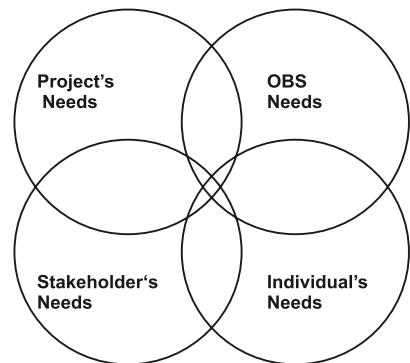


# Introduction To Project Management

Project management offers a **structured** approach to managing projects. The purpose of this book is to outline the latest planning and control techniques used by industry, commerce, sport and domestic projects, and particularly those used by the **project planning software** and referred to in the Project Management Institute's (PMI) **project management body of knowledge** (PMBOK), and the Association of Project Manager's (APM) **body of knowledge** (bok).

As the use of projects becomes more pervasive, so more managers are entering the field of project management. Their success will be helped by their ability to develop a fully integrated information and control system to plan, instruct, monitor and control large amounts of data, quickly and accurately to facilitate the problem-solving and decision-making process. To achieve these goals the project manager needs a comprehensive **toolkit** - as a plumber works with a bag of tools, so the project manager works with a computer producing organisation charts, work breakdown structures, barcharts, resource histograms and cash-flow statements.

Projects have traditionally been managed through a classic functional hierarchical type organisation structure, but with the increase of multi-disciplines, multi-departments, multi-companies and multi-national projects so there has been a move towards *management-by-projects*, project teams and matrix organisation structures. As the project manager is the **single point of responsibility**, it is the project manager's job to set up a management structure which not only meets the needs of the project, but the needs of the organisation, the needs of the stakeholders and the needs of the individuals working on the project as well (see figure 1.1).



**Figure 1.1: Intersecting Needs**  
(OBS = Organisation Breakdown Structure)

## 1. What is a Project?

The main difference between project management and general management (or any other form of management for that matter) relates to the definition of a **project** and what the project intends to deliver to the client and stakeholders. Here are two well stated and eloquent definitions:

The PMBOK defines a project as: “... a temporary endeavour undertaken to create a unique product or service. **Temporary** means that every project has a definite end. **Unique** means that the product or service is different in some distinguishing way from all similar products or services.”

Turner defines a project as: “..... an endeavour in which human, (or machine), material and financial resources are organised in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to deliver beneficial change defined by quantitative and qualitative objectives.”

Traditionally work in the construction industry and defence procurement were seen as projects, but in recent years most proactive companies are structuring their work as projects (*management-by-projects*) and using project management techniques to ensure successful completion.

Projects range in size, scope, cost and time from mega international projects costing millions of dollars over many years - to small domestic projects with a low budget taking just a few hours to complete. Consider the following projects:

- Career development (education and training courses)
- The transition period during which a change occurs.
- Designing and constructing a building, a house or a yacht.
- Designing and testing a new prototype (a car or a washing machine).
- The launch of a new product (advertising and marketing project).
- Implementing a new computer system (IT project, or upgrade).
- Designing and implementing a new organisational structure (human resource project).
- Planning and conducting an audit (quality management project).
- Improving productivity within a target period.
- Disaster recovery (limiting the damage of fires, floods or any type of accident).
- Olympics, or Springboks' tour of New Zealand (a sports project).
- Rolling Stones' world tour (an entertainment project).
- Moving house or going on holiday (a domestic project).

### Other distinctive features of a project include:

- A **start and finish** (although they may be difficult to define - the start may have crystallised over a period of time and the end may be a slow phase out).
- A **life-cycle** (a beginning and an end, with a number of distinct phases in between).
- A **budget** with an associated cash-flow.
- Activities that are essentially unique and **non-repetitive**.

- Use of **resources**, which may be from different departments and need co-ordinating.
- A **single point of responsibility** (i.e. the project manager).
- **Fast tracking** - getting your product to market before your competitors.
- **Team roles** and relationships that are subject to change and need to be developed, defined and established (team building).

Within the context of this book a project may be defined as a beneficial change which uses the special project management techniques to plan and control the *scope of work* in order to deliver a product to satisfy the client's and stakeholder's needs and expectations.

