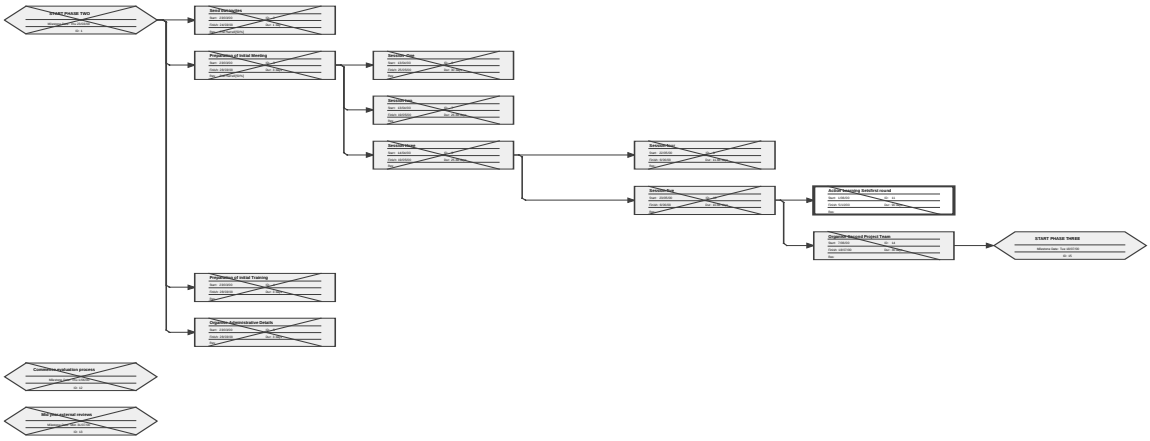
Project Management for Success in Teaching and Learning Projects

An Integrated Project Management Workbook



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Section One
Introduction to the Program

1.1 Introduction

The information contained in this workbook is the result of lessons learned from the 'Enhancing Project Management Skills for Teaching Development Projects' program, which was conducted at the University of New England (UNE) throughout 2000. The program, funded by CUTSD, aimed to improve the quality of project management in teaching and learning projects at UNE as well as provide a model for project management in teaching and learning projects that can be applied at Universities throughout Australia. It involved the conduct of a one-year, action learning based, project management staff development program. This workbook is based on the outcomes of that action learning program.

This workbook assumes little understanding of project management principles but does presume that the reader is familiar with the academic environment. The workbook is a self-paced learning resource that allows the reader to progress at his or her own pace through the various project management modules. Alternatively, with an experienced facilitator, the essentials of this workbook can be taught as a one-day workshop.

This workbook is designed for people who already have an actual project that is to be conducted and are looking for skills and techniques in relationship to the management of the project. It presumes the application for moneys and grants has already been conducted. This workbook is **not** designed to teach people 'how to write a grant application'. It should be noted that a good project plan could be a useful place to begin when applying for a grant however, most people produce a plan once the money has been acquired.

The workbook is divided into eight sections. Section One, 'Introduction to the Program' explains the background to the 'Enhancing Project Management Skills for Teaching Development Project' program and provides a brief overview of how the project was conducted at UNE. An explanation is then given on the most effective way to use these resources. Sections Two through Six provide a workshop on Project Management as it relates to teaching and learning projects in the academic environment. Section Seven provides a number of project management planning sheets. Section Eight details links to project management sites and lists references.

If you are keen to roll up your sleeves and get into it, you may wish skip the background to the UNE project and go straight to the Section 1.3 how to use the workbook.

1.2 An Overview of the Enhancing Project Management Program Conducted at UNE

A need was identified at UNE for the development of project management skills amongst higher education staff. Action learning was chosen as a method for developing project management expertise because it is a contextually specific, experience based approach to management development. It offered the promise of a learning framework that would enable project management principles to be effectively embedded into the unique University organisational setting.

There are many 'schools' of action learning. However, action learning literature is essentially linked by the premise that in the learning process there must be a relationship between reflection on knowledge and action based on that reflection. Action learning involves groups of individuals (termed sets) working together to solve problems. Learning happens because participants in a set have an opportunity to reflect on their experience with support from others and then convert the learning to action (McGill and Beaty 1992; Mumford 1997). In other words, action learning involves, learning from experience, sharing an experience with others, critical evaluation of that experience, and then implementation and review of the experience (Mailick *et. al.* 1998, p52).

As previously stated, the Enhancing Project Management program was a one-year, Action Learning based, project management staff development program. The program commenced in February 2000 and concluded at the end of December 2000. The program manager (appointed in February 2000 for the life of the project) initially conducted a project needs analysis and from this, the structure of the action learning program developed. He identified from interviews with academic and general staff at UNE that the majority of project problem issues (that have already been highlighted above) could be addressed through providing academic and general staff with a number of fundamental project management techniques and skills. However, these techniques and skills would only be effective if they were embedded into workplace practice. This required not only skills development but also culture change. Therefore a combination of workshops and action learning set groups were employed.

Twenty academic and general staff members were involved in the program throughout 2000. At the commencement of the program, participants were provided with course materials and undertook a number of project management skills development workshops (each of two hours duration). The workshops covered the project management life-cycle as well as a range of project management skills including: project scoping, definition and planning, project control, risk assessment, rational estimation techniques and the use of MS-Project planning software. The workshops were a prerequisite for the action learning sets that followed. This ensured all participants were equipped with a baseline skill level necessary to effectively manage projects.

There were three Action Learning Set Groups formed. The Set Group makeup was chosen by the participants and was generally based on non-specific issues such as timetabling and availability. In some cases Educational Designers and Academics working on the same project ensured they were in the same Set Group. The Set Groups met every three weeks for a minimum of two hours. Issues addressed in the set groups included: the nature of conflict, University politics, time management, communication problems, the nature of influence, and dealing with difficult people. The program concluded in December 2000 with an integration workshop focusing on Project Leadership, followed by each Set Group presenting what they had learned to the larger group.

The 'Enhancing Project Management' program provided many positive outcomes and is considered a success which has been verified by external evaluation. The basis for this workbook are the lessons that were learnt from the action learning program along with the knowledge and skills that are required for effective project management of teaching and learning projects.

1.3 How to Use the Workbook

Overview

This is a self-paced project management course. You can expect to work through the material in eight to sixteen hours of study. It is a cumulative process, so in general, you will benefit most from progressing through the program in the order set out below. Of course, please feel free to jump between modules if you feel you have the knowledge to do so. Alternatively, with an experienced facilitator, this can be conducted as a one day, project management workshop. A set of PowerPoint slides is provided to assist facilitation. These are on the UNE, TLC Project Management Web Page.

The workshop will provide you with the skills necessary to effectively, plan and conduct a teaching and learning project. As stated above, no prior knowledge of project management is assumed. This is an introductory program. Experienced project managers may benefit from the planning sheets or simply wish to implement the planning system outlined in this program.

It is worth highlighting at this stage, that this is a workbook **NOT** a manual. In other words, whilst it contains enough information for you to learn about project management and how to plan and conduct a project, it does not cover all aspects of the project management discipline. This is because we want you **to actually use the workbook**. Therefore, we have kept it as compact as possible. If you are interested in more detail than is provided here you may wish to download the Project Management Body of Knowledge (PMBOK) from http://www.pmi.org or refer to the reference list.

Workbook Conventions

The workbook includes a number of learning activities or exercises designed to consolidate your learning. Many of the learning activities will also be preceded by questions aimed at making you think about a particular aspect of project management. You will get most benefit from this workbook if you attempt all questions and learning activities. In some exercises you will be asked to work on generic projects which are designed to reinforce your learning and at other times you will be given the opportunity to work through your own projects. You will learn more effectively by following the instructions and working through all activities. The following symbols are used throughout this workbook.

Exercise or activity.

Questions for you to answer.

Important information

A Word on Generalisability

This manual specifically targets those people involved in the management of teaching and learning projects. However, the principles of project management espoused here are equally applicable across a range of different project types. This workbook will help you manage any project whether it be large or small, simple or complex, within a university or a commercial environment.

1.4 Program Structure and Objectives

Diagram 1.4.1 illustrates a suggested structure for the program. Each module builds on knowledge gained from the previous one.

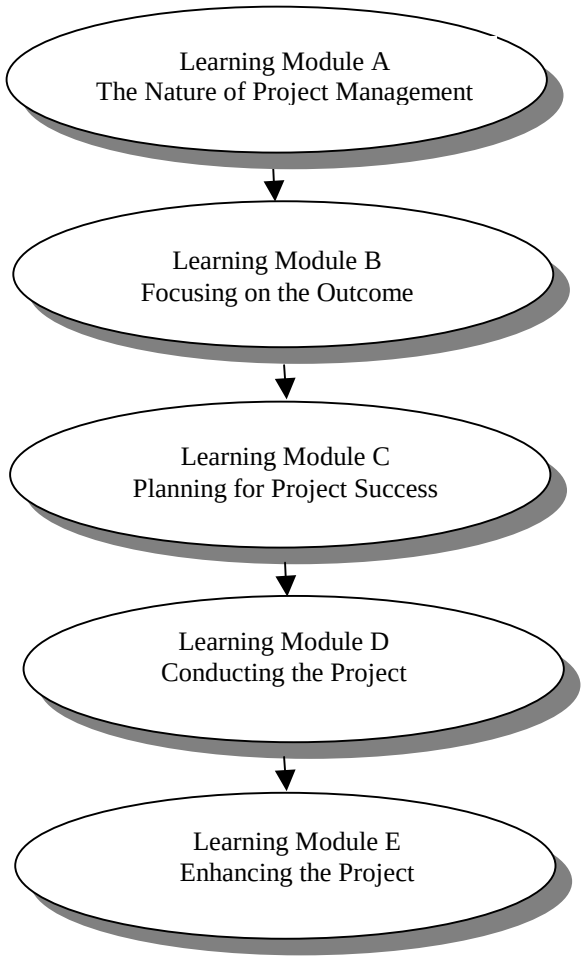
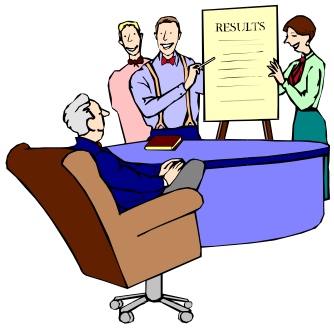


Diagram 1.4.1: Structure of Program



Section Two
Learning Module A: The Nature Of Project Management

2.1 Module A: Objectives

At the conclusion of this module you will be able to:

- Use the self-paced learning materials and explain the sequence of teaching.
- Explain the principles and practices of the discipline of project management as they relate to teaching and learning projects.
- List and explain individual project management issues and problems.

