* (83.9%), *Challenging work opportunity as reward* (68.4%), *Written rules can be broken when necessary* (62.5%), *Team members dealing with an exceptional case* (56.0%), and *Staff have a great deal of work discretion* (45.2%).

Table 8-38: Item Frequencies of Work Flexibility

Item	Rated 4 or 5 (%)	Rated 3 (%)	Rated 1 or 2 (%)	Mean	Std. Dev.
Job De-Codification (JDC):					
Value14: Written job descriptions unnecessary	19.8	6.5	73.7	2.06	1.25
Value15: Written team manual unnecessary	48.3	14.9	36.8	3.16	1.32
Value17: Jobs adjusted to people	26.3	12.4	61.3	2.42	1.26
Value18: Pre-design of communication paths unnecessary	17.4	5.6	77.0	2.15	1.14
Work Autonomy (WKA):					
Value16: Staff have a great deal of work discretion	45.2	14.9	39.9	3.11	1.23
Value19: Team members dealing with an exceptional case	56.0	9.9	34.1	3.30	1.31
Value20: Written rules can be broken when necessary	62.5	13.9	23.5	3.52	1.11
Value22: Staff's autonomy in handling work problems	83.9	9.3	6.8	4.10	0.87
Value29: Challenging work opportunity as reward	68.4	20.4	11.1	3.87	1.02

Note: Rated 4 or 5: Agree or Strongly agree; Rated 3: Neutral; Rated 1 or 2: Strongly disagree or Disagree.

8.4 BELIEFS ABOUT WORK PERFORMANCE

8.4.1 Overview

Using the method of summated scale (Hair *et al*, 1998), this research obtained the factor scores as shown in Table 8-39 for the *Work Performance* factor. Because the positive sub-factor (*Work Performance Itself*) had very high loading (0.99) and the negative sub-factor (*Personal Relationships*) had very low loading (0.18) on the WP factor, the score of the positive sub-factor was used as the score of the WP factor.³⁹ In order to calculate the score of the negative sub-factor, the item Value31 was reversely coded.

Table 8-39: Mean Scores of Work Performance
(All Respondents Averaged)

	N	Min.	Max.	Mean	Std. Dev.
Work Performance Itself	319	2.20	5.00	4.27	0.51
Personal Relationships	323	1.00	4.67	2.72	0.79

The above table shows that, on the scale from the minimum 1 (viewing team members in terms of who they are) and the maximum 5 (viewing team members in terms of their work performance), PM professionals obtained an average score of 4.27 with a standard deviation 0.51 on the positive WPI sub-factor, and 2.72 with a standard deviation 0.79 on the negative PSR sub-factor. The result of a paired sample *t* test, $t(318)=27.342$, $p(2 \text{ tailed}) = 0.000$, showed the significance difference between the scores of the two sub-factors.

What scores did each group with different demographic characteristics obtain on the two sub-factors? Table 8-40 shows the scores of the demographic-grouped respondents. All the groups obtained much higher scores on the WPI sub-factor than on the PSR sub-factor.

³⁹ In this research, the positive sub-factor was regarded as equal to the *Work Performance* factor, and the negative sub-factor was only used to serve the purpose of providing additional information for the understanding of the WP factor.

Table 8-40: Mean Scores of Work Performance

(Demographic-Grouped)

		WPI	PSR
GENDER	Male	4.27	2.73
	Female	4.30	2.51
AGE	30 & below	4.45	2.92
	31-40	4.38	2.79
	41-50	4.23	2.72
	51-65	4.27	2.63
	Above 65	4.29	3.14
LANGUAGE	English	4.26	2.72
	Other	4.44	2.70
EXPERIENCE	Less than 6	4.21	2.79
	6-10 yrs	4.29	2.77
	11-20 yrs	4.24	2.72
	21-30 yrs	4.36	2.68
	More than 30	4.15	2.68
EDUCATION	Below Bachelor	4.32	2.81
	Bachelor	4.27	2.70
	G/certificate	4.32	2.75
	Master	4.23	2.69
	Doctorate	4.33	2.67
PM TRAINING	No formal	4.29	2.81
	Short course	4.29	2.72
	P/graduate	4.25	2.70
	Other	4.31	2.47
PM POSITION	Senior manager	4.33	2.69
	Project manager	4.29	2.70
	P/team member	4.11	2.89
	Other	4.13	2.76
PM QUALIFCTN	Holding	4.28	2.66
	Not holding	4.27	2.77
INDUSTRY	Construction	4.25	2.65
	Services	4.29	2.80
	Resources	4.25	2.94
	Manufacturing	4.31	2.59
	IT	4.36	2.69

8.4.2 An Overview of the Effects of Demographics

Table 8-41 shows the ANOVA results of the scores of the WPI and PSR sub-factors, dividing the respondents into groups with different demographic characteristics. No significant difference was revealed by the ANOVA analysis.

Table 8-41: ANOVA Test of Mean Scores of Work Performance
(Demographic-Grouped)

Grouped By	Test Variables	Test Results
Gender	WPI	F(1,317)=0.032; sig.=0.857
	PSR	F(1, 321)=0.913, sig.=0.340
Age	WPI	F(4,314)=1.015; sig.=0.400
	PSR	F(4, 318)=1.003, sig.=0.406
Language	WPI	F(1,317)=3.767; sig.=0.053
	PSR	F(1, 321)=0.024, sig.=0.876
PM Experience	WPI	F(4,314)=1.199; sig.=0.311
	PSR	F(4, 318)=0.160, sig.=0.958
Education	WPI	F(4,314)=0.431; sig.=0.786
	PSR	F(4, 318)=0.171, sig.=0.953
PM Training	WPI	F(3,315)=0.174; sig.=0.914
	PSR	F(3, 319)=0.871, sig.=0.456
PM Position	WPI	F(3,315)=2.416; sig.=0.066
	PSR	F(3, 319)=0.485, sig.=0.693
PM Qualification	WPI	F(1,317)=0.002; sig.=0.968
	PSR	F(1, 321)=1.724, sig.=0.190
Industry	WPI	F(4,314)=0.313; sig.=0.869
	PSR	F(4, 318)=0.944; sig.=0.438

8.4.3 Exploring the Effects of Demographics

Although no significant difference was revealed by the ANOVA results, the effects of several demographic characteristics, such as, PM experience, education, and PM training, were worth further examination. As mentioned before, these demographic characteristics might have significant efforts on the formation of people's work-related values and beliefs. In addition, because the ANOVA result for the WPI sub-factor among various groups of PM position obtained the significance level $p = 0.066$, a little above the threshold of 0.05, this demographic characteristic might also have some effects on the respondents' scores on the WPI sub-factor.

8.4.3.1 Years of experience in project management

The respondents were re-organised into three groups, one with experience of *less than 6 years*, one of *6-20 years*, and the other of *above 20 years*. Table 8-42 shows the descriptive statistics for the experience groups.

Table 8-42: Mean Scores of Work Performance
 (PM Experience-Grouped)

Variable	Experience	Number of respondents	Average Score	Standard Deviation
Work Performance Itself	Less than 6 yrs	14	4.21	0.69
	6-20 yrs	201	4.26	0.52
	Above 20 yrs	104	4.32	0.46
Personal Relationships	Less than 6 yrs	14	2.79	0.72
	6-20 yrs	203	2.73	0.75
	Above 20 yrs	106	2.68	0.86

The independent samples t tests obtained the results as shown in Table 8-43 for the two groups of respondents.

Table 8-43: Independent Samples t -Test of Work Performance
 (PM Experience-Grouped)

Groups	Variable	t	df	Sig.(2 tails)
Less than 6 yrs VS 6-20 yrs	Work Performance Itself	-0.281	213	0.779
	Personal Relationships	0.256	215	0.798
Less than 6 yrs VS Above 20 yrs	Work Performance Itself	-0.546*	14.616	0.594
	Personal Relationships	0.443	118	0.658
6-20 yrs VS Above 20 yrs	Work Performance Itself	-1.107	303	0.310
	Personal Relationships	0.560	307	0.576

* Equal variance between the groups not assumed at 0.05 level of significance.

With an alpha level of 0.05, no statistically significant difference could be claimed for the two sub-factors between the three groups, but the descriptive statistics showed that a group with longer experience obtained a higher score on the WPI factor and a lower score on the PSR factor than did a group with shorter experience.

8.4.3.2 Education

The respondents were re-organised into two groups: *Graduate & Below* and *Postgraduate*. Table 8-44 shows the descriptive statistics for the education groups.

**Table 8-44: Mean Scores of Work Performance
(Education-Grouped)**

Variable	Education	Number of respondents	Average Score	Standard Deviation
Work Performance Itself	Graduate & Below	127	4.28	0.52
	Postgraduate	192	4.27	0.51
Personal Relationships	Graduate & Below	128	2.72	0.79
	Postgraduate	195	2.72	0.78

The independent samples t tests obtained the results as shown in Table 8-45 for the two groups of respondents.

**Table 8-45: Independent Samples t -Test of Work Performance
(Education-Grouped)**

Groups	Variable	t	df	Sig.(2 tails)
Graduate & Below VS Postgraduate	Work Performance Itself	0.135	317	0.892
	Personal Relationships	0.028	321	0.978

With an alpha level of 0.05, the two groups did not obtain significantly different scores on the sub-factors. They obtained nearly equal scores on the two sub-factors.

8.4.3.3 PM Training

The respondents were re-organised into two groups: (1) *Not trained*: consisting of those respondents with no formal PM training; and (2) *Trained*: consisting of those respondents with any PM training (short courses, postgraduate courses or other courses). Table 8-46 shows the descriptive statistics for the training groups.

**Table 8-46: Mean Scores of Work Performance
(PM Training-Grouped)**

Variable	Training	Number of respondents	Average Score	Standard Deviation
Work Performance Itself	Not trained	68	4.29	0.46
	Trained	251	4.27	0.52
Personal Relationships	Not trained	69	2.81	0.82
	Trained	254	2.69	0.78

The independent samples t tests obtained the results as shown in Table 8-47 for the two groups of respondents.

**Table 8-47: Independent Samples *t*-Test of Work Performance
(PM Training-Grouped)**

Groups	Variable	t	df	Sig.(2 tails)
Not trained VS Trained	Work Performance Itself	0.206	317	0.837
	Personal Relationships	1.123	321	0.262

With an alpha level of 0.05, no statistically significant difference could be claimed for the two sub-factors between the *trained* and *not-trained* groups.

8.4.3.4 PM Position

The respondents were re-organised into two groups:

- *Manager* Group: consisting of senior managers and project managers; and
- *Non-Manager* Group: consisting of all other respondents without a leadership role.

Table 8-48 shows the descriptive statistics for the training groups.

**Table 8-48: Mean Scores of Work Performance
(PM Position-Grouped)**

Variable	Position	Number of respondents	Average Score	Standard Deviation
Work Performance Itself	Manager	257	4.31	0.49
	Non-manager	62	4.12	0.58
Personal Relationships	Manager	259	2.69	0.79
	Non-manager	64	2.81	0.77

The independent samples *t* tests obtained the results as shown in Table 8-49 for the two groups of respondents.

**Table 8-49: Independent Samples *t*-Test of Work Performance
(PM Position-Grouped)**

Groups	Variable	t	df	Sig.(2 tails)
Manager VS Non-Manager	Work Performance Itself	2.629*	83.316	0.020
	Personal Relationships	-1.022	321	0.307

* Equal variance is not assumed at 0.05 level of significance.

With an alpha level of 0.05, the two groups obtained significantly different scores on the WPI sub-factor ($p = 0.020$). The *manager* group obtained a higher score than did

the *non-manager* group. No significant difference could be claimed for the PSR sub-factor between the two groups, but the descriptive statistics showed that the *manager* group obtained a lower score than did the *non-manager* group.

8.4.4 Item Frequency

For the WPI sub-factor, the responses indicated a wide range of agreement among the respondents from 92.6% (*Old & young people equally respected*) to 74.2% (*Evaluation by work results*) (see Table 8-50). Other items received the support rates as 91.3% (*Work capability not age important for a manager*), 86.3% (*Work performance not PM qualification counts*), and 86.0% (*Questioning a wrong instruction*).

For the PSR sub-factor, 49.2 percent of the respondents agreed or strongly agreed to the item Value5 (*New members fitting into the project team*), 23.5 percent to Value31 (*Hierarchical power important for conflict resolving*), and 21.4 percent to Value42 (*Knowing and accepting each other personally*). All the three items had standard deviations greater than 1.0, indicating a wide discrepancy in the responses.

Table 8-50: Item Frequencies of Work Performance

Item	Rated 4 or 5 (%)	Rated 3 (%)	Rated 1 or 2 (%)	Mean	Std. Dev.
Work Performance Itself:					
Value23: Evaluation by work results	74.2	20.5	5.3	3.85	0.76
Value27: Work capability not age important for a manager	91.3	4.0	4.6	4.47	0.84
Value28: Old & young people equally respected	92.6	2.8	4.6	4.59	0.83
Value33: Questioning a wrong instruction	86.0	5.0	9.0	4.17	0.91
Value34: Work performance not PM qualification counts	86.3	5.6	8.1	4.26	0.95
Personal Relationships:					
Value5: New members fitting into the project team	49.2	22.9	27.9	3.30	1.21
Value31: Hierarchical power important for conflict resolving	23.5	16.1	60.4	2.43	1.18
Value42: Knowing and accepting each other personally	21.4	17.3	61.3	2.42	1.25

Note: Rated 4 or 5: Agree or Strongly agree; Rated 3: Neutral; Rated 1 or 2: Strongly disagree or Disagree.

Chapter 9

Discussion

This chapter discusses the research results stated in Chapter 7 and Chapter 8. It firstly discusses several demographic characteristics of the survey respondents which have important implications for the PM profession. The discussion is then conducted for the model of PM culture and PM professionals' current values and beliefs around the identified dimensions and sub-dimensions of PM culture. The purpose of the discussion is to examine the validity of the model of PM culture and the degree to which the current values and beliefs are consistent with the "expected" values and beliefs as reflected in the literature of professions and project management. This chapter includes the following major sections:

- 9.1 Demographic Profile of Survey Respondents
- 9.2 The Model of PM Culture
- 9.3 Current Status of PM Culture

9.1 DEMOGRAPHIC PROFILE OF SURVEY RESPONDENTS

The demographic profile of the survey respondents (see Chapter 7) revealed several demographic characteristics as being worth noticing for the purpose of further promotion of the professionalism of project management.

9.1.1 Women in Project Management

Only four percent of the survey respondents were women. PM is still a male-dominated field, although as early as in 1994, PMI devoted a whole issue of *PM Network* (March 1994) to the special topic of *Women in Project Management*, and thereafter the topic has become one of special interest to some members of the PM profession.

As indicated by Valentine and Price (1994), women, who grew up playing relationship-oriented “girl games”, can contribute the feminine leadership style to the field of project management; and project management, as a relatively new field of management, provides an exciting setting in which organisations can take advantage of the strengths afforded by the feminine management style. For example, the need to coordinate between various organisational constituencies, internal and external, is a function well-suited to women.

It has been suggested that women tend to be more committed to work than men do (Grusky, 1966; Alutto, Hrebiniak, and Alonso, 1973). Some studies about professional commitment have provided empirical evidence to support this point of view. For example, Tuma and Grimes (1981) found that professional commitment has a significant positive correlation with being female and Berger and Grimes (1973) found that female faculty members of business schools obtained significantly higher score on professional commitment than male members did. With only 13 female respondents, this research could not draw a conclusion about a significant difference between professional commitment of female and male members of the PM profession. However, the descriptive statistics did show that the female respondents obtained much higher scores on the *Professional Commitment* factor and all its sub-factors than

did the male respondents (See Table 8-2). Women's greater professional commitment could be due to the fact that they usually have to overcome more obstacles to enter the male-dominant profession. These obstacles also cause women with low professional commitment to be less likely to enter the PM profession than men with low professional commitment.

It can be concluded that females' involvement in project management is important to further professionalism of the PM profession. The implication is that more attention should be paid to the topic of *Women in Project Management* so that more women will be attracted to enter the field of project management.

9.1.2 Education and Training

The examination of the survey results reveals the following three important points for the PM profession:

- While more than 90 percent of the respondents were Bachelor and above educated, less than 80 percent had undertaken formal PM training;
- Among those who were formally trained, 31 percent were trained through only short-courses, which might not meet the requirements of the profession; and
- 21 percent of the respondents had never been formally trained in project management, even by short courses. They learned project management on-the-job.

As discussed in Chapter 3, a profession requires its members to be specially trained in its professional knowledge and skills. Since the 1990s, many degree-granting and other forms of PM courses have been offered by many universities, PM associations, and PM companies in Australia and other countries. However, there were still 21 percent of the respondents who had never received any formal training in project management. A further examination of the survey data revealed that these not-trained respondents were almost-evenly distributed among the three main age groups:

- Aged 31-40: 23 percent of the respondents (13 out of 57 respondents) were not trained;
- Aged 41-50: 20 percent of the respondents (30 out of 157 respondents) were not trained; and

- Aged 51-65: 27 percent of the respondents (26 out of 98 respondents) were not trained.

It is thus clear that the training deficiency is a common problem within the whole community of project management, not just within a certain group of elder members.

While on-the-job training is important for people to learn project management, it is not sufficient. Some kinds of formal training are indispensable. Professional education (training) is not only to transmit formally a body of expert knowledge and skills but also to transmit professional values, attitudes, and commitment (Perrucci and Gerstl, 1969; Atkinson, 1983; Rance, 1995). Previous studies of other professions have found that levels of professional education (training) are positively correlated to professional values and commitment (Perrucci and Gerstl, 1969, Berger and Grimes, 1973). The findings of this research support this kind of correlation (refer to Section 9.3.1).

As indicated by Wilensky (1964), at the early stage of professionalism, practitioners of a profession come, of necessity, from other professions. This situation was quite true for the PM profession. Before PM educational/training programs were initiated in the late 1980s, project managers were usually those technical people who had been occasionally appointed to do such a job. Most of them were not prepared to work in a project environment. A study by Thornberry and Weintraub (cited in Sprague and Greenwell, 1992) in the 1980s found that only 25 percent of the high-tech companies in their survey had any type of formalised training for engineers moving into project management situations. A woman project manager stated:

I was a project manager long before I knew that was the name for what I was doing. For years, no one said, "Here, Ruth, manage this project." They said "Fix this," "Take care of that," "Keep this from blowing up," or just "Help!" I'm embarrassed at how long I fixed, took care, and helped before I realized there was a whole discipline that could help me. (Strbiak, 1994: 17)

In the last decade, project management education/training has grown quickly. However, among those members of AIPM with a membership grade of *Member* and *Fellow*, there were still 21 percent of the respondents who did not have any formal PM training. This implies that the PM profession must put much more efforts into providing professional training to people who want to enter the profession. It also

implies that the PM profession needs to set some kinds of formal PM training as one of its requirements for the recruitment of new members. For a mature profession, such as medicine and accounting, it is impossible for people without formal professional training to enter its professional field.

