

**An inquiry into a project management body of knowledge in the
Japanese construction industry and roles of a Japanese PMBoK
for Japanese managers**

A Thesis Submitted for the Degree of Master of Philosophy

By

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I, Shinichiro Hiyamizu, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This research explores Project Management Body of Knowledge (PMBoK) in the case of the Japanese construction industry. As guides for project management, PMBoKs are developed and updated by project management associations, and used for individual certification programmes and corporate standards of project management in best practice.

Because a PMBoK is expected to express project management philosophy, its design should be based on empirical research. Research on PMBoK has been done in the Western context, but its investigation outside Anglo-Saxon economy has not been well explored.

Therefore this research focuses on the differences in the selection of PMBoK topics between English and Japanese managers and those that exist between the two groups. The case of the Japanese construction industry in 2000 is surveyed as a research field, wherein project management approach is needed. This research seeks answers to the following questions: ‘What PMBoK topics are used in Japanese construction projects?’ and ‘How do the Japanese guidelines for project management differ from those of the Western ones?’

A potential Japanese PMBoK proposed in 2000 refers to the existing PMBoK concepts and literature. The model is tested through questionnaires and interviews of Japanese managers. The data obtained from the survey is compared with similar data from the UK. The comparison indicates that there are significant differences between Japan and UK, classified into five categories.

To describe the differences between the Japanese and the English PMBoK, the five categories are compared with the selection of PMBoK topics published during 2001–2013; this information is then elaborated in an effective framework.

The study concluded that the Japanese group thinking possibly explains the selection of PMBoK topics compared with the English professional approach. The research output enhances an understanding of the thinking in the formation of the PMBoK by Japanese and their English counterparts.

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Chapter 1 Introduction

1.1 The PMBoK in the Japanese construction industry – differences between the situation in Japan and that in the UK

A Project Management Body of Knowledge (PMBoK) is widely used in the West. It is employed for individual certification programmes and/or as a framework for corporate standards in best practice.

The first attempt to describe the body of knowledge in project management was undertaken by the US based Project Management Institute (PMI) in 1976. This later became the baseline for the first certification programme for project managers. Following several revisions during the 1980s and 1990s, the basic framework had been put in place by 1996, when the 1996 edition was published.

In the early 1990s, the Association for Project Management (APM) in the UK launched its certification programme. It did not employ the PMI-PMBOK®. Instead, it created its own body of knowledge. The first version was published in 1992.

European and other countries followed the lead of project management associations in English-speaking countries. Several professional bodies joined the PMI as a chapter of the US-based association, and thus adopted the PMI-PMBOK®. Others used the APM model as a framework. Some, like the Netherlands, used it unchanged, but others, like Switzerland, France and Germany, modified the model to make it more appropriate to their culture and society.

Under the leadership of researchers from the UK, Germany and France, the International Project Management Association (IPMA) produced a common competency baseline in 1998. This was written in the three languages of the above-mentioned countries. These BoKs have been created through discussion and research based on practice (Morris, 1999b).

Thus, several different types of PMBoKs are used in various countries. If there were one generic body of project management knowledge, then all projects could be understood

and learnt using the same set of topics, i.e. the common language of the project professional. The existence of several different PMBoKs suggests that there is room for a common knowledge base to be developed. Empirical evidence is needed to enhance the validity of a PMBoK.

Although it has been more than 35 years since the PMI produced the first PMBoK in 1976, its PMBoK is still largely developed from a practical background. The first research on PMBoK was undertaken in the UK as a review of the APM's PMBoK in 1999.

Despite their importance in practice, there has been very little attention given to the academic aspects of PMBoKs. Robust theories and empirical research on PMBoKs are needed. PMBoKs were created from a practical demand to evaluate project managers (Wideman, 2000).

The first attempt to place PMBoKs on a theoretical footing was seen in the research to update the APM's fourth edition by Centre of Research for Management of Project (CRMP),UK (Morris, 1999b)

The research was the first to use empirical evidence in the covering of topics on the practical use of knowledge in project management.

To determine the topic coverage required for the Japanese PMBoK, the existing PMBoKs, - i.e. those of the PMI, the APM, and the IPMA will be compared. A straw-man of the APM's PMBoK, which was used for research on the revision of the APM's PMBoK in 1998, will be also considered. To identify potential important topics with regard to the Japanese PMBoK (and/or the straw-man of the Japanese PMBoK), literature on Japanese management will be reviewed. Japanese management theories will be documented briefly for each topic in the putative Japanese PMBoK.

To test the coverage of topics in the Japanese PMBoK, a questionnaire was compiled and circulated and interviews were undertaken. The results were then compared with the same survey conducted during the APM's revision in the UK in 1999.

This research is focused on the Japanese construction industry. It should provide a new field for PMBoK research. The Japanese construction industry has a long history and should have a unique type of management as compared with Western countries. The Japanese PMBoK will act as a guide for mutual understanding between the East and the West when undertaking international projects.

The Japanese did not have their own PMBoK back in 1999. What should constitute the Japanese PMBoK? Japanese management has had large impact on Western management in the past two decades. The Japanese have demonstrated high performance in their business practices, especially in the manufacturing industry. Their practices display approaches that are quite different to those of the West.

Japanese managers' identity is said to be a company's general manager rather than sense of professions as seen in the West (Oliver and Wilkinson, 1992). Groupism approach sustains good team work in Japanese organizations. Team work is a base of Quality Management that Japanese management style is referred to the Western management studies. On the other hand, Japanese organizations prefer to maintain long term relationships with their clients. This makes situation in Japanese business context that 'Contract means nothing in Japan' (Bennett, 1998).

If roles of individuals in Japanese organisations are not clear and idea of professionalism is relatively weak, 'how the Japanese explicit guides for professionals can be contrasted to the Western ones?' and 'what are meanings of PMBoKs for the Japanese?' This research addresses this issue.

Therefore one might expect a Japanese PMBoK to differ from a Western one. If so, then in the same way that the West has benefited from the study of Japanese management, so it might benefit from a discussion of the generic nature of projects.

Faced with new challenges, the Japanese construction industry will also have benefit from PMBoK research. Firstly, in Japan, the demand for construction projects has decreased to half that in the 1990s. Secondly, thanks to globalization, the Japanese construction industry now faces more international competition. The industry also needs to adapt to environmental change. It needs to shape the way that it manages projects. To

do so, an explicit guide to Japanese project management is essential. Thus, the Japanese can acquire project management knowledge from a more global point of view, recognising the nature of the current system and the reasons that it has been employed. An explicit guide to knowledge in project management will aid this process. Further, there need to be explained how much fit any theory of PMBoKs that the research can propose to the actual PMBoKs that were produced after 2001.

1.2 Management in Japanese construction sector

In this section, the problem of management in Japanese construction sector is discussed as a background for research on the Japanese PMBoK in construction sector.

1.2.1 Criticisms of the Japanese construction industry

A 2000 Mainichi Newspaper survey reported that 38% of Japanese citizens think that Japanese public construction projects are inefficient-, and 25% of Japanese citizens consider public construction projects unclear in decision-making.

- | | |
|--|-------|
| 1. Public construction projects are inefficient | -38%, |
| 2. Public construction projects have unclear decision-making | -25%, |
| 3. Corruption and collusive tender occur in public construction projects | -20%, |
| 4. Public construction projects increase government debt | -17%. |

(Mainichi Newspaper, 2000)

Japanese public construction projects were criticized because it is thought of as inefficient and unclear from Japanese citizens who are outside the industry. Such projects require accountability in project management.

Japanese general contractors received the same types of criticism as the Japanese public construction projects. According to the Nihon Doboku Kogyokai surveyⁱ, 31% of Japanese citizens considered general contractors unnecessary because

1. General contractors are dependent on subcontractors for performing construction works.
2. Those outside the industry cannot understand general contractors' activities.

(Nihon Doboku Kogyokai, 2000)

ⁱ Nihon Doboku Kogyokai consists of 174 main construction companies. Data of the survey is from 825 individual questionnaires.

From the aforementioned data, it may be concluded that Japanese public construction projects and general contractors received criticism because Japanese society does not have a proper understanding of project management in public construction projects. For example, Yoshida and Teikoku Data Bank Ltd (1998) explained that Japanese general contractors do not perform their duty in building projects because 80% of construction works is outsourced to subcontractors. Because general contractors' activity is unclear to outsiders, people perceive general contractors as people who unfairly exploit their clients (Mainichi Newspaper, 2000).

Sekiya (1997), Saeki(1997), and Eguchi (1997), managers in the Japanese building sector, noted that the management fee is not regarded as an appropriate object of payment. In Japan, it is abnormal to pay for any service. 'Service' here means non-material deliverables benefiting the customers. In the Japanese language, 'service' is translated to be something such as 'free service for the customers'.

Another issue is that the consultants in the Japanese construction sector have relatively low status. Because non-physical service is usually not charged to the client, such activities as construction design are not regarded as ones that necessitate payments (Baba, 1996, Project management committee, 1999).

Thus, Japanese people do not regard management as a legitimate business (i.e. product). Therefore, management costs are generally hidden by already including them in the product price. Because general contractor management costs are relatively high, people believe that Japanese general contractors unfairly obtain profit.

Kunishima (1998), an academic studying the Japanese public construction industry stresses that the Japanese government must more clearly explain their public projects to overcome such criticisms from Japanese citizens.

Kanou (1997) noted that clearly explaining Japanese construction project management is difficult because organisations' and individuals' roles in Japan are not distinctly separated. He says, "The Japanese have a culture of attaining the goal without defining each person's role and responsibility. This way may work well when all people have

same cultural background with long-term relationships” (p.23). He insists that the current Japanese management system should be reformed in order to clarify individual managers’ roles in building projects.

These examples suggest a common need that the Japanese construction industry clarifies its management activities and their value. However, this goal might be challenging for most Japanese organisations, because the Japanese have not explicitly defined their management approaches. Their management ways are sometimes determined culturally rather than logically. In fact, Pascal and Athos (1981; p.22 cited by Gordon, 1988; p.156) say, “Managerial reality is not an absolute; rather it is socially and culturally determined....”.

In Japan, most construction project management practices have rarely been studied academically. ‘Partnering’ is the one of such examples. The feature of ‘partnering’ is typically seen in any Japanese inter-organisational relations. In the 1980s, their practices were studied by the West. ‘Partnering’ is described as being a strategic long-term alliance between Japanese organisations. However, this is not employed based on a theoretical route in Japan. Kunishima and Shoji explain this situation in one of the few Japanese ‘construction management’ textbooks as follows:

“(Partnering) is a new form of agreement or system, adopted within normal construction contracts or design-build contracts, in which the client and contractor together form a project team based on mutual confidence and then work together to manage the project to a successful conclusion, yielding a profit for both parties. ... The relationship between the two parties is called a partnership or alliance. ... Since the formation for certain types of partnership has been limited in the United States over the past few years, the effectiveness and problems of this new system will be revealed in future studies.”

(Kunishima and Shoji, 1995; p.258)

Considering that the Partnering has its root in Japanese management practice, the above understanding among Japanese practitioners may express Japanese at large do not recognise what they are doing in practice as an explicit manner. Thus, a clear guide for Japanese project management would enable them to explain their own practice.

1.2.2 The needs for a PMBoK for the Japanese construction industry

As Bennett (1991) observed, although the Japanese have excellent management practices, they lack a logical approach. Further, Japanese management practice cannot be fairly evaluated without considering negative aspects such as excessive overtime ('Long working hours' has always been a serious problem of the Japanese construction industry).

Baba (1993) and Yashiro (1998) found that Western project management philosophy is different to the body of knowledge of Japanese construction projects, although they did not propose a Japanese PMBoK. Later, Crawford, et al. (2007) identified implications of different emphasis between project management standards in five countries including Japan and Western countries. They implied that the Japanese project management standard exhibited characteristics different to the other standards, although they could not specify the relationship between the differences in standards and the countries' backgrounds underpin the differences.

Having an explicit description of management practice would benefit for Japanese managers as well as those in other countries. From this purpose, the Japanese construction industry requires explicit description of its project management. If the Japanese construction industry has a remarkable production system, the industry might have a unique model of project management and it might thereby contribute to the development of the overall project management discipline.