## 2. Project Management

Project management is defined by the PMBOK as: “..... *the application of knowledge, skills, tools and techniques to project activities in order to meet stakeholder's needs and expectations from a project.*” In other words the project manager must do whatever is required to **make the project happen** - one could not have a wider all encompassing job description!

This definition clearly identifies that the purpose of the project is to meet the stakeholders needs and expectations. It is therefore a fundamental requirement for the project manager to establish who are the stakeholders (besides the client) and analyse their needs and expectations to define, at the outset, the purpose of the project, its *scope of work* and objectives (this will be developed in the *Feasibility Study* chapter).

The discipline of project management can be described in terms of its component processes, conveniently defined by the PMBOK as nine knowledge areas:

- |         |                 |               |
|---------|-----------------|---------------|
| • Scope | • Quality       | • Risk        |
| • Time  | • HRM           | • Procurement |
| • Cost  | • Communication | • Integration |

See page 7 for a brief description of the nine knowledge areas.

The APM bok defines project management as ‘*the most efficient way of introducing change .... achieved by:*

- *Defining what has to be accomplished, generally in terms of time, cost, and various technical and quality performance parameters;*
- *Developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives;*
- *Using appropriate project management techniques and tools to plan, monitor and maintain progress;*
- *Employing persons skilled in project management - including normally a project manager - who are given [single] responsibility for introducing the change and are accountable for its successful accomplishment.’*

Peter Morris describes project management as: ‘..... *the process of integrating everything that needs to be done (typically using a number of special project management techniques) as the project evolves through its life cycle [from concept to handover] in order to meet the project's objectives.*’

Companies performing projects will generally subdivide their projects into several phases or stages to provide better management control. Collectively these project phases are called the *project life-cycle*. Along with the *project life-cycle* some of the other special project management techniques that form part of the project management integrative process are:

- Work breakdown structure (WBS)
- Critical path method (CPM)
- Resource smoothing
- Earned value
- Configuration control.

### 3. Management-by-Projects

Many organisations are changing in nature as more of them are accomplishing their business through projects. This *management-by-projects* approach has been used in engineering, construction, aerospace and defence for many years, and now we see other organisations buying into the process; pharmaceutical, medical, telecommunications, software development, systems development, energy, manufacturing, educational and service organisations. The *management-by-projects* approach encourages:

- organisation flexibility
- decentralised management responsibility
- holistic view of problems
- goal-orientated problem solution processes.

**Time Magazine** identifies these profound changes happening in the job market. '*Full-time, full-year workers are no longer as dominant as they were. There is more self-employment, more part-time employment and the beginnings of what might be called task employment.*' I would call this project employment. Therefore for employer and employee to make the most of the new employment patterns a working understanding of *management-by-projects* and project team dynamics is essential.

**Oracle:** '*The business world is moving increasingly towards projects orientation operation to measure the true costs and perfectibility of any business endeavour.*' It is very difficult, if not impossible, to quantify costs if they are grouped together and shared - the only way would be a sharing percentage.

The importance and acceptance of the trend towards *management-by-projects* was endorsed by the International Project Management Association (IPMA) Project Management Conference in Vienna (1990) that adopted *management-by-projects* as its theme.

**Programme Management:** Where the project office is managing a large capital project (e.g. Channel Tunnel), it may be subdivided into a number of smaller related projects to achieve a single common goal.

**Portfolio Management:** Defines a project office that is running a number of unrelated projects. This could be managing the repairs and maintenance of; a large telecom type company, a power station or a water utility.

**Small Projects:** Managing small projects have their own unique problems, although they may appear to be simple, they are often associated with a lack of definition (no drawings, no specifications and no contact), instructions are given verbally, and minimum standards are not established. There are no arbitration mechanisms, no exit strategies and the small projects may only be for a short duration that does not give you time to establish a management system.