2.2 Content of Module

This module introduces you to the concept of project management and provides an overview of the project management life cycle. You will look at a definition of project management, consider why project management is important and look at the factors affecting the management of projects.

2.3 Why Project Management?

There is a need for effective project management. The teaching and learning environment of today is becoming far more reliant on a project based, team approach. For example, a relatively straightforward teaching initiative, such as placing a course on line, would most likely require input from academic staff, web designers, technical staff and instructional designers. More complex multimedia projects often require an even greater range of people and resources as well as a lengthy development period. This complex project environment requires appropriate project management skills. Projects need to be carefully planned, input from different staff needs to be co-ordinated, time-lines monitored, budgets managed and outcomes evaluated. Effective project management ensures cost effective use of valuable resources such as people and funds.

The university is a unique environment. The skill set required for effective project management is not necessarily the same set necessary for academic success. Many academic staff who are required to manage teaching and learning projects are often not equipped with the project management skills necessary to carry out successful project management. Hayden and Speedy (1995) in their evaluation of the 1993 CAUT Teaching Development Grants highlighted project planning and management issues among the impediments to successful project outcomes. These findings were further supported by the work of Alexander and McKenzie (1998) who identified poor planning and inadequate project management as factors contributing to the failure of teaching development projects.

The focus of those involved in teaching development projects is usually on the tangible product or outcomes of the project and not on the less tangible processes required to ensure the project is managed effectively. Project management is often seen as an unnecessary add-on or something which will happen automatically. Yet academic success in many instances requires project success. This workshop will assist you to develop the range of skills appropriate for effective project management in the higher education sector.

2.4 Understanding Project Management

Exercise One

Before we launch into the skills necessary to effectively manage projects it will be helpful for you to reflect on the issues and problems that you face as a project manager. This will allow you to place the learning for the program into context.

So think back to projects which you have managed or simply been involved in. Answer the following questions in the space provided. *Please note that you should only spend about 5 to 10 minutes on this exercise.*

Question 1 Briefly describe the type of projects you have been involved in.

Question 2 What were the main issues and problems which you faced during the project?

Question 3 What do you want to understand about project planning from working through this workbook? Remember as you work through the program, the clearer you understand your needs, the greater will be your focus of learning.

Problems, Problems, Problems!!!!

Some of the issues that came up at UNE included: 'lack of team-work, no clear direction, lack of co-operation, inability of project participants to meet deadlines, underestimation of project time by project managers, ambivalent commitment from stakeholders and interdepartmental rivalry'. Do you notice the similarities between the issues and problems faced by others and those you listed? As you progress through the workbook, refer back to the issues you have raised here and highlight where there are techniques and skills that will allow you address some of these issues.

Overall Workshop Aims

This workshop aims to provide you with enough knowledge to assist you to achieve project success in teaching and learning projects. You will be able to:

- explain project management terminology, procedures and techniques;
- design, develop and document project plans;
- describe the tools of project management;
- monitor and track projects to maintain control;
- develop ideas to enhance project teamwork.

So let's roll up our sleeves and get involved!!!

What is Project Management?

Firstly, what is a project? After all, if you are going to spend quite a number of hours working on how to manage it, you may as well be clear on what 'it' is. Take a few minutes to answer the question "What is a project?"

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You probably wrote something down about having to achieve a certain amount of work in a certain period of time given a limited amount of resources. Essentially, a project has a start and a finish. You probably have a number of people involved in your project (although if you are conducting a project by yourself, the principles in this workbook are just as relevant to you). In teaching and learning projects these may include instructional designers, programmers, academic staff from various parts of the University and numerous others. These 'resources' often have competing commitments for your particular project. Now consider the definitions below.

"A temporary endeavour undertaken to create a unique product or service."

(The Project Management Institute (PMI), p167)

"Projects are intended to produce certain specified results at a particular point in time"

(Archibald 1976, p19)

"A project is usually a one-time activity with a well-defined set of desired end results"

(Meredith & Mantel 2000, p99)

Teaching and learning projects are normally temporary events designed to a achieve a specific outcome. This outcome might be a new unit or the placing of an existing unit on-line. Furthermore, it is becoming far less usual for teaching and the development of new teaching approaches or resources to involve a single academic working alone. On-line teaching requires input from academic staff, web designers, instructional designers and technical staff. Multimedia projects are complex in their development, often taking lengthy periods to produce and requiring a range of expertise from programmers and other technical staff as well as educational and content experts. There is a growing need for IT support staff to work collaboratively with academics and other support staff to ensure that teaching developments have adequate IT infrastructure and on-going maintenance to be effectively implemented.

The complexity of these projects require careful planning. Input from different staff needs to be co-ordinated, time-lines monitored, budgets managed and outcomes evaluated. Project management for teaching developments using IT brings the additional problem of co-ordinating input from people with very different perspectives and ways of working. Effective project management is a necessity to ensure cost effective use of resources such as people and funds.

Now consider the British Institute of Project Management definition.

"…the overall planning, control and co-ordination of a project from inception to completion aimed at meeting the clients' requirements and ensuring completion on time, within cost and to required quality standards."

(The British Institute of Project Management)

The definition above is an interesting one. Is this an appropriate definition for the teaching and learning environment? How relevant is this to the academic world? Who are your clients? Is it relevant to you in your environment?

Reword the British Institute of Project Management definition to encompass the unique academic environment.

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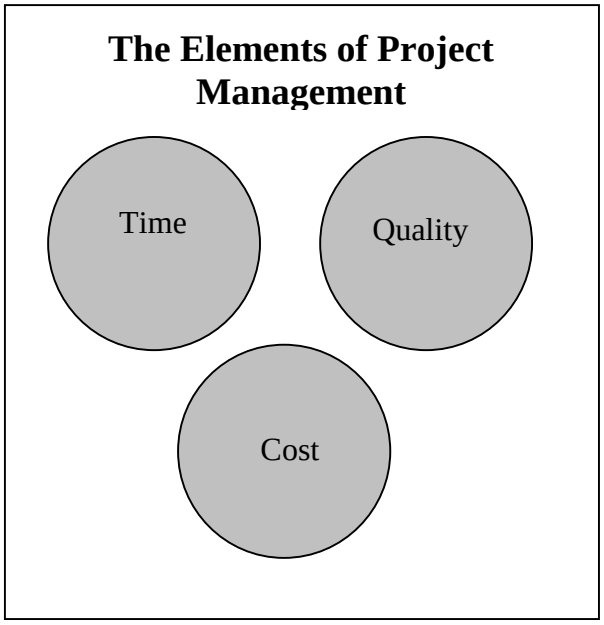


The success of a project is not only defined by the degree to which its overall objectives are met and benefits realised but also in terms of the project managers capacity to maintain control of the project. To achieve this it is normal to break down our body of work into a number of s smaller jobs or tasks which must be managed to a certain level of **quality**. To get these done, we will need to assign resources, which may be people, materials, machines, equipment, vehicles, office space and any other agents that might be required. The use of these items incur **costs.** A project also has a finite **time** frame. In other words, project management is the process of balancing the demands of three major elements: quality, time and cost to achieve project goals. Now let us consider these each individually.

Quality

Quality relates to the project objectives and deliverables. This is the 'why & what' of the project. What is its purpose? What is being delivered and to what degree of refinement? In teaching and learning projects we would be looking at the breadth of the outcome. For example, quality could be related to the type of content on a web-based unit. Interestingly, when teaching and learning projects experience difficulty, the breadth of the outcome can be one of the first things to suffer.

Time

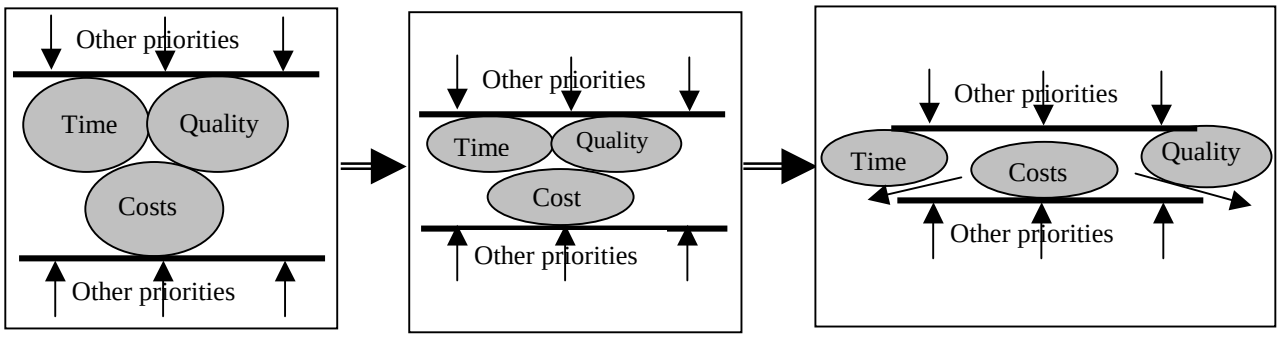
It is important to deliver the project outputs in a pre-specified and agreed-upon time. Time is often the biggest single project mistake in teaching and learning projects. This is often reflected in missed deadlines, incomplete materials and late final reports. Therefore effective control of time requires the careful identification of the tasks that will need to be performed, an accurate estimation of their likely durations, their required allocation of people and materials (resources) and the sequence in which they are going to be done. It is important to calculate a realistic estimate of the total duration for the project.