To summarize, the Japanese see themselves as unique to the rest of the world. In civil construction industry, the Japanese public also has an interest in construction projects as taxpayers. In international project practices with Japanese firms, foreign countries must understand management practices in the Japanese construction industry. The Japanese firms also require an understanding of the differences between their own and other nation's project management.

In Japanese construction projects, engineers usually serve as project managers. However, their current management education is neither well structured nor standardized, and so engineers require the appropriate education and evaluation as project managers. Japanese construction industry therefore would seem to benefit from a more logical, explicit, and structured approaches in management education and assessment in project management.

All these factors indicate the needs for explicit management practices in the Japanese construction industry. More importantly, Japanese managers must clearly know what the project management practices are and why they have such practices. Further, other countries can benefit from detailed knowledge of the Japanese construction industry to utilize Japanese practice.

Construction's project management discipline should address its specific needs. It requires a Japanese PMBoK as explicit guide for the discipline. Project management communities should explore development of a project management model in the Japanese construction industry.

1.3 The structure of this thesis

The remainder of this thesis comprises the following chapters:

Chapter 2 Project management

The aim of Chapter 2 is to describe the background to projects and project management.

Chapter 3 Project Management Bodies of Knowledge (PMBoKs)

Chapter 3 describes the professional associations in the field of project management, together with PMBoKs and their background. Literature regarding project management bodies of knowledge is reviewed. The functions of PMBoKs is analysed in terms of knowledge works of the project management.

Chapter 4 Research methodology: a possible model for a Japanese construction PMBoK in 2000, a questionnaire and interviews

Chapter 4 deals with the research methodology. The process of selecting topics for coverage by PMBoKs is discussed. It includes the design of a model of Japanese PMBoK. The model is used as a straw-man to test through interviews with Japanese managers and the questionnaire circulated to Japanese managers.

Chapter 5 Data analysis 1: the PMBoK within the Japanese construction industry

Chapter 5 examines the results of the interviews and questionnaire regarding topics within the proposed Japanese PMBoK. Meaning of the proposed PMBoK for the respondents is analysed.

Chapter 6 Data analysis 2: an international comparison

Chapter 6 discusses the nature of project management with regard to international comparisons. Firstly, data from Japanese working in various environments (in Japan and overseas) are compared. Secondly, data collected from Japanese managers are compared with those taken from English managers – the latter data being collected during research for the update of APM in the UK in the previous year. The differences are examined through comparisons with actual topics selections of existing PMBoKs during 2001 – 2013.

Chapter 7 Conclusions: research findings and further study

Chapter 7 presents the research findings and proposes further research. weakness in stressing other social relationships with other various parties, especially contractors, compared to the English PMBoKs.

Chapter 2 Project management

2.1 Introduction: what is a project?

The aims of this chapter are as follows:

- to define the terms ‘ project’ and ‘project management’
- to review the evolution of the concepts of ‘project management’, and
- to state what it is about project management that differentiates it from other management approaches.

Question ‘What is a project?’ is the oldest and the most difficult question within the subject of project management. Despite a long history of investigation, a widely accepted definition for the term ‘project’ does not yet exist (Reiss, 1992/1995, p. 11), even among traditional engineering project industries (Turner, 1999, p.2).

Nevertheless, in order to manage a project, providing a definition is extremely important. If we want to manage something, then we should know the object that we are going to manage. Sun Tzu, an ancient Chinese General, said “If you know both yourself and your enemy, you can win numerous (literally, ‘a hundred’) battles without jeopardy” (Tzu, c.500 BC).

When we want to manage a project, we have to know what it is. Therefore, to manage projects, it is preferable to know their tangible characteristics.

The following section gives the definitions of ‘a project’ supplied by many authors.

2.2 The definition of a project and project management

Many authors have tried to describe the nature of a project. Some key words are typically used for an explanation. For instance, Kerzner points out that a project is seen as any series of activities and tasks that have a specific objective, start and end, and funding limits, and that consume resources (Kerzner, 1998; p.2).

Reiss's defines a project as "a human activity that achieves a clear objective against a time scale" by a team of people, no practice or rehearsal and change (Reiss, 1992/1995, p.12).

Wearne sees a project as "investment or resources for an objective that cause irreversible change" (Wearne, 1995, p. 3).

In ISO 8402, a project is defined as "a unique process, consisting of a set of co-ordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements including constraints of time, cost and resources" (ISO 8402, quoted by Lockyer and Gordon, 1996, p. 1).

The PMI guide to the Project management Body of Knowledge defines a project as "a temporary endeavour undertaken to create a unique product or service" (PMI, 1996, p.15).

Young sees projects as a means of generating change(s) with structured method(s). He also mentions 'start point and finish point' and results that satisfy 'needs' (Young, 1998, p. 16).

Maylor describes a project as goal oriented 'non-repetitive activity' activities, with set of constraints such as time and resource. A project causes some changes that are measurable (Maylor, 1996/1999, p.4).

Burke expresses the characteristics of a project as "a life cycle, a start and finish date, a budget, activities that are essentially unique and non-repetitive" as well as "co-ordinating, a single point of responsibility, that are subject to change and need to be developed, defined and established". He defines a project as "a group of activities that have to be performed in a logical sequence to meet preset objectives outlined by the client" (Burke, 1994; pp. 8–9).

Field and Keller (1998, p.3) use 'objective', 'resources', 'unique (venture)', 'budget', 'schedule', and organised work towards a pre-defined goal or objective as key words.

The ISO 10006 (quoted by Lockyer and Gordon, 1996, p. 1) notes that some key concepts and tools, such as organisation, objectives, and products are constructed during the course of the project. They also explain that project activities are interrelated and complex.

Lockyer and Gordon (Lockyer and Gordon, 1996, p. 3) states that uniqueness, having a start and finish, and having phases, are characteristics of a project.

Turner and Simister (2000, p. 66) define projects as “unique, novel and transient endeavours undertaken to deliver novel business development objectives”.

Lock (2000, p. 4) insists that a project’s characteristics are ‘novelty’ and ‘uncertainty’. A project is unique in terms of “one or more commercial, administrative or physical aspects”.

A project thus seems not to have a common definition. Many elements have been suggested as definitions of a project, by many authors. Those elements that were suggested by the above-mentioned authors as characteristics of a project are as follows:

A project:

(Goal-related definitions)

- is started, having some purposes, intentions, and/or constraints
- is an activity whose objectives may be defined and achieved progressively during the course of progress
- should have a definite goal to achieve
- has a specific objective to be completed within certain specifications

(Time-related definitions)

- is concerned with time
- has defined start and end dates

(Uncertainlyⁱⁱ-related definitions)

- is concerned with uncertainty
- is an activity that cannot be totally predicted in advance

(Planning- and change-related definitions)

- is an activity in which the plan should be changed in accordance with its progress

(Resource- and budget-related definitions)

- has funding limits (if applicable)
- consumes resources (i.e. money, people, equipment)
- is an investment of resources

(Human-related definitions)

- needs a single point of responsibility

(The other definitions)

- includes almost all activities.

The above definitions are indirect descriptions of project activities. They do not directly express ‘what a project is’. Instead, they directly express *how* people have perceived projects. In fact, almost all of the authors define project management as managing all (or some) of these elements. These elements are indirect factors for comprehending the meaning of ‘a project’.

So far, we do not have an answer to the question: ‘what is a project?’ Instead, we know that each project has certain characteristics – uniqueness, irreversibility, and changes by human beings. We also know that a project has a life-cycle. These definitions express project’s characteristics. Therefore, a manageable definition for a project is as follows:

ⁱⁱ In Oxford dictionary, risk is defined as: [Exposure to] the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility.
“Frank Knight (1921) established the distinction between risk and uncertainty in his work “*Risk, Uncertainty, and Profit*”. Whereas risk is measurable provability of damages, uncertainty is the lack of complete certainty, that is, the existence of more than one possibility. With uncertainty the "true" outcome/state/result/value is not known (Wikipedia, 2011).

- **A project is unique, involves change by people and has a predetermined life-cycle.**

Morris (1994/1997) notes that whereas the life-cycle is the only characteristic that distinguishes projects from non-projects, all other management theories contained in project management do not differ from 'general' management, such as "planning, organizing, controlling, and so on" (Morris, 1994, p. 307).

It is questionable whether we can find the 'right answer' for the definition of 'a project'. The above definition of 'a project' may be right for an appropriate case, but it may be wrong for other cases. In fact, no one has ever succeeded in providing a totally accepted definition of what a project is, so the question will not be answered properly. Instead, we could have an agreement on what 'our project management' is to be. Our question should be 'what is our agreement on the definition of a project'.

'Project management' is simply the discipline of managing projects. The definition of project management is thus intimately bound up with the definition of a project. Further, in a definition of a project, we also see some 'parameters' – goal, time, uncertainty, team, quality, etc. – which are suggested by many authors to describe a project. Whatever we choose as parameters, we can and should have these parameters to manage projects. Therefore, project management is defined as follows:

- **Project management involves the management of unique changes throughout a predetermined project's life-cycle.**
- **Projects are managed through the management of their parameters, e.g. goal, time, uncertainty, organisation, value, etc.**

The above two definitions of project management will be used in this thesis. Regarding the selection of parameters, it should also be very central issue to define project management. In fact, there have been debates in the project management community on the extent to which project managers should be knowledgeable in managing projects. For

instance, Morris (1999) critiqued that project management should focus not only on the traditional view, i.e. ‘on time, in budget, to scope’, but also the sponsor’s success. Ohara, *et al.* (2004) also stressed that the topics of project management should be extended to the very early stage of projects, when projects are created that ‘focus on management processes’ to deliver project outcomes towards ‘predetermined objectives’. The question: ‘What parameters should be selected for a guide on project management?’ is a main theme for project management. This research deals with this question, using a case of the Japanese construction sector.

The following sections show the development of project management along with the development of management theories. This approach is important, since the development of project management theories has a close relationship with the development of management theories.

2.3 The ‘task idea’ and routine operations

The early twentieth century saw the rise of modern management. The ‘task idea’ (Taylor, 1911*b*, p. 39) was central to the evolution in management. The idea, focusing on the workflows and the efficiency of the work, enabled huge improvements in productivity and changed our society. Today, these theories are understood as ‘normal’ operation management. Normal operation management stems from the theories of Adam Smith (1776), Frederick Taylor (1911), Max Weber (1947), and Henri Fayol (1949).

Smith (1776) explains the relationships of increase in productivity and ‘division of labour’. He mentions the basic theory of mass production, using a pin-maker:

“the important business of making a pin is, in this manner, divided into about eighteen distinct operations, ... Each person, therefore, making a tenth part of forty-eight thousand pins, might be considered as making four thousand eight hundred pins in a day. But if they had all wrought separately and independently, and without any of them having been educated to this peculiar business, they could certainly not each of them have made twenty, perhaps not one pin in a day.”

(Smith, 1776, p. 110)

Taylor (1911b) established a scientific approach to management. His application of the scientific method to mass production brought huge improvements in productivity. Fayol's (1916) work in France coincided with that of Taylor in the US. Fayol describes basic organisation theories, such as the division of work; the discipline of the relationship between individuals and the organisation; and a united organisational control and command system. According to him, management responsibilities are as follows: planning, organising, command, coordination, and control (Sheldrake, 1996, pp.45–57, Burnes, 2000, pp.32-35).

Weber (1947) introduced the term 'bureaucracy' for the understanding of the mechanisms of big organisations. He explains how bureaucracy is controlled through laws that govern a system of abstract rules and the formal memberships of the organisation. In a bureaucracy, the roles of members are granted by the organisation. The organisational structure is described as hierarchically controlled. Tasks are defined as continuous, and based on regulations. These offices and/or roles that constitute an organisation are functionally divided (Sheldrake, 1996, pp. 61–63).

2.4 Routine operations and project management

While traditional management theories such as bureaucracy and the task idea had been prevalent in management practice as a basic concept, these theories were increasingly recognised as being unsuitable for application to one-off activities (Bennett, 2000, Turner, 2000a). As our activities have become complex, large-scale, and/or urgent, the need for management of one-off activities has increased. The modern term 'project management', which is now widely used, first emerged in the 1930s to 1950s (Morris, 1994).

