

1

Introduction to Project Management

Learning Outcomes

After reading this chapter, you should be able to;

Define project management

Define management-by-projects

List the benefits of project management

Outline the role of the project manager and team members

Explain the difference between project management and general management

Introduction to Project Management – features the management of small projects and project administration, and offers a structured approach to getting started. The purpose of this book is to introduce the latest project management techniques used to manage a range of projects. These techniques are used by the planning software and are referred to in the PMI's Project Management Body of Knowledge (PMBOK), the APM's body of knowledge (bok), and the SA unit standards.

This broad based introduction to project management is ideal for managers who are new to project management and who are managing small projects or sub-projects and need information, knowledge and skills to get started.

This book is also written for project team members who need to understand the special techniques of project management so that they can support the project manager and run the project management office (PMO) administration. As a team member this may involve gathering and processing project data, monitoring and reporting project progress, administrating scope change control, administrating documentation control and expediting progress.

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, there has been a trend towards the following;

- project teams
- management-by-projects
- matrix organisation structures.

These organisation structures empower all levels of the company and help to make the project team members feel more responsible and motivated to achieve their goals. As the project manager is the single point of responsibility, it is the project manager's responsibility to set up a management structure which meets the needs of the project, the needs of the organisation, the needs of the stakeholders and the needs of the individuals working on the project (see figure 1.1).

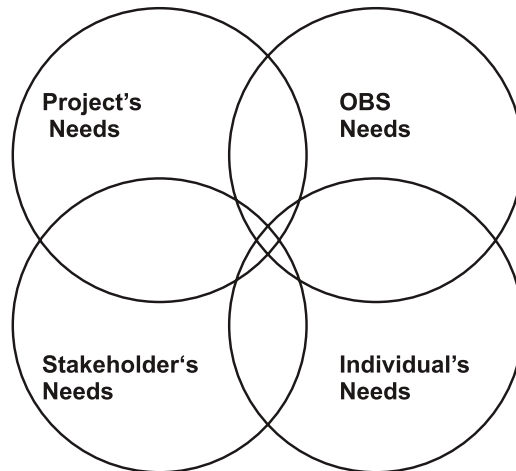


Figure 1.1: Intersecting Needs – shows the project's needs, the OBS's needs, the stakeholders' needs and the individuals needs as intersecting circles

1. What is a Project?

The main difference between project management and other management disciplines relates to the definition of a project and what the project intends to deliver for the client and stakeholders.

DEFINITION

The Project Management Institute's (PMI) guide to the project management body of knowledge (PMBOK) defines a project as; *'... a temporary endeavour undertaken to create a unique product or service (outcome or result). 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.'*

Some of the special features of a project include;

Start and Finish	A project has a clear start and finish.
Lifecycle	A project has a beginning and an end, with a number of distinct phases in between.
Schedule and Timeline	Projects are often time-limited. This means they must finish by a certain date.
Budget	Projects have a clear budget, often broken down to a budget per work package.
Non-Repetitive	Activities are essentially unique and non-repetitive.
Resources	Resources may be sourced from different functional departments and need to be co-ordinated.
Single Point of Responsibility	The project manager, project leader or project entrepreneur are responsible for the whole project.
Teams	Project teams are formed to complete the project.

Traditionally projects were associated with construction, petro-chemical and defence type projects, but in recent years most proactive industries (particularly IT), businesses and government departments have re-structured their work as projects. Consider the following different types of projects:

Construction Project	Designing and constructing a building, a bridge or a power station.
Product Development Project	Designing and testing a new product – a prototype car or a washing machine.
Advertising and Marketing Project	Launching and promoting a new product.
IT Project, or Computer Upgrade Project	Designing and implementing a new computer system which includes new hardware and software.
Human Resource Project	Designing and implementing a new organisation structure.
Office Project	Moving office, implementing new management systems.
Quality Management Project	Planning and conducting an audit.
Disaster Recovery Project	Limiting the damage to the business and loss of information caused by fires, floods or any type of accident.
Maintenance Project	Repairing and maintaining equipment.
Sports Project or Event Management	Managing a rugby tour to New Zealand, managing the London Olympics.
Entertainment Project or Event Management	Organising the Rolling Stones or Robbie Williams' world tour.
Travel Project	Planning an overseas business trip or holiday.
Fashion Show	Planning a fashion show of the latest designer fashions.
Domestic Project or Event Management	Planning a wedding or 40th birthday party.
Training and Education Project	Developing a new course.
Social Project	Building a heritage centre.
Police Project	Managing terrorism.
Aid Project	Providing basic infrastructure to remote villages.