**General Management:** Although this book is about project management, the successful project manager must also be competent in a wide range of general management skills in addition to the nine knowledge areas. These would include:

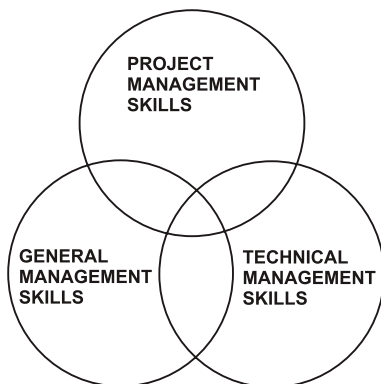
- recruiting and personnel
- economics
- computer systems
- legal contracts
- personnel and human resources
- sales and marketing
- accounts and salaries.

The project manager would obviously not be expected to be an expert in all these fields, but for a project to be successful they may all need to be addressed at one time or another and as the *single point of responsibility*, the project manager will be responsible for either performing the work, or delegating it (see figure 1.2).

**Production Management:** Although projects are deemed to be unique, in reality they usually consist of groups of repetitive tasks. Henry Ford emphatically showed years ago that production lines are the quickest, and most cost effective way to manufacture a car. The same applies to projects, if there are repetitive tasks, then setup a production process to carry them out at the same time.

**Technical Management:** The technical aspects of the project also need to be managed. On smaller projects the project manager may be expected to be the technical expert as well as the manager. In fact early on in your career you will probably only be appointed as project manager if you are a technical expert.

There is usually a certain amount of overlap between project management, general management and technical management. This can be simply presented as intersecting circles (figure 1.2).



**Figure 1.2: Intersecting Management Skills**

**Project Management Environment:** The project environment directly affects the project and how it should be managed. Projects are not carried out in a vacuum, they are influenced by a wide range of stakeholders and issues. Consider the following:

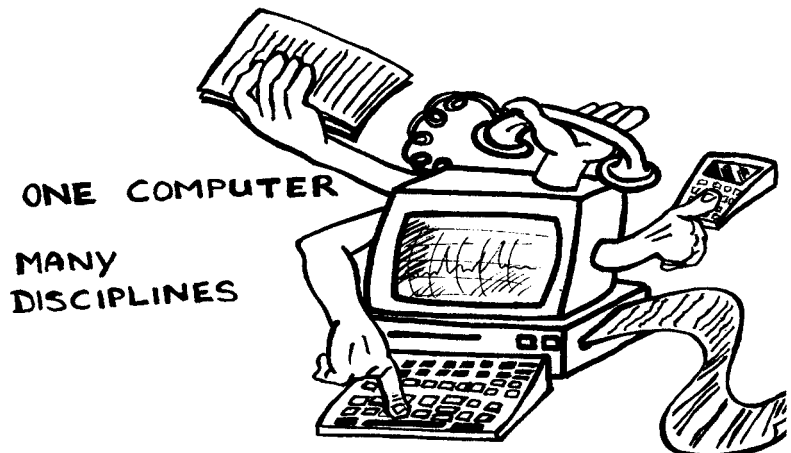
- Stakeholders (all interested parties)
- Client / sponsor's requirements
- Your own company's organisation structure
- Market requirements
- Competitors
- New technology
- Rules and regulations (Health and safety)
- Politics (both internal and external)
- Cultural, social and religious background
- Economic cycle.

For project managers to be effective they must have a thorough understanding of the project environment which may well be changing and so continually shifting the goal posts. The project environment consists of the numerous stakeholders and players that have an input or are effected by the project. All must be managed as any one person could derail the project (see stakeholder analysis in the *Feasibility Study* chapter).

#### 4. Project Management Software

Today, powerful but inexpensive project management software is readily available for the personal computer. This availability has essentially moved project management computing away from the data processing department to the project manager's desk. This represents a major shift in the management of information.

Whilst project planning software will certainly help the project manager plan and control their projects, its application will only be effective if the planning and control techniques are clearly understood. The purpose of this text is therefore to develop these techniques through manual exercises, but with the assumption that computer systems will be used later - see the project management computing chapter.



## 5. Project Management Associations

A number of project management associations and institutions have formed chapters around the world to encourage the development of project management as a profession. These chapters organise regular meetings and newsletters to keep their members informed about project management issues:

- body of knowledge
- certification of project managers (PMP)
- unit standards
- ethics
- global forum.