Cost

It is also important to deliver the project outputs in a pre-specified and agreed-upon budget. Obviously, in conducting teaching and learning projects you do not want to run out of money but equally you do not want to under spend either. Many government grants have a 'use it or lose it' approach to project money. This can mean that if the budget has not been well planned money can be wasted in a last minute scramble to spend the allocation of funds. So, having identified the resources that will be required for the work, be they materials or human resources, it is important to calculate the expected cost of each to the project.

2.5 The Real World of Project Planning

Of course, in the real world of project management, it is never as simple as it appears in texts. In reality, many other priorities impact on the management of our projects. What is required is a system that is flexible enough to allow us to maintain control of our projects even during times of difficulty. Consider the diagrams below. As we progress through the project other priorities impact and squeeze us. If they keep squeezing then something has to give. What normally gives in teaching and learning projects that you have been involved?



It is our observation that with teaching and learning projects the easiest thing to 'give' in such projects is often quality. 'Let's not produce that really innovative interactive software with all those graphics…Let's just throw some words down and call it a day'. Often it is very easy to reduce the output of the course that you want to produce. Quality is often the first thing to 'give'. The other aspect to 'give' is time. People don't make the deadline or they do make the deadline but at quite a significant cost. In other words the project team is not leaving work at 5 pm, they are leaving late at night so that they can make the deadline.

You can gauge your performance during a project often by the degree you are in control when other priorities interfere. The degree to which deadlines and budgets are being met is an appropriate indicator of your progress. Faced with pressures of agendas, politics, changing priorities, scarcity of resources and money, a project manager is nonetheless required to meet commitments.

Project management is in many ways a process to avoid surprises caused by the dynamic, fluid nature of the real world. If they cannot be eliminated, then they at least need to be minimised. As a project manager you should expect surprises. These come in the form of missed deadlines, people off sick, software not performing as expected, miscommunication and changed priorities of the department or stakeholders, to name just a few.

The immediate nature of projects mean that it is not always possible to have a dress rehearsal (although in some projects, particularly with new technology, including a trial is an important component). The next best option is to model the likely flow so that problems can be anticipated and avoided. This is all a project plan is – a representation of the project on paper or on a computer screen, that allows you to get a sense of what is likely to happen in reality. Much of the work that will occupy us during this workshop is aimed at developing project models or plans so that the impact of unexpected events can be mitigated.

Exercise Two

The following exercise is designed to highlight the principles, skills, tool and techniques of project management. Read the following project management brief, produce a project plan and then answer the questions below.

Project Management Brief:

You have been tasked with managing an important teaching and learning project. You are to produce a generic unit that can be used in a distance education program, which will be developed across three faculties. The project will involve the production of interactive training material including a CD ROM. A travelling promotional tour will follow the production of the CD ROM. It is now the middle of Semester 2 and you are required to have the materials ready for Semester 1 next year.

In your project team, you have an academic representative from each faculty and an instructional designer. Your job is to manage this group of highly motivated academics and to get the project completed on time and on budget. You have done some research and you have discussed the project with your head of department, the person who has given you the job. You have also spoken to a colleague who has undertaken a similar project in the past. From these discussions, you have identified some information, which is listed below.

There are some fundamental philosophical disagreements regarding the content of what different team members believe should be in the unit materials.

The materials must be developed in consultation with the three faculties.

The materials are to consist of a Unit Guide (text and diagrams), readings, CD ROMS and on-line support.

The materials must be given to the DTP section who will convert the material to your university's style.

One academic will be absent on study leave during the second half of Semester 2.

You are asked to briefly define and plan your project and develop a project plan. In your plan, identify the problems you envisage and how you intend to deal with them. What costs would you need to consider? How can you keep track of resources?

The aim of this exercise is to identify ways that we can manage and keep control of the project. You should not dwell on the detail. Simply think about the mechanisms which you are going to use to keep control of your project. You should consider the following questions:

- How are you going to make sure that you do not go over time?
- How are you going to ensure that at any point in time, you are aware of how the project is progressing?
- How are you going to ensure that you have an effective planning system?
- How are you going to keep your people motivated?
- What communication plan do you have in your project?

Produce a useable project plan either here or on the page opposite and then answer the questions on the next page.

There are numerous tasks that you could brainstorm for this project. Here are six broad tasks that may give you some form to start with.

Task 1: Review information - you estimate two months.

Task 2: Production of initial draft of material - you estimate another two months.

Task 3: Production of final draft of materials - two months.

Task 4: Distribute draft for comments - one month.

Task 5: Produce final policy - one month

Task 6: Disseminate materials.

a. What is the outcome of the project and how will you know when it is completed?

b. What tasks have you identified that need doing?

c. How will you keep control of the project to ensure you complete on time?

d. What other factors are important when conducting the project?

When this activity has been conducted as part of a workshop, the following issues are usually raised in the subsequent discussion.

- **The importance of meetings.** Hold an establishment meeting of the management team. During the meeting, the project would be defined as well as its goals, parameters, aims and objectives, stages, deliverables, outcomes, research parameters. Establish regular meeting times.

- **The importance of consultation.** Consult with stakeholders. Refine parameters of the project if necessary after the consultation and input by the stakeholders.

- **Understand the outcome that is required.** Conduct a needs analysis and identify clients, people, resources and tools. Consider the people who are part of the project and their roles and responsibilities. Consider the project management tools available and select those which are appropriate. Consider the constraints – time and money.

- **Communication is important.** Identify methods of communicating. Identify procedures for dealing with disagreements. Develop a communications plan.

- **Plan effectively and efficiently.** Apply the project management tools to the practical planning of the project to enable the project to proceed from its initiation to its completion. Establish long and short term goals. Allocate tasks. Establish control mechanisms and a monitoring process (that is, quality assurance) for the project to check the efficiency (that is, how the project is proceeding?) and the effectiveness (is the project achieving?) and establish whether there is a gap between where the project is and where it should be. If there is a gap, establish methods to get the project back on track. The monitoring process will track the project. Develop a process to redefine goals as a result of unexpected problems such as finance, people etc.

Real-world projects are plagued with complexity, volume and uncertainty. We therefore need to develop a project management methodology which will help us manage this complexity. The methodology selected must combine the best of analytical techniques and include proper documentation, particularly, for very large projects. The project management methodology must be a streamlined and effective process and should recommend a functional yet easy-to-use software package.

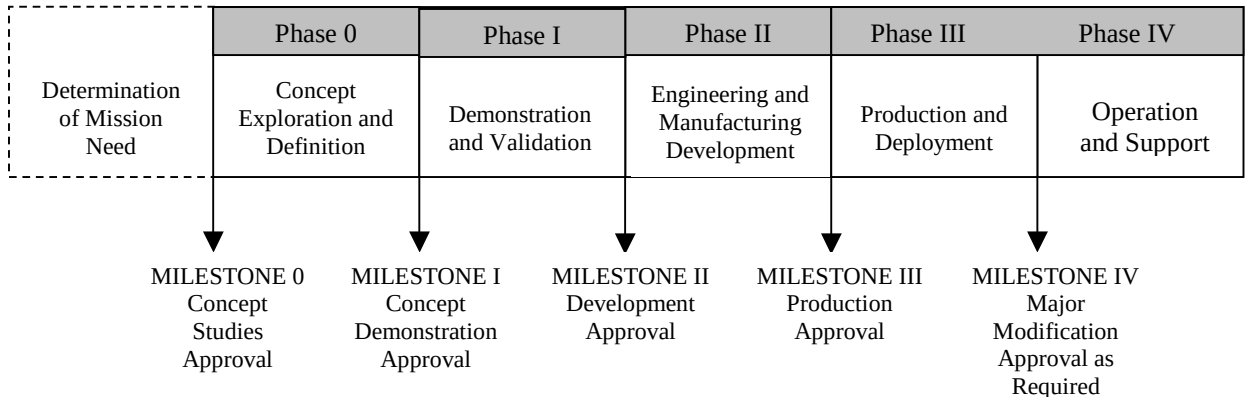
2.6 The Project Life Cycle

Because of the complex nature of a project, it is usual to divide the events of a project into several phases which make up the life cycle of the project. A project normally has a finite life cycle; it has a commencement, a conduct or implementation and a conclusion marked by the completion of one or more deliverables. The specific names of the phases differ depending on which book or model is being used. However, they all include some way of clarifying the outcome of the project, producing a comprehensive useable plan, conducting the project, and reviewing it after its completion.

Consider some examples of typical project life cycles and phase names listed on the following page. These have been selected to demonstrate the different approaches which may be taken.

The Defence Acquisition project life cycle is used by the US Department of Defence and includes a series of acquisition milestones and phases.