Table 1.1: Types of Projects – shows the different types of projects

Within the context of this book a project may be defined as implementing a change, event, solution, or a new venture which uses a range of special project management techniques to plan and control the scope of work in order to deliver a product to satisfy the client's and stakeholders' needs and expectations.

2. What is Project Management

DEFINITION

Project management is defined by the PMBOK as; ‘..... *the application of knowledge, skills, tools and techniques to project activities in order to meet stakeholders needs and expectations from a project.*’

In other words the project team 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 team to establish who are the stakeholders (besides the client) and analyse their needs and expectations to define, at the outset, the project’s scope of work and objectives (this will be developed in the *Feasibility Study* chapter).

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

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

These nine knowledge areas are defined in the *Project Management Standards* chapter.

DEFINITION

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.’*

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 lifecycle. Along with the project lifecycle the other special project management techniques which form part of the project management integration process are:

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

3. Types of Projects

Projects range in type, size, scope, cost and time from mega international projects costing millions of dollars and implemented over many years, to small domestic projects with a small budget and taking just a few hours to complete. Projects can also be grouped – it is becoming popular for large companies that have many small projects, to adopt a management-by-projects approach where all their projects are channelled through a project office.

Another way of classifying projects is by focusing on the clarity of the objectives and the development of the project management processes and tools. The following model and text is developed from Obeng, Frigenti and Comminos (2002).

Fog Type	Fog-type projects can be described as walking in thick fog. On these type of projects, the project participants and stakeholders are not sure what is to be achieved or how it is to be carried out.
Movie Type	Movie-type projects are projects where participants and stakeholders have a high degree of certainty of how the project is to be carried out, but not what is to be delivered.
Quest Type	Quest-type projects are also known as semi-closed projects. On Quest projects, the project participants and stakeholders have a high degree of certainty of what should be done, but they are not sure of how to achieve it.
Painting by Numbers	Painting by numbers projects are known as closed projects. The project participants and most of the stakeholders have a high degree of certainty about what is to be done and how to achieve it.

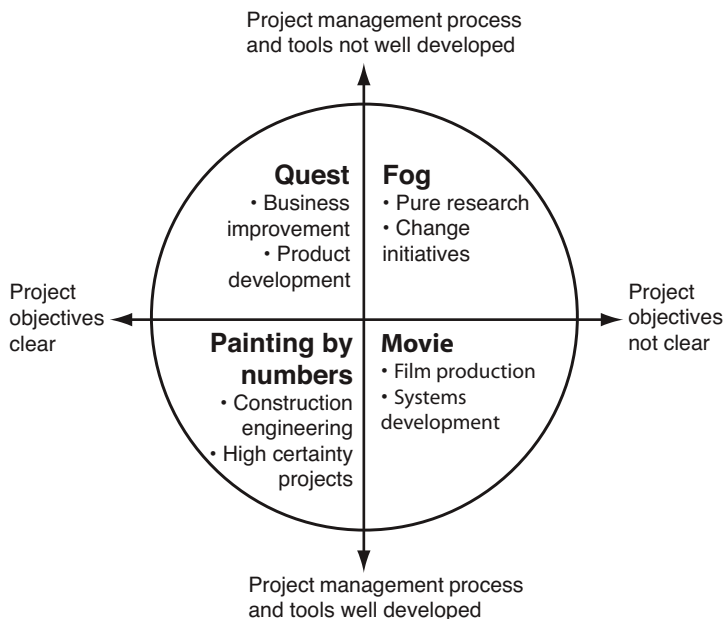


Figure 1.2: Types of Projects – shows the four project types in terms of project objectives (clear / not clear), and project management processes and tools (well developed / not well developed)

As a project develops it can move from one state to another; for example, the early stages of a business improvement project could be described as a 'fog project' as the organisation knows it needs to improve performance but is not sure exactly where to focus its attention. As the project emerges from the fog into clarity, targets for improvement are set, moving the project into a 'quest' state, but the best approach to achieve the project is not yet clear. As the project progressively elaborates, the design and implementation details emerge which, when sufficiently clear, lead to the 'painting by numbers' state. During the implementation the project is predominantly in the 'painting by numbers' state, although it may at times need to revert back to 'quest' or 'fog' if unforeseen factors arise.