**Body of Knowledge:** Over the past fifty years a considerable body of knowledge has built up around project management tools, skills and techniques. This database of information has been developed into the following:

- The APM's bok - Association of Project Managers (UK)
- The PMI's PMBOK - Project Management Institute (USA)
- The IPMA's BOK - International Association of Project Managers (formerly called INTERNET)
- The AIPM's Competency Standards for Project Management (Australia)
- ISO 10006 '*Guideline to Quality in Project Management*' - this will assist clients evaluating the effectiveness of the project management system
- South African unit standards.

The purpose of the body of knowledge is to identify and describe best practices that are applicable to most projects most of the time. There is widespread consensus about their value and usefulness. They are also intended to provide a common lexicon and terminology within the profession of project management - locally and internationally. As a relatively young international profession there is still a need to converge on a common set of terms. The PMBOK describes project management under the following nine knowledge areas:

- **Project Scope Management:** includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. It is primarily concerned with defining and controlling what is or is not included in the project, to meet the sponsors' and stakeholders' goals and objectives. It consists of authorisation, scope planning, scope definition, scope change management and scope verification.
- **Project Time Management:** includes the process required to ensure timely performance of the project. It consists of activity definition, activity sequencing, duration estimating, establishing the calendar, schedule development and time control.
- **Project Cost Management:** includes the process required to ensure that the project is completed within the approved budget. It consists of resource planning, cost estimating, cost budgeting, cash-flow and cost control.

- **Project Quality Management:** includes the process required to ensure that the project will satisfy the needs for which it was undertaken. It consists of determining the required condition, quality planning, quality assurance and quality control.
- **Project Human Resource Management:** includes the process required to make the most effective use of the people involved with the project. It consists of organisation planning, staff acquisition and team development.
- **Project Communications Management:** includes the process required to ensure proper collection and dissemination of project information. It consists of communication planning, information distribution, project meetings, progress reporting and administrative closure.
- **Project Risk Management:** includes the process concerned with identifying, analysing, and responding to project risk. It consists of risk identification, risk quantification and impact, response development and risk control.
- **Project Procurement Management:** includes the process required to acquire goods and services from outside the performing project team or organisation. It consists of procurement planning, solicitation planning, solicitation, source selection, contract administration and contract closeout.
- **Project Integration:** integrates the three main project management processes of planning, execution and control - where inputs from several knowledge areas are brought together.

The body of knowledge can be subdivided into four core elements which determine the **deliverable** objectives of the project:

- Scope
- Time
- Cost
- Quality

The other knowledge areas provide the **means of achieving** the deliverable objectives, namely:

- Integration
- Human resources
- Communication
- Risk
- Procurement and contract.

**APM bok:** The APM bok takes a much broader approach than the PMBOK, by subdividing project management into 55 knowledge areas. It incorporates not only inward focused project management topics (such as planning and control techniques), but also broader topics in which the project is being managed (such as social and ecological environment), as well as specific areas (such as technology, economics, finance, organisation, procurement and people, as well as general management). The topics are described at an outline level, leaving the details to recommended texts (on their book list) to explain the working of the knowledge areas (see [www.apm.org.uk](http://www.apm.org.uk)).

**Certification of Project Managers (PMP):** The certification process offers a means for experienced project managers to gain a formal qualification in project management. There is a trend away from the knowledge based examinations which assess a person's knowledge, towards competence based examinations which assess a person's ability to perform. The PMI's certification is called the Project Management Professional (PMP). There is an increasing recognition of certification and for some projects it is being made a mandatory pre-qualification.

Competency is a mixture of explicit knowledge derived from formal education, tacit knowledge and skills derived from experience. For young professionals, explicit knowledge is more important, but the other competencies will become increasingly important as they progress in their careers. The PMI's (PMP) is a single level certificate programme, which measures explicit knowledge directly through a multi-choice test, and tacit knowledge and skill indirectly by assessing the candidate's work experience. It is therefore aimed at an early to mid-career professional.