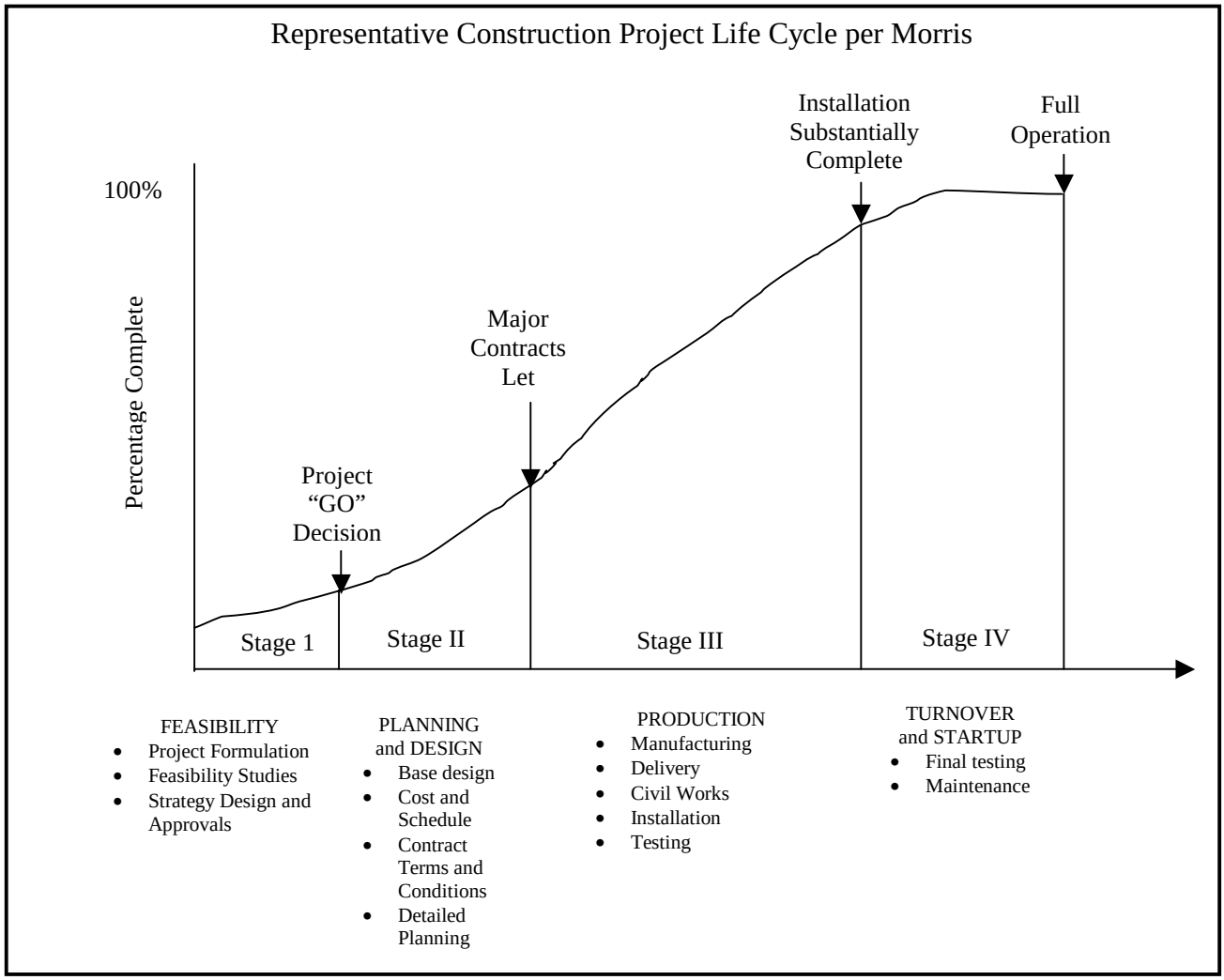
Representative Life Cycle for Defence Acquisition (from US DOD 5000.2 (Rev.2/26/93))



(taken from page 13, PMBOK.)

The construction project life cycle describes a model used for the building of a facility and includes a series of stages and outcomes.

Representative Construction Project Life Cycle per Morris



(taken from 14, PMBOK)

Different types of projects may require different phases. For instance, a marketing project involving the identification and development of a new product, will often commence with a feasibility study and conclude with a product launch. We have tried to follow the KIS (Keep it Simple) principle when defining a life cycle for teaching and learning projects. We have divided such projects into four broad phases. These are Definition, Planning, Conduct and Review.

Project Definition

This phase has one simple purpose - Clarity of Purpose. How well a project has been defined will in turn determine how well the project is then set up for planning. It is our experience that many problems in teaching and learning projects stem from inadequate project definition. Once a project is to proceed then the clarity of objective is vital. As is the assessment of risks, project constraints, feasibility etc. This process is sometimes called project scoping. A project definition should be detailed enough to answer the question - **Do I have a project?**

Project Planning

This is the detailed phase of breaking down the project into 'bite size chunks'. It involves analysing what work needs to be done, who will be required to do it and the amount of time necessary and the costs required to complete the project. It is also vitally important that the project is well documented. This allows for greater control during the conduct of the project as well as an easier report writing and review phase. As we discuss further on, we encourage you to use project planning software to assist in the planning process. The question to ask at the end of this phase is - **Do I have a detailed enough plan to maintain control of the project?**

Project Conduct

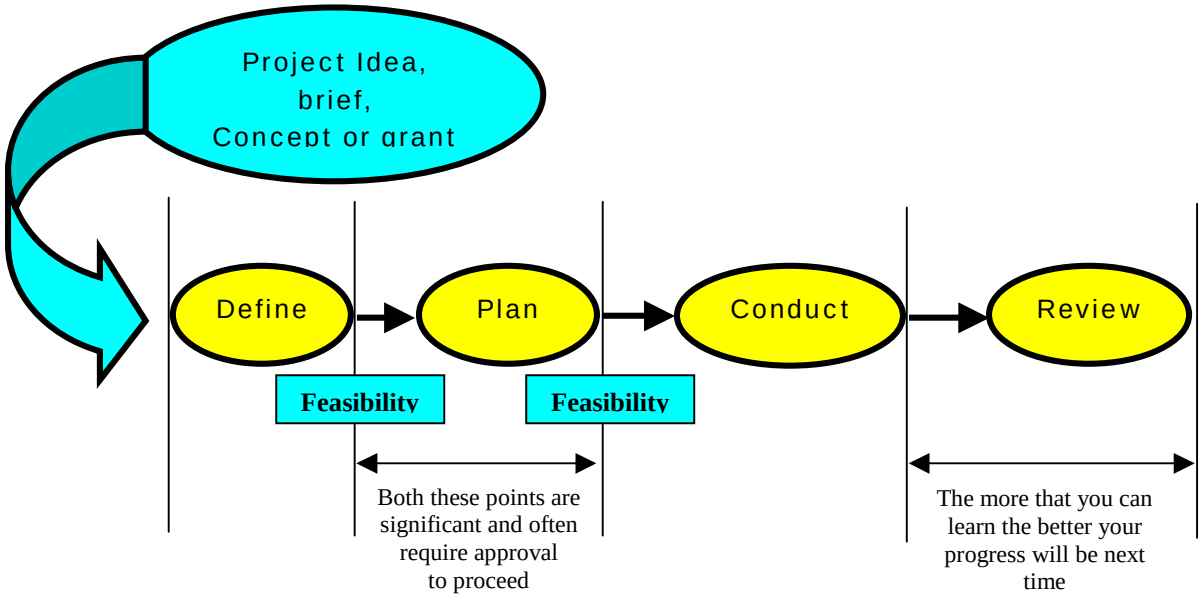
You need to conduct your project in accordance with your project plan. You must measure the 'plan' *versus* the 'actual'. You need to know what is actually happening with your project versus what you thought was going to happen. Whilst it is important to minimise variance, it is more important to be in control. This may require adjustments and corrective action. The question to ask during this phase is – **Am I in control?**

Review

The review of the project involves an in depth analysis of the project normally at its conclusion. This is an opportunity to examine all the project issues and learn from mistakes that have been made. If the project has been well documented then this phase is relatively straight forward. The question to ask at the end of this phase is - **What can I learn?**

These phases are shown in the diagram below.

The Project Life Cycle

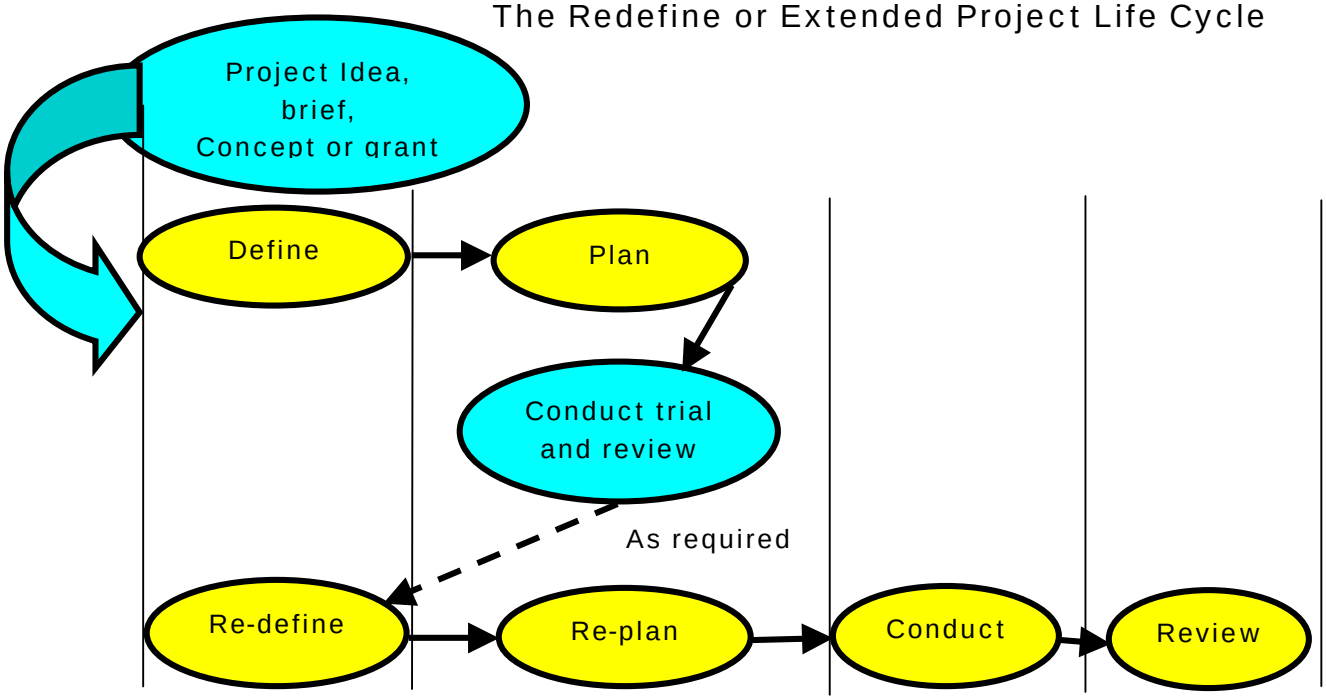


It is worth highlighting that this model is a simple model designed to assist in the management of teaching and learning projects. In the real world of project planning you may need to:

- define and plan;
- conduct a trial to assess development time; and then
- redefine and plan.