Project type (description by Obeng)	General description	Project Process	Project Tools	Management approach
Fog Pure research Change initiatives First-time projects	We are not sure where we are going, or how to get there	Not well understood	Not well developed	Proceed with caution one step at a time. Focus on the next beacon and carefully move towards it. Having reached a beacon, the path to the next beacon becomes clear through the fog.
Movie Film production Systems development	We are not sure what our final destination will be. Once we have some idea we will know how to get there	Well understood	Well developed	Because the project management and production processes are well known, avoid spending too much time on definition and planning. It is better to concentrate on finding a good product (script), and the project process will be easily managed.
Quest Business improvement Project development	We know what our destination is, but we are not entirely sure how to get there	Not well understood	Not necessarily well developed	These projects require considerable research in the project initiation and definition phase, so a picture can be built up of a means and an approach required to achieve the final outcome. Care should be taken not to get into too much detailed planning and design, but rather progressively elaborate the project. This project type usually requires considerable buy-in from the performing organisation as well as important stakeholders.
Painting by Numbers Construction and engineering Similar projects done in the past	We know what our destination is We are confident of getting there	Very well understood	Very well developed	Painting by Numbers projects are complex, and tend to be large and involve many parties. As time and costs are predictable, the challenge is to deliver within tight financial, time and specification constraints. Diligent application of process and workflow is critical to success.

4. Management-by-Projects

Many organisations are changing the way they manage their work. Instead of the work being done as the resources become available (resource limited), the work is being packaged as scheduled projects, and the resources adjusted to suit the work schedule as time-limited 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, fashion, travel, education and service organisations.

To achieve a flexible workforce which can adjust its availability to meet the workload (not the other way round), companies are increasingly having to outsource their work to many small entrepreneurial type companies and contractors. For example, a telecom company would deal directly with their clients and log the jobs. This work (new connections, repairs or maintenance) would then be outsourced to private contractors for an immediate response. This way the telecom companies can vary their workforce to meet the workload and not have to permanently employ a large workforce on stand-by.

To manage a large number of small projects, companies are using a project office management (PMO) approach where the project office captures the work, initiates the project and assigns the work to a department or contractor. This way the clients can be advised more accurately when the work will be done, so they in turn can plan their workload. The management-by-projects approach encourages:

- organisation flexibility
- decentralised management accountability, responsibility and empowerment
- a holistic view of problems
- a goal-orientated problem solution process
- a direct costing giving better planning and control.

There are profound changes happening in the job market. **Time Magazine**; *‘...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 short term project employment. Therefore, for the 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.

Programme Management: The APM bok defines Programme Management as: *‘... the management of a collection of projects related to some extent to achieve a common objective’*. This could be a multi-disciplined project like a heritage site, or a sports stadium which is subdivided into many minor sub-projects. The key feature is many inter-related small projects to achieve a common goal.

Portfolio Management: The APM bok defines Portfolio Management on the other hand as: ‘...the management of a number of projects that do not share a common objective’. This would apply to the project management office (PMO) using a management-by-projects approach to manage a number of unrelated projects. For example, a city council projects department will have many unrelated small projects; fix a street light, fill a pothole, or repair a park bench.

Entrepreneur Projects: Creating a new venture, particularly the implementation phase has all the characteristics of a small project which should benefit from project management skills. In fact, it can be argued that most projects are initiated by an entrepreneur’s creative and innovative skills and their ability to spot marketable opportunities.

5. General Management

Although this book is about project management, the successful project manager and team member must also be competent in a wide range of general management skills:

- leadership
- communication
- organising
- staffing
- team building
- planning
- instructing
- co-ordinating
- implementing
- monitoring
- controlling.

General management also includes a number of support disciplines:

- computer systems and electronic filing
- 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, all these areas may need to be addressed at one time or another. It is the project manager’s responsibility to delegate the work to a team member or outsource as required.