9.1.3 Current PM Position

Eighty percent of the survey respondents were senior managers or project managers. The other 20 percent were project team members or researchers, university lecturers and independent consultants. From this, it probably can be inferred that the majority of members of the PM profession are playing a leadership role. This profile has some implications for the PM profession to refine its core work tasks and to draw a clear boundary between its members and non-members.

According to Wilensky (1964), a profession needs, during its process of professionalism, to continually refine its core tasks and delegate non-core tasks to others. All professions in short supply, such as doctors, dentists, teachers, engineers, scientists, and social workers, have done that. For example,

The doctor allocates much of his job to less-trained nurses and laboratory and X-ray technicians; the nurses, as they seek to professionalize, allocate much of their less attractive work to practical nurses, aides, and nurse assistants; and these, in turn, allocate some of their chores to ward helpers. (Wilensky, 1964: 144)

The early focus of project management was on the role of the project manager and, by the 1990s, the focus had shifted to include the whole of the project team beyond that of the project manager (Crawford, 2000). There have been suggestions in recent years that the role of a single project manager is becoming less important, as responsibility for projects is shared by all project team members (Crawford, 2000). In this way, project management has become an everything-inclusive discipline and its core tasks have been confounded. It is probably the appropriate time for the PM profession to refine its core tasks. Since the majority of its members play a leadership role, the PM profession may define the project leadership role as its core professional work. If so, it certainly needs to delegate other work, such as project accounting, project administration, to others, who will be providing support to PM professionals.

9.2 THE MODEL OF PM CULTURE

9.2.1 Introduction

Through the factor analysis in Chapter 7, an empirically grounded position has been established to suggest the existence of four factors (dimensions) relevant to PM culture and each of the factors can be further analysed on its sub-factors (sub-dimensions) level. On the basis of the extracted factors and sub-factors, the model of PM culture could be expressed as a guideline to PM professionals' behaviours as shown in Figure 9-1:

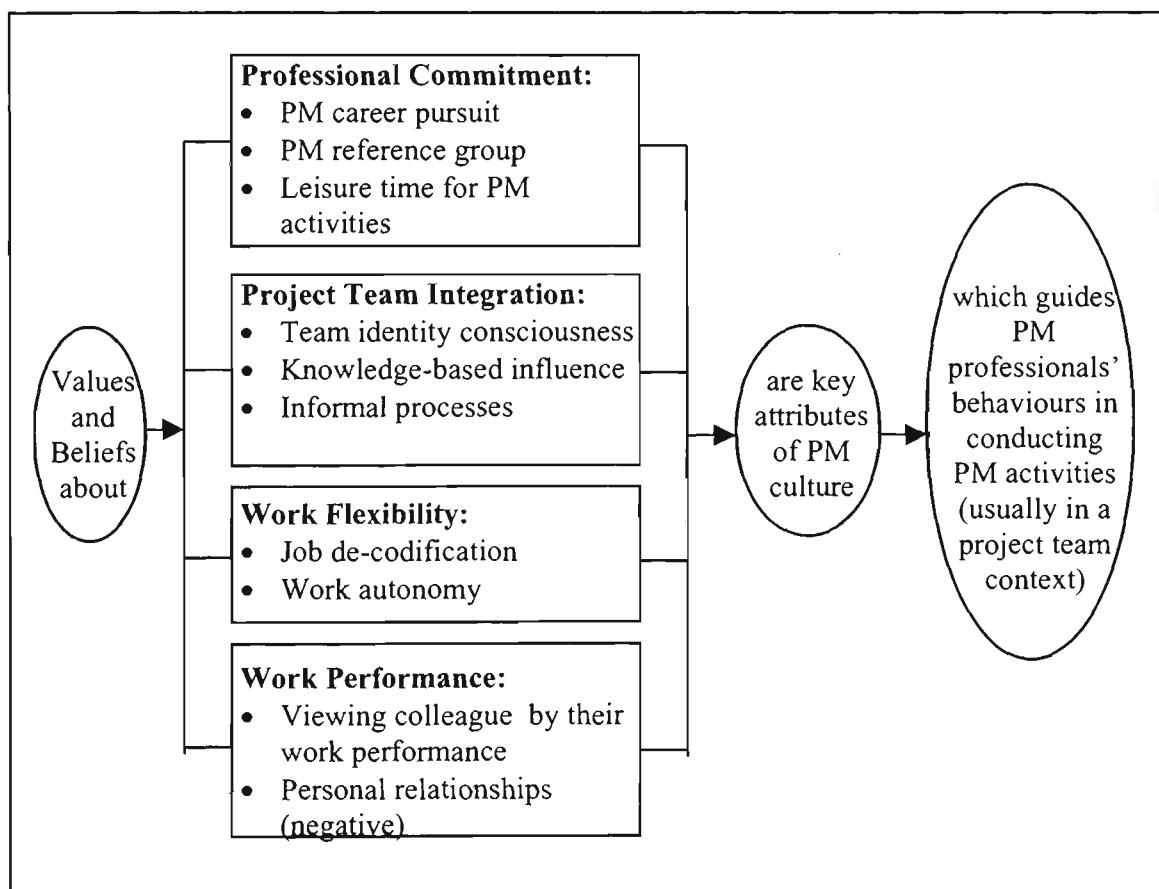


Figure 9-1: PM Culture to Guide Behaviours

The model of PM culture will be discussed in this section from both the technical perspective of factor analyses and the theoretical perspective of the theories of professions and project management.

From the technical perspective of factor analyses, attention will be given to: (1) for the result of exploratory factor analysis, the strength of factor loadings, the cleanliness of the factor structures, and the reliability of the scales (factors); and (2) for the results of confirmatory factor analyses, the goodness-of-fit measures, the significance levels of factor loadings, and the question of whether there exist any offending parameter estimates. These discussions will lead to an answer to research questions 1: *Could PM culture be described by a model consisting of several discrete dimensions?*

From the theoretical perspective of the theories of professions and project management, the validity of the model will be examined on the basis of the following rational theoretical considerations: (1) Parsons' pattern variable scheme, which is the theoretical framework of this research, and the theoretically-designed research variables; (2) The key points relevant to work-related values and beliefs reflected in the literature of project management and professions; and (3) the theoretical expectations of the relationships between the identified dimensions/sub-dimensions and the *PM culture* construct. These discussions will lead to an answer to research question 2: *What dimensions would empirically emerge?*

9.2.2 From the Technical Perspective of Factor Analyses (Answer to Research Question 1)

9.2.2.1 The result of exploratory factor analysis

As stated in Chapter 6, only those items with loadings 0.3 and above were kept as indicators of the factors. From both the perspectives of a rule of thumb and the sample-size-decided rule (refer to Chapter 6, Section 6.5.2.4), the “0.3 and above” criterion can ensure that all the factors are significant in terms of the items’ loadings on them.

The structures of all the four factors are sufficiently clean so that it can be reasonably concluded that the factor analysis has achieved its objective, ie., a simple, interpretable resolution. The factor structures are briefly examined as follows:

- The *Professional Commitment* factor (combination of Factor 1 and 5 in Table 7-4) has a very clean structure and no item has a loading 0.3 and above on any other factors. So is the *Work Performance* factor (Factor 4 in Table 7-4).
- The structure of the *Project Team Integration* factor (Factor 2 in Table 7-4) is quite clean and only three items have loadings a little over 0.3 on the *Work Flexibility* or *Work Performance* factor. These three items are:
 - ◆ Value10: *Group discussions lead to better decisions.* It has a negative loading (-0.32) on the *Work Flexibility* factor which measures work de-codification and work autonomy. A possible explanation is that group discussions may imply some loss of individuals' work autonomy.
 - ◆ Value30: *Members' influence by what they know.* It has a positive loading (0.31) on the *Work Performance* factor which is about viewing project team members in terms of their work performance instead of whom they are. It is understandable that this item implies something relevant to work performance.
 - ◆ Value40: *Informal communications enhance team performance.* It has a positive loading (0.34) on the *Work Flexibility* factor. It is understandable that informal communication is closely related to work flexibility.
- The *Work Flexibility* factor (Factor 3 in Table 7-4) has also a quite clean structure. Only one item (Value22: *Staff should have a high level of autonomy in handling work problems*) has a 0.35 loading on one (the *Project Team Integration* factor) of the other factors.

The factor structures, obtained by a Principle Components Analysis (PCA) with a varimax rotation, have been confirmed by a Principle Axis Factoring (PAF) and an oblique rotation. This study, as an exploratory one, was unable to assume the prior knowledge requirement of variable variances inherent in the PCA method, but the exactly same structures obtained by the PAF method have demonstrated the acceptability of the factor structures obtained by the PCA method. Also the oblique rotation has demonstrated that the factor structures obtained by the varimax rotation are acceptable as good solutions.

The reliability (inter-item consistency measured by standardised alpha α_s) of the factors varies from 0.53 to 0.80. With $\alpha_s = 0.80$ and 0.75, the PC factor and the PTI factor each has a sufficient reliability. For the WF factor, $\alpha_s = 0.64$, exceeding the value $\alpha_s = 0.60$, which Hair *et al* (1998) and Nunnally (1978) suggest as appropriate for exploratory research. For the WP factor, $\alpha_s = 0.54$, is a bit lower than the minimally acceptable 0.6 value.

The low reliability of the WP factor is probably due to the fact that the items measure the variable *work performance* relative to three kinds (age, hierarchical position, and professional qualification) instead of one particular kind of personal status of ascription. Previous research usually measured work performance relative to one particular kind of personal status of ascription. For example, Hampden-Turner and Trompenaars (1993) measured people's achievement (work performance) orientation against only age-orientation. Their reason was that "because everyone grows older, and ascribing status to age is not unfair or arbitrary in the way that ascribing status to people on the basis of class, gender, or ethnicity is unfair" (Hampden-Turner and Trompenaars, 1993: 90). Trompenaars (1993) also used only one particular status, ie., family background, as the status for comparison with achievement (work performance). Compared to these authors' choices of only one particular kind of ascription, this research adopts a much wider range of ascription, including age, hierarchical position, and professional qualification. Therefore, relatively to the previous similar research, it is appropriate to accept the scale of the WP factor.

9.2.2.2 The results of confirmatory factor analyses

As shown in Chapter 7, the model of PM culture and other models for sub-dimensions of PM culture are acceptable on the basis of the goodness-of-fit measures and significance levels of the factor loadings. The CFA results support the theoretically identifiable structures of the models, the expected dimensionality of the construct *PM culture*, and the expected relationships among *PM culture*, its dimensions and sub-dimensions, although some minor modifications were done to the initial models during the CFA processes. According to the standard textbooks of structural equation modeling (eg., Hair *et al*, 1998), once a model has been modified, the modified model

should be tested with new data for its validity. This rigorous step in re-assessment has not been followed in this study given that the modifications did not distort the structures of the initial measurement models.

The discussions of the appropriateness of each of the models are as follows:

- **The sub-dimension model of Professional Commitment** (refer to Figure 7-15). All the goodness-of-fit measures show a very good model-data fit and all the estimated parameters are in the expected direction (positive). Also all the estimated parameters (except those for measurement errors) are significant at 0.01 or 0.001 level. There are no offending estimates in the model. The result has confirmed the expectation of the three sub-dimensions, even though with two paths modified and an error sub-factor extracted. The path changes are theoretically justifiable (refer to Section 7.4.1) and the error sub-factor represents PM professionals' general attitude towards work-leisure relationships, which is not correlated to any of the three sub-dimensions (sub-factors) of the PC factor. The extraction of this error sub-factor is consistent with Parker's (1972) theory of work-leisure relationships.
- **The sub-dimension model of Project Team Integration** (refer to Figure 7-16). All the goodness-of-fit measures, except p (with a value of 0.00) and NFI (with a value of 0.73), show a good model-data fit. As discussed in Chapter 6, p is sensitive to sample size and the ADF estimation often leads to a low value of NFI. So, despite the values of p and NFI, the model-data fit is acceptable. In this model, all the estimated parameters are in the expected direction (positive) and are significant at 0.001 level. There are no offending estimates in the model. The CFA result has thus confirmed the expectation of three sub-dimensions, even though the CTI and IFP sub-dimensions (with a high correlation of 0.87) are technically mergeable (if merged, there is a similar model-data fit). From the theoretical perspective, it is more appropriate to retain the two sub-dimensions as they are.
- **The sub-dimension model of Work Flexibility** (refer to Figure 7-18). All the goodness-of-fit measures, except NFI (with a value of 0.83), show a good model-data fit. The NFI value is minimally acceptable. In this model, all the estimated

parameters are in the expected direction (positive) and there are no offending estimates. Also, the estimated parameters (except those for measurement errors) are significant at 0.001 level. The CFA result has thus confirmed the expectation of the two sub-dimensions.

- **The sub-dimension model of Work Performance** (refer to Figure 7-20)). All the goodness-of-fit measures, except NFI (with a value of 0.71), show a good model-data fit. The NFI value is low. But due to the same reason as discussed before, the model-data fit is acceptable. In this model, all the estimated parameters are in the expected directions (positive or negative) and significant at 0.001, 0.01, or 0.05 level. There are no offending estimates in the model. The CFA result has thus confirmed the expectation of the two sub-dimensions, even though with a path modified. The path modification is theoretically justifiable (refer to Section 7.4.4).
- **The full model of PM culture** (refer to Figure 7-22). All the goodness-of-fit measures, except p (with a value of 0.02) and NFI (with a value of 0.82), show a good model-data fit. Due to the same reasons as discussed before, the values of p and NFI can be regarded as minimally acceptable. In this model, all the estimated parameters are in the expected directions (positive or negative) and significant at 0.01 or 0.001 level. There are no offending estimates. The CFA result has thus confirmed the expectation of the dimensionality of the construct *PM culture*.

9.2.2.3 Answer to research question 1: Can PM culture be described by a model?

The results of factor analyses show that:

- The factor structures from the exploratory factor analysis are satisfactorily clean;
- The questionnaire items have significant factor loadings on the dimensions and sub-dimensions in the expected directions (positive or negative) in both the EFA and CFA solutions;
- All the CFA models of the sub-dimensions and the full CFA model of PM culture have an acceptable model-data fit;
- There is no offending estimate in all the CFA models; and

- There are significant relationships (as expected) between the sub-dimensions, dimensions and the terminal construct *PM culture* (as illustrated in the full CFA model of PM culture).

Being successful in the establishment of the structural model of PM culture consisting of several dimensions and their respective sub-dimensions, this research comes to the answer to the research question 1: *Yes, PM culture can be described by a model consisting of several discrete dimensions on the basis of PM professionals' answers to written questions about work-related values and beliefs.* Its respective research hypothesis 1 is also confirmed.

9.2.3 From the Theoretical Perspective (Answer to Research Question 2)

9.2.3.1 Compared with Parson's pattern variable scheme

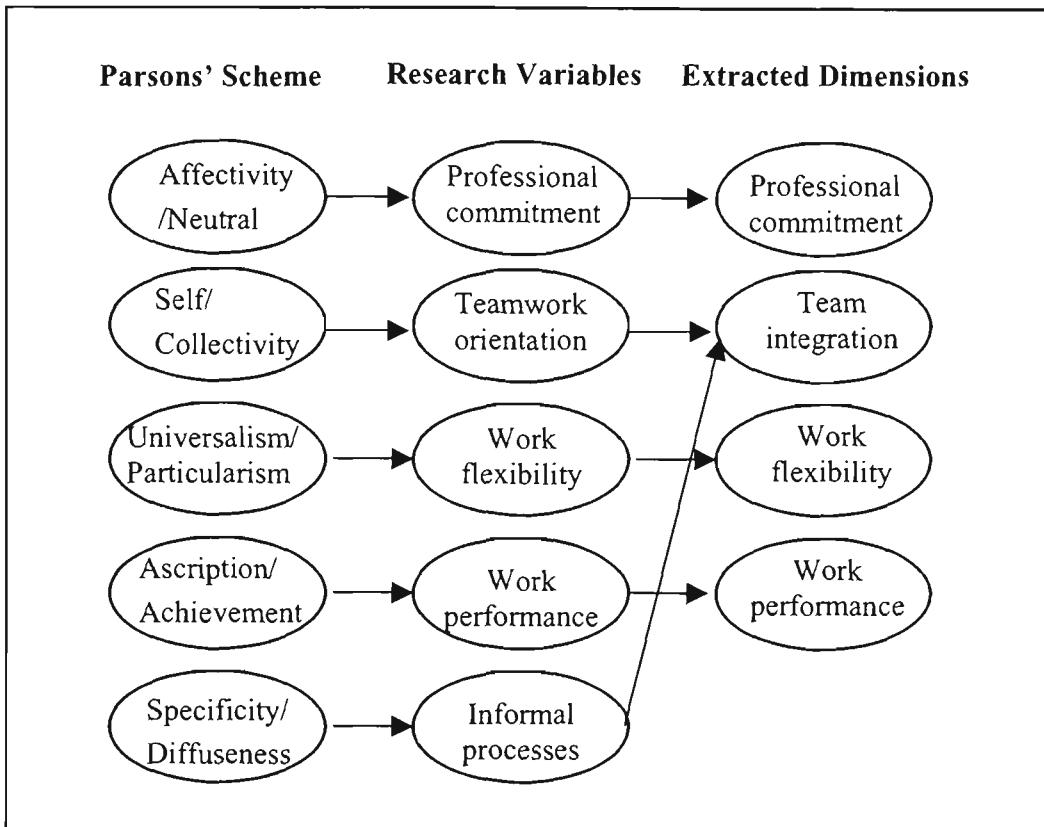
From the theories of culture and action, it is clear that (1) culture is a values and beliefs system guiding people's actions (refer to Chapter 2) and (2) people must make specific choices before they take actions with respect to particular situations within each pair of Parsons' five dichotomous pattern variables: *Affectivity* versus *Affective Neutrality*; *Self Orientation* versus *Collectivity Orientation*; *Universalism* versus *Particularism*; *Ascription* versus *Achievement*; and *Specificity* versus *Diffuseness* (refer to Chapter 5). These pattern variables are, at the cultural level, considered as "value orientations" for members of a particular group to take actions with respect to particular situations and they are claimed as a system guiding people's actions (Parsons and Shils, 1951). In Chapter 5 and 6, these pattern variables were applied to the content area of this research and developed respectively into the five research variables as PM professionals' values and beliefs about (1) Professional Commitment, (2) Teamwork Orientation, (3) Work Flexibility, (4) Work Performance, and (5) Informal Process. Therefore, an empirically-derived model of PM culture is valid only if it is largely consistent with Parsons' pattern variable scheme and its particular application (the theoretically designed research variables) in this research. A model significantly deviated from the pattern variable scheme cannot probably be used as an effective guide for understanding the PM culture as a work-related values and beliefs system guiding PM professionals' work behaviours.