Project management is management of non-routine activity. Many researchers clearly differentiate between project management and routine operations (Burke, 1994, Lockyer and Gordon, 1996, PMI, 1996, Morris 1994/1997, Turner, 1999, Turner and Simister, 2000). For instance, Burke (1994) differentiates project management from "with two other common types of management", 'productionⁱⁱⁱ', and 'process' (Burke, 1994, p.10). Project management involves non-repetitive activities. It deals with the coordination of subdivided work packages (Figure 2.1).

ⁱⁱⁱ Burke (1994, p.10) defines 'Process Management' as "the product flows along a process line, i.e. a chemical plant processing petrol from crude oil."

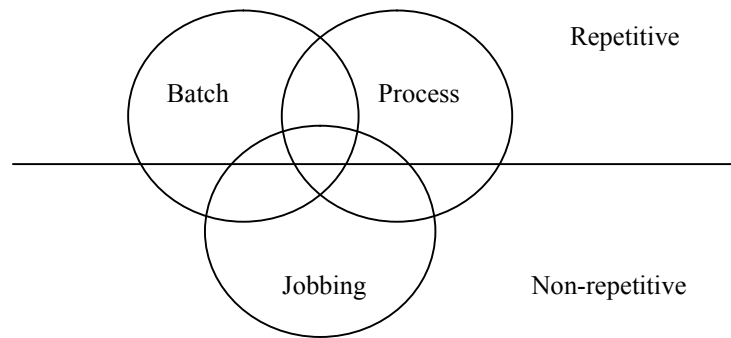


Figure 2.1: Three different types of management. Source: Burke (1994), p. 10

Apart from the fact that Burke’s categorisation is appropriate to discuss project management, the idea that project management always deals with non-routine operations is a major one. The PMI also differentiates routine operations from projects. They say “Operations and projects differ primarily in that operations are ongoing and repetitive while projects are temporary and unique” (PMI, 1996, p.5).

Turner explains the difference between routine operations and projects as “In the process, we recognise that rather than having either projects or routine operations, we have a spectrum of endeavours ranging from the routine to the unique, novel and transient. As we move along that spectrum we use management approaches designed for the routine or the unique, novel and transient, or something between” (Turner, 1999, p. 3).

Turner differentiates between ‘projects’ and ‘routine operations’ by way of our conceptual approach, not by focusing on the activity.

Whatever we choose as an approach and/or perception, routine operations and projects are thus distinguished. We have two different approaches to managing our activities – routine operations and non-routine operations. Non-routine operations are frequently used to describe projects’ activities.

2.5 Project management and routine work

The finding of ‘task idea’ may characterise the most significant epoch in modern management. In fact, the idea is still strongly affecting today’s management (Hammer and Champy, 1993, Bennett, 2000, Turner, 2000a). There is no doubt that the task idea was developed into ‘routine operations’.

Because there is general agreement on that ‘projects’ can be clearly differentiated from ‘routine work’, it is good to start to examine how the idea of ‘a project’ has been distinguished from ‘routine work’. Then, this section examines ‘what is the opposite word to “routine work”?’ Therefore, this section examines the point at which the idea of ‘routine work’ was first separated from all our activities in modern management.

It was Taylor (1911) who first scientifically used the notion of differentiation between management and routine work. Introducing the term of ‘brain work’ to distinguish management and routine work, he developed the use of the concept of routine work in management.

“All possible brain work should be removed from the shop and centred in the planning ... department ...”

(Taylor, 1911*a*, pp. 98–99, cited in Burns, 2000, p. 29)

“The work of every workman is fully planned out by management ... and each man receives in most cases complete written instructions, describing in detail the task which he is to accomplish ...”

(Taylor, 1911*b*, p. 39, cited in Burns, 2000, p. 29)

The concepts of routine work are shown in Figure 2.2: i.e. model, input and output. In the model, there is no brain work. Once this model is established, we should concentrate on the monitoring and/or control of input and output. This has long been used as the basic concept of a control system. Thus, when (the concept of) routine work was stated, the concept of brain work also gained ground.

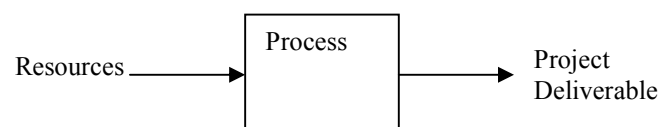


Figure 2.2: Basic model of a control system. Source: Maylor (1996/1999), p. 192

Figure 2.2 shows a basic model of a control system. This idea is exactly the same as Taylor’s routine operations. So, where, and how, should we describe brain work?

Whichever approach we employ, *ad hoc* ‘management’ needs to perform the brain work. The basic view of project management is expressed in Figure 2.3. A project manager manages the input. He or she designs and controls the model. Project managers also monitor the output so that the output can meet expectations. What project managers do in projects is brain work. This is clearly different in nature to routine work.

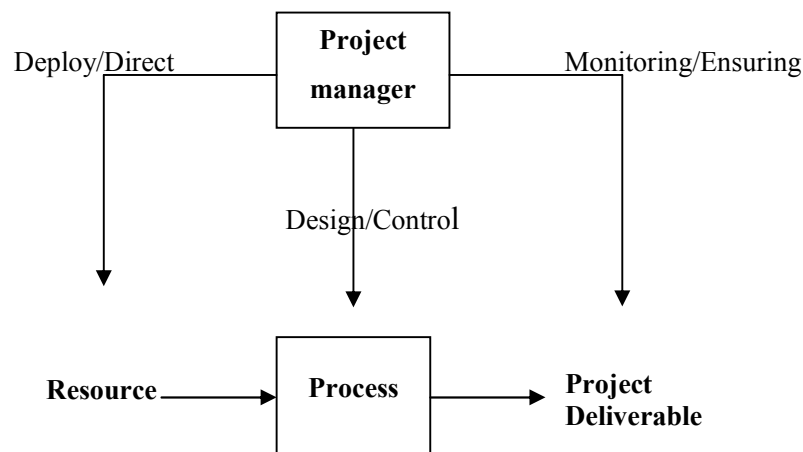


Figure 2.3: One view of project management. Based on Norris *et al* as quoted in Field and Keller (1998)

2.6 Four approaches to project management

Although, it is widely accepted that routine operations differ from projects, project management is perceived in many different ways. For instance, Kezsbom *et al.* introduced their example in their project management workshop. Their audiences conceived project management as if it were a special method to manage their project. At their workshop, they found “many different perceptions there are of just what project management really is” (Kezsbom *et al.*, 1989, p. 3).

An adequate tangible discipline of project management has still not yet been found. It is still developing. Its tools, techniques, and even its conceptual base are evolving rapidly. Lock (2000) asserts that keeping up with the cutting edge of knowledge in project management is important for project managers (Lock, 2000).

Morris (1997) also tells us that “genuine generic practices and terminology” of project management has not been thoroughly explored (Morris, 1997, p.1 of the preface to the hard book edition).

Thus project management discipline is still growing. There are many different approaches and/or perceptions of project management. The following sections discuss different approaches to project management. Following a review of the literature on project management, this research classifies project management into four distinct approaches.

The first group of researchers emphasise the **control** of project-based activities. Another group of researchers consider project management as a **system** approach that is more advanced than the control approach. These two approaches are the so-called traditional project management views (APM, 2000). While these two approaches share the same idea, the system approach is more advanced and complicated than the control approach.

The third group of researchers sees project management as a **goal-oriented** process, which could be a cross-functional activity in a conventional organisation, or it could also be a change process within a conventional organisation. Because the approach considers project management as one of the functions in a conventional organisation, the approach is differentiated from the others.

The fourth group of researchers use a more recent approach. For convenience, this approach is called as the **human-centred** approach. This approach focuses on project managers' intelligent work, which, as we have seen, was distinguished from 'routine work' by Taylor in the early twentieth century.

These four groups are used as a framework in the following sections. The author does not intend to make a rigid classification of all the approaches using the framework. The purpose of the framework is to enhance the understanding of different perceptions of project management. The proposed framework will aid comprehension of the development of project management.

The overall trend in project management could be explained as the expansion of its scope, from the traditional management view to the human-centred approach.

2.6.1 The control approach

The control approach is closely related to the traditional management approach. Where line operation is central to management, project management is regarded as a supplementary function. Taylor and Watling (1973, p.12) envisage this type of project “authority arises out of the project and its needs, it tends to emphasis planning and control more than a line operating department”.

Stallworthy and Kharabanda (1983) clearly state that their main concern is the control of costs in projects. O’Neil (1989, pp.3-4) distinguishes the general management approach from that of project management, according to the project’s temporality to be done for objectives. He sees project management as the control of resources.

The control of some dimensions is the initial step of project management. As Taylor picked out from all activities, its base is the management of routine work (Figure 2.3). It is indeed important as the first step. Compared with the other approaches, however, the control approach emphasises the importance only part of the whole works of project management. As we shall see in the next section, the control approach can be expanded to the system approach.

2.6.2 The system approach

This approach has its roots in Operational Research (OR), which Stafford Beer championed, amongst others. This is an advanced control approach. The approach is sustained by the following three basic logics (Figure 2.4):

- “System is run by human beings in a purposeful manner
- System is defined against its ‘Environment’ and the system has its input and output toward the environment
- System consists of structured components”

(Meredith and Mantel, 2000, p. 88)

In the system approach, a boundary that implies the ontology of the inner and its environment is recognised. The input and the output are then monitored to obtain a yield

from the system. The components in the system are arranged so that the system can perform as intended. Accordingly, the boundary is maintained as the system is recognised.

Kerzner (1998, pp. 4–5) also has a view of the system approach. He sees project management as managing the company’s resources by using control systems as “having functional personnel (the vertical hierarchy) assigned to a specific project (the horizontal hierarchy).”

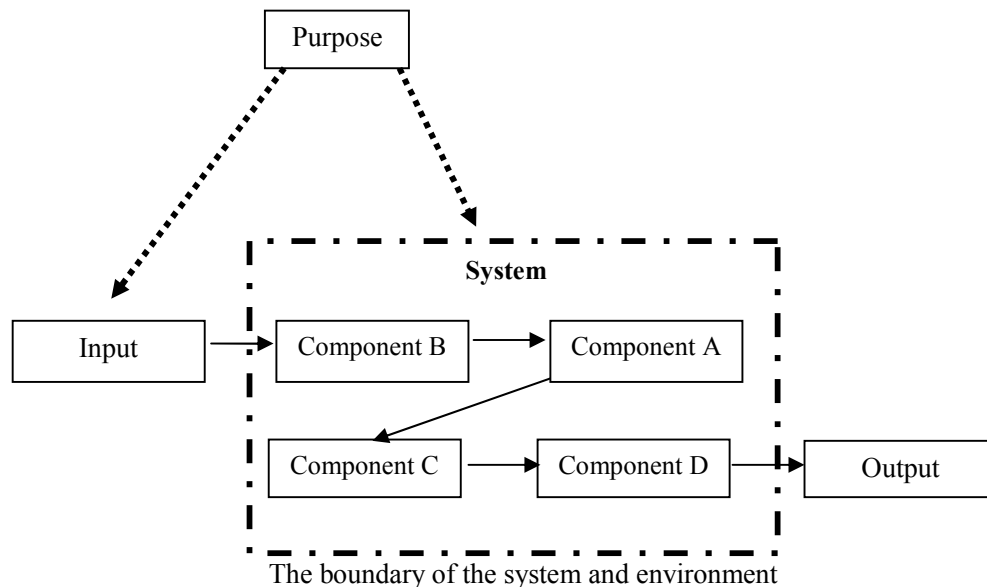


Figure 2.4: The concept of the system approach, based on Meredith and Mantel (2000), p. 88

Kezsbom *et al.* (1989) state that the aim of project management is to manage company resources using a systems approach that differentiates project management from a functionally assigned traditional approach.

Young (1998) defines project management as a control system for change with a specific purpose. He insists that our own perception to traditional management approaches should be withheld in order to make the changes that we need.

Figure 2.5 is a blend of Figures 2.3 and 2.4. Project managers manage and control the system, manage resources as input, and monitor project delivery as output.