The redefine or extended model is particularly useful when dealing with technology such as developing CD-ROMS as it allows for trial and error and ultimately should lead to more reliable project plans. Use this model as a guide to develop your project so that it suits your needs.

The Redefine or Extended Project Life Cycle



2.7 The Project Manager in Teaching and Learning Projects

Up until now we have talked about 'costs', 'resources' and 'phases' and mentioned little about the people in a project. The key to project success is to have an effective planning system coupled with solid people skills. It has been our experience that at least 50% of issues and problems in projects could be avoided by effective management of people. The way people are managed is crucial to project success. This will be dealt with in some detail in Learning Module E.

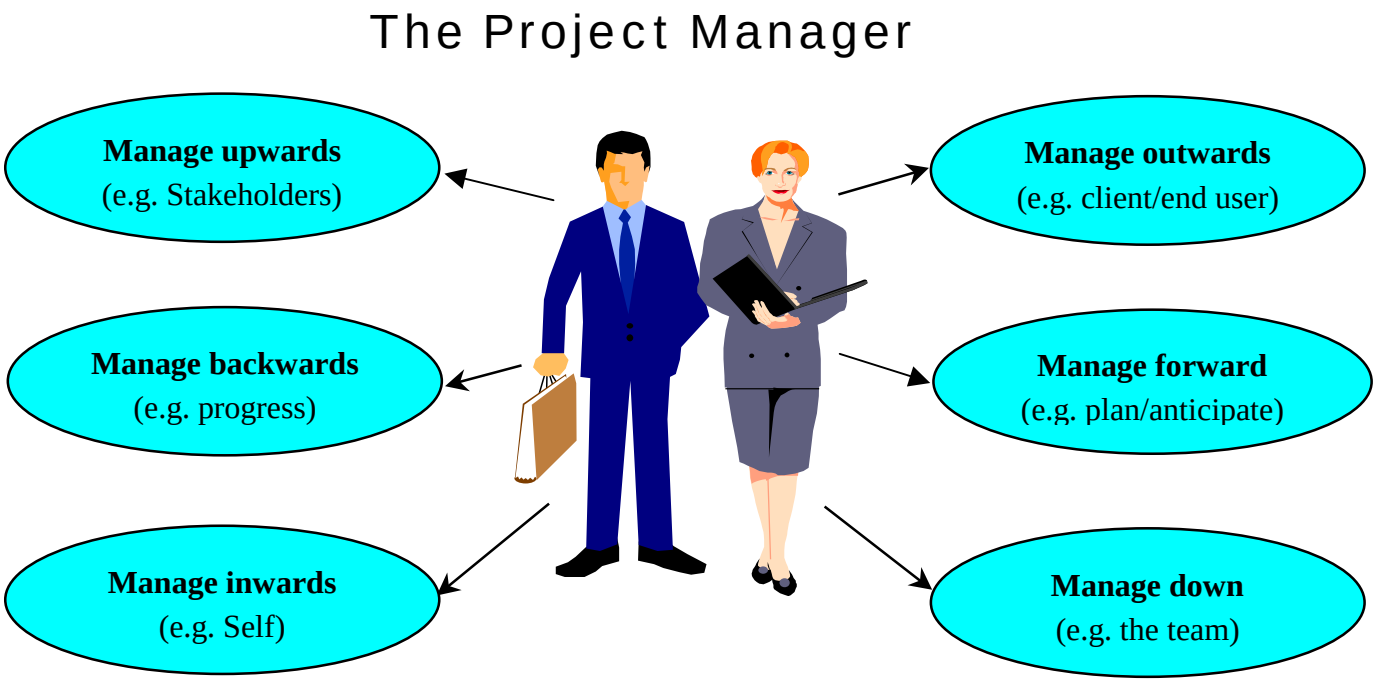
It is worth remembering that a humble project manager has many responsibilities. The leader of a project team is certainly responsible for effectively leading his or her team through the four stages of project management. However, to really understand the role of the project leader we need to extend the definition of project management to include '*managing the visible and invisible team to achieve the objectives of the stakeholders.*' Underlying this definition are five concepts that we must recognise:

- The **visible team** - these are the people who work directly on the project.
- The **invisible team** - the people who contribute indirectly, marginally or have an interest in an aspect of the project.
- The **stakeholder** - the significant people who have an interest in the project outcome.

The project leader in addition to taking these potentially conflicting interest groups into account must also consider:

- The **organisational context** - there are many factors that impact on the leader's decision making that are not central to completing the task. These include numerous vested interests, organisational politics and strategic significance.
- The **people factor** - as many fiascos are caused by inadequate people management as by insufficient technical skills.

The project leader, to be effective, must be able to balance many, often competing issues. These issues are represented in the diagram below.



Hints for the Project Manager

Being a project manager and managing a project can be a very daunting task. Most project managers are thrown into the tasks without any prior training. Meredith and Mantel (2000, p 28) posed the question "What information were you never given as a novice project manager that, in retrospect, could have made you job easier?" to dozens of project managers over several years. They came up with a list of 12 rules which they call the "Vital Dozen for Project Managers" which they suggest that project managers need to keep in mind while they are progressing through the project cycle.

Vital Dozen for Project Managers

1. **Understand** the content of project management.
2. **Recognise** project team conflict as progress.
3. **Understand** who the stakeholders are and what they want.
4. **Accept** and use the political nature of organisations.
5. **Lead** from the front.
6. **Understand** what "success" means.
7. **Build** and maintain a cohesive team.
8. **Enthusiasm** and despair are both infectious.
9. **One look** forward is worth two looks back.
10. **Remember** what you are trying to do.
11. **Use time** carefully or it will use you.
12. **Above all**, plan, plan, plan.

(taken from Meredith and Mantel 2000)

2.8 Module Summary

- Project management is the overall planning, control and co-ordination of a project from inception to completion aimed at meeting the clients' requirements and ensuring completion on time, within cost and to required quality standards.
- Project management is the process of balancing the demands of three major elements: quality, time and cost to achieve project goals.
- The project Life Cycle can be broken into four broad phases; Definition, Planning, Conduct and Review.
- Project managers need to manage the people who work directly on the project, those who contribute indirectly, marginally or have an interest in an aspect of the project to achieve the objectives, to significant people who have an interest in the project outcome.
- The Project Manager must be able to balance many, often competing issues.

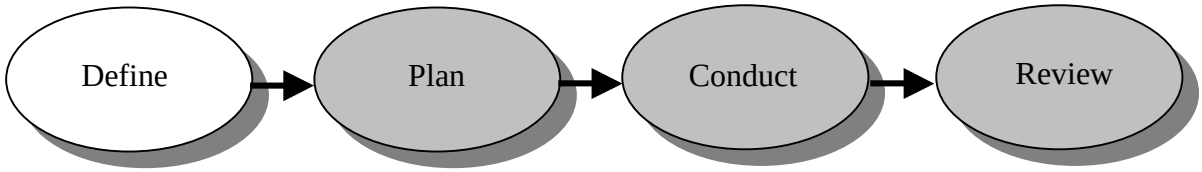
Section Three
Learning Module B:
Focusing On The Outcome

3.1 Module B: Objectives

At the conclusion of this module you will be able to:

- Explain the importance of effectively defining the project outcome.
- Use techniques necessary to define the project.

3.2 Content of Module



This module introduces you to the first phase of the Project Management Cycle, **Define**. It deals with the importance of clarifying the purpose of the project and risk management. You will learn how to complete a project definition form and to conduct a risk management analysis.

3.3 The Importance of Clarifying the Project Purpose

Introduction

The project definition phase, also called project inception, is the critical element in project planning. How well a project is defined will by and large determine how effectively it is planned. It has been our experience that many teaching and learning projects tend to fall down at this stage. If there is no clear direction of what needs to be achieved, it is very difficult to effectively plan for it.

There are many ways that a project gets started. This can be from a grant application or a policy initiative from the University or simply an idea for a new unit generated by an academic staff member. Essentially a project need is generated and a project manager then takes responsibility for the project.

An amusing (but not necessarily uncommon) project start was initiated at UNE during the course of the 'Enhancing Project Management' program conducted during 2000. We call this the 'last person standing in the tea room' method of project allocation The Head of Department announced to colleagues at morning tea that he had decided a research unit was required. All the experienced staff disappeared immediately and the last staff member still in the room was given the job of project managing this unit development project. Needless to say this person lacked commitment and time to give the project the attention it deserved, consequently it did not progress well.

The point with the example above is that the project manager needs to feel ownership of a project if it is to progress successfully. A project manager should have a clear idea of what is to be achieved in the project. Obviously, if the project manager is the holder of a successful grant application then this is fairly obvious. However, if a project manager has been appointed by a similar system to the example above, then more information is going to be required.

Whilst the project initiation comes in many forms, in an ideal world it begins with a briefing by a stakeholder and from there, the planning process progresses. In this ideal scenario the designated project manager receives a written brief. This brief should encompass the scope of the project, anticipated outcomes and any constraints, for example budgetary considerations. If there is no written brief, the project manager will need to clarify the project requirements. The project definition process is an ideal way to achieve this. A planning form is provided later in this section for your consideration. However, **any project definition process should at least include the following steps**.

A Clear Objective

The project may have a number of objectives; these are the benefits or outcomes of the project. For example a project objective for a teaching and learning project might include the production of a workbook. This is a clear outcome. It is precise and realistic and once the parameters of the workbook have identified, will form the basis for the planning process.

A Deliverable

According to the PMBOK a deliverable is any measurable, tangible, verifiable, outcome, result or item that must be produced to complete a project. The deliverable is the physical manifestation of the project. In the example above of producing a workbook, the deliverable would be the final printed (or electronic) workbook completed and available.