As shown in the research results stated in Chapter 7, Section 7.3.3, the EFA-extracted dimensions of PM culture are in general consistent with Parsons' pattern variable scheme and its particular application (the research variables) in this research:

- The *Professional Commitment* dimension corresponds to the research variable of the same name;
- The *Project Team Integration* dimension is the combination of the two research variables: *Teamwork* and *Informal Process*;
- The *Work Flexibility* dimension corresponds to the research variable of the same name; and
- The *Work Performance* dimension corresponds to the research variable of the same name.

The above comparison between the structure of the EFA-extracted dimensions and that of the theoretically-designed research variables reveals one major point worthy noticing. In the solution of the extracted-dimensions, the two theoretically-designed variables, *Teamwork* and *Informal Process*, come out as one dimension instead of two. This implies that true teamwork requires active informal interaction among team members. This finding supports many authors' statements, such as Kinlaw (1998), about the importance of informal processes for enhancing team performance. This kind of relationship between teamwork and informal process is also supported even from the view of national culture, because nations' scores on the two dimensions of individualism/collectivism and specific/diffuse tend to be positively correlated. An individualism society tends to be specific, and a collectivism society tends to be diffuse. For example, Trompenaars' (1993) survey shows that USA and Australia are among countries exhibiting both individualism and specificity, while South Korea and Thailand are among countries that exhibiting both collectivism and diffuseness. Therefore it is comfortable to accept the extracted *Project Team Integration* dimension which includes the two theoretically designed variables: *Teamwork* and *Informal Process*.

Figure 9-2 shows the structure of the EFA-extracted dimensions in comparison with Parsons' pattern variable scheme and the theoretically-designed research variables.

**Figure 9-2: Theoretical Variables and Extracted Dimensions**

From the above discussion the research hypothesis 2-A is thus confirmed, that is, *the empirically-emerged dimensions of PM culture are in general consistent with the themes covered in Parsons' pattern variable scheme.*

9.2.3.2 Compared with what are reflected in the PM literature

As discussed in Chapter 4, PM culture has been discussed in the PM literature, e.g., Kerzner (2000), Kerzner (1998), Graham (1993), Hobbs and Menard (1993), Harrison (1992), Firth and Krut (1991), and Hofstede (1983). The literature's discussion of PM values and beliefs can be summarised as the following key points:

- PM is horizontal management, basically different from traditional vertical management. In PM, people are of low power distance, more task-oriented than boss oriented, and their status comes from what they do rather than whom they are.
- PM is teamwork oriented. An integrated project team is essential. Relationships among people are interdependent and cooperative instead of individualistic and competitive.

- PM is change oriented. Temporary situations and relationships are normal, uncertainty and change are taken as a way of life, and flexibility are emphasised.
- PM is results-oriented to deliver a project product. Even with indefinite and inadequate authority (this is not unusual in a project context), a project manager must get the job done.

The last three of the identified dimensions (and their sub-dimensions) of PM culture correspond to the above key points covered in the PM literature:

- The dimension *Project Team Integration* is closely relevant to horizontal management, team-orientation, and results-orientation which are reflected in the literature. Project team integration requires (1) a knowledge-based instead of a hierarchical-position-based influence on team performance, (2) a consciousness of team identity – team members see themselves as part of the project team and are team-oriented, and (3) as many informal processes as needed by true teamwork to achieve project results. Furthermore, the structure of the three sub-dimensions is consistent with what is reflected in the PM literature. For example, Lewis (1998b) identifies *Identity*, *Information*, and *Relationships* as the three domains to the establishment of a self-organising and integrated project team that produces team synergy. The three sub-dimensions, *Consciousness of Team Identity*, *Knowledge-Based Influence*, and *Informal Process*, identified in this research correspond respectively to Lewis' (1998b) three domains.
- The dimension *Work Flexibility* corresponds to a change-orientation which requires high flexibility. Both the two sub-dimensions, *Job De-Codification* and *Work Autonomy*, are closely related to the change orientation. The structure of the sub-dimensions is consistent with what is reflected in the literature, such as, Miller's (1991) two dimensions of work formalisation. Work flexibility and formalisation can be generally regarded as “the two sides of a coin”.
- The dimension *Work Performance* corresponds to results-orientation and horizontal management, both of which require people's status comes from what they do rather than whom they are. The negative sub-factor identified in this research is easily understandable. If an individual has close personal relationships with another one, their views of each other are likely to be emotionally affected by these relationships irrespective of their work performance.

But the first of the identified dimensions, *Professional Commitment*, is beyond the discussion in the PM literature. The PM literature does not provide any explicit discussion about PM professionals' commitment to the PM profession. Reflecting a traditional view of PM, the literature stresses PM professionals' customer-orientation and neglects their profession-orientation and treats PM culture mainly as a culture or sub-culture within an organisational context rather than as a professional culture at a profession-wide level.

Figure 9-3 illustrates the correspondence between the identified dimensions of PM culture and the literature-reflected key points of PM culture.

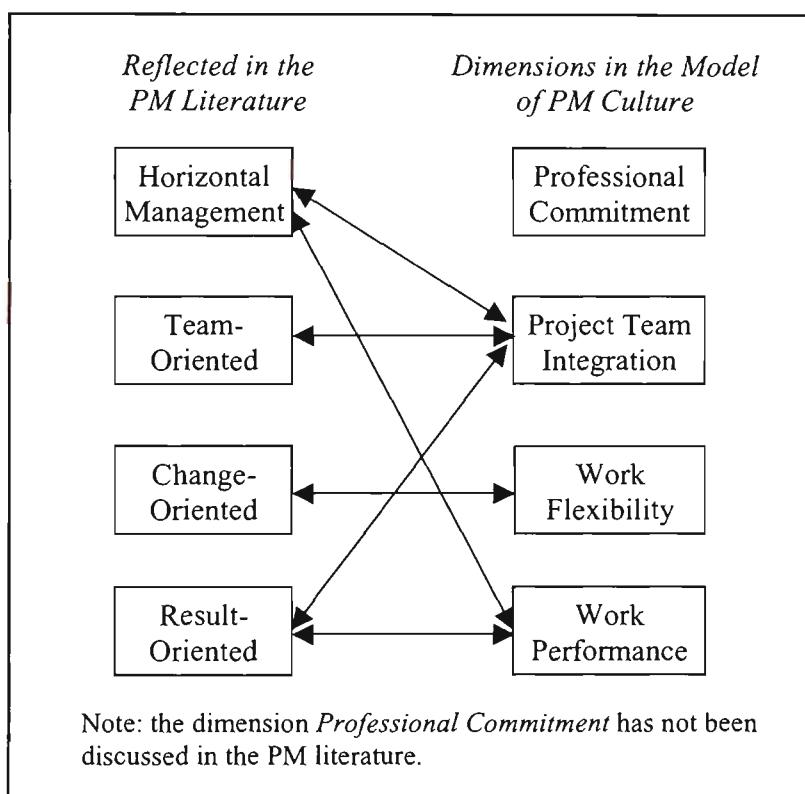


Figure 9-3: PM Culture – The Model and Literature-Reflected

Although not discussed in the PM literature, the dimension *Professional Commitment* corresponds to the relevant points in the theories of professions. As discussed in Chapter 3, a profession has a trait of *professional commitment*, that is, its members identify with the profession and their fellow professionals and they are committed to the profession as a calling (refer to Section 3.2.1). As one of the important factors in determining people's work behaviour, professional commitment is a topic attracting

much attention from academics and managers, eg., Morrow (1993); Lee, Carswell and Allen (2000), Dwyer, Welker and Friedberg (2000); Irving, Coleman and Cooper (1997); and Meyer, Allen and Smith (1993), just to name a few. Professional commitment has been studied in many other professions, such as physicians (Hoff, 2000; Shuval and Bernstein, 1996), accountants (Jeffrey and Weatherholt, 1996; Aranya, Pollock and Amernic, 1981), MIS (management information systems) professionals (Vandenberg and Scarpello, 1994), and engineers (Baugh and Roberts, 1994). However, no such study has been conducted for PM professionals. If project management is a profession, its members' commitment to it must not be neglected. Therefore, the identification of *Professional Commitment* as one of the key dimensions of PM culture is necessary and reasonable.

As discussed in Chapter 7, Section 7.3.3 and Section 7.4.1, the identified dimension *Professional Commitment* and its three sub-dimensions are theoretically appropriate. The structure of the sub-dimensions is consistent with Morrow's (1993) and Hiremath, Gudagunti, and Kulkarni's (1996) definitions of professional commitment and also with Salaman's key components of a professional community (refer to Section 6.2.2.1).

In this research, the structural model of *Professional Commitment* was established from the perspective of the defining characteristics of a professional community, differently from the previous method of simply borrowing the model of *Organisational Commitment*. For example, Meyer, Allen and Smith's (1993) three-component model of *Professional Commitment* was modified from Meyer and Allen's (1991) same model of *Organisational Commitment*. This previous way of defining and measuring *Professional Commitment* is deficient because it regards a professional community as just another employing organisation in spite of the fact that they are not the same. As shown in the research results stated in Chapter 7 and Chapter 8, the scale of *Professional Commitment* has satisfactory reliability (Cronbach's $\alpha = 0.80$) and discriminative ability to distinguish the respondents with different demographic characteristics. Therefore, the new model of *Professional Commitment* is a contribution of this research to the theories of professions.

From the above discussion this research comes to the confirmation of the research hypothesis 2-B, that is, *the empirically-emerged dimensions of PM culture in general cover the issues discussed in the literature of PM and professions which are relevant to work-related values and beliefs in the PM profession.*

9.2.3.3 Relationships between the dimensions and the *PM culture* construct

In the CFA model as shown in Figure 7-22, the relationships between the dimensions/sub-dimensions and the *PM culture* construct are reflected as the construct's direct effects on the dimensions and indirect effects on the sub-dimensions. Based on the CFA model, these effects are calculated as shown in Table 9-1.

Table 9-1: PM Culture's Standardised Effects on Dimensions/Sub-Dimensions

	PM Culture	PC	PTI	WF	WP
Dimension:					
Professional Commitment	0.23* (0.014)**				
Project Team Integration	0.80 (0.002)				
Work Flexibility	0.46 (0.002)				
Work Performance	0.54 (0.002)				
Sub-Dimension:					
PM Career Pursuit	0.15 (0.014)	0.65 (0.002)			
PM Reference Group	0.22 (0.013)	0.95 (0.002)			
Leisure Time for PM	0.08 (0.014)	0.33 (0.002)			
Consciousness of Team Identity	0.45 (0.002)		0.56 (0.002)		
Knowledge-Based Influence	0.46 (0.002)		0.58 (0.002)		
Informal Process	0.61 (0.002)		0.76 (0.002)		
Job De-Codification	0.19 (0.002)			0.40 (0.002)	
Work Autonomy	0.42 (0.002)			0.91 (0.002)	
Work Performance	0.54 (0.002)				0.99 (0.002)
Personal Relationships	-0.10 (0.009)				-0.18 (0.009)

Note: * The figures in bold are direct effects, and other figures are indirect effects.

** The figures in parentheses are two-tailed significance levels of the standard effects, which were obtained through bootstrapping 1000 samples. In the software, bootstrapping is the only way to obtain significance levels for indirect effects.

From the above table, it is clear that the construct *PM culture* has significant direct positive effects as theoretically-expected on the four dimensions. It also has significant indirect effects as expected on the sub-dimensions. All the dimensions' effects on their respective sub-dimensions are also significant and positive or negative as theoretically-expected. Therefore, this research comes to the confirmation of the research hypothesis 2-C, that is, *the empirically-derived model of PM culture reveals that PM professionals are expected to be (1) committed to the PM profession, (2) teamwork oriented, (3) work flexibility oriented, (4) work performance oriented in viewing project team members, and (5) willing to develop as many informal work relationships with project team members as needed for true teamwork.*

9.3 CURRENT STATUS OF PM CULTURE

9.3.1 Professional Commitment

In general, the survey results (see chapter 8) show that PM professionals' commitment to the PM profession is at an acceptable level. They obtained a score of 3.65 on the scale from 1 (no commitment to the profession) to 5 (high commitment to the profession). In particular, PM professionals have a strong career pursuit in project management (with a score of 4.06), an appropriate use of the PM reference group (with a score of 3.72), but their contribution of leisure time to PM is relatively low (with a score of 2.68).

9.3.1.1 PM career pursuit

It is essential for any profession that its members view the profession as a terminal career and not as a stepping stone to another occupation. As Goode (1957:194) stated, "Once in it, few leave, so that it [the profession] is a terminal or continuing status for the most part [of the professional community]." Therefore, the degree to which PM professionals regard project management as their permanent career is an important measure of the degree of the professionalism of project management.

During the 1960s and 1970s, project management was only an "accidental" occupation, and few people saw it as their career pursuit. Since the 1980s, project management has become a career that people consciously choose to pursue. The PMI's *Fortune 500 Project Management Benchmarking Study* shows that all the respondents feel that project management should be a career track (Toney and Powers, 1997). PMI's *1998/1999 Environmental Scanning* shows that two-thirds of PMI members view project management as their primary profession (career) (PMI, 2001).

The survey results of this research are consistent with what are reflected in the literature, that is, PM professionals see project management as their career pursuit. For all the four items measuring PM career pursuit, more than 70 percent of the respondents rated them as important or very important factors in determining their job

satisfaction. PM professionals want to build their professional reputation, improve PM knowledge, earn salary relative to other PM professionals, and have good career prospects in project management.

PM professionals' career pursuit in project management is probably supported by recent changes in business, such as, (1) the tasks that organisations are facing have become more complex and demand integration of different functional disciplines, (2) the increased size and scope of projects require the development of a project management system, and (3) the rapidly changing environment in which organisations operate requires more flexible structures. These changes in business promote the wide application of project management and encourage organisations to create project management as a new career path along with the traditional career paths of general management and technology (Kerzner, 2000; Lewis, 1998a). PMI (2001) estimates that about 15 million people in the world and 4 million or 1.5 percent of the population in the USA might consider project management as a profession (career) of choice.

9.3.1.2 PM reference group

The concept of reference group involves the three aspects which are related to each other (Shibutani, 1955):

- a group which serves as comparison point for people to form a judgment about themselves;
- a group to which people aspire to gain or maintain acceptance; and
- a group whose perspective is assumed by people to be their own frame of reference for action.

Professionals' knowledge and skills are continually being refined and developed with the assistance of professional peers outside of their employing organisations; and moreover, their continued standing as competent professionals cannot be validated by members of their own organisations who are not in the same profession (Gouldner, 1957). Even working in an organisational context, professionals are likely to be oriented to cross-organisational labour markets and have relatively short tenures in a particular organisation (Martin, Riemens and Wajcman, 2000). For these reasons, professionals are more likely to seek recognition and acceptance from their

professional peers outside their organisations, that is, they use other members of the same profession as their most important reference group for their professional performance.

The survey results from this research show that PM professionals have to some extent established their PM peers as a major reference group. More than 60 percent of the respondents rated important or very important these items: *Belonging to the PM professional community*, *Contacting with PM professionals*, and *Earning excellence in eyes of PM professionals*. Using other PM professionals as a reference group is certainly associated with a view of the PM profession as a terminal career. PM professionals pursue project management as a career, consequently they desire to be compared with and accepted by other PM professionals. This reference group will in turn reinforce PM professionals' career pursuit in project management.

However, PM professionals' use of PM reference group is not as strong as their PM career pursuit. Two reasons may be mainly accountable for the relative weakness in the reference group. One is that a time lapse between the establishment of PM as a career and the emergence of a PM reference group. Project management, as a new profession, has at most a 20 years history since it became a potential career people consciously chose to pursue. The PM profession has not yet had sufficient time to establish a PM reference group on a sufficiently-wide basis. The other reason is the weaknesses in the process of the professionalism of project management, such as lacking a unique title to cover all its members and lacking a set of professional criteria for its members' evaluation of their peers' performance from the perspective of the PM profession.

What do you do? When asked this question, members of several typical professions, such as accounting, medicine, and engineering, are usually ready to answer: "I am an *accountant*, a *doctor* (*a nurse*), or an *engineer*". For members of the PM profession, there is not yet such a title which is clearly defined and exclusively linked to the PM profession. This is a substantial obstacle to people's self-identification with the PM profession. For example, in a membership survey conducted by AIPM in June 2000, when asked the question "What is your profession (What do you do)", 66 percent of its

members stated their professions as engineer, architect, IT professional, quantity surveyor, etc, and only 34 percent declared themselves as a project manager (AIPM, 2000). This result is understandable because the PM profession does not provide an appropriate title to its members who are not project managers. It is unlikely that a person calling himself/herself *engineer* would identify himself/herself with the PM profession and use PM professionals as a major reference group.

The title, *project manager*, is widely used in the PM profession. However, its current usage has at least two problems:

- it is so widely and randomly used in an organizational context as a position title, similar to *marketing manager*, *finance manager*, and *production manager*, that its link to the PM profession is quite weak. Many people are even called, or call themselves, *project manager* without any reference to the PM profession.
- it cannot cover all members of the PM profession. When performing PM activities, members of the PM profession may play not only the role *project manager* but also other relevant roles such as *project engineer*, *project accountant*, *contract administrator*, to name just a few.

Probably it is the time for the PM profession to re-define the term *project manager* or create a new word or word combination, similar to *accountant* for the accounting profession and *engineer* for the engineering profession, as the exclusive title of members of the PM profession. According to Wilensky (1964), a profession may change its name during the process of professionalism, for example, hospital superintendents have become hospital administrators; relief investigators have become caseworkers; and newspaper reporters have become journalists.

Traditionally, project management was defined as to complete a project within time, cost, scope, and quality constraints that are mainly viewed from the perspective of a project owner/client, and project success and PM performance are consequently evaluated against such criteria. Are these also the professional criteria of the PM profession for measuring project success and PM performance? In the sociology of professions, it is assumed that a client- or customer-orientation is sometimes incompatible with a professional orientation (Wilensky, 1964). As different project

owners/clients impose different constraints on their projects, the traditional criteria are likely to be incomparable from project to project, and inappropriate to be used for the purpose of comparison within the *whole* PM community. The PM profession needs to develop a set of professional criteria for its members' evaluation of their peers' PM performance from the perspective of the PM profession. These criteria should constitute the basis on which a peer review program can be established in the *whole* PM profession across organisational, industrial, and even national boundaries.