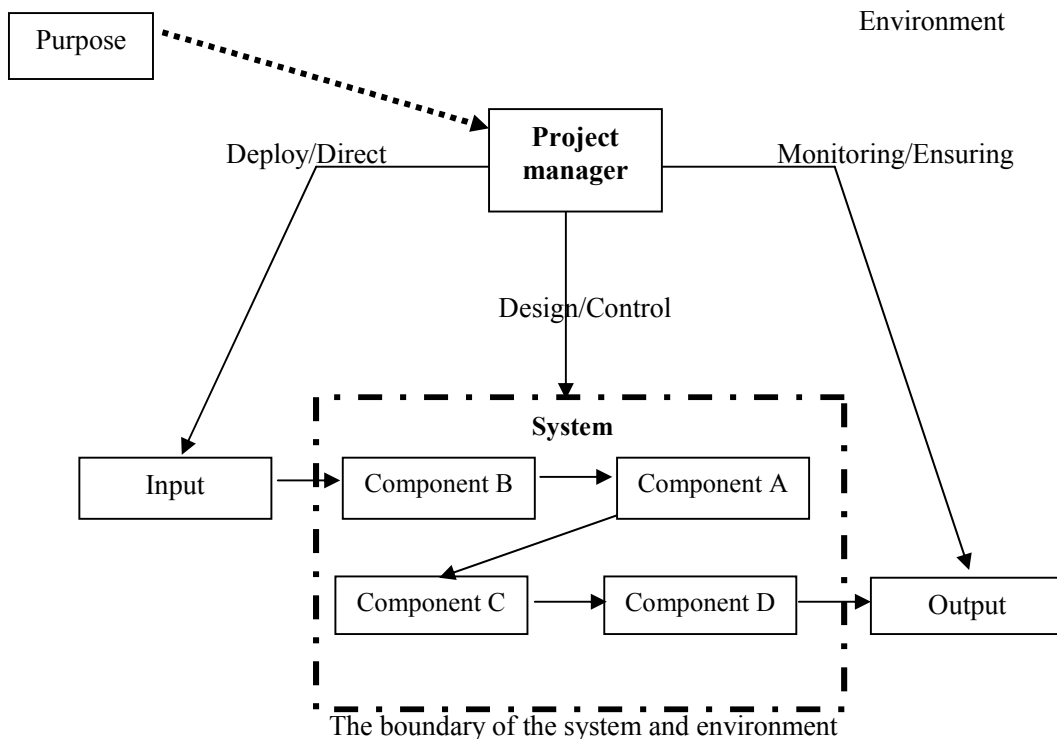


Figure 2.5: A combination of the concept of the system approach and the role of project managers (= Figures 2.3 and 2.4)

2.6.3 The goal-oriented approach

Some authors see project management as a means of managing a change in an organisation, stressing the difficulty of realising a change in conventional organisations that are designed to execute relatively static tasks. A change brings confusion in such organisations. This is because a project is goal-oriented, while conventional organisations are task-oriented structures. Changes, which are normally effected by projects, break existing norms and rules in the organisation. Changing existing norms and rules requires planning and leadership. In the current rapidly changing business environment, organisations need to generate changes. Project management is conceived as the driving force of changes to meet a particular objective.

Turner, *et al.* (1984) proposed ‘Goal Directed Project Management’ as a method to implement changes that are more complex tasks than the company’s normal routine work (Turner, *et al.*, 1984, p. 26). They describe their approach to project management as directing “the project manager’s attention towards achieving results, and gives him methods and tools that increase the likelihood of his bringing the project to a successful conclusion” (Turner, *et al.*, 1984, p. 23).

Lockyer and Gordon are also among those who define project management as management of change in the normal business framework of a company. They say “The project organisation ... is set up to achieve a particular objective: project product” (Lockyer and Gordon, 1996, p. 1).

For project managers, propelling changes without assistance from an authority outside task-based management is difficult, because the rate of change caused by conventional organisations is usually slow. Therefore, Lockyer and Gordon (1996) introduce project centred organisations that is suitable to promote changes.

Change needs to be managed properly, because if it is not, then the people in the organisation may resist the changes. Changes may be resisted by functional managers because; resources required by projects are taken from normal operations, and functional managers' authority is seen as of threatened by the introduction of a project manager within context of conventional organisation. Project management must be sensitive to issues of human aspect (Lockyer and Gordon, 1996).

In their perception, project management is defined as objective-oriented management at large, as against task-oriented management that stems from a hierarchical administrative idea. It is stressed that project management is a breakthrough technique in overcoming rigid boundaries between sections. This perception is one of the important approaches to project management. However, it clearly has limited scope.

2.6.4 The human-centred approach

The human-centred approach includes the idea that intellectual work by humans is the central issue of project management. The human-centred approach does not emphasise particular tools and techniques. Introducing work and tools, instead it emphasises how project managers undertake brain work.

Lock expresses the fact that the human factor plays an important role in project management. He explains project management as a function of forecasting and planning for successful projects (Lock, 2000, p. 3).

Project managers are central to project management. Lientz and Rea (1998) assert that people have been empowered to manage changes and are expected to be knowledgeable in project management.

Morris stresses the importance of the role of people in project management as; “projects, ultimately, are managed by people. Not systems, not contracts – people” (Morris, 1994/1997, p. 303). Project managers produce everything – all the scenarios for achieving a goal that are required for managing projects. It is people who deploy resources and control everything required to manage projects. No definite system and no single rule can be applied in the management of changing objectives.

There are various factors that make a project a success or a failure (Lientz and Rea, 1998, Morris and Pinto, 2004). The things that we need from projects are not measured only by engineering dimensions. Hence, we have to give deeper consideration to broader topics than the scope of the former three approaches, that are control, system, and goal oriented. Lientz and Rea (1998) show example that a success may be turned out to be a failure later. Whether a success or not may be dependent on perspectives that differ in countries’ development. A successful project may cause other problems as side effects (Lientz and Rea, 1998). For instance, they explain “When nuclear power was first developed, it was viewed as a great success and saviour for energy, medicine, and a variety of social problems. Although it has had many benefits, the view today is mixed. In short, something that appears as a success in one year may be a failure two years later” (Lientz and Rea, 1998, p.15).

With this view, two questions were posed by Morris (1994/1997, p. 217): ‘What should the proper scope of the subject of managing projects be?’ and ‘What makes a project successful?’ Who is able to answer these questions, and who is responsible for answering them? It is project managers who do the essential work in managing one-off activities. The development of human ability should be a central issue to enhance the performance of projects. It implies that the development of project management practice also essentially owes a debt to experience in the profession of project management.

Regarding the definition of success, Cooke-Davies (2004, p.105) asserts that there are three levels of success criteria. These are: (1) project management success: ‘doing the

project correctly'. This is concerned with the execution of project; (2) project success: 'doing the right project'. To do so, the right projects need to be selected; and (3) consistent project success: doing the right project correctly, time after time. Considering that an organisation has to be run as a going concern, profit needs to be generated continually via project success.

More recently, Pryke and Smyth (2006) focus on relationships between people and organizations in project and project management. Importance of focusing on relationships in projects is based on a view that a project is a social endeavor. They clearly define that "Delivering a project is a social activity. People are at the centre of realizing the goals, completing the tasks. People add the value"(Pryke and Smyth, 2006, p13). What they insist is that project management is not merely functions to generate project deliverables but to create clients' satisfactions and processes to attain the satisfactions. They say that our perception to projects would be changed if project management focus on clients' value and relationship with the clients (Pryke and Smyth, 2006, p.9).

In terms of attention to the front-end issue, Ohara (2009) defines the owner as the central player, "who is completely responsible for the total lifecycle" (p.15) in project management. He defines relationships of owners and contractors as a team jointly involved in value creation, defining mission and seeking solutions to obtain the value. As a model of value creation by organizations, he introduces Kaikaku project management (KPM) that is defined as innovative reform of business strategy and capabilities of organizations. The KPM consists of '*kakushin* (innovation)', '*kaihatsu* (development)', and '*kaizen* (improvement)'. In the KPM, people are centered in value creation. '*Kakushin* (innovation)' treats radical breakthrough. '*Kaihatsu* (development)', new knowledge and information are developed through challenges. '*Kaizen* (improvement)' is efforts of continuous improvement at work-floor level. Though these three components treat different scope of changes in organizations, managers in every component are expected to act creatively to manage projects in radically changing business context.

With human-centered view, to be successful in a project, project managers need to be more intelligent than when using the other approaches explained in this chapter. Dealing with complex needs and demands, we have to manage our quality of life, not merely engineering detentions. Project managers not only need to meet given objectives, but also

to set the appropriate measurement of success. Management needs to satisfy the preset dimensions as well as satisfying the client. Managers need to create value as well as to analyze situations that need to deliver a project outcome. Morris and Pinto (2004) expect project managers to be ‘thinking managers of projects’ (Morris and Pinto, 2004, p. xiv). This is why this approach is termed human-centred. The project manager’s intelligent work has a significant influence on the success of a project. Learning of/in project management is an issue central to project management.

2.7 The conversion process model and the project management process

The conversion process that is shown in Figure 2.6 is generally accepted by the APM (APM, 2000). The process is expressed as process that needs and wants are inputted and satisfied. The process is realised by the mechanisms as resources. The process is in the context on which some constraints are imposed (Maylor, 1996/1999, p4).

In this process, once needs are inputted, needs are processed. Finally, needs are satisfied. The human-centred approach emphasises that ‘project management is done by people’. This process cannot be done by only a predetermined system(s)/organisation(s). The want or need is converted into the satisfaction of the want or need.

The process in Figure 2.6 is divided into various elements. If we subtract the model in Figure 2.5 from the model in Figure 2.6, then we can see the model in Figure 2.7. In project management, project managers turn *needs* into *project management plans*. In Figure 2.7, ‘needs’ means what we need to obtain as a consequence of our activities. This may be a ‘need to feed ourselves’, a ‘need to take transportation’, a ‘need to feel safe’. These examples are intangible and too obscure to deal with. We need to change these intangible things to more realistic things.

The phrase ‘project management plans’ means all plans that are required to achieve the needs that we inputted as needs. Plans include the schedule, organisation design, resource allocation, system design, contract strategy, risk-management strategy. These are tangible enough to be conceived. These are realistic procedures to obtain needs.

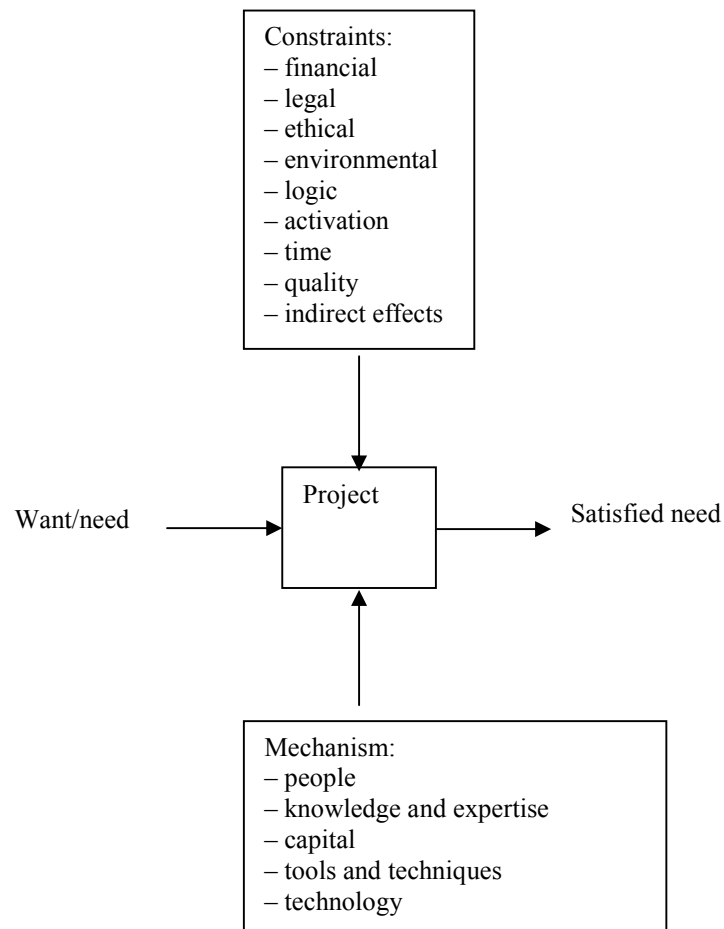


Figure 2.6: The project as a conversion process (source: Maylor, 1996, p. 4)

These plans are dealt with as the output of project management work. These outputs are used to deploy resources, to compose systems, and to monitor a project’s deliverables as the output of projects. Project management also needs to ensure that the projects’ deliverables meet the needs of the projects (see Figure 2.5). Thus, these two models are different parts of project management.