A Clear Understanding of the Scope of the Project

The scope is usually considered to be the sum of the products and services that are provided by a project. In teaching and learning another way to view the scope is in terms of what needs to be done. For instance, in our example of producing a workbook as one of our objectives, the scope would be what is to be included in the workbook. This would then provide a useful basis for planning the breakdown of work.

The Constraints

Constraints are issues that you know will definitely impact on your project. For example, a team member undertaking study leave is a constraint as is the budget.

The Risks to the Project

Project risks are normally defined as the probability of a loss through the occurrence of an undesired event. Put another way, a risk is a constraint that might happen.

Risks need to be identified and the likelihood of the occurrence and the severity of the impact on the project analysed. We can divide risk into two types - project risk and strategic risk.

- **Project risk** is risk that is associated with the actual project. For example, a change in availability of people and materials. At some Universities the likelihood of industrial action by academic staff would be considered a risk. An identified risk requires an appropriate strategy.

- **Strategic Risk** is a risk associated with reputation and the impact of other products. For example, a new unit offered in one Faculty may draw students from a unit in another. This impacts on the University as a whole rather than the particular project.

NB: Project risk will be explored in greater detail later.

A Broad Breakdown of Work

The breakdown of work into tasks is often called the Organisational Breakdown Structure (OBS) or the Work Breakdown Structure (WBS). In this workbook we will refer to the WBS as it is more commonly used. WBS is helpful when using software packages such as MS-Project.

The Nature of Defining your Project

The project definition process enables you to clarify the outcome of the project and therefore makes it easier for you to plan and conduct. After you have worked through the definition process you must be in a position to be able to answer the question – do I have a project? Project definition though, should not be a one off event – it may require you to revisit the definition a number of times. Also, the earlier you can get the project team involved in the definition process the better. The project definition may require you to interview stakeholders, conduct a brainstorming session with your team or negotiate with the accounts department. The more people you involve and effort you put in at this early stage, the better will be your ultimate result.

The Project Definition Form

To assist you with defining your project, we have designed a Project Definition planning form.

Exercise Three

At the end of the manual there is a blank project definition planning form. Your mission is to either define the exercise project that we looked at in Section Two or alternatively, you may wish to define a project that you have been involved in. Once you have completed the form, compare your project definition with the completed example on the following pages.

On the following pages are a project definition form and a completed example.

Project Definition

Project Name:

Faculty/School/Project ID:

Where applicable

Projection Description, Rationale and Scope:

Description – an outline or explanation of the tasks, outcomes and deliverables associated with the project

Rationale – Reason or justification for the project

Scope – Statement which draws boundaries around the project

Project Stakeholders:

Name	**Project Role**	**Contact details**

A list of the people with a vested interest in the outcomes of the project

Project Team:

Name	**Project Role**	**Contact details**

A list of the people who will be working on the project

The first name listed should be the person responsible for the project ie the Project Manager

Project Objectives:

List the project outcomes

Project Deliverables:

How will you know when the project is completed?

Project Constraints:

Constraint	**Strategy**
Definite, identifiable obstacles that will impede the progress of the project	

Project Risks:

Risk	**Strategy**
Factors that *might* impact on the progress of the project	

Broad Work Breakdown (WBS):

WBS	**Task Name**	**Duration**

A broad list of tasks that must be done to complete the project

Dependent Projects:

List any projects which will affect the outcomes or deliverables of this project

Resources Available:

List the resources which have been allocated to the project – people, money, equipment etc

Budget Issues:

Monetary factors which may affect the funding for the project

Further Detail/Action:

Any other factors which may affect the project

Project Start_____ Project End_____

Project Definition

Project Name:

Development of a distance education teaching materials for Unit ABC000

Faculty/School/Project ID: Example

UNE A- 01 - 000

Projection Description, Rationale and Scope:

The project will involve the creation of a new academic skills module which is to be delivered by distance education using print based/on-line material, CDROM and website. The package will be jointly sponsored by the Arts, Science and Education faculties and will be developed by a team of representatives from each faculty.

First year students enrolling at the university do not have basic academic skills such a note taking, research, referencing, essay writing, sitting for examinations etc. The university does not currently have a unit on this subject yet students remark in their evaluations that there is a requirement for such a course.

The new academic skills unit will be used by first year students enrolled in the Faculties of Arts, Science and Education and should address all the skills identified as deficient in first year students. The unit is to be a 100 level unit and to include CD ROM, readings, activities. It is to be delivered in first semester next year.

Project Stakeholders:

Name	Project Role	Contact details
Prof Smith	Sponsor	67 730 XXX
Prof Jones	Sponsor	67 730 XXX

Project Team **(first name listed is person responsible for the project):**

Name	Project Role	Contact details
Dr Harris	Project manager	67 730 XXX
Mary House	Instructional Designer	67 730 XXX
Tim Jenkins	Graphic Designer	67 730 XXX
Dr Garden	Author	67 730 XXX
Dr Barker	Author	67 730 XXX
Dr House	Author	67 730 XXX

Project Objectives: **(the project outcomes)**

Enhance the quality of academic skills in the Faculties of Arts, Science and Education.

Project Deliverables: **(how you will know when the project is completed)**

Produce a first year academic skills unit in Print, CD ROM, and Internet form

Project Constraints: **(definite obstacles that will impede progress)**

Constraint	**Strategy**
Workload of staff	Set deadlines, Back up staff
Leave	Identify replacement staff

Project Risks: **(factors that might impact on project progress)**

Risk	**Strategy**
Overtime	Set deadlines, regular update meetings
Printing press breakdown	Identify alternate means of printing
Errors in product	Allow sufficient review time
Copyrighted material not cleared	Allow sufficient time
Styles inconsistent	Set styles initially

Broad Work Breakdown (WBS): (a broad list of tasks that are needed to be done to complete the project).

WBS	Task Name	Duration	Predecessor
1	Develop outline	5 days	Nil
2	Identify reading material	5 days	1
3	Design CD ROM	20 days	1
4	Graphic design	2 days	3
5	Trial materials	2 days	3, 4
6	Review materials	3 days	5
7	Desk Top Publishing	5 days	6

Dependent Projects:

Nil

Resources Available:

Dr Harris	Project manager	67 730 XXX
Mary House	Instructional Designer	67 730 XXX
Tim Jenkins	Graphic Designer	67 730 XXX
Dr Garden	Author	67 730 XXX
Dr Barker	Author	67 730 XXX
Dr House	Author	67 730 XXX

Budget Issues:

Printing, DTP and graphic design should be done internally

Further Detail/Action:

Nil

Project Start_____ Project End_____

3.4 Risk and Uncertainty in Project Management

Overview

Many of the concepts in the project definition phase are reasonably self-explanatory. However, one that is worth spending more time on is the notion of risk. Project risk has been previously defined as the probability of a loss through the occurrence of an undesired event.

All projects offer the promise of success and the risk of failure. We should not avoid risk, rather understand and manage it. An accurate risk assessment early in a project can eliminate problems before they occur. It has been our experience that whilst risk is a fundamental project planning tool it is often ignored in teaching and learning projects. Yet risk identification, quantification and control are fundamental to project success.

Risk of the Project

As discussed earlier in this section, risks need to be identified and the likelihood of the occurrence and the severity of the impact on the project analysed. We can divide risk into two types - project risk and strategic risk.

- **Project risk** is risk that is associated with the actual project. For example a change in availability of people and materials. At some Universities the likelihood of industrial action by academic staff would be considered a risk. An identified risk requires an appropriate strategy.
- **Strategic Risk** is a risk associated with reputation and the impact of other products. For example, a new unit offered in one Faculty may draw students from a unit in another. This impacts on the University as a whole rather than the particular project.

Risk Identification

It is important to determine which risks are likely to affect the project. The risks should be divided into project risk and strategic risk (as mentioned above). Once identified, they will then need to be quantified along with probability of occurrence and potential impact.

Remember that risk identification is about management rather than avoidance. During the project definition phase the project team members need to produce a risk management analysis (RMA). This will conclude with a list of risks and appropriate strategies. These strategies should be transcribed onto the project definition planning sheet.

Risk Management Analysis (RMA)

In teaching and learning projects RMA can be a straightforward process as the range of risks that impact on teaching and learning projects are relatively clear-cut. Consider the example on the next page. A number of risks have been identified (normally this is done during the brainstorming process). The risks are graded 1 to 5 where 1 is low and 5 is extremely likely. The potential impact of the risk is then listed. Finally, an appropriate strategy is identified. The identified strategy (listing who is responsible) is then transcribed to the project definition form. Risk analysis is an ongoing process. At each milestone it will need updating as the threats to your project change over time.

On the following pages we have included a RMA and a completed example.

Risk Management Analysis

Project Name

Brief statement of the outcome of the project

Project Manager

Name and contact details of Project Manager

Date_____

Part A Project Risk

Factor	Likelihood	Impact	Strategy

Factor – events associated with the actual project which are likely to affect the project

Likelihood – scale of 1 to 5 where 1 is not likely and 5 is extremely likely

Impact - scale of 1 to 5 where 1 is little or no effect and 5 is a large effect

Strategy – actions which can be taken in the event the risk eventuates

Part B Strategic Risk

Factor	Likelihood	Impact	Strategy

Factor – events associated with the actual project which are likely to affect the project

Likelihood – scale of 1 to 5 where 1 is not likely and 5 is extremely likely

Impact - scale of 1 to 5 where 1 is little or no effect and 5 is a large effect

Strategy – actions which can be taken in the event the risk eventuates

Part C Summary of Key Risks

List risks which are highly likely to occur ie 5/5, 5/4, 4/5

Risk Management Analysis

Project Name

Development of a distance education teaching materials for Unit ABC000

Project Manager

Dr Harris	Project manager	67 730 XXX

Date ?/??/??