9.3.1.3 PM professionals as cosmopolitans or locals

Most members of the PM profession work in organisations. They are not only members of the profession but also members of their employing organisations. These two roles are in some cases complementary and supplementary, and in others compete or even conflict. Like members of other professions, PM professionals' commitment to organisations and the profession can also be measured by the concepts of *cosmopolitan* and *local*. According to Gouldner (1957: 290),

[Cosmopolitans are] low on loyalty to the employing organization, high on commitment to specialized role skills, and likely to use an outer [professional] reference group orientation...[and, locals are] high on loyalty to the employing organization, low on commitment to specialized role skills, and likely to use an inner [organizational] reference group orientation.

The survey results of this research show that PM professionals are more likely to be cosmopolitans rather than locals, that is, they are more committed to the PM profession than to employing organisations. As shown in Table 8-3, the survey respondents obtained significantly ($p < 0.01$) higher scores on professional commitment than on organisational commitment, and as shown in Table 8-16, the questionnaire items about professional commitment were rated important or very important by most respondents (from 62% to 85%) while the items about organisational commitment only by about half of the respondents (45% to 73%).

The survey-evidenced cosmopolitan status of PM professionals can be explained by the following several reasons:

- PM knowledge and skills, derived from long formal education and training, lead PM professionals to make a more basic commitment to their PM job than to the organisations where they work.

- Because of their PM competencies, they have greater opportunities for horizontal job mobility and can obtain jobs in many different organisations. For example, El-Sabaa's (2001) survey shows that project managers' average number of movements from one organisation to another is 5.1, while functional managers' is only 2.3.
- Because of the temporary nature of projects, it is essential for PM professionals to be ready for job mobility from project to project. For example, El-Sabaa's (2001) survey show that project managers' average number of movements across projects is 6.8 while functional managers' is only 2.1.

9.3.1.4 Leisure time for PM

True professionals derive intrinsic satisfaction from their work and see it as an activity with which they can exercise creativity and intelligence. Viewing work in this way, they are likely to carry work-related activities, interests and relationships into their non-work lives (Salaman, 1974). Their non-work lives can be severely affected by their work roles. This kind of work-leisure relationships is consistent with Parker's (1972) theory of work-leisure relationships. Parker's (1972) theory identifies three patterns of work-leisure relationships, ie., extension, opposition, and neutrality, and relates each of them to a set of associated variables. From the theory, it is clear that professionals are expected to be extension-pattern oriented, that is, they have a strong tendency to extension of work into leisure.

Salaman's and Parker's above theme could be applicable to the PM profession. PM professionals are expected to contribute some of their leisure time to professional activities and interests, and they are also expected to prefer to associate with other members of the PM profession than with outsiders. In some way, their non-work lives may be so significantly influenced by their PM activities that the boundaries between their work and non-work lives fade.

The survey results of this research show that

- the respondents obtained a score of 2.68 on the 1-5 scale, and
- more than 50 percent of the respondents did not like to participate in PM activities (such as PM conferences, discussions, seminars) and did not take project management as one of their favourite topics in leisure time.

So, generally speaking, PM professionals are not yet prepared to contribute their leisure time to the profession. Their professional commitment in terms of the *Leisure Time for PM* is low. However, a further examination of the data reveals that:

- the large standard deviations (1.22 and 1.45) of the two questionnaire items demonstrate wide discrepancies in the support for the items.
- 41 percent of the respondents liked to participate in PM activities in leisure time.
- 30 percent of the respondents liked to talk about PM in leisure time.

So it can be concluded that there is a great disagreement among PM professionals about contributing leisure time to professional activities.

In addition to their attitude (commitment) to the profession, PM professionals' general attitude about work-leisure relations may also affect their willingness to contribute leisure time to professional activities. According to Parker's (1972) theory of work-leisure relationships, people with a general philosophy of segmentalism and of holism tend to develop different patterns of work-leisure relationships. In a general sense, the latter like to work even in their leisure time (extension pattern), and the former want a clear boundary between their work and leisure (neutrality or opposition pattern). Because of the difference in their general attitude, PM professionals equally committed to the PM profession would be different in their attitudes about contributing leisure time to professional activities. The confirmatory factor analysis (Chapter 7, Figure 7-15) has confirmed the existence of a factor representing such a general attitude. As an error factor, the factor of general attitude causes extra difficulties in measuring and interpreting the construct of *Professional Commitment*. The discussion of the general attitude is beyond the scope of this research and it needs to be studied as a separate topic.

9.3.1.5 The effect of demographics

The effects of several demographic characteristics are discussed in the following text.

Age and years of PM experience

The research results in Chapter 8 show that the respondents' professional commitment is somewhat associated with their age and years of PM experience. Among the three experience groups of *less than 6 years*, *6-10 years*, and *above 10 years*, the group of *6-10 years* obtained the highest scores and the group of *less than 6 years* obtained the

lowest scores on the PC factor and its sub-factors (see Figure 9-4). A similar situation exists among the three age groups of *30 years and below*, *31-50 years*, and *above 50 years*. But among the age groups, the group of *30 and below* obtained the highest score on the PCP sub-factor.

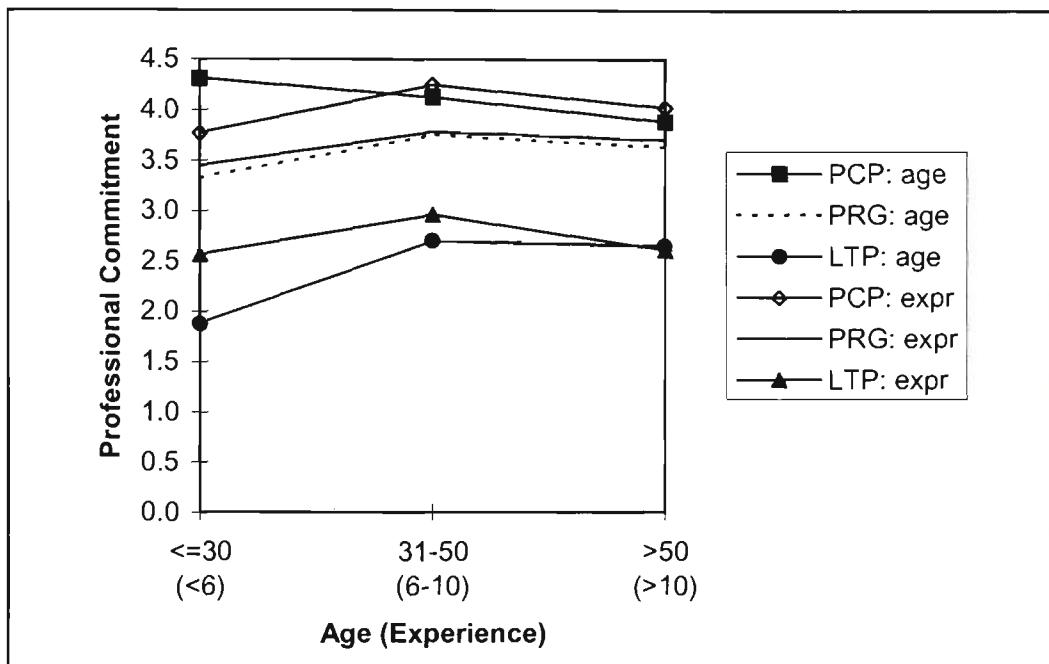


Figure 9-4: Age/Experience and Professional Commitment

The independent samples t-test results in Chapter 8 show that:

- the respondents aged *30 and below* obtained a significantly lower score on the PRG sub-factor than either those aged *31-50* or those aged *above 50* ($p = 0.000$);
- the respondents aged *31-50* obtained a significantly higher score on the PCP sub-factor than did those aged *above 50* ($p = 0.006$).
- the respondents with PM experience of *6-10 years* obtained significantly higher scores on the PC factor ($p = 0.033$), and its PCP sub-factor ($p = 0.012$) and LTP sub-factor ($p = 0.030$) than did those with experience of *above 10 years*.

Therefore, it can be concluded that:

- Young people aged *30 and below*, who are strongly pursuing project management as a career, need more years of PM experience to reinforce their professional reference group orientation.
- Those PM professionals who are at the peak of their career are most highly committed to the profession. Approaching the end of their PM career, peoples'

professional commitment (especially their career pursuit) will to some degree decrease.

- At least 6 years of industrial experience is needed for people to be well-established in their professional commitment.

Education and PM training

The survey results show that postgraduate-educated respondents obtained significantly higher scores on the PC factor ($p = 0.005$) and its PRG sub-factor ($p = 0.046$) and LTP sub-factor ($p = 0.000$) than did graduate and below educated respondents. On the PCP sub-factor the former group of respondents also obtained a higher score than the latter, although the difference could not meet the requirement of the usual statistical significance levels.

Compared with their general education, PM professional education and training have more significant impacts on people's professional commitment. The survey results show that those respondents who had been professionally educated/trained in project management by formal postgraduate PM courses or PMP® examination preparation courses obtained significantly higher scores on the PC factor ($p = 0.001$) and its all PCP, PRG, LTP sub-factors (respectively, $p = 0.021, 0.038, 0.001$) than the others who were short course trained or without any PM training.

From the survey results of this research, it is known that postgraduate PM education/training is important for PM professionals to establish and reinforce their professional commitment. During the courses, they not only systematically learn the PM body of knowledge, but are also socialised in accordance with a set of professional values and beliefs. The socialisation is usually completed through not only the formal instruction but also contact with faculty and professional peers.

These survey results from this research are consistent with relevant statements in the sociology of professions and also with findings from previous studies of other professions. For example,

- One of the key tasks of medical schools is "to provide him [a student] with a professional identity so that he comes to think, act, and feel like a physician." (Merton, 1957: 7)

- One of the purposes of professional schools is “the transmission of values, attitudes, and commitments that will serve to bind the novice to the profession.” (Perrucci and Gerstl, 1969: 55)
- From a survey of engineers’ professional values, Perrucci and Gerstl (1969: 123) concludes:

The findings ... indicate that the importance of professional values is more highly associated with educational level than with work career patterns. This suggests either that advanced education imparts the expertise that generates the associated professional values in work settings or that the values are imparted in the more intensive socialization of graduate education.

- Berger and Grimes’ (1973) survey of faculty members of business schools shows that professional commitment (scientific research ethic) is positively correlated with the survey respondents’ educational levels (degrees) at the significance level $p < 0.01$.

Other two important points revealed by the survey results in this research are:

- On-the-job training and short courses are not sufficient to develop a high professional commitment. Every PM professional going through the never-ending on-the-job training, may have attended, and will attend one or more short courses. Short courses can be used as an effective and efficient supplement to formal PM courses. Ideally, PM professional training includes: a formal postgraduate PM course, plus short courses as necessary, plus on-the-job training.
- Commitment by PM professionals who have completed PMP® exam preparation courses is similar to that by those who are postgraduate trained. Two possible reasons are: (1) Professionals who plan to sit the PMP® exam usually have established a good basis of PM knowledge before attending the preparation courses; and (2) the preparation courses, although they are short term courses, are probably of better quality than other kinds of short courses.

Current PM position

The survey results show that PM professionals in the position of project managers more highly commit themselves to the PM profession than those in non-project-manager positions ($p = 0.014$), and project managers regard project management as their career more highly than non-project-managers ($p = 0.014$). Compared to project

team members, project managers are more likely to use other PM professionals as their major reference group ($p = 0.005$).

These survey results are rational. In the PM profession, the term “project manager” is so widely used that it has to some extent become a term representing the PM profession. Some people may say that the PM profession is a profession of *project managers*. Actually, existing PM standards, such as AIPM’s competency standards and its professional qualification program of registered project managers, are primarily directed to the role of project managers. Also, the PM literature pays more attention to the role of project managers than to those of others.

As discussed previously, the PM profession does not have an appropriate title to cover all its members. For those in the position of project manager, this problem is not significant. They can be called project manager by both insiders and outsiders of the PM profession. However, for those in a non-project-manager position, the lack of an appropriate title can be a significant obstacle for their identification with the PM profession. If someone asks them about their job, it is not easy for them to find a title to transmit the information that they are members of the PM profession but not project managers. Facing this difficulty, they may choose to answer in terms of other relevant professions in which they maintain memberships, such as engineering, architecture, computer, accounting, etc.⁴⁰

9.3.1.6 Summary

From the survey results and above discussion, it can be generally concluded that:

- PM professionals’ commitment to the PM profession is at an acceptable level (scoring 3.65 out of 5) in terms of the combination of their pursuing a PM career, using PM professionals as a major reference group, and contributing leisure time to professional activities.
- PM professionals take project management as their career pursuit (scoring 4.06 out of 5) and use other members of the same profession as their reference group

⁴⁰ According a survey of AIPM, 72 percent of AIPM members maintain memberships of other professional institutes or associations (AIPM, 2000)

(scoring 3.72 out of 5), but their willingness to contribute leisure time to PM professional activities is relatively weak (scoring 2.68 out of 5).

- PM professionals are more cosmopolitan (profession-oriented) than local (employing-organisation-oriented).
- The demographic characteristics of age and PM experience have some effects on professional commitment. PM professionals at the peak of their PM career are mostly committed to the PM profession.
- Professional commitment is positively associated with people's educational levels, especially PM professional educational/training levels. Postgraduate educated professionals commit themselves to the profession more highly than graduate (and below) educated ones. Postgraduate-PM-trained professionals commit themselves to the profession more highly than those who are short course trained or without any PM training.
- Professionals in a position of project manager are more highly committed to the PM profession than others in a non-project-manager position.

9.3.2 Project Team Integration

9.3.2.1 Overview

The most important function of project management is integration. A project manager is usually an integrator of different functional disciplines, different organisational units, and even different organisations. The larger and more complex a project is, the more critical such integration skills. To achieve the required integration, a highly integrated project team is a must in which team members with different backgrounds are integrated into a whole. No matter how many functional disciplines, organisational units, and organisations are involved in a project, it is such an integrated project team that ultimately determines the success of the project.

The survey results show that PM professionals have strong beliefs about project team integration. The respondents obtained a score of 4.34 with a standard deviation 0.38 on the PTI factor and respectively 4.38 with 0.52, 4.11 with 0.64, and 4.41 with 0.43 on its CTI, KBI, and IFP sub-factors. It is possible that the particular obstacles to teamwork in a project context (See Chapter 5, Section 5.3.2 for details) make PM

professionals pay close attention to the matter of project team integration. PM professionals are aware of those obstacles and that an essential way to overcome them is to stress project team integration, ie., every team member is an integrated part of the team no matter what position he/she is on the project and what background he/she has.

These findings are consistent with what are reflected in the PM literature. In the literature, project teamwork is one of the hottest topics. Kerzner (2000) states the four basic values of project management as cooperation, teamwork, trust, and effective communication. Kliem, Ludin and Robertson (1997) view a project team as an integrated, multifunctional entity to deliver a product yielding complete results. In such a team, participation by everyone is essential. The team is not viewed as consisting of an elite corps of highly specialised functions with other ones as mere appendages. Each discipline has a significant role in contributing to the successful completion of the project.

9.3.2.2 Consciousness of team identity

Identity is the most fundamental principle to all self-organising systems (Lewis, 1998b). One of important tasks of project managers is to develop a sense of team identity among team members.

It is not easy to establish a team identity in a project context. Projects are temporary tasks, and consequently project teams will be disbanded as soon as the projects are completed. Memberships of project team keep changing. New members join the teams as required from time to time, while some of old members leave. Some members of the teams are borrowed from relevant functional departments of the organisations. With the two bosses of their functional managers and the project managers, they may have little opportunity or motivation to develop a commitment towards the projects. As a multi-disciplinary team, its members come with very different backgrounds and may have difficulties in identifying with each other.

It may be due to the importance of and these obstacles to developing a project team identity that PM professionals believe in its establishment. The majority of the survey respondents in this research regarded themselves as part of the project team when

working on a project; regarded group discussions as a desirable way of decision-making; believed that a project team is where people work together rather than individuals perform their own tasks; believed that team members should be equally responsible for the completion of the whole project rather than for only their own part of the tasks; and believed that team members should be encouraged to make suggestions for improving every aspect of team performance rather than to confine their opinions to what is most relevant to their own tasks. These beliefs would be helpful for PM professionals (usually as project managers) to develop a group of diverse people into an integrated project team.

Among the five items measuring consciousness of team identity, Value12 (*Members equally responsible for the whole project*) obtained the lowest (74 percent) support from the respondents. Two reasons may be accountable for the relatively low support:

- The item is of relatively low discrimination, as evidenced by Trompenaars' (1993) survey using a similar item to measure individual and group's responsibility for a defect caused by a team member's negligence. A possible explanation is that because individual responsibility and collective responsibility are both required to ensure good team performance, it is relative difficult for the respondents to make a choice between the two things offered in the dilemma. The large standard deviation (1.21) from this survey can demonstrate this difficulty. A reconciliation is needed to obtain a balance between individual and collective responsibility. An integrated project team would see the collective responsibility as its "end" and the arrangement for individual responsibility as a "means" to achieve that end.
- In traditional project management textbooks, it is stressed that a project manager is a single point of responsibility for the project without an explicit expression of team members' responsibility. It may be more appropriate to express the statement of responsibility as: *A project manager, as the representative of the project team, is a single point of responsibility towards all external parties involved in the project, while all team members are, within the team's boundaries, regarded equally responsible for the success of the whole project.*

PM professionals may be different from general managers in the aspect of individualism or collectivism. According to the results from previous studies, such as

Hofstede (1980), Hampden-Turner and Trompenaars (1993), and Trompenaars (1993), Australian are generally classified as individualists rather than collectivists. Hampden-Turner and Trompenaars (1993) use the following dilemma to measure individualism and collectivism:

Which kinds of jobs do you prefer:

- (a) *Jobs in which no one is singled out for personal honour, but in which everyone works together.*
- (b) *Jobs in which personal initiatives are encouraged and individual initiative are achieved.*

Ninety-seven percent of Australian managers choose (b), showing a strong orientation towards individualism. However, this research, using a similar item⁴¹, obtained a very different result: only 58 percent of the respondents chose the answer of personal initiatives. This result implies that PM professionals are likely to be more oriented towards collectivism than general managers. Generally speaking, individualists may not be as good team players as collectivists, and people's emphasis on teamwork is closely correlated with their collectivism orientation. For example, using the same method as Hofstede's (1980), Wallace, Hunt, and Richards (1999) found that, because police organisations produce great emphasis on teamwork and mutuality, Australian police are considerably lower on the individualism than that recorded by Hofstede (1980) for the national level (40 compared with 90 on a 1-100 scale).

9.3.2.3 Knowledge-based influence

The survey results of this research show that the majority of the respondents believed that bosses should be characterised by their knowledge and skills rather than their position power, team members should have more influence on the basis of what they know instead of what position they have, and different sources of information for problem-solving should be treated equally pending the outcome of evaluation of them. This kind of knowledge-based influence is consistent with what is reflected in the PM literature. It is really a basic requirement for successful project management.