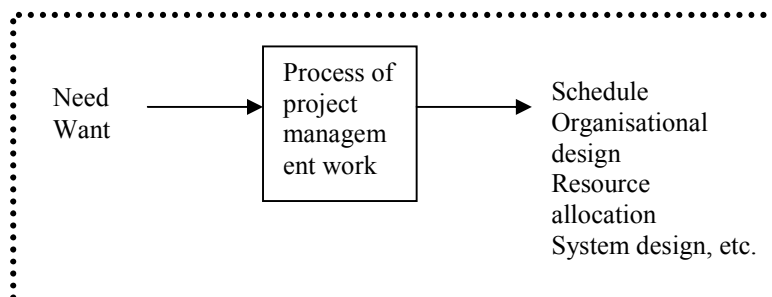


Figure 2.7: Project management work, based on Figures 2.5 and 2.6

Someone may think, for instance, that organisation design is part of a predetermined environment. When we are in an organisation, we will be given a role in the organisation.

Someone may report to a boss or bosses and/or might have subordinates. We may feel that we cannot decide to change our roles as a subordinate or as a boss. In our daily life, we may feel that the organisational structure is our environment.

But this is not strictly the truth. Managers' thinking (at all levels) creates organisational design. People design organisational structures. Organisational structure is not only the environment for people, but also a tool to organise ourselves. Organisational design is the product of our thinking. The fact that we have an organisational structure is a consequence of our action, which is based on our thinking.

Thus, project plans are products that are to be produced by project management.

2.8 Summary

The aims of this chapter were as follows:

- (1) to define 'a project' and 'project management', and
- (2) to review some approaches to 'project management'.

Firstly, 'a project' and 'project management' were defined. Secondly, some approaches to project management were reviewed. Project management was begun as a control approach; then it was expanded to a system approach. One of the important aspects of project management, the goal-oriented approach, was explained. And finally, the human-centred approach was reviewed. Using the view of the human-centred approach, topics to learn project management for project managers is the main issue of this research.

It is managers at all levels who learn and experience project management. They have, or should be, empowered to think and act to make project management better serve the success of projects. Rapid learning by managers and good performance of project management teams are important. In such a situation, the methods of learning project management at all levels are a key issue. In other words, main question should be what and how people should learn and share project management practices.

The next chapter will describe some of the professional associations set up for project managers and their endeavours to define project management in order to share and develop knowledge and experience in project management.

Chapter 3 Project Management Bodies of Knowledge (PMBoKs)

3.1 Introduction

An important concern in project management is the enhancement of project managers' performance, and therefore their learning of project management knowledge (see chapter 2).

The professional associations in the field of project management have been playing a central role in enhancing public awareness of project management by establishing their own discipline. Such disciplines are reflected in their 'Project Management Bodies of Knowledge' (PM BoKs).

In this chapter the background of these project management associations and their PMBoKs are explained. Then, several PMBoKs are compared and rationales of the formation of PMBoKs are discussed. Finally, PMBoKs are analysed in terms of function of language.

This chapter aims to define concepts in the PMBoKs, since this is essential to the aim and theoretical basis of the following empirical survey. It is stressed that concepts in PMBoKs should indicate centrally 'what makes projects go well', rather than 'how project managers should be'.

3.2 Project managers and professional bodies in the field of project management

The project manager used to be an informal position in an organisation. "Project manager's identity is often hidden behind some other organisational role" (Lock, 2007, p. 155). Project managers are given various names, particularly for in-house projects. This situation reflects the fact that project management is underestimated as a profession. Ruggles, et al. (1997) stress the need for recognition of the project manager as other professions such as medical doctors, architects, accountants and lawyers.

People working as project managers, or in similar types of position, need to know what is involved in project management. Organisations, on the other hand, need to select a suitable people to assign as project managers. Project management associations have played a significant role in meeting these demands.

The first attempt to form an association was initiated by a US-based association in 1969, followed by a UK-based association in the early 1970s. Many Western countries followed the lead of these two associations (Hodgson and Muzio, 2010).

Through the promotion of project management as a profession, these associations aim to promote the discipline across a wide range of different industrial sectors. The status and rewards of project management profession has been enhanced in recent years. As a profession, the job title has been more recognised (Lock, 2000).

We can comprehend that the rise of the discipline of project management has been parallel with the development of project management associations. The following sections will explain in more details the growth of these associations.

3.2.1 Project management associations around the world

There are several project management associations worldwide (Crawford, 2004b). The following associations are the principal ones.

International Project Management Association (IPMA)

Started as INTERNET (which was the name of the organisation until 1994) in 1967, the International Project Management Association (IPMA) has 42 membership countries, including Germany and Franceⁱ, representing over 40,000 individuals,

ⁱ German Project Management (GPM)

GPM was founded in 1979. Some 1400 individuals and 100 organisations are participants in GPM, which was the second-largest national association of IPMA members in 2000.

Association Francophone de Management de Project (AFITEP)

AFITEP was founded in 1982 as an association for cost control, estimation and planning, mainly in the engineering, construction and manufacturing sectors. It had over 1000 individual members in March 2000. AFITEP promotes project management in all places where French is spoken.

mainly from Europe, Asia, and Africa. IPMA publishes the *International Journal of Project Management* and hold annual research conferences and seminars (IPMA, 2010).

Project Management Institute (PMI)

This US-headquartered organisation was established in 1969 (ENAA, 2000, PMI, 2001a, 2001b). It has more than 250 chapters in 70 countries. PMI has more members than any other project management association. By 1990, PMI had 7500 members. In 1995, it had 17,000 members, and by the end of 1998 the membership had exploded to over 44,000. In September 2010, its membership and credential holders reached over 500,000. It publishes journals for its members (PMI, 2010).

Association for Project Management (APM)

APM was established in 1972 (APM, 2010). It is a UK-based organisation. In July 2010, APM has 17,500 individual and 500 corporate members, including project managers, project management practitioners, students and academics. The APM-sponsored publications are *Project Magazine* and some other guides for the project management profession.

Australian Institute of Project Management (AIPM)

This organisation started as a project management forum in 1976, and was renamed (to AIPM) in 1989. AIPM had 4000 individual members in 2003. Since AIPM has been independent from both IPMA and PMI, it has been played active role in global cooperation among these two international organizations and other associations (Crawford, 2004b).

Project Management Association of Japan (PMAJ)

Japan Project Management Forum (JPMF) was founded in 1998 as a division of the Engineering Advancement Association of Japan (ENAA) in order to promote project management in Japan. JPMF was merged with the Project Management Certification Centre (PMCC), forming the Project Management Association of Japan in 2005. PMAJ runs three levels of certification, one of which is the most popular in Japan, i.e. Project Management Specialist (PMS). As of 2009, PMAJ had certified 5,200 individuals (PMAJ, 2010).

3.2.2 Professional association and certification program

Rapid growth of associations in the new economic environment

Project management associations have acquired a large number of participants in the last 15 years. Around 1995, the number of members really started to take off (see Figure 3.1). In 2010, the number of members and credential-holders reached 500,000 (PMI, 2010).

The explosion in numbers of members in the 1990s indicates that the application of project management as a discipline had spread to a broader area of activities. In terms of the rapid growth of membership, PMI is the driver of the promotion of both project management and professionalism in the field (Meredith and Mantel, 2000).

The business environment has been changing rapidly. This situation has stimulated the adoption of the discipline of project management to respond to the changes in a wide range of activities.

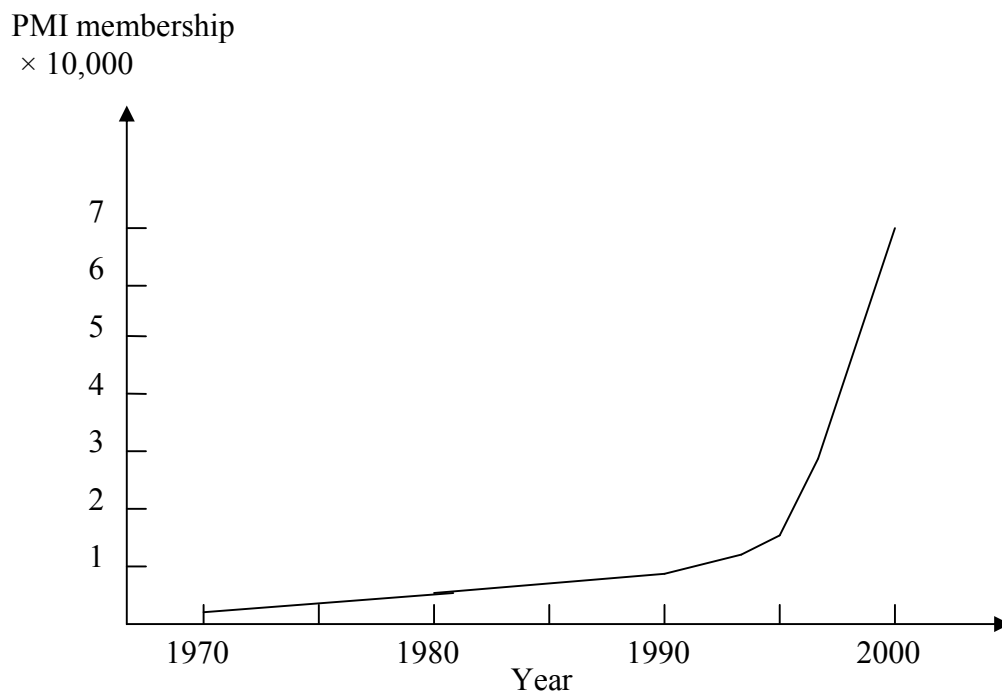


Figure 3.1: History of the growth in membership of the Project Management Institute. Source: based on Meredith and Mantel (2000), p. 5.

Membership and professional development

The activities of project management associations first began as discussions on the professional discipline of project management, mainly via journals, conferences and seminars (Morris, 1999b). These discussions were the first step toward the establishment of project management as a profession. Communication between academics and practitioners was started in order to establish the discipline itself. For instance, PMI, the US based community, provides 'the Project Management Journal' and 'PM Network magazines' for exchanging of ideas and finding some solutions for a common problem (Meredith and Mantel, 2000, p. 5).

As a place of exchange of knowledge in project management, associations have contributed to the development of project managers. Integrating various aspects, project managers are expected to use knowledge appropriately to manage projects and for getting favourable results from the project activities (Meredith and Mantel, 2000).

The project management associations provide several levels of membership. This also encourages recognition of the project management profession. For project managers, membership helps develop their knowledge such as current awareness of modern techniques, practices, and computer systems (Lock, 2000).

Contribution of the certification programs to the professionalism of project management

In large companies, it has become more common to have project managers as specialists. They are provided with training as project managers and will be rewarded with promotion. The project manager has increasingly been recognised as a career path in many organisations that conduct projects (Meredith and Mantel, 2000).

Certification programs are one of the ways for companies to select their project managers. Ruggles, et al. (1997), one of the founders and a board member of PMI, stress the impact of the certification program for establishing the project management profession (PMP). Certification is an effective mean to establish the profession increasing memberships as well as meeting the demand of the industries. These lead to enhancement of status, influence and revenue of the professional bodies (Hodgson and Muzio, 2010).

3.3 Project Management Bodies of Knowledge (PMBoKs)

Those who manage projects are working in environments with an increasing rate of change. People are required to be more effective and efficient in learning from experience. For this type of learning, they need to be aware of what they need to know in project management practice, i.e. need to know discipline of project management.

Many professions have their own distinct domains that are defined as bodies of knowledge. Such bodies of knowledge help to establish public recognition of the profession (Crawford, 2004a). In the business context, project management as a profession is competing, or compared, with other disciplines such as change manager (Crowford and Nahmias 2010), or many other disciplines (Hodgson and Muzio, 2010).

Consequently, the demand has arisen for criteria to select and train project managers. Defining the area that project managers should be knowledgeable in is thus becoming of vital importance. To address this, project management associations have had lengthy discussions about defining the evaluation criteria for the selection and career development of project managers.

The Project Management Bodies of Knowledge (PMBoKs) were first conceived as a model of such a set of criteria (Wideman, 1995). From the mid-1980s, certification programs were started in order to promote the recognition of the profession of project management. Based on discussions on the discipline of project management, the associations provide various kinds of education and certification programs. PMBoKs are used as the basis of these curriculum and certification programs (Meredith and Mantel, 2000, APM BoK, fourth edition, 2000).