Example

Part A Project Risk

Factor	Likelihood	Impact	Strategy
Overtime	3	5	Set deadlines, regular update meetings
Breakdown	1	5	Identify alternate means of printing
Errors	3	5	Allow sufficient review time
Copyright	2	4	Allow sufficient time
Styles	2	4	Set styles initially

Part B Strategic Risk

Factor	Likelihood	Impact	Strategy
Negative Impact on other units	2	4	Monitor

Part C Summary of Key Risks

Overtime	Set deadlines, regular update meetings
Breakdown	Identify alternate means of printing
Errors	Allow sufficient review time

3.5 Practical Conduct of the Project Definition

Before leaving the project definition phase it is worth looking at the best way that it should be conducted. The project definition process is an extremely useful tool, to not only to clarify the project outcome, but also to gain commitment from all project team members.

One of the fundamental issues when dealing with projects of any kind is that project team members have a clear understanding of their involvement. Everyone needs to be clear on their roles and responsibilities within the project team. In our experience at UNE, one of the main causes of problems and frictions within the team was the lack of role clarity. The earlier roles are defined within the team the better.

The people side of project management will be dealt with in detail Section Six. However, the more people who can be involved during the initial stage, the better. We will make an assumption at this stage that you have a grant of some description or you have decided to develop a new unit. Your first step is to get the project team members together as soon as possible. Working through the project definition is a great way to develop team work and enhance team commitment. Ensure all team members are clear on their roles. For instance, you may have an inner and outer team. The inner team consists of the core group on the project. The outer group just joins in for specific issues, such as to provide expert advise. In the example mentioned earlier in Section B, regarding the development of a new research unit allocated by using the 'last person standing in the tea room' methodology. This project made a number of fatal errors. One of the most fundamental, was failing to get commitment from the team. The project team were unclear of individual roles (interestingly the allocated project manager did not see himself as the project manager) consequently meetings broke down. In this example, they stopped the project, went back to the stakeholders and recommended that the project go back to the project definition process six months after the project was originally started!

A common reason for projects to fail is that the project team do not clarify the outcomes of the project. The process, at an intellectual level, is very simple but it is seldom done effectively. Projects which run the greatest risk of going 'off the rails' are those for which the objective and outcomes are not clearly defined.

The purpose of the definition phase is also to identify the risks (factors to which the project could be exposed) and the constraints (definite obstacles that will impede progress). An example of this was a project manager who went on sabbatical midway during a project. There is nothing wrong with going on sabbatical. It was not considered during the project definition and planning phase, nor were the effects, real or potential, identified and nor were the required measures to address these specified.

Diagram 3.5.1: UNE Project team working through their project definition.

3.6 Module Summary

- Effective project definition is vital to solid project planning and consequent project success.
- Involve the project team in the definition process.
- Define succinctly and iteratively
  - Clarify roles
  - Determine objects
  - Define the deliverables
  - List constraints
  - Conduct a risk management analysis (RMA)
  - Conduct a broad breakdown of work to be done
- Ask the question – do I have a project?

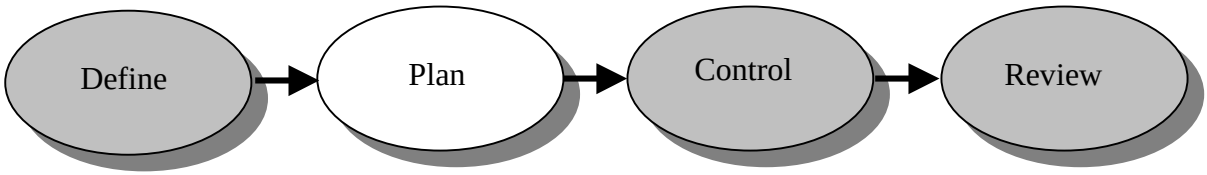
Section Four
Learning Module C:
Planning For Project Success

4.1 Module C: Objectives

At the conclusion of this module you will be able to:

- Explain the process of planning.
- Produce an effective plan to achieve project success.

4.2 Content of Module



This module introduces you to the second phase of the Project Management Cycle, the **Plan**. You will learn about the processes involved in planning a project including, developing a detailed Work Breakdown Structure (WBS), scheduling, allocation, communications, resource loading, costing and documenting. Participants will also learn how to schedule out a project using the Critical Path Method (CPM). This will involve task identification, predecessor relationships, identification of the critical path and resource allocation. The planning process will be demonstrated using a generic project.

4.3 Planning the Project

A project plan is the mechanism that allows you to convert the outcomes that you want in a project to concrete reality. The project plan goes beyond the project definition to provide you with the specific actions that are required, the timeframe in which the actions need to occur, who will do them, how much they will cost, what is needed to complete them and to what level of quality. **The definition provides the overview of the project; the planning provides the specific details that allow us to get the job done**. In larger projects it is normal to require approval before proceeding to detailed planning. If this is not the case, after the project has been defined, you should be clear that you have a viable project. If you are not clear on your outcome, it is unlikely that you will be able to plan it in detail.

The project plan is represented in a number of ways. If you think about it carefully, the plan needs to represent your progress. In its simplest form, this is usually presented as a Gantt chart (or bar chart). A Gantt chart represents tasks over time; it consists of a horizontal time scale, a vertical list of activities, and a horizontal line or bar for each activity (See the example Diagram 4.3.1).

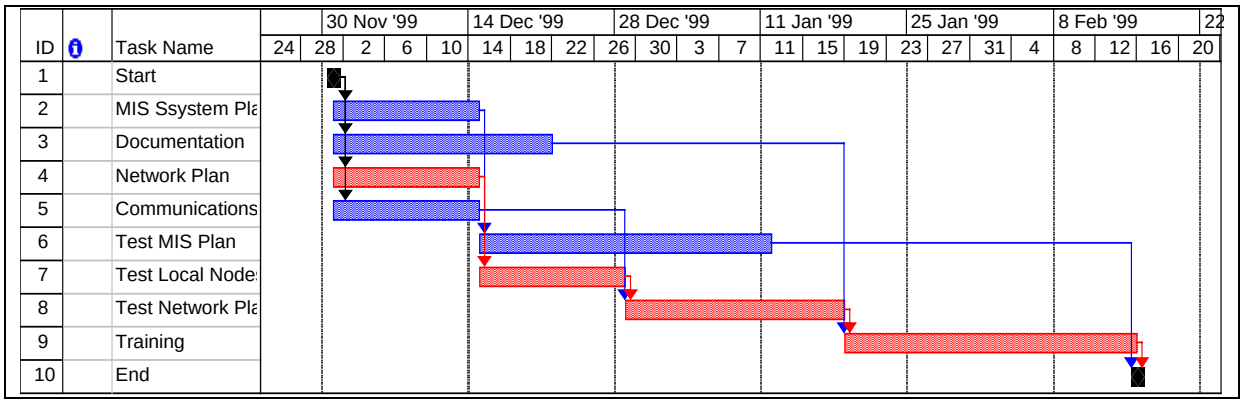


Diagram 4.3.1: A Typical Gantt chart.

The typical Gantt chart diagram illustrated above provides a clear and unambiguous pictorial representation of the project plan.

Another way of representing the project plan is a Program Evaluation Review Technique (PERT) chart or network diagram. This type of representation became popular in the late 1950s concurrent with the growth in complex projects such as the US Navy's Polaris Missile Submarine program. They provide a good indication of the flow of the project (see Diagram 4.3.2).

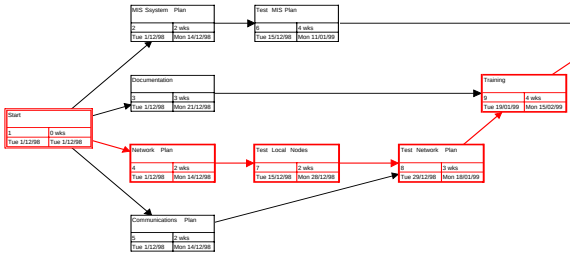


Diagram 4.3.2: A Typical PERT chart.

The two representations discussed above (the Gantt chart and the PERT chart) provide the simplest form of a project plan. There is obviously a lot more involved including breaking down resources and costs as well as effective documentation. All this information together is your project management information system. That is, the information you need to be able to effectively conduct your project.

We encourage the use of specialised project management computer software which allows you to represent all aspects of a project plan. The one used at UNE in 2000 was MS-Project. In our experience, MS-Project is an appropriate package to use for teaching and learning projects.

Together all this information is your project management information system. This is the information you need to be able to effectively conduct your project.

4.4 Developing a Project Schedule

In the project definition stage we broke down the work that needs to be done into a broad breakdown of work which we called the work breakdown structure or WBS. Now in the detailed planning process we need to look at it in more detail. Firstly, a detailed WBS is required before we can produce a meaningful schedule. Once the entire schedule has been completed then we are in a position to allocate resources, develop an effective communication plan and produce an appropriate recording system.

The steps required to produce a project schedule are:

- **produce a detailed work breakdown;**
- **schedule the project using the critical path method (CPM); and**
- **allocate resources and costs.**

Step One: The detailed work breakdown

As with all aspects of project planning, the detailed WBS is best achieved through using all project team members. We recommend a team brainstorming session to identify the particular tasks that are required. It should be noted that the brainstorming activity is a good team building exercise because it brings people together as well as gaining commitment from the entire team of what is to be achieved. The team are more likely to have ownership of the project if they have had a role in its production.

The project is broken down into 'bite-sized' chunks such that the big picture is decomposed into smaller and smaller segments. The broad tasks have generally been identified during the project definition phase. These broad tasks are written separately on 'post it' notes. These are then broken down into smaller sub-tasks and written on different coloured 'post it' notes. Depending on the complexity of the project, the sub tasks may then be broken even down further.

Successful Brainstorming involves:

- Ensuring all the project team are familiar with the project definition before the planning brainstorming session.
- Considering the use of an external facilitator to conduct the brainstorming.
- Ensuring an appropriate and accurate recording system (for example, a computer with project management software is ideal to create the WBS).
- Discussing the duration, resources etc, for each element.
- Using the six rules of brainstorming (listed in Section 7 Planning sheets and forms).