⁴¹ The item is Value6. Because of its low MSA measure, the item was excluded from the factor analysis (See Chapter 6).

In a project context, a project manager is usually not the boss over project team members, since many of the members are borrowed from functional departments and some of the members may be higher in the hierarchy than the project manager. The project manager has to work with the members to create a climate of cooperation and coordinate the efforts of the team members without having direct line authority. There is a wide agreement about the fact that project managers' authority is often incommensurate to their responsibility for the project, such as Lewis (1998b), Young (1996), and Frame (1995). Without sufficient authority, the only way to get things done for a project manager is through influence. A leadership profile survey of American project managers found that "leadership by example" is the most important characteristic of effective project managers (Zimmerer and Yasin, 1998). Also, as stated by Lewis (1998b: 86),

It seems to be an unchangeable fact of life that project managers have a lot of responsibility but no authority. I say it is unchangeable because I don't see many organizations setting up hierarchically structured project groups so that the project manager "owns" the people on the team. When you have no authority over people, you have to get things done through the use of *influence*.

While influence can come from different sources, knowledge-based influence is powerful. In a project team, those member are in power who are best equipped with the knowledge/skills particularly relevant to a special case. Based on the knowledge-based influence, it is common to many projects that important decisions are made by many different individuals throughout the project (Frame, 1995). Frame (1995: 57) argues that, in a project team, "in answer to the question 'Who is in charge?' we are not being frivolous if we answer, 'To a certain extent, *everyone* is in charge.'"

Due to the separation of authority from responsibility, PM professionals probably believe more in knowledge-based influence than general managers do. Hampden-Turner and Trompenaars' (1993) survey found that 62.5 percent of Australian managers thought that a boss should be characterised by his/her job knowledge and skills rather than position power. But in this research, 91 percent of the PM professionals believed that a boss should be characterised by knowledge and skills rather than position power. This result supports Kerzner's (1998) argument that, in project management, the traditional superior-subordinate relationship is largely

replaced by peer-to-peer, manager-to-technical expert, and associate-to-associate relationship.

9.3.2.4 Informal process

The survey results of this research show that PM professionals believe in informal processes for communication within a project team. The respondents obtained a score of 4.41 on a 1-5 scale, and the majority of them were willing to help other members and believed that

- Communications should be encouraged between all hierarchical levels instead of just two immediate levels, and informal communication could enhance team performance;
- Relationships among team members should go beyond formal relationships, members should have access to any other members for problem-solving and members should give informal appreciation to each other for peers' work performance; and
- If a team member has a personal problem that comes up, he/she can expect the special consideration he/she might need to solve it from the project team.

The above findings of this research are consistent with what are reflected in the PM literature (eg., Kerzner, 2000; Lewis, 1998b).

True teamwork can only be reached with the support of informal interaction within the project team. A project team may use formal titles, job descriptions, and rules and procedures to manage formal relationships among project team members. However, this kind of formal relationships is insufficient for true teamwork if it is not supported by some kinds of informal relationships among team members. Like in a football team, each member has a formal position in a game but his/her role must not be limited to the position. He/she must be ready to provide assistance to other players and do everything needed to win the game.

In a project context, it is not unusual that project managers have insufficient formal authority and people need to work together under no or weak formal relationships. Thus they must rely heavily on informal relationships to get things done. Kerzner (2000) argues that the application of *informal project management* which is based on

informal processes is the most significant change in project management over the past 20 years. In informal project management, a project manager's authority is not clearly documented but implied in informal processes, and paperwork for policies and procedures are minimal. Lewis (1998b) identifies relationships as an important domain to ensure team performance. He suggests that an important task of project managers is (1) to create networks of communication and interaction; (2) to promote open access to everyone in the team, breaking down political barriers that would inhibit such access; and (3) to develop a norm for collective inquiry/reflection as well as a sense of collective accountability. It is these relationships that convert a diverse, cross-functional team to an integrated team with team synergy.

9.3.2.5 The effects of demographics

The effects of several demographic characteristics are discussed in the following text.

Years of PM experience

PM professionals' beliefs about project team integration are somewhat positively correlated to their years of PM experience. Among the groups of *less than 6 years*, *6-20 years*, and *above 20 years*, a group with longer experience obtained higher scores on the PTI factor and its all sub-factors (refer to Table 8-20). Especially, either the group of *6-20 years* or that of *above 20 years* obtained a significantly higher score on the KBI sub-factor than did the group of *less than 6 years* ($p = 0.017, 0.004$) (refer to Table 8-21).

From the survey results, it can be said that PM experience of several years is important for people to develop maturity in their beliefs about project team integration. This experience is particularly important for people to change from a traditional orientation of boss-based influence to the new orientation of knowledge-based influence. In traditional functional management, the boss-based influence is probably not a problem. A functional department is usually composed of staff from similar disciplines and often deals with repetitive tasks that have enough history to avoid uncertainties. In this case, the boss would usually be well-equipped to manage functional tasks. However, project management is multi-disciplinary. The project manager is unable to be an expert in all the areas. Actually, he/she may be more a generalist than a specialist. In a

particular technical area, he/she must rely on the opinions of the relevant experts rather than those of someone in a particular hierarchical position. Also, project management deals with work with high uncertainties. It is usually a very difficult task to estimate duration, cost, and resource requirements for a project which is defined as a unique task. So it is quite reasonable that people with longer PM experience would be maturer in their beliefs about knowledge-based influence than those with shorter or no PM experience.

Education and PM training

Between the two groups, graduate and below educated and postgraduate educated, the latter obtained higher scores on the PTI factor and its CTI and KBI sub-factors. The two groups obtained nearly equal scores on the IFP sub-factor. In particular, the latter group obtained a significantly higher score ($p = 0.037$) on the CTI sub-factor than did the former.

Between the two groups, one with no formal PM training and the other with some PM training, the latter obtained higher scores on the PTI factor and its CTI and KBI sub-factors. The two groups obtained nearly equal scores on the IFP sub-factor. In particular, the latter group obtained a significantly higher score ($p = 0.019$) on the CTI sub-factor than did the former.

It is clear from the survey findings that education and PM training have some effects on the maturity of people's beliefs about project team integration, in particular their consciousness of project team identity. Although this research did not obtain highly discriminative results among the respondents with different educational and training levels, it did show that high levels of education and PM training are helpful in forming an integrated project team.

Construction industry and services industry

The survey results of this research show that the respondents from the services industry obtained a significantly higher score on the IFP sub-factor than those from the construction industry ($p = 0.01$). This difference is probably due to the difference between construction projects and services projects. Compared to construction

projects, services projects are more difficult to define because they are usually designed to produce intangible products. The memberships and structure of a services project team are usually less stable and formal than those of a construction project team.

9.3.2.6 Summary

From the survey results and above discussion, it can be generally concluded that:

- PM professionals believe in project team integration (obtaining a score of 4.34 out of 5), which involves a consciousness of project team identity, knowledge-based influence, and an orientation towards informal processes within a project team.
- Working with borrowed and multi-disciplinary members, PM professionals believe that to develop a sense of project team identity is essential. Without such a sense, a project team cannot produce true teamwork.
- Without sufficient authority, project managers rely more on knowledge-based influence than on hierarchical position-based influence. Within a multi-disciplinary project team, knowledge-based influence is essential because the project manager cannot be an expert in all the disciplines and in most cases he/she must get the things done through other experts who do not have hierarchical position power.
- PM professionals would like to use informal processes to develop and enhance true teamwork within the project team. In a project context, project managers may not have sufficient formal authority and people need to work together even under no or weak formal relationships. Thus they must rely heavily on informal relationships to get things done.
- PM experience of several years can help people to develop their beliefs about project team integration, especially their orientation towards knowledge-based influence.
- High education and formal PM training are useful in helping people to develop their beliefs about project team integration, especially their consciousness of team identity.
- PM professionals from the services industry are more informal process oriented than those from the construction industry.

9.3.3 Work Flexibility

9.3.3.1 Overview

From the theory of project management, project management is flexibility oriented. In the modern people-centred approach of project management, work is less formalised, cases would be treated in the first place by team members, and team members have a lot of discretion in doing their jobs (Culp and Smith, 1992); and also, individual job descriptions usually do not exist for project team members in the way they do in a stable work team (Bee and Bee, 1997). The model of PM culture proposed in this research supports these points, as all the factor loadings on the *Work Flexibility* factor and its sub-factors are positive and significant as expected (refer to Figure 7-22).

However, in general, the survey results of this research show that PM professionals are neutral towards work flexibility. Obtaining a score of 3.07 on the 1-5 scale of *Work Flexibility*, they neither support nor reject the work flexibility orientation reflected in the PM literature. In particular, with respectively a score of 2.44 on *Job Decodification* and 3.58 on *Work Autonomy*, PM professionals show their beliefs about a certain level of job codification and a certain level of work autonomy. Furthermore, the fact that all the items except one have standard deviations above 1.0 (refer to Table 8-38) demonstrates wide discrepancies among PM professionals with respect to the matter of work flexibility/formalisation. If what are reflected in the PM literature are regarded as the ideal situation in project management, the survey results demonstrate a gap between PM professionals' current beliefs about work flexibility and the "expected" beliefs espoused in the literature.

Several reasons could explain the gap between the current and the "expected" beliefs about work flexibility:

- If project management, as indicated by Culp and Smith (1992), needs to shift from the traditional structural approach (in which work is highly formalised and work autonomy is limited) to the people-centred approach, the process of such a shift may not yet have been completed.
- Different types of projects, such as a building construction project and a research and development project, have different requirements for work flexibility.,

- There is usually a need to make a reconciliation between work formalisation and flexibility. Work formalisation is semi-rational. It can help to reduce internal uncertainty caused by the unpredictability of team members' behaviours, but may also destroy their autonomous judgment and lead them to do things they would have considered inappropriate without the job rules.
- The gap may also be due to the matter between individual-level work flexibility and team-level work flexibility. Previous studies in organisational behaviour found that these two levels of flexibility have opposite effects on team cohesiveness (Langfred, 2000) and team effectiveness (Uhl-Bien and Graen, 1998). This research did not distinguish between the two levels of flexibility. Nor does the PM literature. This matter is subject to future investigation.

9.3.3.2 Job de-codification

The survey results of this research show that most PM professionals believe that written job codification is necessary. They believe that written job descriptions are necessary for all members, pre-design of communication paths is necessary, and people should be fitted to the necessary jobs.

The survey respondents obtained a score of 2.44 on the 1-5 job de-codification scale. So, generally speaking, the survey results do not support the hypothesis that PM professionals prefer job de-codification. However, the fact that all the items have large standard deviations above 1.0 demonstrates a wide discrepancy in their beliefs about job de-codification.

After reversing the score of 2.44, a score of 3.56 was obtained about PM professionals' belief in job codification. This score is similar to Australia's national score of 3.45 on Hofstede's (1980) item C9: *A good manager gives his employees detailed and complete instructions as to the way they should do their jobs.* So it is appropriate to say that PM professionals do not differ significantly from other Australian in their beliefs about job codification.

9.3.3.3 Work autonomy

The survey respondents obtained a score of 3.58 on the 1-5 scale of work autonomy, showing limited support for work autonomy. However, the respondents showed a high support rate for the item Value22: *Staff should have a high level of work autonomy (versus Staff should strictly follow job descriptions and other written rules/procedures) for handling problems occurring on their jobs.* Compared with the support rates (from 45% to 68%) for the other four items measuring work autonomy, Value22 obtained support from 84% of the respondents. These survey results demonstrate that written job descriptions and rules/procedures are necessary, but when problems occur on their jobs, team members should be allowed not to follow these descriptions and rules but use their own discretion to deal with the problems. In this way, the job descriptions and rules are seen to be in the nature of guidance instead of mandatory.

In Hofstede's (1980) culture survey, Australians obtained a score of 3.11 on a 1-5 scale on the item B60: *Company rules should not be broken – even when the employee thinks it is in the company's best interests.* This item was one of the three central questions which Hofstede used to calculate the Uncertainty Avoidance Index (UAI). In the survey of this research, the item Value20 (*Written rules can be broken when necessary versus Written rules must not be broken for any reason*) is similar to Hofstede's B60. Coding Value20 in the same direction as B60, this research obtained a mean score of 2.48, considerably lower than 3.11 recorded by Hofstede (1980), showing that PM professionals are lower in uncertainty avoidance or, in other words, higher in work autonomy. This finding is consistent with what is reflected in the PM literature, for example, Hofstede (1983) argues that project management assumes weak uncertainty avoidance.

9.3.3.4 The effects of demographics

The independent samples *t* tests show that among the three groups of PM experience of *less than 6 years, 6-20 years, and above 20 years*, the third group obtained a significantly higher score on the WKA sub-factor ($p = 0.014$). The descriptive statistics also show that a group with longer experience obtained higher scores on the WF factor and all its sub-factors than a group with shorter experience. But no

significant effect was revealed for the demographic characteristics of education and PM training.

These findings suggest that a belief about work autonomy is more closely associated with work experience than with the socialisation of advanced degree education and formal PM training. As people become more experienced, they seek greater work autonomy. These findings are similar to Perrucci and Gerstl's (1969). Perrucci and Gerstl's research of the American engineering profession found a similar association between work autonomy and respondents' demographic characteristics.

9.3.3.5 Summary

From the survey results and the above discussion, it can be concluded:

- In general, PM professionals are neutral towards work flexibility.
- In particular, PM professionals believe that a certain level of job codification is necessary and they have limited support for work autonomy within a project team.
- There is a gap between PM professionals' current beliefs about work flexibility and what is reflected in the PM literature (and also the "expected" beliefs revealed in the model of PM culture established in this research).
- When a work problem occurred on their jobs, PM professionals would like to have the autonomy to deal with it, rather than being required to strictly follow job descriptions and rules.
- PM professionals' beliefs about work autonomy is more closely associated with their PM experience than their educational and PM training backgrounds.

9.3.4 Work Performance

9.3.4.1 Work performance

In order to deliver a project product within specified time, cost, scope and quality constraints, project management is very task focused and requires that people's status comes from what they do on the project rather than whom they are. As discussed in Chapter 5, there are several other factors which determine the work performance focused view of people in project management:

- Insufficient formal authority of a project manager, relative to his/her formal responsibility for a project, makes the role of project manager better understood in terms of what he/she does rather than what authority he/she has.
- To enhance cooperation and teamwork among *diverse* team members, an emphasis must be put on the members' work performance rather than on whom they are.
- To enhance the participation of team members, it is essential to ensure that every member has a chance to demonstrate work competence through good performance.
- The temporary nature of the project team makes people less concerned with whom others are than what others do for the project.

The survey results of this research support the work performance orientation reflected in the PM literature, that is, PM professionals view project team members in terms of their work performance rather than whom they are. The survey respondents obtained a score of 4.27 on the 1-5 scale for their work performance orientation. The majority of the respondents believed that: (1) team members should be evaluated by their work results, (2) work capability not age (relative to subordinates') is an important consideration for selecting a manager, (3) young and old people should be equally respected on the basis of their work performance, (4) people with and without PM qualifications should be equally respected on the basis of their work performance, and (5) a superior should be questioned if he/she issues a wrong instruction.

According to Trompenaars (1993), in an achievement (performance) oriented culture, respect for a superior in the hierarchy is based on how effectively his/her job is performed, and senior managers are of varying age. This research used three items to survey PM professionals' beliefs about these two aspects. The items were: Value33 (*Questioning a wrong instruction from the superior*), Value27 (*Work capability not age for selecting managers*), and Value28 (*Old and young people equally respected*). The survey results show that PM professionals are performance oriented.

9.3.4.2 Personal relationships

The survey respondents obtained a score of 2.72 on the 1-5 scale for their personal relationship orientation which is negative to the work performance orientation. This means that the PM professionals, in general, do not want to develop personal

relationships with team members, because such relationships conflict with their assessment of team members in terms of work performance. Sixty-one percent of the respondents believed that teamwork can be enhanced if team members respect each other's work, regardless of their friendship and personal relationships.

9.3.4.3 The effects of demographics

The independent samples *t* tests show that

- the group of managers (including senior and project managers) and the other of non-managers (all other respondents) obtained significantly different scores on *Work Performance* ($p = 0.020$). The former was more work performance oriented than the latter. Also, the descriptive statistics show that the manager group was less personal relationship oriented than the non-manager group.
- No other significant effect was revealed for PM experience, educational and PM training backgrounds.

The survey results of this research suggest that work performance orientation is somewhat associated with PM professionals' position, that is, those in a managerial position are much more performance oriented than those in a non-managerial position. The work performance orientation is not significantly associated with other kinds of demographic characteristics.

9.3.4.4 Summary

From the survey results and the above discussion, it can be generally concluded:

- PM professionals are work performance oriented. They view team members in terms of work performance.
- PM professionals do not want to develop personal relationships with team members because this kind of relationship conflicts with their assessment of team members in terms of work performance.
- PM professionals in a position of manager are much more performance oriented than those in a non manager position.

9.3.5 Answer to Research Question 3: What are PM professionals' current values and beliefs?

Based on the above discussion, this research now comes to the answer to research question 3: What are PM professionals' current values and beliefs around the identified dimensions and sub-dimensions of PM culture?

From the research results and the discussion of PM professionals' current values and beliefs around the dimensions and sub-dimensions, it can be concluded that:

- PM professionals' current values about *Professional Commitment* are in general consistent with the “expected” values revealed in the model of PM culture, that is they are committed to the PM profession. While PM professionals are strong in the *PM Career Pursuit*, their *PM Reference Group* needs to be further improved and their *Leisure Time for PM* is weak and consequently needs to be addressed in the future by the PM profession. PM professionals show great discrepancies in their support for contributing leisure time to PM.
- PM professionals' current beliefs about *Project Team Integration* are consistent with the “expected” beliefs revealed in the model of PM culture, that is, they believe that *Project Team Integration* is an effective work-means in a project context.
- PM professionals' current beliefs about *Work Flexibility* neither support nor reject the “expected” beliefs revealed in the model of PM culture, that is, they are in general neutral towards work flexibility. Their scores on the two sub-dimensions show that they believe that a certain level of job codification and a certain level of work autonomy are both necessary in a project context. PM professionals have great discrepancies in their support for *Work Flexibility* and its two sub-dimensions. The matter of work flexibility appears to be complicated and needs to be further studied in depth by the PM profession.
- PM professionals' current beliefs about *Work Performance* are consistent with the “expected” beliefs revealed in the model of PM culture, that is, they view project team members in terms of what they do on the project (work performance) rather than whom they are. Because personal relationships among people are likely to

conflict the view of work performance, PM professionals do not encourage the development of personal relationships in a project team.