Technical Management: The technical aspects of the project also need to be managed. The technical skills refer to the technical knowledge you need to design and make the product. Every profession has its unique range of technical skills and as an apprentice you will be shown the ropes and learn ‘the trade’. Training courses will help you ‘fast track’ up the learning curve. This is your opportunity to get a broad based grounding in all the technical aspects of your trade, and acquire plenty of relevant work experience. On smaller projects the project manager may be expected to be the technical expert as well as the project manager. In fact, early on in your career you will probably not be appointed as project manager unless you are a technical expert in your field.

Two other management styles to consider with respect to project management are production management and process management.

Production Management: Although projects are deemed to be unique, in reality many projects contain similar activities. For example, if your project includes manufacturing 100 similar items it could be more efficient to set-up a jig (former or mould) and make all the items at the same time rather than making them one at a time as you need them (additional storage accepted). The project manager should, therefore, always be looking for ways of using production management techniques embedded in the project.

Process Management: Process management is used to manage products which flow from one process to another. For example, in wine making the grapes are crushed, fermented, blended and bottled in batches. The same manufacturing process applies to chemical plants and refineries. Process management techniques are unlikely to be as useful to the project manager as production management techniques, however, in a petro-chemical plant, where process management techniques are used, they might also use a management-by-projects approach.

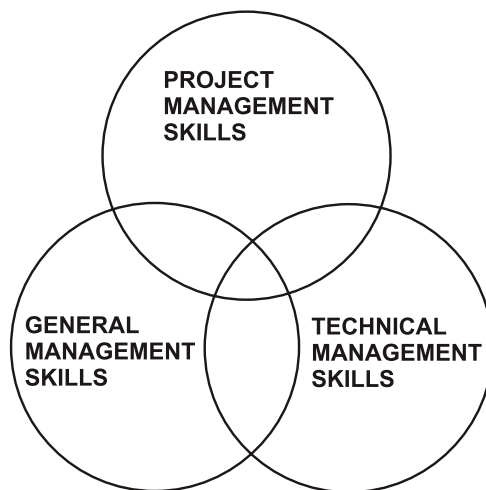


Figure 1.3: Intersecting Management Skills – shows project management, general management and technical management skills

6. Project Management Process

DEFINITION

The PMBOK states that project management is accomplished through processes. The PMBOK defines a process as: ‘...a set of interrelated actions and activities that are performed to achieve a pre-specified set of products, results or services.’

The project management process can be subdivided into five key processes which are linked by the results they produce - the outcome from one process is often the input to another process.

Initiating Process	The initiating process starts the project – this would usually include the project charter and feasibility study.
Planning Process	The planning process selects and develops the best courses of action to attain the objectives that the project was undertaken to achieve.
Execution Process	The execution processes integrates, instructs and coordinates people and resources to implement and carry out the management plan and make-it-happen.
Controlling Process	The controlling process ensures the project objectives are met by monitoring and measuring progress regularly to identify any variances from the management plan so that corrective action can be taken as necessary.
Closing process	The closing process formally accepts the project and brings it to an orderly end. This involves commissioning the product and handing it over to the client for operation.

Table 1.2: Project Management Processes – shows the five key project management processes

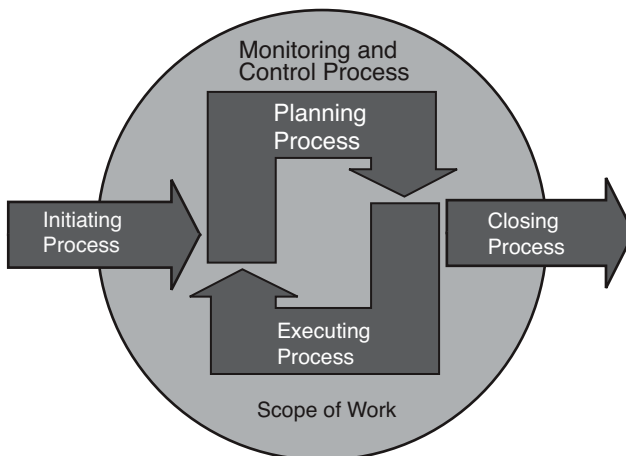


Figure 1.4: Project Management Process – shows the relationship between the five project management processes developed from the PMBOK

7. Project Lifecycle

The project lifecycle and the PMBOK are excellent models to explain the major processes and activities required to manage a project. The project lifecycle outlines the project as four sequential phases, and the PMBOK outlines the processes as nine knowledge areas. Figure 1.5 shows the integration of these two models.