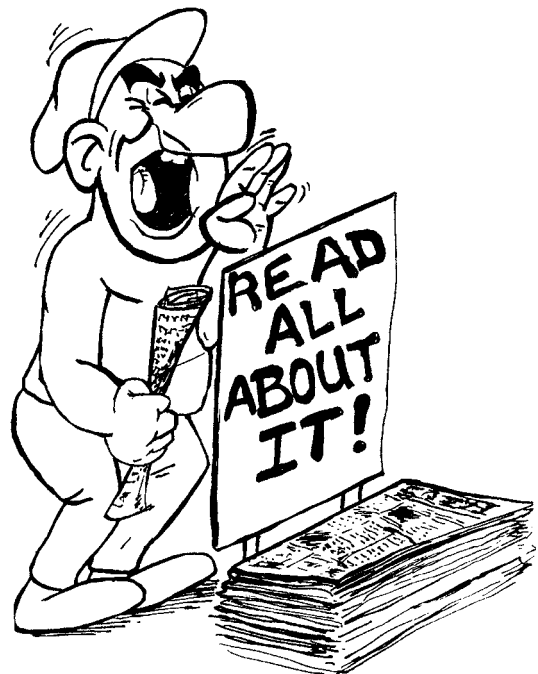
The IPMA and AIPM (Australia), on the other hand, have developed a multi-stage programme. At the first stage explicit knowledge is measured directly through a multi-question test. This is aimed at the professional managers starting their careers. At the second stage tacit knowledge and skill are measured directly. This is early to mid stage certification, equivalent to PMP. At the third stage, the programme measures performance of senior project managers directly, and IPMA has a fourth stage to measure the performance of project directors.

The key issue is ensuring equivalence, so that client organisations can compare the competence of project managers against different programmes. In Europe the integration of the EU is encouraging a growing number of cross-border projects, which not only require collaboration, but a need to converge on common practices, legal systems and, not least, a common business language.

### **Global Project Management Forum:**

Project management has been an international profession for many years, but only recently have the global issues of project management been discussed. The first global project management forum was held in New Orleans in 1995 where 30 countries were represented. Some of the key topics discussed at the forum included:

- What industries or types of projects are the main users of modern project management in your country?
- What industries or areas of application in your country have the greatest need for more or better project management?



- What industries or organisations offer the greatest opportunities for growth of professional project management in your country?

The answers to these and other questions relating to standards, certification, a global PMBOK and advancing the project management profession were published by the PMI as *The Global Status of the Project Management Profession*.

## 6. Benefits of Project Management

The benefits of using a project management approach, obviously follows on from addressing the needs of the project. The project manager is responsible for developing a plan through which the project can be tracked and controlled to ensure the project meets preset objectives. To do this effectively the project manager requires accurate and timely information. This information should be supplied by the planning and control system, which outlines the scope of work and measures performance against the original plan.

Although the planning and control systems will incur additional management costs, it should be appreciated that lack of information could be even more expensive if it leads to poor management decisions, mistakes, rework and overrun. Listed below are some of the main benefits associated with a fully integrated project planning and control system:

- **Client:** The project manager is the project's *single point of responsibility* and the company's representative to the client (and other stakeholders). During meetings with the client the planning and control system will provide information about every aspect of the project. Clients prefer to deal with one person - the project manager - who is accountable. This gives them confidence that problems will be addressed and the project will be completed on time.
- **Single Point of Responsibility:** With the project manager responsible for the complete project, this should limit scope overlap and scope underlap.
- **Estimating:** The estimate forms the basis of the project plan. If you cannot estimate and measure it, how can you manage it?
- **CPM:** The critical path method calculates all the activities start dates, finish dates and floats. Activities with zero float form the critical path which determines the duration of the project - delaying a critical activity will delay the project.
- **Fast Track:** Bring a new product to the market quickly before your competitors.
- **Schedule Barchart:** Communicates the what, where, when and who.
- **Project Integration:** Co-ordinates and integrates the contribution of all the project participants.
- **Reporting Interfaces:** The planning and control system's database can be structured around the work breakdown structure (WBS) for project reporting and around the organisation breakdown structure (OBS) for corporate reporting. Without an integrated system the two reporting requirements would have to be processed separately.