The findings of this research partly support the research hypothesis 3, that is, *PM professionals' current values and beliefs around the PC, PTI, and WP dimensions of PM culture are consistent with the "expected" values and beliefs revealed in the model of PM culture*. But their beliefs about *Work Flexibility* imply a complicated situation for the PM profession. In addition, the PM profession needs to improve its members' use of PM reference group and attract more leisure time from the members. Furthermore, several demographic characteristics that have significant effects on PM professionals' values and beliefs also imply some ways for the PM profession to further promote the professionalism of project management.

Chapter 10

Conclusions and Implications

This chapter reports the conclusions about the model and the current status of PM culture that were arrived at from the research process. The conclusions are organised around the research questions and objectives stated in Chapter 1, Section 1.2 and Chapter 5, Section 5.4. After the presentation of the conclusions, this chapter discusses the research findings' implications for relevant theories and practices. The limitations and some areas for future research are also presented in this chapter. This chapter includes the following major sections:

- 10.1 Overview of the Research Process
- 10.2 Research Conclusions
- 10.3 Implications for Theories
- 10.4 Implications for Practices
- 10.5 Research Limitations
- 10.6 Suggested Future Research

10.1 OVERVIEW OF THE RESEARCH PROCESS

The sociology of professions recognises a professional culture as one of the defining characteristics of a profession, which can be minimally defined as a set of work-related values and beliefs shared by the members of the profession. Project management, as a newly emerged profession, should have its professional culture, ie., a PM culture. Based on this assumption, this research was conducted to identify and evaluate the key dimensions of the PM culture.

At the early stage of this research, a broad literature review was conducted to understand the concept and measurement of culture, the concepts of profession and professional culture, the history and current situation of the PM profession, the basis on which a PM culture evolved, and the limited discussion of PM culture in the PM literature. The scope of the literature review covered the organisational literature, the literature of professions, and the literature of project management. The literature review provided a foundation for the design of this research, such as, the operationalisation of the concept of culture, the selection of to-be-studied phenomena, the selection of the analysis level and perspective, the selection of the quantitative research method, and the development of the theoretical framework.

On the basis of the literature review, a theoretical framework for measuring PM culture was developed from

- Parsons and Shils' (1951) *General Theory of Action*, especially their *pattern variable scheme*, which is claimed to be a system for determining people's actions; and
- PM values and beliefs reflected in the PM literature, such as teamwork, horizontal management, flexibility, temporary relationships, and a results orientation.

The *pattern variable scheme* was particularly applied into the area of project management in accordance with the PM values and beliefs espoused in the PM literature. Each pair of the five pattern variables was then defined for the purpose of this research.

Within the theoretical framework, five research variables were established to constitute a system determining PM professionals' behaviours in performing PM activities (usually within a project team context). These variables were:

- PM professionals' commitment to the PM profession (also compared with their commitment to employing organisations);
- PM professionals' beliefs about teamwork;
- PM professionals' beliefs about work flexibility;
- PM professionals' beliefs about viewing team members in terms of work performance; and
- PM professionals' beliefs about informal processes within a project team.

The research variables were then operationalised in order to develop a research instrument, ie., a written questionnaire titled the *Project Management Culture Survey* which included 57 closed questions about PM professionals' work-related values and beliefs. The questionnaire was mailed to 790 AIPM members with the membership grades of *Member* and *Fellow*. The data collection process produced 323 useable responses.

The data were coded and input into a computer. An exploratory factor analysis was conducted using the software SPSS 10.0 to determine several key dimensions of PM culture. Confirmatory factor analyses were conducted using the software AMOS 4.0 for structural equation modeling to test the theoretically-identifiable structure of sub-dimensions of each of the EFA-extracted key dimensions. A confirmatory factor analysis was finally conducted to test the researcher's expectation of the dimensionality of the *PM culture* construct and consequently the full model of PM culture. Through the exploratory and confirmatory factor analyses, a structural model of PM culture was successfully established.

Based on the results from the factor analyses, factor scores were computed and used as input materials in the analyses of descriptive and inferential statistics to determine PM professionals' current values and beliefs around the dimensions and sub-dimensions of PM culture.

10.2 RESEARCH CONCLUSIONS

As defined in Chapter 1, Section 1.2, the purpose of this research was *to identify the key dimensions of the PM culture and to investigate and evaluate PM professionals' current work-related values and beliefs around these dimensions*. This section presents the conclusions from this research about the research objective and its respective research questions.

10.2.1 The key Dimensions of PM Culture

Through an exploratory factor analysis, four key dimensions of PM culture were identified, and for each of the dimensions, two or three theoretically-identifiable sub-dimensions were confirmed by a confirmatory factor analysis. The dimensions and sub-dimensions are:

- **Dimension 1: Professional Commitment:** PM professionals' commitment to the PM profession. It has three sub-dimensions as follows:
 - ◆ *PM Career Pursuit* – PM professionals take project management as their permanent career pursuit rather than a stepping-stone to other professions;
 - ◆ *PM Reference Group* – PM professionals use other members of the PM professionals as their important reference group for their PM performance;
 - ◆ *Leisure Time for PM* – PM professionals contribute some of their leisure time to PM professional activities.
- **Dimension 2: Project Team Integration:** PM professionals' beliefs about project team integration for successful project management. It has the following three sub-dimensions:
 - ◆ *Consciousness of Team Identity* – In project management, it is important to build a sense of team identity within a project team;
 - ◆ *Knowledge-Based Influence* – In project management, team members' influences on team performance should be based on their relevant knowledge and skills rather than on their hierarchical positions; and
 - ◆ *Informal Process* – In project management, a project team should encourage the use of informal processes for effective and efficient communication and true teamwork.

- **Dimension 3: Work Flexibility:** PM professionals' beliefs about work flexibility as an effective work means within a project team. Its two sub-dimensions are:
 - ◆ *Job De-Codification* – In project management, jobs should be loosely codified and de-formalised to allow flexibility; and
 - ◆ *Work Autonomy* – In project management, team members should have a sufficient level of work autonomy and team rules and job descriptions act only as guides to work.
- **Dimension 4: Work Performance:** PM professionals' beliefs about viewing team members in terms of their work performance on the project rather than whom they are. It has positive and negative sub-dimensions as follows:
 - ◆ Positive: *Work Performance Itself* – In project management, team members should view fellow members on the basis of what they do for the project rather whom they are in ascription; and
 - ◆ Negative: *Personal Relationships* – In project management, personal relationships among team members should not be encouraged because these relationships could detrimentally affect the members' views of others in terms of work performance.

Putting all the dimensions and sub-dimensions together, the model of PM culture can be illustrated as shown in Figure 10-1.

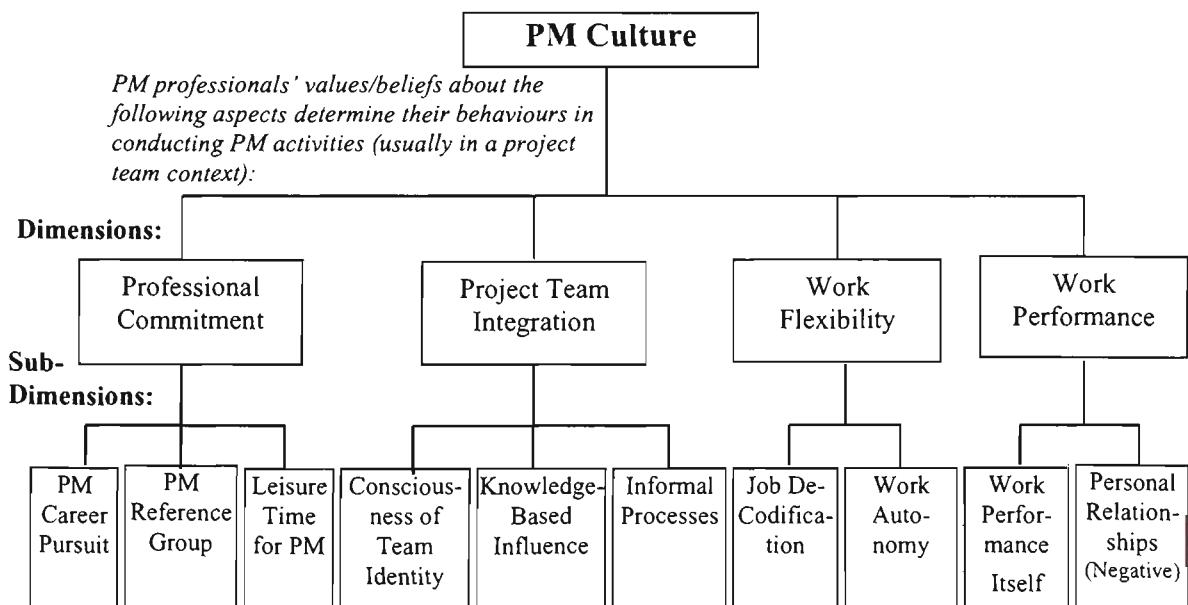


Figure 10-1: The Illustrated Model of PM Culture

This empirically-derived model is not only technically appropriate from the statistical perspective of factor analyses, but also theoretically appropriate from the perspective of relevant theories. The model is consistent with Parsons' pattern variable scheme which constitutes a system guiding people's behaviours. The only difference between this model and Parsons' scheme is that, in the model, the theoretically-designed variable *Informal Process* does not appear as an independent dimension but joins the variable *Teamwork* to form the dimension of *Project Team Integration*. This result in the model is theoretically rational, because informal processes are important for true teamwork and collectivism-oriented people tend to develop diffusive relationships with others.

All the dimensions and their sub-dimensions, except *Professional Commitment*, are consistent with what could be expected from the PM literature, that is, project management is teamwork oriented, requires high flexibility, and is results (performance)-oriented. The dimension of *Professional Commitment* and its sub-dimensions have not been explicitly discussed in the PM literature. However, they correspond to relevant key points in the literature of professions. From the theory of professions, members of a profession commit themselves to the profession.

The successful establishment of the model of PM culture means that this research has successfully answered the first two research questions:

- Could PM culture be described by a model consisting of several discrete dimensions on the basis of PM professionals' answers to written questions about work-related values and beliefs? The answer is: Yes, it could.
- What dimensions would empirically emerge? The answer is: The emerged dimensions and sub-dimensions of PM culture are in general consistent with the themes covered in the theoretical framework and the common values and beliefs discussed in the literature of project management and professions.

Therefore, this research has reached its two sub-objectives: (1) To investigate the work-related values and beliefs of selected PM professionals at a *profession-wide* level across organisational and industrial boundaries; and (2) On the basis of the investigation, to identify the key dimensions and establish a model of PM culture; and

in doing so completed the first half of the total research objective, ie., to identify the key dimensions of PM culture.

10.2.2 PM Professionals' Current Values and Beliefs

On the basis of the findings from descriptive and inferential statistical analyses, this research drew conclusions about PM professionals' current values and beliefs around the dimensions and sub-dimensions.

10.2.2.1 Professional Commitment

In general, PM professionals' commitment to the PM profession is at an acceptable level (scoring 3.65 out of 5). In particular, PM professionals are strong in pursuing project management as their permanent career (scoring 4.06 out of 5) and are appropriately using other PM professionals as their important reference group (scoring 3.72 out of 5), but most of them are not willing to contribute their leisure time to PM professional activities (scoring 2.68 out of 5).

Other relevant conclusions are as follows:

- PM professionals are more committed to the PM profession than to their employing organisations, that is, they are more cosmopolitan than local.
- At the early stage of their PM career, young PM professionals need time to reinforce their PM reference group orientation, even though they are strongly pursuing project management as their career.
- PM professionals who are at the peak of their career are most highly committed to the PM profession.
- At the end stage of their PM career, older PM professionals' commitment to the PM profession (especially their PM career pursuit) would to some degree decrease.
- At least six years of industrial experience is needed for the maturity of new entrants' commitment to the PM profession.
- PM professionals' levels of education have significant effects on their commitment to the PM profession. Postgraduate-educated PM professionals are more highly committed to the PM profession than those with a lower educational level.

- Formal training and education in project management are very important for people to establish their commitment to the PM profession. In particular, the PM professionals who have been educated (trained) by formal postgraduate PM courses or PMP® examination preparation courses are more highly committed to the PM profession than those who are short-courses-trained or without any training.
- The PM professionals in the position of project managers are more highly committed to the PM profession than others in non-project-manager positions

10.2.2.2 Project Team Integration

PM professionals have strong beliefs about project team integration (scoring 4.34 out of 5). The majority of them believe that a project team should develop a true sense of team identity, knowledge-based influence, and a set of informal processes for communication.

Other relevant conclusions are as follows:

- PM professionals' years of PM experience have significant positive effects on the maturity of their beliefs about project team integration, especially their orientation towards a knowledge-based influence.
- High education and formal PM training are useful in helping people to develop their beliefs about project team integration, especially their consciousness of team identity.
- PM professionals from the services industry are more informal processes oriented than those from the construction industry.

10.2.2.3 Work Flexibility

In general, PM professionals are neutral towards work flexibility (scoring 3.07 out of 5). In particular, they believe that a certain level of job codification (scoring 2.44 out of 5 on the de-codification scale) and a certain (not high) level of work autonomy (scoring 3.58 out of 5) are necessary. These findings neither support nor reject the "expected" work flexibility orientation which is reflected in the PM literature and also in the model of PM culture established in this research. Recognising project management as a change-oriented management, the PM literature emphasises a flexibility-orientation, especially when discussing the people-centred approach of

project management (eg., Culp and Smith, 1992). The relevant significant and positive parameter estimates in the full structural model of PM culture (Figure 7-22) support this point as reflected in the PM literature. Therefore, a gap can be claimed between PM professionals' current beliefs and the "expected" beliefs revealed in the PM literature about work flexibility.

The longer PM experience is, the higher PM professionals score on the WF factor and its two sub-factors. In particular, the PM professionals with a PM experience of above 20 years are significantly more highly oriented towards *Work Autonomy* than those with a PM experience of less than 6 years.

10.2.2.4 Work Performance

Several conclusions are as follows:

- PM professionals are work performance oriented (scoring 4.27 out of 5). They view team members in terms of work performance rather than whom they are.
- PM professionals do not encourage the development of personal relationships among team members because this kind of relationships is seen as having the potential to detrimentally affect their view of others in terms of work performance.
- The longer PM experience is, the higher PM professionals score on the *Work Performance Itself* sub-factor and the lower they score on the *Personal Relationships* sub-factor.
- PM professionals in manager positions are much more performance oriented than those in non-manager positions.

10.2.2.5 Answer to research question 3

Taken all together, the above conclusions constitute the answer to research question 3: What are PM professionals' current values and beliefs around the identified dimensions of PM culture? The answer is: PM professionals current values and beliefs around the dimensions of *Professional Commitment*, *Project Team Integration*, and *Work Performance* are consistent with the "expected" values and beliefs revealed in the model of PM culture (and also in the PM literature); but their current beliefs about *Work Flexibility* neither support nor reject the "expected" work flexibility orientation. This conclusion partly supports the research hypothesis 3: PM Professionals' current

values and beliefs around the dimensions are in consistent with the “expected” values and beliefs revealed in the model of PM culture.

Consequently, this research has reached its third sub-objective (also the second half of the total objective), which was to analyse and evaluate PM professionals’ current work-related values and beliefs around the dimensions of PM culture.

10.3 IMPLICATIONS FOR THEORIES

The research findings have some important implications for the theories of project management, professions, and organisational behaviour.

10.3.1 Implications for the Theory of Project Management

The most significant contribution of this research is that it contributes an empirically-derived model of PM culture to the theory (human side) of project management. The human side of project management has been attracting more and more attention from academics and managers in the discipline of project management. Although the PM literature has provided some discussions about work-related values and beliefs in the area of project management, the discussions lack any explicit theoretical framework and are supported by few or no empirical data. The model of PM culture is not only based on empirical data but also developed under a sound theoretical framework which is an integration of Parsons' *General Theory of Action* (particularly the *pattern variable scheme*) and the key PM values and beliefs discussed in the PM literature. It can thus be used as a theoretical reference to guide and understand PM professionals' behaviours in performing project management tasks (usually in a project team).

10.3.2 Implications for Theories of Professions and Organisations

The theories of professions and organisations recognise the existence of professional cultures and that professional culture plays an important role in determining people's behaviours at the workplace. This research's successful establishment of the model of PM culture provides some empirical evidence to support these points of views in the theories of professions and organisations. Irrespective of their employing organisations and industries, members of the same profession share a set of work-related values and beliefs which bind them to form a professional community. When entering employing organisations, professionals bring such a set of values and beliefs into the workplace as guidelines for their work behaviours. Therefore, professional cultures must be considered if organisational theories are to locate and explain more of the behavioural variability of the workplace. Although the literature abounds with the discussion of professional cultures, it provides few specific guides about how to explore and measure

those cultures in order to explain professionals' work behaviours at the workplace. Developed under the guidance of Parsons' general theory of action, the model of PM culture in this research can be used as a framework for understanding PM professionals' work behaviours at the workplace (in organisations). The model of PM culture can also serve as a reference for the development of similar models for other professions.

Because Parsons' pattern variable scheme, as a general framework for studying culture, must be *particularly* interpreted and operationalised before it can be applied to a study of the professional culture of a particular profession, the model of PM culture cannot be directly applied to other professions. The rationale is that different professions may apply the five pattern variables in very different ways. For example, in the accounting or medicine profession, a high degree of work formalisation instead of flexibility is probably essential. However, the process and methodology used in this research can be adopted by similar studies of other professions. Based on their particular application of Parsons' pattern variable scheme, the studies would be able to establish similar models of the professional cultures.

As commonly agreed by many authors, culture can be measured by different sets of dimensions. Sackmann (1991) suggests that the dimensions of a culture should emerge empirically. This research provided a valid method by which several key dimensions of a culture empirically emerge. This method includes the following steps: (These steps are not only applicable to the studies of professional cultures but also to the studies of organisational cultures.)

1. Determining what phenomena of a culture are of interest: because culture is an elusive concept, a researcher must operationalise it by choosing the phenomena to be studied. For example, this research focused on the work-related values and beliefs of PM professionals.
2. Determining the level of analysis: Do you study a professional culture at a *profession-wide* level or at a narrower level (such as, within an organisational context)?
3. Determining the perspective of analysis: Do you study a culture from an integration, differentiation or fragmental perspective?