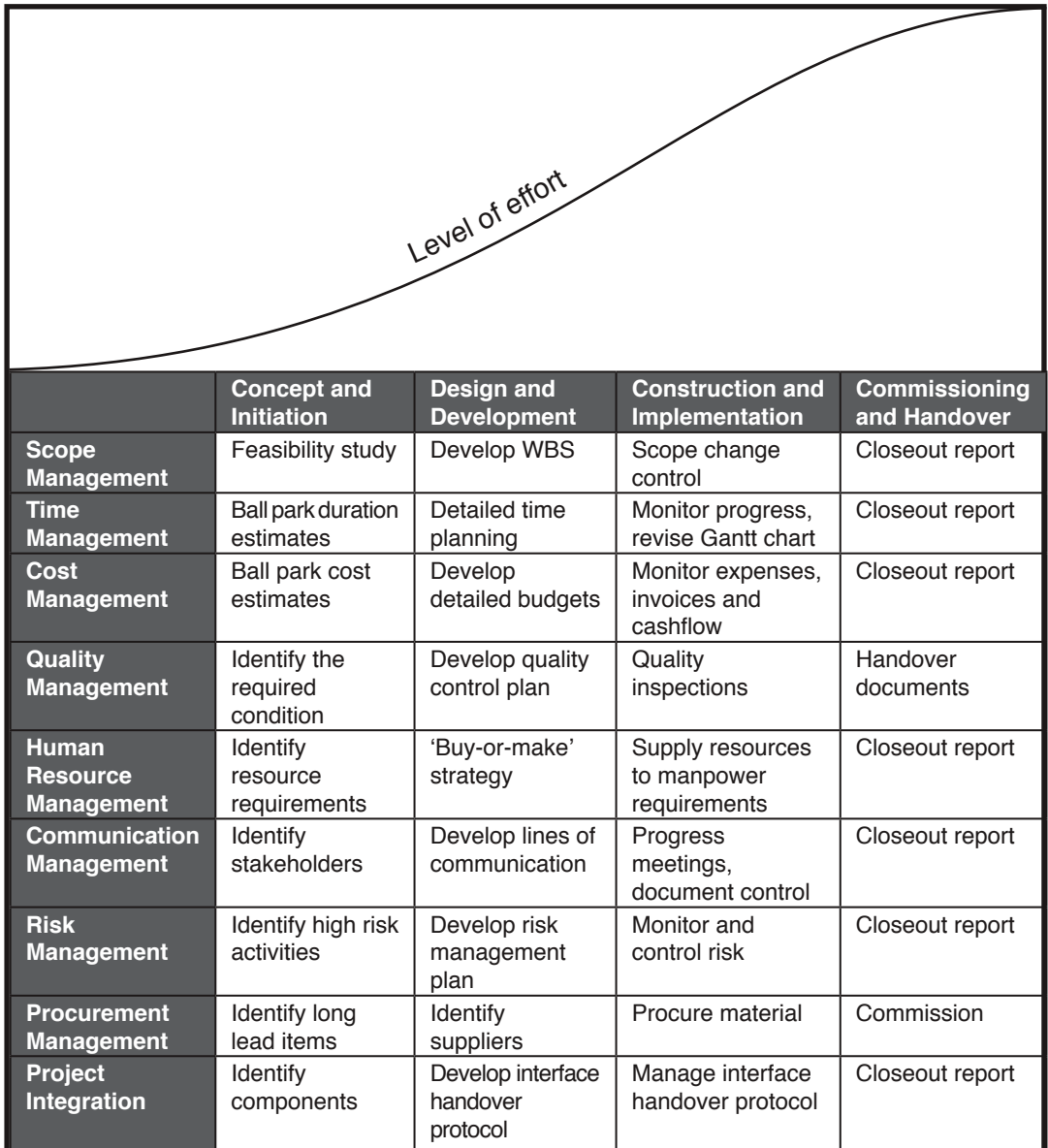


Figure 1.5: Project Lifecycle PMBOK Interface – shows a number of the key planning and control techniques