Wideman (1995) explains that knowledge in management is created by processes that differ from 'reductionism', i.e. the model which traditional scientific subjects such as physics or mathematics normally use.

He describes the process of evolution of project management discipline as the following six stages:

“Empirical observations through the collection of anecdotes,
The generation of hypotheses based on these observations,
Testing of the theses through theoretical projections and further
observations,
The generation of antitheses to account for contradictions,
The adoption of a new level of theory,
The gradual establishment of a mature discipline.”

(Wideman, 1995, p.72)

In the above processes, bodies of knowledge are created and they are validated on the course of establishment of professions (Gasik, 2011). Through creation and revisions of PMBoKs, project management associations define key topics in project management (Morris, 1999b). Thus, activities of defining PMBoKs are to construct philosophy of project management (Morris, 1999a, 1999b).

Paton, et al. (2010) observed project managers who are newly assigned in organizations. These project managers are in a tension between project management’s identity and other traditional professions, and are feeling need of more robust professional background as a project manager with a body of knowledge, which can be more recognized and respected by members of their companies. PMBoKs thus have an aspect to help people in project management practice as a social entity.

PMBoKs and the development of knowledge of PM

Since education in project management at an academic level began relatively recently, most current project managers are trained in non-academic ways. This training is on-the-job. There are also seminars as well as workshops that last half a day to two weeks. Private consulting firms offer training courses for project management, as well as training course for PMP certification (Meredith and Mantel, 2000, p. 92).

Although scientific theories were used in traditional project management, project managers get knowledge through practices and not gained by reduction (Wideman, 1995). It is vital to have appropriate key topics to learn from experience. A project manager reflects in his practice. Using key concepts in practice is vital for better performance in practice as well as learning as practitioners as shön (1991) described

professionals as reflective practitioner. This means that a project manager can learn faster with an appropriate framework than when he/she does not have such a framework. While learning from error is a main source of learning, this approach is slow and inefficient in project management (Morris, 1999c).

The method of management using PMBoKs is not to increase the manager's activities but to increase the efficiency of learning from experience. With an appropriate framework, learning will be effective. PMBoKs make it easier to access existing theories and practices.

Further, PMBoKs act as cognitive frameworks. As explained in Chapter 2, a project can be managed through the management of key sub-concepts. Hence, sub-concepts for managing projects express the existence of project management showing "the purpose and provide the set of words, relationships and definitions of project management" (Morris, 1999b, p.2). Consequently, defining such language as bodies of knowledge enables the transfer and sharing of project management knowledge at the global level as well as individual (or micro-) level's and team/organizational level's learning (Gasik, 2011). Knowledge is thus socially created (Berger and Luckman, 1967).

In fact, whatever they are, we need to select and use some key parameters to manage projects. A project would not be managed explicitly without some sub-concepts, e.g. goals, uncertainty, time, cost, contract, etc. Such sub-concepts constitute the language to recognise project management practices and theories. PMBoKs are not a specific method or theory – they are the very thing that shows us the ontology of project management.

"Project management is social construct" (Morris, 2010, p15). A discipline of project management exists in a sense of that people working on the discipline and literature on its subject, as well as existence of professional associations and their bodies of knowledge (Morris, 2002, pp.17-18). Aspect of projects can be used to study activities of organizations as well as for better understanding of even social life (Söderlund, 2004). Bodies of knowledge are thus the hearts of interpretation and the development of knowledge for managing projects.

3.4 Existing PMBoKs

There are between three and five models of PMBoKs in the world. PMBoKs are used as the bases of these certification programs for the project management profession.

Project Management Institute (PMI) and Australian Institute of Project Management (AIPM) use the PMI Guide to Project Management Body of Knowledge (PMI-PMBOK®).

APM has its own 'Guide to PM BoK (APMBoK)'. In the late 1980s and the 1990s, GPM (Germany) and AFITEP (France), as well as other European countries including Austria, Switzerland and Netherlands, followed the UK's model. They adopted and modified the PMBoK model as their own knowledge/competency baselines (Morris, 1999b).

Stimulated by the Western PMBoKs and certification systems, ENAA; a Japanese project management association, and the PMCC; a non-profit organisation which provides project management certification programs, created their own guide to project management in 2002. The guide is called 'Project and Program Management' (P2M).

To respond to the industry that needs to select a PM standard among existing different version of PMBoKs, various efforts has been made to create a global PMBoK (Crawford, 2004b). Among them, the most explicit output was produced from Global Alliance for Project Performance Standards (GAPPS); an international working group, which has no body organization and sponsor. Their standard was published in 2007 as 'A Framework for Performance Based Competency Standards for Global Level 1 and 2 Project Managers' (GAPPS, 2007).

The following sections describe several types of PMBoKs.

3.4.1 PMI-PMBOK® and other guides by PMI

The PMI-PMBOK® (PMI, 1996, 2000, 2005, 2008, 2013) was produced as the first Project Management BoK in 1983. PMI revised this and published it as the 'Project

Management Body of Knowledge' in 1987 (Crawford, 2004a). After further revisions, the fifth edition was published in 2013. Two million copies are in circulation in North America and other parts of the world, as both hard copy and free electronic files.

PMI (2005) has published other two guides: **The Standard for Program Management** and **The Standard for Portfolio Management**

The PMI-PMBOK® and the other two standards are described as the following.

Project Management Body of Knowledge

The PMI-PMBOK® (2005/2008) has nine knowledge areas (Figure 3.2.2 and 3.2.5). The nine knowledge areas consist of Integration, Scope, Time, Cost, Quality, Resources, Communication, Risk and Procurement. These knowledge areas are defined as knowledge that is seen only in project management. The fifth edition (2013) added Project Stakeholder Management as tenth knowledge area. The fifth edition defines stakeholders as project team, as a principle one, as well as sponsor, portfolio manager, program manager, customers/ users, sellers/ business partners, and other stakeholders (Figure 3.2.7).

Its structure (Figure 3.2.1- 3.2.6) has been very slightly changed during the above revisions. Knowledge areas in the PMI-PMBOK® are 'generally accepted project management practices'. They differentiate the environment of projects as being external to the core knowledge areas of project management (see Figure 3.2.3). Relations between project management knowledge area and other related knowledge areas used in managing projects are described in Figure 3.2.4. General management knowledge and practice and Application area knowledge and practice are differentiated from project management area although these three areas are overlapped with each other.

In the fourth edition (PMI, 2008), the structure of the PMI-PMBOK® consists of three Sections. Section III has nine knowledge areas (Figure 3.2.5). In the fifth edition, the section of the process groups is introduced basic thinking as a preceding section of the Project Management Knowledge Areas (Figure 3.2.6). The chapter of 'Organizational influences and project life cycle' is explained as constraints and

environment of a project, while PMI still defines only ‘the Knowledge Areas’ as a professional field for project management, (PMI, 2013, in 3.9 Role of the Knowledge Areas). However, the structure that differentiates between the core Knowledge Areas and environment issues of project management was removed. The above differentiation seems to have been moderated.

Figure 3.2.1: The PMI-PMBOK® (Structure)

- | |
|---|
| <p>The PMBoK Guide</p> <ol style="list-style-type: none">1. Project life-cycle definition2. Project management processes for a project3. Project management: nine knowledge areas |
|---|

Figure 3.2.2: PMI-PMBOK®, third edition, Project management knowledge areas

- | | |
|---|--|
| <p>Project Integration Management</p> <ul style="list-style-type: none">– Develop Project Charter– Develop Preliminary Project Scope Statement– Develop Project Management Plan– Direct and Manage Project Execution– Monitor and Control– Integrated Change Control– Close Project <p>Project Cost Management</p> <ul style="list-style-type: none">– Cost Estimating– Cost Budgeting– Cost Control <p>Project Communications Management</p> <ul style="list-style-type: none">– Communications Planning– Information Distribution– Performance Reporting– Manage Stakeholders <p>Project Scope Management</p> <ul style="list-style-type: none">– Scope Planning– Scope Definition– Scope WBS– Scope Verification– Scope Control <p>Project Quality Management</p> <ul style="list-style-type: none">– Quality Planning– Perform Quality Assurance– Perform Quality Control | <p>Project Risk Management</p> <ul style="list-style-type: none">– Risk Management Planning– Risk Identification– Qualitative Risk Analysis– Quantitative Risk Analysis– Risk Response Planning– Risk Monitoring and Control <p>Project Time Management</p> <ul style="list-style-type: none">– Activity Definition– Activity Sequencing– Activity Resource Estimation– Activity Duration Estimation– Schedule Development– Schedule Control <p>Project Human Resource Management</p> <ul style="list-style-type: none">– Human Resource Planning– Acquire Project Team– Development Project Team– Manage Project Team <p>Project Procurement Management</p> <ul style="list-style-type: none">– Plan Purchase and Acquisition– Plan Contracting– Request Seller Response– Select Sellers– Contract Administration– Contract Closure |
|---|--|

Figure 3.2.3: PMI-PMBOK®, third edition, Environment of projects

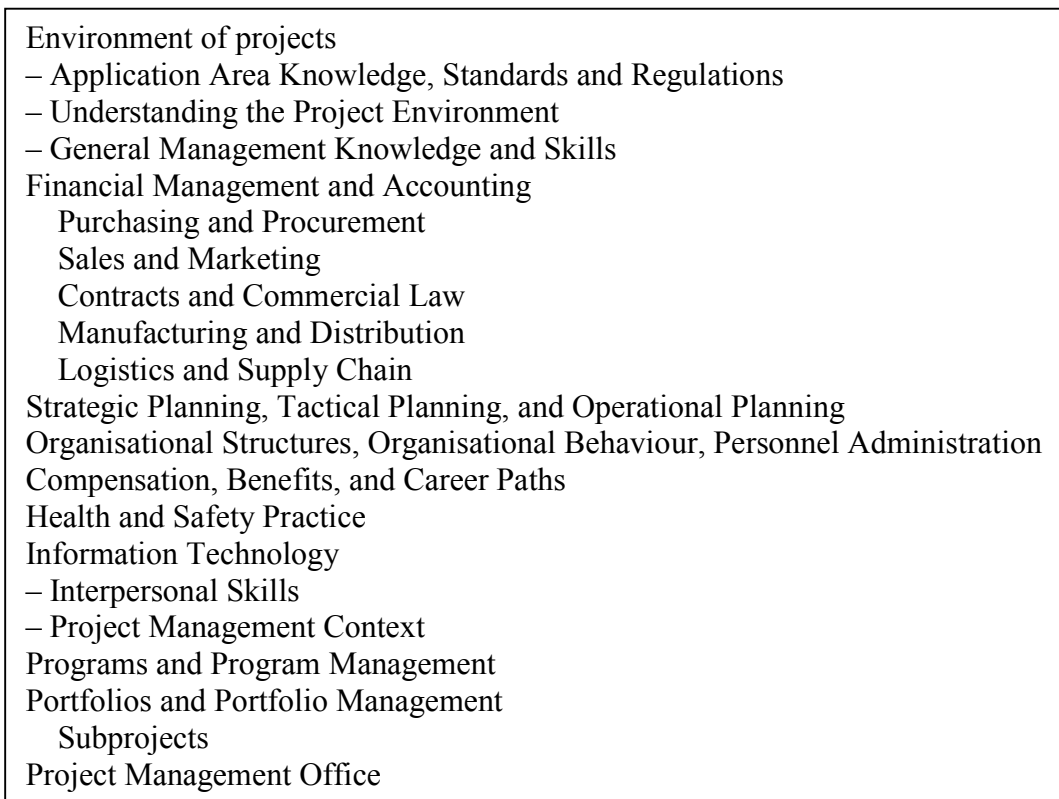
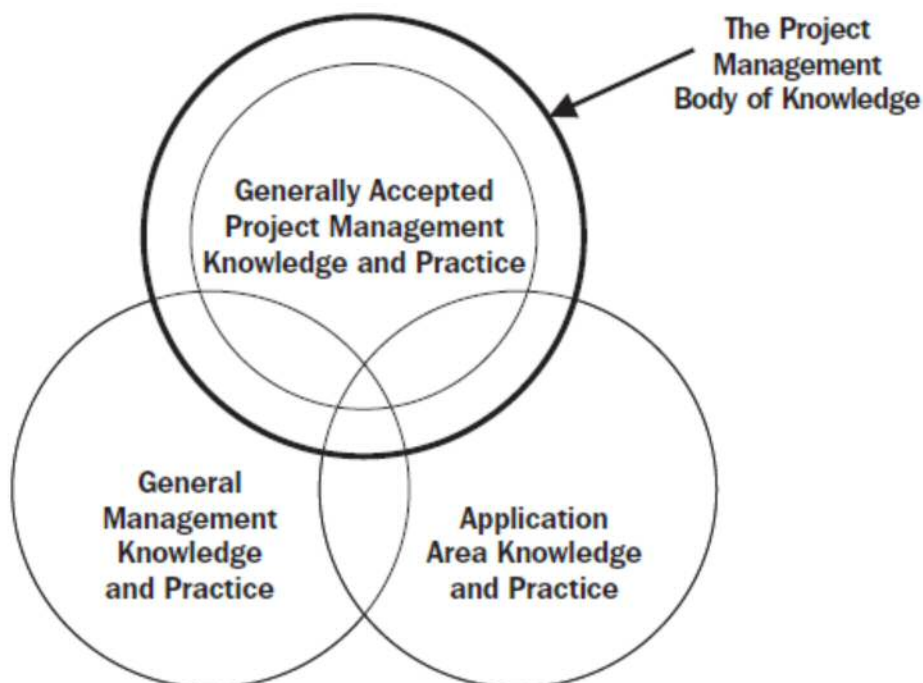


Figure 3.2.4: Relationship of project management to other management disciplines, according to PMI (2000)



This figure is a conceptual view of these relationships. The overlaps shown are not proportional.