4. Determining the general design of your research: Depending on the selections of the phenomena, the level of analysis, and the perspective of analysis, you may design your research as a quantitative or qualitative research or the mixture of the two.
5. Determining a theoretical framework as the starting point, which may be borrowed from anthropology, sociology, or management literature. As this research showed, Parsons' *General Theory of Action* (especially his *pattern variable scheme*) can provide a sound theoretical basis for the studies of professional cultures.
6. Applying the selected theoretical framework to the context of a particular profession of interest and its community in order to develop a particular set of research variables and an appropriate research instrument.
7. Collecting and analysing data so that a set of dimensions of a professional culture will empirically emerge. For a quantitative study of culture, exploratory factor analysis and confirmatory factor analysis (structural equation modeling) are powerful tools for extracting and confirming a set of dimensions of a culture.

Although the full model of PM culture cannot be directly applied to other professions, one of the dimensions, *Professional Commitment*, and its three sub-dimensions can be used as an independent model for *any* profession to measure its members' commitment to the profession. The three sub-dimensions can be generalised as three kinds of commitment, ie., *Career Pursuit Commitment*, *Reference Group Commitment*, and *Leisure Time Commitment*, to describe the concept of *Professional Commitment*. In this research, the relevant items for measuring the three kinds of commitment produced respectively a Cronbach's $\alpha = 0.80$, 0.79, and 0.55 and satisfactory discrimination among the survey respondents with different demographic characteristics.

Professional Commitment was previously measured using the same methods as those used to measure *Organisational Commitment* (OC). For example, two widely-used measurements, Aranya, Pollock and Amernic's (1981) unidimensional scale and Meyer, Allen and Smith's (1993) three-component model of *Professional Commitment*, are both modified from their OC versions. Ignoring a profession's difference from an employing organisation represents a major deficiency in the previous measurements. The model of *Professional Commitment* in this research was

developed on the basis of the defining characteristics of a professional community, independently from the definitions and measurements of *Organisational Commitment*. It thus could avoid the limitations associated with the previous methods of borrowing the definitions and measurements of OC, such as the problems of Meyer, Allen and Smith's (1993) model of PC.⁴² It also provides benefits which the previous OC-based PC models (measurements) cannot, ie., measuring the degree to which an occupation is professionalised. In addition to some visible traits (eg., a body of knowledge, standards, codes of ethics, educational and certification programs), to be a profession, an occupation must also develop its professional community based on its members' commitment to it. Many occupations aspire to become professions or claim themselves to be professions. But, what is their actual status during the process of professionalism? The three kinds of commitment developed in this research could be used as indices to measure the status of the professions and consequently to indicate the potential areas for their improvement. To promote its professionalisation, an occupation needs to put efforts into developing all the three kinds of commitment.

⁴² For example, one of the problems is at the component of continuance commitment. Continuance commitment develops as an individual makes investments (eg., the time and effort put into acquiring profession-specific knowledge and skills) that would be lost or reduced in value if he/she leaves the profession. Meyer, Allen and Smith (1993) expect and find that continuance commitment *negatively* correlates with affective commitment (people stay because they want). Here is the problem. According to this kind of negative correlation, people with a higher level of professional education develop a higher continuance commitment, and consequently a lower affective commitment. However, this is obviously in conflict with the statements about a *positive* correlation between professional education and professional identity in the sociology of professions (Merton, 1957), which has been evidenced by empirical studies (e.g., Gerstal, 1969; Berger & Grimes, 1973). A possible explanation is that Meyer, Allen and Smith's (1993) model ignores the difference between a profession and an organisation. It is much easier for professionals to move from organisation to organisation than from profession to profession. With an orientation to cross-organisational professional markets (Martin, Riemens, & Wajcman, 2000), professionals are likely to view investments in an organisation as a *negative* force for leaving the organisation. But with the common view of seeing their profession as a permanent career (Goode, 1957), professionals are likely to see investments in professional knowledge and skills as a *positive* force for staying at the profession.

10.4 IMPLICATIONS FOR PRACTICE

The findings of this research has some important implications for practices in the PM profession and organisations.

10.4.1 Implications for the PM Profession

10.4.1.1 The model's implications

The model of PM culture can be used for PM education and training. It is suggested that students and trainees be clearly informed that PM is a profession and they must not only learn its technical knowledge and skills but also learn its professional values and beliefs which determine how and why PM professionals should behave in their professional activities. For example, the dimension *Professional Commitment* provides a way of measuring and enhancing PM professionals' commitment to the PM profession, and it can tell students and trainees that, as members of the PM profession, they are expected to pursue PM as a permanent career, use other PM professionals as a major reference group, and take part in PM professional activities even in their leisure time.

In the model of PM culture, the dimension *Project Team Integration* (PTI) provides a small number of focus points which may be central to the complicated matter of project team building. In PM practices, the PTI dimension and its three sub-dimensions (CTI, KBI, and IFP) could be used to guide project team building, although they are subject to further confirmation by future research.

The core values and beliefs expressed in the model of PM culture can help the members of the PM profession to establish and improve their self-image as PM professionals so that a PM professional community is formed, maintained, and reinforced across organisational, industrial or even national boundaries. Being aware of the core PM values and beliefs, PM professionals can transmit them to new members through PM education, training, and practices. Figure 10-2 illustrates PM culture's role in the maintenance and reinforcement of a PM professional community.

Even though PM professionals belong to different organisational, industrial and national cultures, they have one common thing, ie., the PM culture which is supported by the PM profession. For example, the value/belief about *project team integration* can provide a way for members of the PM profession to identify with each other, even though their national cultures differ significantly on Hofstede's (1980) cultural dimension of *individualism/collectivism*.

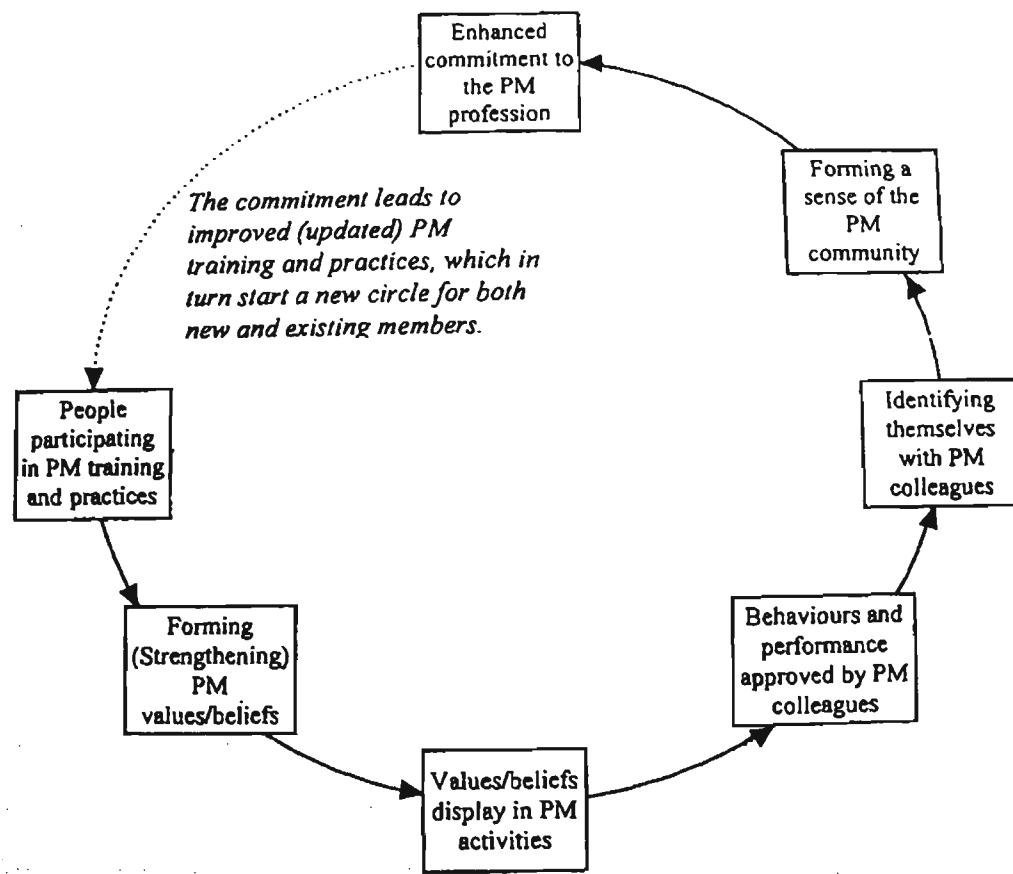


Figure 10-2: PM Culture (Values and Beliefs) and PM Community

10.4.1.2 Implications from the current status of PM culture

Project management is a newly emerged profession and needs to be further promoted. From the results of this research, at least three aspects need further attention by the PM profession:

- **Professional training.** The survey of this research showed that 21 percent of the respondents were not trained in project management, even though the survey sample included only those members of AIPM with a membership grade of *Member* and *Fellow* which required a certain level of educational and practical experience. If

it is to be a mature profession, *every* member must be formally trained (educated) in project management. On-the-job training is important but is not enough. So the PM profession needs to impose a formal PM training requirement on its members.

- **PM reference group.** While taking PM as their permanent career, PM professionals are relatively weak in using other PM professionals as their major reference group. The weakness may be partly due to the lack of a set of criteria for PM performance evaluation which are applicable to the *whole* PM profession. Unlike other mature professions (such as medicine), the PM profession has not yet established its own heroes who provide excellent examples for other members. The PM profession needs to develop a set of professional criteria for its members' evaluation of their peers' PM performance from the perspective of the PM profession. These criteria should allow a peer review program in the *whole* PM profession across organisational, industrial, and even national boundaries.
- **Attracting more of its members' leisure time.** The survey results of this research showed that more than 50 percent of PM professionals are not willing to take part in PM professional activities in their leisure time. Although their general attitude towards "working in leisure time" (this attitude is irrelevant to their professional commitment) may significantly affect their willingness in contributing their leisure time to PM activities, the profession needs to make more efforts to attract more of its member' leisure time. The efforts may involve the studies of such matters as how much of the members' leisure time is spent on PM-related activities, what kinds of PM-related activities are suitable to be held in members' leisure time, what other activities compete for members' leisure time, etc. It is also possible for the profession to use featured stories and movies about PM and PM games to attract the members' interests.

10.4.1.3 Summary

The following comments from the anonymous reviewers of a paper⁴³ based on the first stage results of this research can be used as the summary of this research's implications for the PM profession: It presents not only "timely, thorough

⁴³ Titled *Developing a true sense of professional community: An important matter for PM professionalism*, the paper discusses the PM community and its PM culture. It is based on the literature review and research design of this research. It has been accepted for publication in the refereed journal *Project Management Journal*.

considerations of the missing elements to round out the development of the project management profession within the global community” but also “a challenge for others to pursue the missing elements and develop them with research” (Personal communication with the editors of *Project Management Journal*, August 2000).

10.4.2 Implications for Employing Organisations

The survey results of this research shows that PM professionals are more highly committed to the PM profession than to their employing organisations. The employing organisations are suggested to be aware of this matter and not to require the professionals to take actions that are contrary to their professional rules. Otherwise, a severe organisational-professional conflict (OPC) would occur. For example, an unreasonable project owner could make OPC obvious on a construction project where the project manager plays a duplicate role as both a representative of the owner and an administrator of the contract between the owner and the contractor. The first role of the project manager requires a loyalty to the owner while the second role requires a loyalty to the professional ethics, ie., fairly treating the owner and the contractor.

Previous research of other professions, such as accountants by Aranya, Pollock and Amernic (1981) and lawyers by Gunz and Gunz (1994), has shown that organisational commitment and professional commitment are to some degree compatible (positively correlated) and an encountered or perceived OPC can decrease either organisational or professional commitment or both of them. PM professionals could be expected to have a similar pattern between their professional and organisational commitment. So it is best for their employing organisations to make efforts to minimise OPC so as to allow PM professionals’ commitment to both the organisations and the profession.

10.5 LIMITATIONS OF THIS RESEARCH

There are three general study limitations to discuss:

- The quantitative design of this research prevented an in-depth exploration of PM culture through observing behavioural patterns of PM professionals and field case studies. In this sense, the research findings are subject to qualitative validation in the future.
- What are the values and beliefs of the PM professionals who did not reply to the survey questionnaire? This research did not try to determine why they did not reply. However, it is not inappropriate to generally think that they are not committed to the PM profession as highly as those PM professionals who replied to the survey. So the non-respondents' values and beliefs may be different from those of the respondents (as stated in this research).
- Inter-item reliability of the scales. The scales *Work Flexibility* and *Work Performance* did not have a desirable inter-item reliability. This limitation was due to the exploratory nature of this research and the difficulties inherent in the development of a questionnaire to measure the elusive concept of culture. These difficulties were further increased due to the fact that this research's survey was conducted across traditional organisational/industrial boundaries to cover the profession-wide participants.

10.6 SUGGESTED FUTURE RESEARCH

This research found a discrepancy between the “*expected*” beliefs about work flexibility revealed in the PM literature (also in the model of PM culture) and PM professionals’ *current* neutral attitude towards it. This discrepancy is subject to further investigation. A possible research topic is to investigate work flexibility both at the group level of a project team and the individual level of members of a project team. The current PM literature discusses the matter of work flexibility only in a general sense, not involving the difference between a group level flexibility and an individual level flexibility. A team with a high level of the group level flexibility does not necessarily provide its members with high individual level flexibility. Also, the matter of work flexibility is suggested to be investigated among different types of projects as they may require very different degrees of work flexibility in their management.

Due to the elusive nature of the concept of culture and the complexity in the study of a professional culture which exists beyond the traditional boundaries of organisations, industries, and even nations, some areas beyond the scope of this exploratory research are suggested for future research:

- Research to explore a *global* PM culture. As the PM profession is obviously beyond national boundaries and is developing towards its objective of globalisation, PM culture surveys are suggested to be conducted in some other countries, such as the USA and the UK, with the questionnaire (to be improved as necessary) to see if the same or similar model of PM culture would empirically emerge. These surveys are important to further test the reliability and validity of the model and consequently improve it and to promote the globalisation of the PM profession.
- Comparison research of PM professionals from different countries. On the basis of PM culture surveys in various countries, comparison studies are suggested for PM professionals from different countries to see what differences exist among these countries and to study how and to what extent national cultures affect PM professionals’ work-related values and beliefs.

- Comparison research of PM professionals from different industries. Project management has its own application in the areas of various industries. Construction project management may be quite different from IT project management. So it is necessary to see how PM professionals from different industries share a set of values/beliefs and how they differ from each other.
- Qualitative research of PM culture through in-depth observation of PM professionals' behaviours. This kind of research may also reveal some difference between PM professionals' *actual* and *espoused* values/beliefs.
- Research of relations between PM professionals' values/beliefs and their PM performance. If positive correlations are revealed, the concepts of PM culture and relevant values/beliefs would be strongly supported.
- Research of interaction between PM culture and organisational culture. As most PM professionals work as employees in organisational settings, it is necessary to study the interaction between PM culture and organisational culture within PM professionals' employing organisations. This kind of research needs to examine how the PM culture interacts with organisational structures and practices, the way in which the PM culture is integrated with organisational cultures or remain as a sub-culture in the organisations.

It is impracticable for any single study to reveal a complete picture of the PM culture. Measuring and describing PM culture is to some extent similar to the situation of “blind people feeling at an elephant”. Each single study may only provide a limited view of one or several aspects of the ‘elephant’. To obtain a complete understanding, many similar studies need to be done and the results of the studies need to be cross-validated and confirmed.

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Appendices

Appendix 1: Initial Contact with AIPM

Recd - 7 /

May 20, 1999

The Executive Officer
National Office
The Australian Institute of Project Management (AIPM)
PO Box 420, Spit Junction
New South Wales, 2880

Dear Sir/Madam,

Re: Asking for your assistance in my Ph.D research in Project Management

I am a Ph.D student at the Department of Management, Victoria University. My research topic is "*Identification and Evaluation of the Key Attributes of Project Management Culture*". The purpose of this research is to identify and evaluate the pattern of professional values and beliefs of Project Management professionals.

As a profession, Project Management is assumed to have developed a somewhat unique set of professional work values and beliefs during the process of professionalism. However, no systematic and empirical research has been done to investigate what the professional culture of Project Management (Project Management culture) is and to what extent it exists. My research will answer these questions. I think that this research will be of value in further promotion of Project Management professionalism.

Based on my practical experience and my Master degree in Project Management, I become very interested in Project Management. I am deeply motivated by the idea that Project Management is not just a set of technical tools for planning and control, but rather a management philosophy and a specific way of thinking about and doing things. To further pursue my interest in Project Management, I have recently applied for membership of the AIPM.

As the representative of the Project Management profession, the AIPM's assistance in gaining access to your members is indispensable for my data collection. Specifically, this research will investigate all the members with the grades of Member and Fellow of the AIPM by the way of a questionnaire. Therefore, it would be greatly appreciated if you could agree to assist me with their names and addresses.

This project requires approval from the Human Ethics Committee and all data, including names and addresses, will be kept strictly confidential.

The university requires an official letter from the AIPM about your agreement to assist me. The letter must be included in my research proposal which will be submitted to the university for its approval.

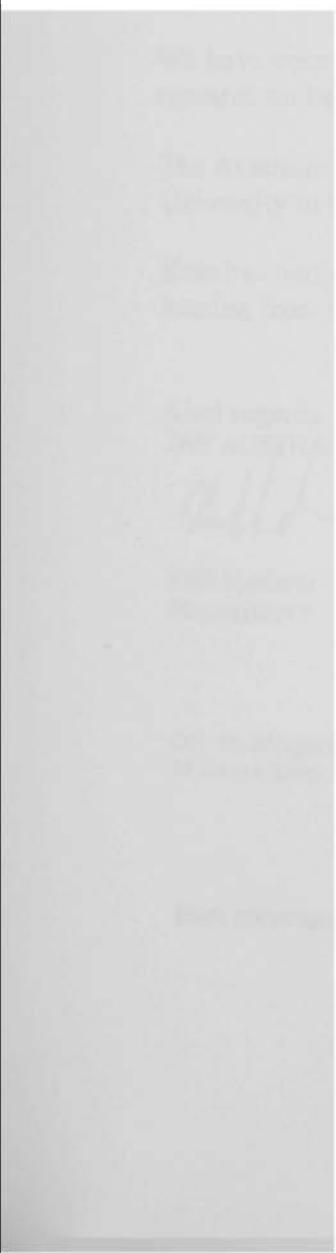
If you have any questions, please feel free to contact my supervisor Prof. Anona Armstrong, Department of Management, or me. Besides the postal address and Fax number shown as this letter header, Professor Armstrong can also be reached at e-mail: Anona.Armstrong@vu.edu.au, and Tel: 03 92481037. I can be reached at e-mail: xiaojinwang@hotmail.com

I am looking forward to the letter from you. Thank you for your assistance.