- **Response Time:** Timely response on project performance is essential for effective project control. The project planning and control system can adjust the content and frequency of the feedback to address the needs of the project, while the corporate systems may be less flexible. Consider the accounts department for example - they generally use a monthly reporting cycle where feedback on invoices may be four to six weeks behind timenow.
- **Trends:** Projects are best controlled by monitoring the progress trends of time, cost and performance. This information may not be available to the project manager if the trend parameters are derived from a number of different functional sources and not communicated.
- **Data Capture:** If the project progress reporting is based on information supplied by the functional departments, the project manager cannot control the accuracy of this information. The problem here is that it may only become obvious towards the end of the project, that the reporting is inaccurate, by which time it may be too late to bring the project back on course to meet the project's objectives (see *Project Control* chapter).
- **Procedures:** The planning and control system enables the project manager to develop procedures and work instructions which are tailored to the specific needs of the project.
- **Project Office:** Offers a centre for project management excellence.
- **Closeout Report:** The performance of the current project will form the estimating database for future projects. If this data is not collected by the planning and control system it may be lost forever and you will live to repeat your mistakes. The closeout provides an effective mechanism to learn by mistakes, and strive for continuous improvement.
- **Marketing:** Vendors can distinguish themselves by marketing their project management systems. If two vendors are offering similar products at similar prices - then their selection may be based on the vendor who can demonstrate they can effectively manage the project.

Although there are many benefits from using project management techniques, senior management should tread carefully if the project management culture is not already established within the company, because the resistance to change could derail the project.

## 7. Role of the Project Manager

It is appropriate to conclude this chapter with a few words on the role of the project manager. Experience has shown that the selection of the project manager is a key appointment which can influence the success or failure of the project. As the *single point of responsibility*, it is the project manager who integrates and co-ordinates all the contributions, and guides them to successfully complete the project.

The role of the project manager should be outlined in the **project charter** (see *Scope Management* chapter) along with the purpose of the project. The following lists some desirable project manager attributes:

- Ability to select and develop an operational team from a standing start
- Leadership and management ability
- Ability to anticipate problems, solve problems and make decisions
- Ability to integrate the project stakeholders
- Operational flexibility
- Ability to plan, expedite and get things done
- Ability to negotiate and persuade
- Understand the environment within which the project is being managed
- Ability to review monitor and apply control
- Ability to administer the contract, the scope of work and scope changes
- Ability to manage within an environment of constant change
- Ability to keep the client happy.

We are witnessing a silent revolution - the transition from conventional functional management to project management. It is *Goodbye MBA - hello M.Sc Project Management*. I hope you are on-board!

### Key Points:

- The project management body of knowledge (PMBOK) and APM (bok) define project management under a number of knowledge areas.
- Project management has become a recognised profession with international accreditation of its members.
- Many companies are adopting a *management-by-project* approach with the project manager as the *single point of responsibility*.

### Further Reading:

**Morris**, Peter, *The Management of Projects*, Thomas Telford

**Oosthuizen**, Pieter, *Goodbye MBA*, International Thomson

**Project Management Institute (PMI)**., *The Global Status of the Project Management Profession*, PMI publication

**Turner**, R., *Handbook of Project Based Management*, McGraw-Hill

**Global PM Forum** <[www.pmforum.org](http://www.pmforum.org)>

**PMI** <[www.pmi.org](http://www.pmi.org)>

**APM** <[www.apm.org.uk](http://www.apm.org.uk)>

**IPMA** <[www.ipma.ch](http://www.ipma.ch)>

**APM** <[www.apm.org.uk](http://www.apm.org.uk)>

**Australian AIPM** <[www.dab.uts.au/aipm/competencystandards/index.html](http://www.dab.uts.au/aipm/competencystandards/index.html)>

**South African Qualifications Authority** <[www.saqa.org.za](http://www.saqa.org.za)>

**Case Study and Exercises:**

You have been appointed by the CEO of an international telecommunications company to make a short presentation to the board of directors about the benefit of using a *management-by-projects* approach on the company's next project. Your short presentation (written and/or verbal) should consider the following:

1. Explain what project management is, and why it is different to other forms of management.
2. Explain how project management can be applied to your company's projects.
3. Point out the trend towards professional project management and your local project management society / association who are supporting certification.
4. Outline the role of the project manager.
5. Suggest a small pilot project on which you can develop your project management systems.