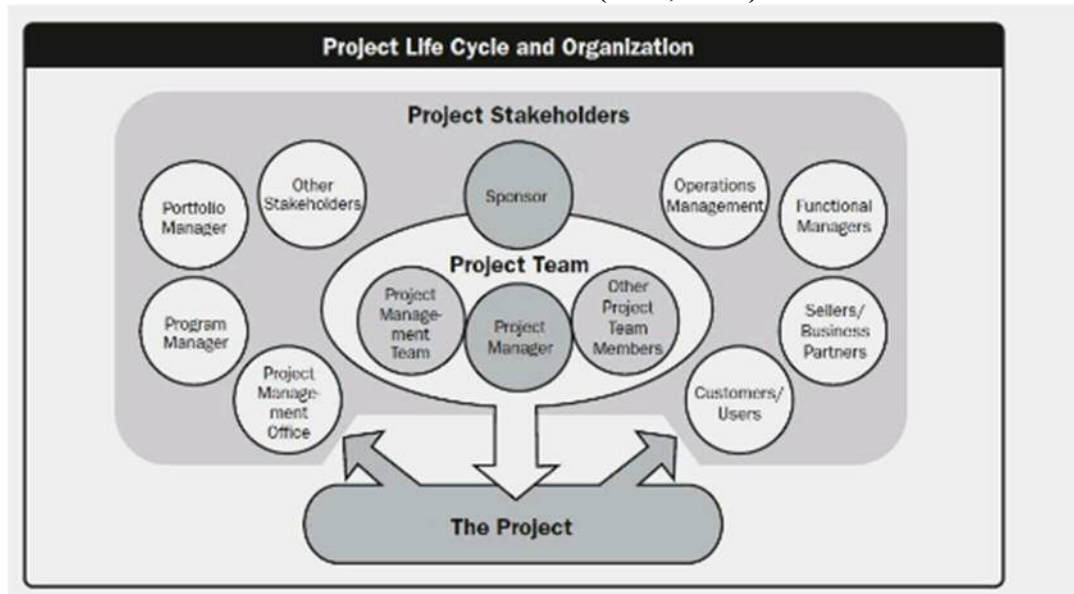
**Figure 3.2.5: The PMI-PMBOK® Guide Forth edition
Structure and project management knowledge areas**

Section I The project management framework
1. Introduction
2. Project Life Cycle and Organization
Section II The standard for project management of a project
3. Project Management Processes
Section III The project management knowledge areas
4. Project Integration Management
5. Project Scope Management
6. Project Time Management
7. Project Cost Management
8. Project Quality Management
9. Project Human Resource Management
10. Project Communications Management
11. Project Risk Management
12. Project Procurement Management

**Figure 3.2.6: The PMI-PMBOK® Guide Fifth edition
Structure and project management knowledge areas**

1. Introduction
2. Organizational influences and project life cycle
2.1 Organizational influence
2.2 Project Stakeholders and Governance
2.3 Project Team
2.4 Project Life-Cycle
3. Project Management Processes
4. Project Integration Management
5. Project Scope Management
6. Project Time Management
7. Project Cost Management
8. Project Quality Management
9. Project Human Resource Management
10. Project Communications Management
11. Project Risk Management
12. Project Procurement Management
13. Project Stakeholder Management

Figure 3.2.7: The relationship between stakeholder and the project in The PMI-PMBOK® Guide Fifth edition (PMI, 2013)



The Standard for Program Management

The Standard for Program Management is defined as “to describe generally recognized good practices and place program management in the context of portfolio and project management” (PMI, 2006, p. 3). In addition to the nine knowledge areas in the PMI-PMBOK®, Benefits Management, Programme Stakeholder Management and Programme Governance are introduced, which are strategic-level topics that are not covered by the PMI-PMBOK®.

The Standard for Portfolio Management

The Standard for Portfolio Management focuses on a higher management level than the other PMI guides. PMI says that “Whilst project management and program management have traditionally focused on ‘doing work right’, portfolio management is concerned with ‘doing the right work’” (PMI, 2005, p. 1). For this purpose, PMI includes the management of the link between Portfolio Management and corporate operational management, which includes: Finance, Marketing, Corporate Communications, and Human Resource Management. As for role of the Portfolio Management, it is defined as Benefits Realization, Program and Project Management Methods and Techniques, Process Development and Continuous Improvement, and General Management Skills.

In the guide of Portfolio Management, knowledge domain of Portfolio Management is defined. Knowledge defined as a portfolio management refers to a higher management-level topic than PMI-PMBOK® and Program Management. PMI describes the link between Portfolio Management and corporate-level management (Figure 3.2.8). Portfolio Management topics includes Strategy, Corporate Governance, and Operations; the corporate-level management include Finance, Marketing, Corporate Communications, and Human Resource Management. “Each project is defined by its contribution to the portfolio’s strategic intent, and can then be managed according to the principles in the PMI-PMBOK® *Guide*—Third Edition, and other principles as appropriate” (PMI, 2005, p5).

In essence, PMI separates the roles of Program Management and Portfolio Management from Project Management.



Figure 3.2.8: The organisational context of Portfolio Management.
Source: PMI (2005).

Program Management and Portfolio Management introduce front-end knowledge such as Benefit Management and Program Stakeholder Management, and are connected with operation management such as Finance and Marketing, whereas PMI-PMBOK® deals with project execution. PMI published their first BoK in 1983, so over 20 years

had passed before project context issues were dealt with as core knowledge areas in official standards. From those two standards that are the Portfolio Management and the Program Management, PMI enlarged the coverage of topics for project management from the execution level to the higher management level.

Construction Extension to A Guide to the Project Management Body of Knowledge (Construction Extension)

Construction Extension was published in 2003 as the second application area extension to the PMI-PMBOK® (PMI, 2007). In addition to the nine knowledge areas in the PMI-PMBOK®, the following four knowledge areas are added:

- Safety Management
- Environmental Management
- Financial Management
- Claims Management

Idea of the extension is same as that of previous two standards. Although above four topics may be used in construction sector, there is no explanation why only four topics are added.

3.4.2 APMBoK

The APMBoK was first published in April 1992. Since its first publication, there have been four revisions (APM, 1995, 2000, 2006, 2012).

The structure of the third edition of the APMBoK consists of four ‘key competencies’: project management, organisation and people, processes and procedures, and general management (Figure 3.3.1). Each component includes six to thirteen topics. Each topic has a definition and references.

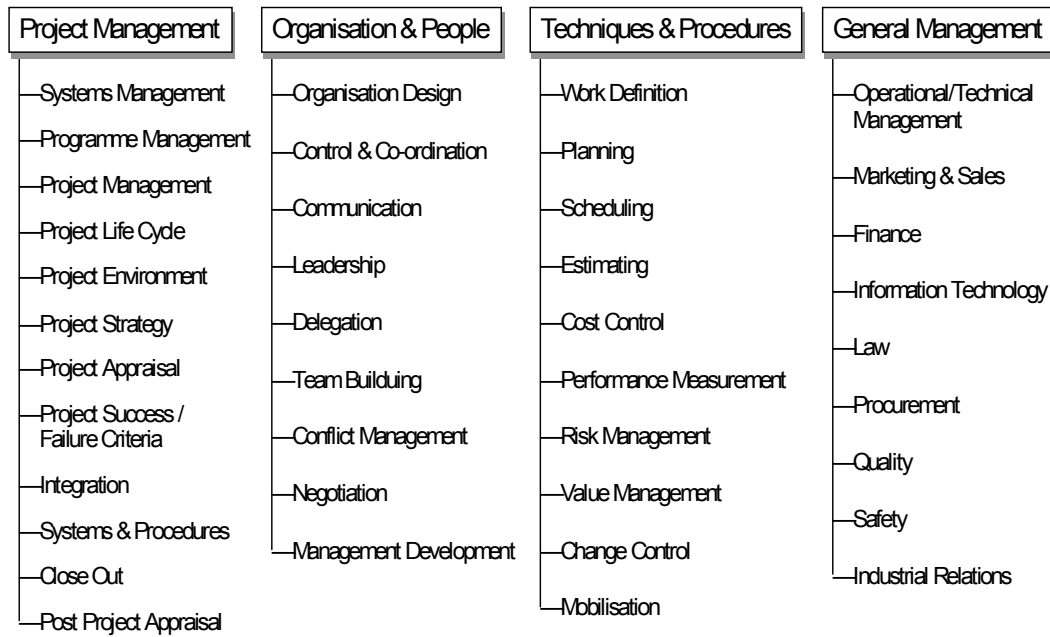


Figure 3.3.1: The structure of the APMBok third edition, cited by Morris, Patel, and Wearne (2000)

Between 1998 and 2000, APM, with the collaboration of six leading companies, executed a program to revise the APMBok (Morris, Patel, and Wearne, 2000, Morris, 2001). The revision was done based on research by the Centre of Research for Project Management (CRMP) at UMIST, from 1998 to 1999. The research was the first attempt to obtain empirical evidence that the APMBok is considered to be a useful guide for organisations in project management, not only what committees, academics or practitioners think is appropriate.

The objectives of the research were:

- to test coverage of topics in use across industries and organisations, as well as practitioners, academics, and other experts in project management,
- to provide documents that describe the topics most appropriately in terms of both generic meaning and practical usage,
- to update the references within the topics.

Based on the results of the research, APM reviewed and published the APM fourth edition in 2000. The framework of the fourth edition is shown in Figure 3.3.2. The

following elements were changed in the fourth edition as compared with the third edition:

(1) Value Management was divided into Value Management and Value Engineering (while VM includes front-end strategy, VE is a more technical term used at the design and execution stages).

(2) Several new topics about technical elements were added: Design, Production and Hand-over, Requirements Management, Technology Management, Modelling and Testing.

(3) Topics in Life-Cycle Design and Management were enlarged.

(4) The following topics were deleted, merged with and/or changed to another topic:

- System Management
- Integration Management
- Project Monitoring and Controlling
- System and Procedure
- Industrial Relations were changed to Organisational Role

In 2006, the BoK was revised to the fifth edition. The revision was made through 18 months research project. The fifth edition has 52 knowledge areas under seven categories, which are presented in Figure 3.3.3. The main changes from the previous edition were as follows:

- Programme Management and Portfolio Management were promoted to distinct disciplines. The link to business purpose was emphasised. Portfolio Management, Project Sponsorship, Project Office, Benefit Management, and Governance of Project Management, were added.
- Topics dealing with the project's environment, i.e. Stakeholder Management and Issue Management, were added.
- The project development cycle and its application in the context that projects are managed were emphasised.
- With regard to technical management issues, Requirement Management is referred to first, followed by the Development 'Vee model' (Forsberg, et al., 2000 as is in Morris, et al., 2006b).
- Issues regarding people were enhanced by adding three new topics: Behavioural Characteristics, Learning and Development, and Professionalism and Ethics (Morris, et al., 2006b; APM, 2006)

(Morris, et al., 2006b)

Other than the above changes, there were some terms and new structures that were proposed by the research team but not reflected in the revision. Because the BoK was used as APM's certification program and curriculum, there were constraints on radically changing the BoK's topics and structure. Consequently, some proposals by the research team were considered as radical changes by APM committee (Morris, et al., 2006b). This episode implies that there is certain relationship between the selection of the topics of the BoK, its structure and its nature as a social institution.