8. 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 from stakeholders 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. Consider the following lists of desirable attributes:

Team Creation	Ability to select and develop an operational team from a standing start.
Leadership	Leadership skills and management ability.
Problem-Solving	Ability to anticipate problems, solve problems and make decisions.
Integration	Ability to integrate the project stakeholders.
Flexibility	Operational flexibility.
Expediting	Ability to plan, expedite and get things done.
Negotiation	Ability to negotiate, persuade and make deals.
Environment	Understand the environment within which the project is being managed.
Control	Ability to review monitor and apply control.
Contract	Ability to administer the contract, the scope of work and scope changes.
Change Control	Ability to manage within an environment of constant change.
Client	Ability to keep the stakeholders and client happy.

Table 1.3: Project Manager's Role

Team Members: Team members play an important role in the management of projects. Their tasks would typically involve; collecting data, processing information, managing scope changes, distributing documentation, organizing meetings and expediting progress – the team members are often the unsung heroes. Their roles usually include;

Support	Undertake or support the project management activities.
Assist	Assist the project manager and/or project team by contributing and participating in planning, execution and control activities.
Administration	Provide support to the administration of a project.
Tools and Techniques	Describe and apply specialized technical methods, tools and techniques to a project to deliver project objectives.

Table 1.4: Team Member's Roles

9. Project Management Environment

The project environment directly influences 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 company's organisation structure
- Market requirements
- Competitors products and pricing strategy
- New technology
- Rules and regulations (health and safety)
- Economic cycle.

For project managers to be effective they must have a thorough understanding of the project's environment. The project environment consists of the numerous stakeholders and players that have an input, or are impacted by the project. All must be managed as any one person could derail the project (see *Feasibility Study* chapter).

10. Project Management Software

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

Whilst project planning software will certainly help project manager's plan and control their projects, its application will only be effective if the planning and control techniques are clearly understood by the project manager and the project team members. The purpose of this text is therefore to develop these techniques through manual examples and exercises.

11. 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, costly mistakes, rework and overruns. Listed in table 1.5 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 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, responsible and manages the complete project. Client's do not like being passed around like a football!
WBS	The work breakdown structure subdivides the work into manageable work packages and checklists which are easier to estimate, plan, monitor, control and assign to a responsible person.
Estimating	The estimate forms the basis of the project plan.
CPM	Critical path method calculates the activities' start dates, finish dates and float. The activities with zero float form the critical path of activities which determine the duration of the project - delaying a critical activity will delay the project.
Fast Track	Changing the logic and crashing activities enables the project manager to get the product to market before the competition.
Scheduled Gantt	Communicates the what, when and who.
Project Integration	Project integration co-ordinates and integrates the contribution of all the project participants. It limits underlap and overlap of work preventing a doubling up of effort.
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 functional systems may be less flexible. Consider the accounts department for example - they generally use a monthly reporting cycle where feedback on invoices may be 4 to 6 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. The project manager needs to work through a common data base.
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 was inaccurate, by which time it may be too late to bring the project back on course in order to meet the project's objectives (see <i>Project Control</i> chapter).
Procedures	Planning and control system enables the project manager to develop procedures and work instructions which are tailored to the specific needs of the project.
Quality Management	A quality management system enables the project manager to set up a quality system to manage the project. The quality control plan can be developed to vary the level of inspection and number of hold points to suit the project. Quality audits enable the project manager to inspect management systems within their own company and within the sub-contractor's company.
Closeout Report	The performance of the current project will form the estimating data base 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.

Table 1.5: Benefits of Project Management

There are many benefits from using a project management approach to managing projects. However, if there is not a culture of managing projects within the company, senior management should consider a softly softly approach as resistance to change could derail future projects.

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*.

Exercises:

Discuss how you could use project management techniques to manage your company's work. Your discussion should consider the following:

1. What is project management, and why it is different to other forms of management.
2. Explain how project management can be applied to your company's projects.
3. Outline the role of the project manager.
4. Suggest a small pilot project on which you can develop and prove your project management systems.

Further Reading:

Frigenti, Enzo, and Comminos, Dennis, *The Practice of Project Management: a guide to the business - focused approach*, Kogan Page, 2002.