Yours faithfully,



Xiaojin Wang



Appendix 2: Letter from AIPM



PROJECT MANAGEMENT

ACN 001 443 303

June 2, 1999

Professor Anona Armstrong
Dept of Management
PO Box 14428
MELBOURNE CITY
MC 8001 AUSTRALIA

Dear Anona

RE: Research "Identification and Evaluation of the Key Attributes of Project Management Culture – Identify and evaluate the pattern of professional values and beliefs of Project Management Professionals"

Thank you for confirmation on this research when you last spoke on Monday 31st of May, 99 to our National Office Manager, Kate Josephson.

We have been contacted by one of your students, Mr Xiaojin Wang in regard to doing research on behalf of the University on the above mentioned topic.

The Australian Institute of Project Management would be delighted to support the University in this research.

Kate has outlined the procedure on this in an e-mail to Xiaojin and we look forward to hearing from him in the near future (e-mail attached).

Kind regards
THE AUSTRALIAN INSTITUTE OF PROJECT MANAGEMENT

Phil Harlow
PRESIDENT

CC: Mr Xiaojin Wang
99 Curran Street, NORTH MELBOURNE VIC 3051.

REF: SRVICUNI:AIPMSR

Australian Institute of Project Management

From: Australian Institute of Project Management <aipm@ozemail.com.au>
To: Xiao Jin Wang <xiaojinwang@hotmail.com>
Subject: Re: ASSISTANCE IN RESEARCH IN PM
Date: Monday, 31 May 1999 12:29 pm

Dear Xiao Jin

I spoke to Professor Anona Armstrong and conferred that AIPM would be delighted to assist the University in your research.

At this stage, AIPM policy is to encourage appropriate student research however we do not give out our database. AIPM uses a private mailing house located in Victoria - Wares Mailing House. The contact name is Mr Neil Ware. Neil's phone number is 03 9417 2377 and his e-mail is wpm@alphalink.com.au. Ware's address is: 43 Rupert Street, COLLINGWOOD VIC 3066.

Your University would be responsible for forwarding the questionnaire to the mailing house at the above address. You would also be responsible for the mailing costs. Please notify this office by e-mail when you require the database of full members, fellows and life fellows to be forwarded by e-mail to Wares?

Your research has been approved by Mr Bill Beck, our National Treasurer and Director of AIPM. In the event that you require his contact number his mobile phone number is 03 9228 7032 and his e-mail is bill.beck@iaccess.com.au.

I will forward a letter on behalf of the Board to Professor Anona outlining the procedures and authorising the research. A copy will be cc'd to you and to Mr Beck for future reference if required. - REF: SRVICUNI:AIPMSR

I suggested to Professor Armstrong that the results of the research be published in our quarterly journal. Kay Fay is the Editor of the Journal. Kay's e-mail is kayfay@cia.com.au. Her telephone number is 02 9337 4644 and her fax is 02 9337 3325. Kay's mobile is 0417 237 229.

I hope this assists and please contact us if you have any further queries.

Goodluck with this.

Kind regards

Kate Josephson
AIPM NATIONAL ADMINISTRATION OFFICE
PO BOX 420
SPIT JUNCTION NSW 2088
PHONE: 02 9960 0058

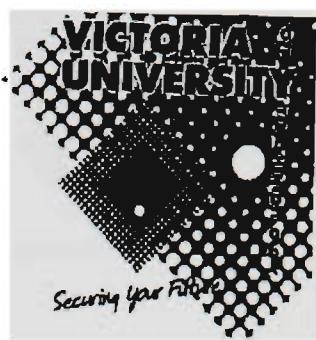
Appendix 3: The University's Approval of the Research

Victoria University of Technology

PO Box 14428
Melbourne City
MC 8001 Australia

**Footscray Park Campus
Postgraduate Studies Unit
Ballarat Road
Footscray**

3115967



17 February 2000

Mr Xiaojin Wang
9 Curran St
Nth Melbourne Vic 3051

Dear Mr Wang,

I am pleased to inform you that at the 10 February 2000 meeting of the Committee for Postgraduate Studies it was recommended that you be admitted to candidature for the degree of Doctor of Philosophy with the thesis topic and supervisors as detailed below:

Thesis Title: Identification and Evaluation of the Key Attributes of Project Management Culture

Principal Supervisor: Assoc. Prof. Anona Armstrong, Director, Department of Management,
City Campus

Co-Supervisor: Assoc. Prof. Peter Rumpf, Head, Department of Management, St Albans Campus

The Committee noted that your candidature application was a highly ori

If you have any queries about your candidature please do not hesitate to contact me on 96881529

Yours sincerely

Kale White
Acting Secretary to Committee for Postgraduate Studies

cc Assoc. Prof. Peter Rumpf, Head, Department of Management, St Albans Campus
Assoc. Prof. Anna Armstrong, Director, Department of Management, City Campus

Campuses at Footscray, Melbourne City, Melton, Newport, St Albans, South Melbourne, Sunbury, Sunshine and Werribee Incorporating Western Melbourne Institute of TAFE

Victoria University of Technology

PO Box 14428
Melbourne City
MC 8001 Australia

Telephone:
(03) 9248 1066
Facsimile:
(03) 9248 1064

City Flinders Campus
Faculty of Business
300 Flinders Street
Melbourne



Associate Professor Anona Armstrong
Department of Management
City Flinders Campus

20 October 1999

Dear Anona

Project BHREC 99/19: Identification and Evaluation of the Key Attributes of Project Management Culture

Thank you for the additional information that you have supplied about the above project. I am pleased to be able to tell you that the Chair of the Faculty of Business and Law Human Research Ethics Committee has given approval for research for the project to proceed.

Yours sincerely

A large rectangular black redaction box covering several lines of text.

(Dr) Jean Dawson
Secretary, Human Research Ethics Committee
Faculty of Business and Law

cc. Mr Xiaojin Wang

Appendix 4: Cover Letter of the Survey

Victoria University of Technology

PO Box 14428
Melbourne City
MC 8001 Australia

Footscray Park Campus
School of Management
Ballarat Road
Footscray

Telephone:
(03) 9688 4535
Facsimile:
(03) 9688 4272
Email:
Business.Management@vu.edu.au



July 31, 2000

Dear AIPM member,

Has our project management profession developed its own professional culture (work-related values and beliefs)? If yes, what is it? These questions are important for the project management profession, if it is to become further mature. However, no systematic empirical study has been done in this area. Here is an opportunity for us to contribute something new to the project management profession.

To achieve this contribution, your help is essential. As a full member of *the Australian Institute of Project Management* (AIPM), you are a very important part of the project management profession, and you can provide valuable information about the profession.

Could you please spend a little time (about 20 – 30 minutes) to complete the enclosed questionnaire, which is designed to investigate the professional culture of project management. Please answer the questions as frankly as possible. There are no right or wrong answers. It would be greatly appreciated if you could return your completed questionnaire at your earliest convenience and not later than August 30, 2000.

As a study for the degree of Doctor of Philosophy at the University, this study strictly follows the ethics rules issued by the *Human Research Ethics Committee*. Your answers are confidential. Only summaries for groups of people will be reported in the final thesis.

This study has been endorsed by the AIPM. The results of this study will be available from AIPM. Or, you may contact us for the results.

If you have any questions, please do not hesitate to contact us.

Thank you for your assistance.

Yours sincerely,

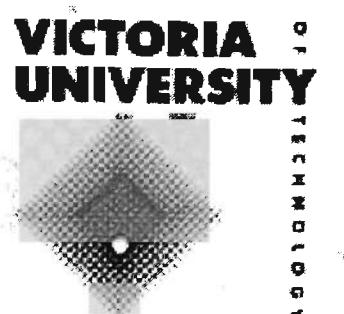
Xiaojin Wang
PhD Candidate
School of Management

A/s Prof. Anona Armstrong
Supervisor
School of Management

A/s Prof. Chandra Bhuta
Co-supervisor
School of the Built Environment

Appendix 5: The Survey Questionnaire

Project Management Culture Survey



School of Management

PO Box 14428

Melbourne City, MC 8001

For further information, contact Mr. Xiaojin Wang by e-mail:

xiaojinwang@hotmail.com

August 2000

Project Management Culture Survey

This questionnaire investigates the work-related values and beliefs of Australian project management professionals to see if project management has developed its own professional culture and community or not.

Part 1: Background Information

This part asks you for some general information about yourself. Please tick (✓) one answer for each item.

1. You are:

Male Female

2. Your age is:

Below 30 31-40 41-50 51-65 Above 65

3. Your first language is:

English Other: _____

4. You have been involved in project management for:

Less than 6 years 6–10 years 11–20 years 21–30 years More than 30 years

5. Your highest education is:

Below Bachelor's Bachelor's Graduate certificate (diploma) Masters Doctorate

6. Your training in project management is:

Short course Undergraduate course Postgraduate course Other: _____

7. Your current position in project management is:

Senior manager Project manager Project team member Other: _____

8. Do you hold a professional qualification from a project management association, such as PMI's PMP, AIPM's Reg PM, etc?

Yes No

9. Your industry is:

Construction Services Resources Manufacturing Other: _____

Part 2: Aspects of Job Satisfaction

This part consists of 14 aspects of job satisfaction relevant to your roles as a member of the project management profession and as a member (employee) of your parent organisation. Please circle the appropriate number for each item according to how important it is to you.

1 = Very unimportant

2 = Unimportant

3 = Neutral (Neither important nor unimportant)

4 = Important

5 = Very important

	Very Unimportant	Very Important
1. Have an opportunity for advancement to a high position in my parent organisation	1 2 3 4 5	
2. Build my professional reputation in project management	1 2 3 4 5	
3. Belong to the professional community of project management	1 2 3 4 5	
4. Belong to my parent organisation	1 2 3 4 5	
5. Improve my knowledge in project management	1 2 3 4 5	
6. Improve my knowledge of my parent organisation	1 2 3 4 5	
7. Have adequate career prospects within the project management profession	1 2 3 4 5	
8. Have adequate career prospective within my parent organisation	1 2 3 4 5	
9. Keep contact with others in the project management profession	1 2 3 4 5	
10.Keep contact with others in my parent organisation	1 2 3 4 5	
11.Earn excellence in the eyes of project management colleagues outside my parent organisation	1 2 3 4 5	
12.Earn excellence in the eyes of organisational colleagues outside the project management profession	1 2 3 4 5	
13.Have an adequate level of salary relative to other staff within my parent organisation	1 2 3 4 5	
14.Have an adequate level of salary relative to other project management professionals outside my parent organisation	1 2 3 4 5	

Part 3: Work-Related Values/Beliefs

In this part, each item consists of two statements, A and B, which are logically opposite to some extent. To complete this part, please circle one of the following indicators for each item:

- A = I agree with A much more than with B
- a = I agree with A somewhat more than with B
- ? = I cannot choose between A and B
- b = I agree with B somewhat more than with A
- B = I agree with B much more than with A

Please show your value/belief leanings on each item, even though you do not feel strongly on the topic or do not feel well informed. Please choose between the two statements, even though both of them may seem acceptable to you, or both unacceptable.

1. About boundaries between professional work and leisure: A. It is important for me to have a clear point where my professional work ends and leisure begins. B. When necessary, I am willing to extend my professional work into my leisure time.	A a ? b B
2. In my leisure time, A. project management is one of my favourite topics to talk about. B. I do not like to talk about project management.	A a ? b B
3. In my leisure time, A. I like to participate in professional activities (such as seminars, discussions, conference, etc.) in project management. B. I do not like to participate in professional activities (such as seminars, discussions, conference, etc.) in project management.	A a ? b B
4. I like to work A. individually. B. in a group situation.	A a ? b B
5. The most important consideration for selecting a new member is A. his/her fitting into the project team. B. his/her technical knowledge and skills.	A a ? b B
6. I prefer the job in which A. personal initiatives are encouraged and achieved. B. no one is singled out for personal honour, but everyone works together.	A a ? b B
7. Which is more important for project management? A. Cooperation among project team members. B. Competition among project team members.	A a ? b B

<p>8. About project team goals and team members' personal goals:</p> <p>A. Team goals should always take precedence over team members' personal goals.</p> <p>B. Team members' personal goals must not be sacrificed on any account.</p>	A a ? b B
<p>9. A project team is</p> <p>A. a group of people working together.</p> <p>B. a place where individual members perform their own part of project tasks.</p>	A a ? b B
<p>10. Better decisions can usually be made by</p> <p>A. group discussions.</p> <p>B. individuals alone.</p>	A a ? b B
<p>11. Working on a project,</p> <p>A. I see myself as part of the project team.</p> <p>B. I am only concerned with my own part of the project task.</p>	A a ? b B
<p>12. In a project team,</p> <p>A. each member should be equally responsible for the successful completion of the whole project.</p> <p>B. an individual member should be responsible only for his/her own part of the project task.</p>	A a ? b B
<p>13. It is necessary to</p> <p>A. withhold information from other team members for an individual's personal power.</p> <p>B. share information with other team members for true teamwork.</p>	A a ? b B
<p>14. In a project team, written job descriptions</p> <p>A. should be available for every member.</p> <p>B. are unnecessary for some members.</p>	A a ? b B
<p>15. In a project team,</p> <p>A. there should be a written team rule manual.</p> <p>B. a written team rule manual usually causes an unnecessary loss of flexibility in the team's day-to-day work.</p>	A a ? b B
<p>16. Jobs should be defined and structured in such a way that</p> <p>A. staff have a great deal of individual discretion in doing things.</p> <p>B. standardised methods and procedures are used.</p>	A a ? b B
<p>17. For the best result,</p> <p>A. people should be fitted to the necessary jobs.</p> <p>B. jobs should be adjusted to the people.</p>	A a ? b B

<p>18.In a project team,</p> <p>A. communication paths should be written specified in detail. B. pre-designs of communication paths are unnecessary, and the communication paths should be left to be decided as necessary.</p>	A a ? b B
<p>19.When an exceptional case occurs, it should be</p> <p>A. referred to someone higher up for review before any action can be taken. B. treated in the first place by team members making their own decisions.</p>	A a ? b B
<p>20.An organisation's written rules and procedures</p> <p>A. must not be broken for any reason. B. can be broken when necessary.</p>	A a ? b B
<p>21.Communications should be</p> <p>A. encouraged between all levels of hierarchical structure. B. limited to between two immediate levels as specified in organisational rules.</p>	A a ? b B
<p>22.For handling problems occurring on their jobs, staff should</p> <p>A. have a high level of autonomy. B. strictly follow job descriptions and other written rules/procedures.</p>	A a ? b B
<p>23.In a project team, members should be</p> <p>A. constantly checked on for rule violations. B. evaluated only on the basis of their work results, regardless of rule violations.</p>	A a ? b B
<p>24.When an exceptional case occurs, it should be treated</p> <p>A. in accordance with the most relevant rule, however imperfectly. B. on its unique merits, regardless of the rules and procedures.</p>	A a ? b B
<p>25.Becoming successful is a matter of</p> <p>A. hard work. B. good luck.</p>	A a ? b B
<p>26.A boss should be characterised by</p> <p>A. his/her relevant knowledge and skills. B. his/her position power.</p>	A a ? b B
<p>27.In a project team,</p> <p>A. a manager should be older than his/her subordinates. B. “work capability” instead of “age” is the consideration in the recruitment of a manager.</p>	A a ? b B

28.In a project team, A. older people should be more respected than younger people. B. older people and younger people should be equally respected on the basis of their work performance.	A a ? b B
29.The most important reward for a person's excellent work performance is to A. promote him/her to a higher position in organisational status. B. offer him/her interesting and challenging work opportunities.	A a ? b B
30.Team members should have more influence based on A. what they know. B. what positions they have.	A a ? b B
31.For resolving conflicts, A. hierarchical authority is of value. B. relevant knowledge is of value.	A a ? b B
32.To solve a problem, potential sources of information and solutions A. from top managers and middle/low managers should be treated as if they were equal, pending the outcome of evaluation of them. B. from higher managers should be given priority for consideration.	A a ? b B
33.If my superior issues an instruction I think is wrong, I will A. do as it requires. B. not do as it requires but question it.	A a ? b B
34.In a project team, A. members with a professional qualification in project management should be more respected than those without it. B. it is work performance instead of a PM professional qualification that counts.	A a ? b B
35.In a project team, whenever a fellow member asks for my help, I usually A. go out of my way to help him/her. B. regard his/her job as irrelevant to me.	A a ? b B
36.After the work time, A. I do not want to keep contact with my fellow project staff. B. I like to attend an informal gathering of project staff, such as an after-work party.	A a ? b B
37.Relationships between fellow project team members should be A. limited to the formal relationships as specified in formal rules and procedures. B. extended to beyond the formal relationships that are specified in formal rules and procedures.	A a ? b B

<p>38.If a team member has a personal problem that comes up,</p> <p>A. he/she can expect the special consideration he/she might need to solve it from the project team.</p> <p>B. he/she must not bring the problem into the project team.</p>	A a ? b B
<p>39.In a project team,</p> <p>A. team members should be encouraged to make improvement suggestions for every aspect of team performance, not just for their own parts of the project task.</p> <p>B. it is best for team members to avoid intruding themselves into the areas of other members.</p>	A a ? b B
<p>40.In a project team, informal communication</p> <p>A. is important for enhancing team performance.</p> <p>B. causes authority/responsibility confusion.</p>	A a ? b B
<p>41.Generally speaking,</p> <p>A. team performance can be enhanced if team members show informal appreciation to each other of their peers' work performance.</p> <p>B. people do not care much about other people's informal appreciation of their work performance.</p>	A a ? b B
<p>42.Team performance can be enhanced by members</p> <p>A. knowing and accepting each other personally.</p> <p>B. respecting each other's work, regardless of friendship.</p>	A a ? b B
<p>43.In a project team, whenever a team member has a work problem,</p> <p>A. he/she should have ready access to any fellow members who can help to resolve it.</p> <p>B. he/she is supposed to go to the same person for an answer.</p>	A a ? b B

Part 4: Comments (Optional)

If you have any comments, please write them down here:

Thank you very much

Appendix 6: Follow-Up Letter of the Survey

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August 10, 2000

Dear AIPM member,

Re: Project Management Culture Survey

We sent you a questionnaire about 10 days ago, which is part of a PhD study of the professional culture (work-related values and beliefs) of project management.

If you have completed and returned the questionnaire, please accept our thanks for your cooperation and assistance.

If you have not yet found the time to do so, could you please complete and return it in the next few days. We recognise how busy you must be and greatly appreciate you taking the time to complete the questionnaire. As a full member of the *Australian Institute of Project Management* (AIPM), you are a very important part of the project management profession. We need your completed questionnaire because of the importance it has to the study.

If by chance you did not receive the questionnaire or it got misplaced, we would be happy to send another out to you. Please e-mail Mr. Xiaojin Wang at xiaojinwang@hotmail.com to request another form.

Thank you for your assistance.

Yours sincerely,

Xiaojin Wang
PhD Candidate
School of Management

[Redacted]

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