Figure 3.3.3: APM The Body of Knowledge (APMBoK), fifth edition (APM, 2006)

<ul style="list-style-type: none">1. Project Management in Context<ul style="list-style-type: none">1.1 Project Management1.2 Programme Management1.3 Portfolio Management1.4 Project Context1.5 Project Sponsorship1.6 Project Office2. Planning the Strategy<ul style="list-style-type: none">2.1 Project Success and Benefits Management2.2 Stakeholder Management2.3 Value Management2.4 Project Management Plan2.5 Project Risk Management2.6 Project Quality Management2.7 Health, Safety and Environmental Management3. Executing the Strategy<ul style="list-style-type: none">3.1 Scope Management3.2 Scheduling3.3 Resource Management3.4 Budgeting and Cost Management3.5 Change Control3.6 Earned Value Management3.7 Information Management and Reporting3.8 Issue Management4. Techniques<ul style="list-style-type: none">4.1 Requirement Management4.2 Development4.3 Estimating4.4 Technology Management4.5 Value Engineering4.6 Modelling and Testing4.7 Configuration Management	<ul style="list-style-type: none">5. Business and Commercial<ul style="list-style-type: none">5.1 Business Case5.2 Marketing and Sales5.3 Project Financing and Funding5.4 Procurement5.5 Legal Awareness6. Organisation and Governance<ul style="list-style-type: none">6.1 Project Life-Cycles6.2 Concept6.3 Definition6.4 Implementation6.5 Handover and Close-out6.6 Project Reviews6.7 Organisational Structure6.8 Organisational Roles6.9 Methods and Procedures6.10 Governance of Project Management7. People and the Profession<ul style="list-style-type: none">7.1 Communication7.2 Teamwork7.3 Leadership7.4 Conflict Management7.5 Negotiation7.6 Human Resource Management7.7 Behavioural Characteristics7.8 Learning and Development7.9 Professionalism and Ethics
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In 2012, the sixth edition was published. The sixth edition has 53 knowledge areas under four categories, which are presented in Figure 3.3.4. The main changes from the previous edition are as follows:

- Strong emphasis on the integration of Project Management, Programme Management, and Portfolio Management (P3Management)
 - ‘Context’ is an integrative structure that consists of Governance and Setting. Governance defines the base of control and management of project, program and portfolio (APM 2012, p.8). Setting deals with issues of relationships between P3Management and host organisation (APM 2012, p.40).
 - Each topic is given descriptions from each point of view of Project Management, Program Management, and Portfolio Management.

- Description of distinctive management roles and/or other professionals
 - Interfaces introduce coordination between other five distinctive disciplines. (Accounting, Health and Safety, Human Resource Management, Law, Security, Sustainability are placed under the ‘Interfaces with other disciplines’.)
 - Particular management roles are added. Those topics are: Change Managementⁱⁱ and Operations Managementⁱⁱⁱ

- Two human related topics become independent from existing topics. Influencing, and Ethics Frameworks are added.

- Newer management terms are selected.
 - Success Factors and Maturity^{iv}: Maturity idea is introduced through combining with Success Factors.

 - Knowledge Management, Communities of Practice^v, and Competence^{vi}.

ⁱⁱ Change Management is distinguished from Change Control and Configuration Management. Change Management deals with organisational changes in line with business strategy (APM, 2012, p.136).

ⁱⁱⁱ “Operation Management relates to the management of those activities that create the core services or products provided by an organisation” (APM, 2012, p44).

^{iv} Success factors and maturity is defined as “management practices that, when implemented, will increase the likelihood of success of a project, programme or portfolio. The degree to which these practices are established and imbedded within an organisation indicates its level of maturity (APM, 2012, p. 32).

Reflecting the development in the subject of Knowledge and Learning during 2000s, the above three topics are added:

- The following topics are renamed to emphasise their more sophisticated approaches to realising clients' needs. The needs of abstraction of these topics' names probably come from the need to generalise description of concepts that are used in the three levels: Project, Program, and Portfolio
 - Value Management is changed to Solutions Development
 - Total Quality Management is developed and renamed as P3 Assurance^{vii} and Reviews^{viii}
 - Benefits Management is independent
 - Provider Selection and Management^{ix} is independent from Procurement with coverage of long-term relationships with the providers at portfolio level
 - Project Life-Cycles topics are grouped into one topic whereas Mobilisation is reselected

- The following existing topics are revised to more sophisticated methods.
 - Schedule Management is divided into Resource Scheduling and Time Scheduling
 - Risk management are divided into Risk Context and Risk techniques

Regarding to the structure, section 3 Delivery employs similar structure to the nine knowledge areas of the PMI-PMBOK® fourth edition (Figure 3.2.5). The Delivery consists of seven groups as the followings:

^v “Communities of practice are groups of people who share a concern or passion for an aspect of P3Management and develop expertise through regular interaction” (APM, 2012, p.82).

^{vi} “Competence is the combined knowledge, skill and behaviour that a person needs to perform properly in a job or work role” (APM, 2012, p. 84).

^{vii} P3 assurance is the process of providing confidence to stakeholders that projects, programmes and portfolios will achieve their scope, time, cost and quality objectives, and realise their benefits” (APM, 2012, p. 192).

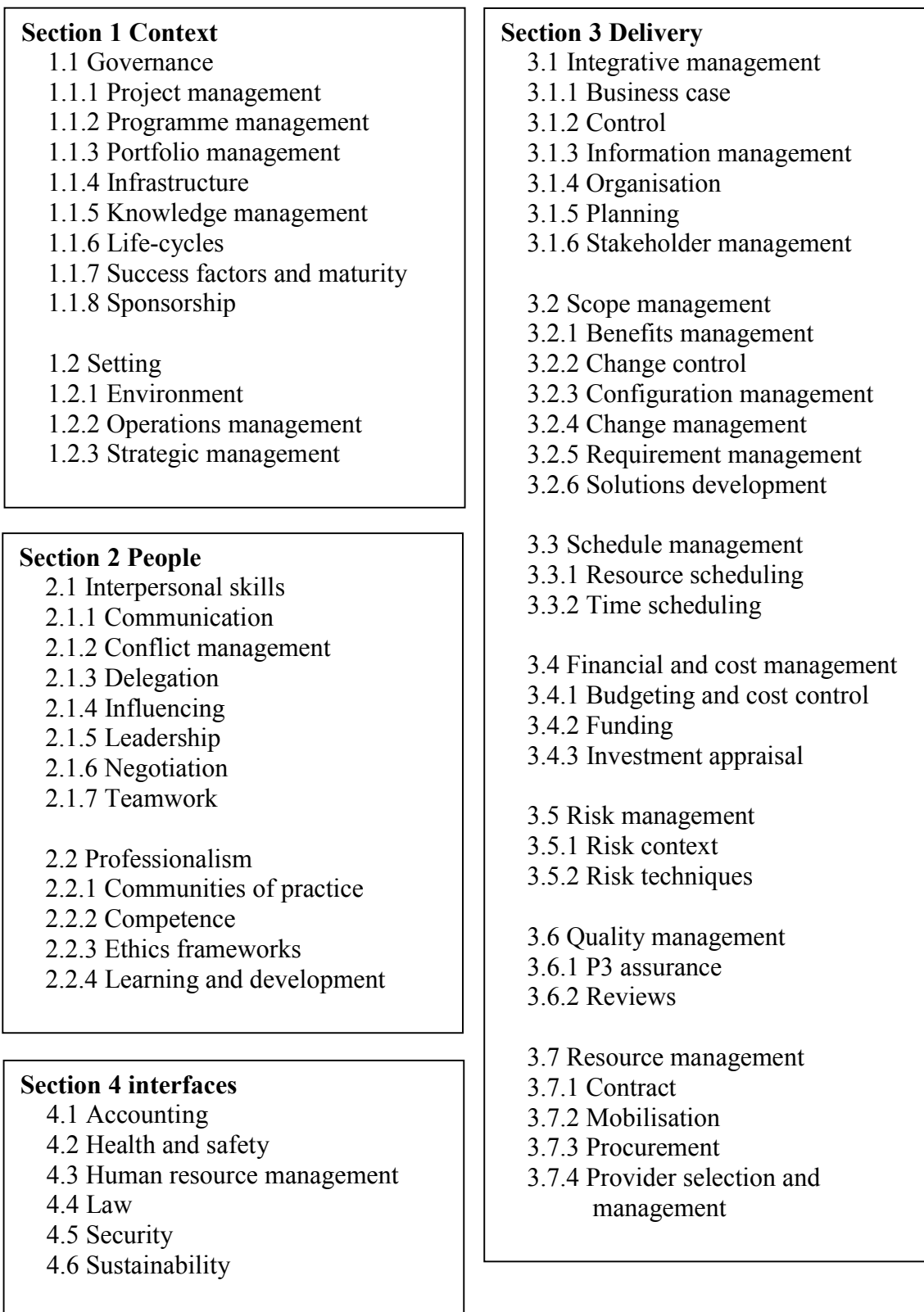
^{viii} “A review is a critical evaluation of a deliverable, business case or P3Management process (APM, 2012, p.196).

^{ix} “Provider selection and management is the process of identifying, selecting, appointing and supervising providers through the P3 life cycle” (APM, 2012, p.214).

- 3.1 Integrative management
- 3.2 Scope management
- 3.3 Schedule management
- 3.4 Financial and cost management
- 3.5 Risk management
- 3.6 Quality management
- 3.7 Resource management

Other than Communication Management and Procurement Management, project management knowledge areas of section III of the PMI-PMBOK® fourth edition are covered by this section, though APMBOK's scope is broader in terms of that each topic is described from three levels of views; i.e. P3Management (project, program, and portfolio management). In this sense, the APMBOK sixth edition has been made easier to compare with the PMI-PMBOK®.

Figure 3.3.4: APM Body of Knowledge (APMBoK), sixth edition (APM, 2012)



3.4.3 European BoKs and the International Competency Baseline (ICB)

With the creation of certification programs, some European countries constructed their own BoKs. The APMBoK is the model for all of them. The Swiss Project Management Association (SPM) and the German Project Management Association (GPM) translated and modified the APM model. The basic structure and topics are the same as in the original BoK. The French society (AFITEP) also translated an abbreviated version of the BoK.

In 1998, International Project Management Association (IPMA), in which many associations from Europe and other parts of the world participated, published the international standard (IPMA, 1989). The standard is known as the International Competency Baseline (ICB). It is written in three languages: English, French and German. The ICB contains 28 core topics and 14 selective topics.

IPMA employed a sunflower structure (see Figure 3.4.1) in which the topics in the BoK act as its petals, forming a flower. Therefore, topics are displayed in no particular order, surrounding the centre of the flower. By using the sunflower structure, IPMA tried to avoid emphasising the order of the topics, and tried not to imply relationships between topics. The sunflower model reflects the reality that people from different national associations have difficulty agreeing on a single structure in which to add topics to the standard.

Those participant associations that do not have a standard can create their own. They are required to use 28 core topics. The participants can also use 14 selective topics. Up to eight topics can be added to or reduced from 14 selective topics, as the need arises. Some associations, like the Egyptian one, have created their own standard using this method (IPMA, 1999, Pannenbacker, 2000).

The ICB version 2.0b was published in 2001. The ICB was given three categories within its structure: General Impression, Personal Attitude, and Knowledge and Experience (Figure 3.4.1). The ICB version 2.0b was revised to version 3.0 in 2006 (Caupin, et al., 2006). In the revision, the three categories were changed to the following three groups: Contextual Competency, Technical Competences, and Behavioural Competences (Figure 3.4.2). In version 3, the sunflower motif was