Diagram 4.4.1: A project team brainstorming using 'post-it' notes to create a suitable WBS.

Once the tasks have been identified then you need to determine four aspects of each task:

- the objective and/or deliverable of that task;
- the dependency relationship;
- the duration of the task;
- the resources required for that task.

You should note the following when determining these four aspects:

1. The objective and deliverable is best agreed upon during the brainstorming session by the project team members.
2. The dependency relationship is important. The easiest way is to work out what has to come before that task - this is its predecessor.
3. The duration of the task is often the most difficult to work out. This requires a realistic estimation of the duration. This will be dealt with in greater detail below. The key here is to avoid 'blue skying' (that is, unrealistic estimations of duration).
4. The finalisation of resources is best left until after the schedule has been determined (this is called the critical path method (CPM)). However, it is important at this early stage to identify who will be doing what. Particularly, as this will assist in your accurate estimation of task durations.

Once these tasks have been identified then a suitable WBS can be developed. In the example illustrated below, a simple university research project has been identified. Note that each element of the WBS structure is numbered. This is called a WBS code.

Next, you would break each of these elements into sub-elements so that the list becomes a hierarchical structure as shown below. Consider the example below. Note also, the columns for predecessors (PRD) and durations. **A simple WBS planning sheet is provided in Section Seven.**

A Simple University Research Project

WBS	Phases/Tasks	Deliverables	PRD
1	**Initial Research Clarification**		
1.1	Interview key stakeholders	Broad summary of interviews	Start
1.2	Undertake initial literature review	Written review available	Start
1.3	Produce research outline	Detailed research proposal	1.1,1.2
1.4	Proposal acceptance	Signed approval of acceptance	1.3
2	**Detailed Research**		
2.1	Detailed review of literature	Draft literature review	1.4
2.2	Conduct of qualitative research	Production of research summary	1.4
2.3	Summary of data	Summary of data brief prepared	2.2,2.1
2.4	Brief agreed to be research team	Team sign brief	2.3

WBS	Phases/Tasks	Deliverables	PRD
3	**Draft Production**		
3.1	Preparation of manuscript Ver1	Manuscript prepared	2.4
3.2	Revision of manuscript	Revised manuscript produced	3.1
3.3	Preparation of Manuscript Ver2	Manuscript prepared	3.2
3.4	Team edits document	Signed copies from team	3.3,3.2
3.5	Deliver to key stakeholder	Stakeholder copy	3.4
3.6	Final approval	Stakeholder signature	3.5
4	**Final Production**		
4.1	Produce printer proofs	Commercial printer copy	3.6
4.2	Final modifications	Final copy	4.1
4.3	Commercial Printing	Three printed copies	4.2
4.4	Delivery to Stakeholder	Signature of acceptance	4.3

The above example is obviously simplistic. It is designed to highlight the principles of a WBS. Note the identification of deliverables and dependencies. Note also in the first phase, that two tasks (1.1 &1.2) can be undertaken concurrently and the others tasks are linear. Throughout the project some tasks have multiple predecessors and others do not. The final phase is totally linear. There is a rich diversity to how the task allocation falls out. Many project plans are often produced lineally when there is no need.

The next step is to agree on the duration of each task. You are then in a position to be able to establish a schedule. The ultimate project completion time will depend on the interrelationship of tasks. The accurate estimation of task durations is dealt with in greater detail in **Part 4.5.**

The use of a WBS allows you to focus on specific areas of the work and to identify the tasks associated with each. You can use a top-down method of planning, that is, commence with the big picture and then break the broad tasks into sub-tasks and even sub-sub tasks.

Step Two: Schedule the project using the critical path method (CPM)

Now that we have a breakdown of work to be done it is time to schedule out the project. As already discussed the project schedule is usually depicted as a Gantt chart. From the Gantt chart, it is possible to identify when tasks should start and finish. It is a very simple mechanisms for illustrating a timeline. Creating a Gantt chart involves determining the tasks, the predecessor relationships, the critical path and then allocating people to those tasks. The most effective way to work it out is using the critical path method.

If a project that you undertake is very small, say less than ten tasks, or linear (i.e. sequential tasks) then it is a relatively easy to simply plot a Gantt chart on paper. However, for anything more complicated using the CPM is very useful. We recommend this be achieved through using specialised project management software. We use and therefore recommend MS-Project as it is available for both the Macintosh and the PC. Scheduling is much easier to do on a computer using project management software. **We strongly recommended that you use project management planning software.**

There are a number of tools and techniques to produce a schedule. One of the most useful is the Critical Path Method (CPM). The PMBOK defines CPM as:

> A network analysis technique used to predict project duration by analysing which sequence of activities (which path) has the least amount of scheduling flexibility (the least amount of float). Early dates are calculated by means of a forward pass using a specified start date. Late dates are calculated by means of a backward pass starting from a specified completion date (usually the forward pass's calculated project early finish date).
>
> (The Project Management Institute (PMI) p.162)

The concept of the critical path is useful to understand but difficult to explain. We have found no better an explanation of the CPM than that produced by Numerix Pty Limited. Numerix is a specialist project management consulting organisation that we recommend to Universities. They also provide MS-Project training.

If you would like to understand the CPM complete the exercise below then read through the explanation provided by Numerix on the following pages.

Exercise Four

Food for Thought – The Problem

Suppose you are planning dinner for two. Your menu consists of a very special soup and a baked chicken main course. The soup must be boiled for 35 minutes and you should allow 15 minutes to serve and consume it. The chicken dish requires a fair amount of preparation: You have to boil rice (for 30 minutes), lightly fry the chicken (for 15 minutes), and then bake the chicken and rice for 15 minutes. It takes 5 minutes to prepare a sauce and 15 minutes to boil peas. You have a fine red wine. Allow 5 minutes to uncork it and then let it stand for 30 minutes before serving. Allow 25 minutes to serve and eat the main meal and wine.

You have unlimited staff at your disposal. The utensils you have available are two boiling pots, a frying pan, saucepan and cork-screw.

Question 1. How quickly can you prepare and consume the entire dinner if there were no resource constraints?

Question 2. Which tasks should not be delayed if the project is to be completed on time?

Question 3. What are the other considerations?

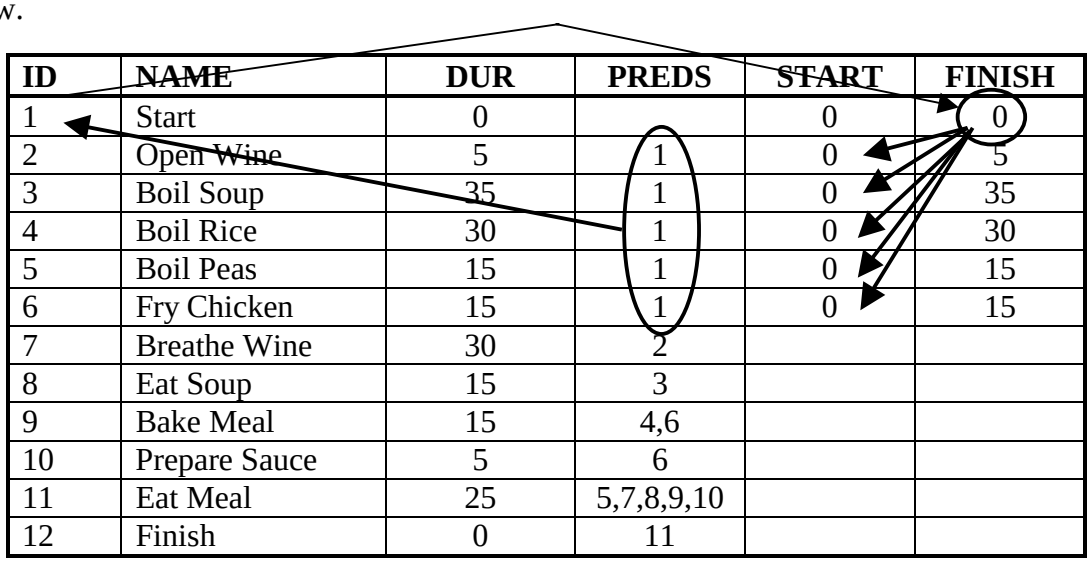
To schedule this project, we need to find the start and finish times for each task. A useful approach is to determine the earliest possible start and finish times (subject, of course, to predecessors). These may not represent the best possible times since there may well be reasons for delaying some of the tasks. Also, the early schedule may not satisfy some of our resource constraints. However, the earliest times provide a platform from which refinements can easily be made.

In the table below, we will develop the schedule, ignoring for the moment considerations other than durations and predecessors.

ID	NAME	DUR	PREDS	START	FINISH
1	Start	0			
2	Open Wine	5	1		
3	Boil Soup	35	1		
4	Boil Rice	30	1		
5	Boil Peas	15	1		
6	Fry Chicken	15	1		
7	Breathe Wine	30	2		
8	Eat Soup	15	3		
9	Bake Meal	15	4,6		
10	Prepare Sauce	5	6		
11	Eat Meal	25	5,7,8,9,10		
12	Finish	0	11		

This simple rule is sufficient to produce the required schedule. We need to set a base starting time, which is usually zero. This zero point can be mapped onto any real-time point in the calendar. The starting milestone is therefore set to zero.

The method is worked through in the context of our "unit notes" problem in the tables that follow.



ID	NAME	DUR	PREDS	START	FINISH
1	Start	0		0	0
2	Open Wine	5	1	0	5
3	Boil Soup	35	1	0	35
4	Boil Rice	30	1	0	30
5	Boil Peas	15	1	0	15
6	Fry Chicken	15	1	0	15
7	Breathe Wine	30	2		
8	Eat Soup	15	3		
9	Bake Meal	15	4,6		
10	Prepare Sauce	5	6		
11	Eat Meal	25	5,7,8,9,10		
12	Finish	0	11		

Clearly, tasks 2 to 5 all have the same predecessor (the starting milestone) and therefore can all start at its completion (time zero). Add their durations to determine their finish times as shown in the table above.

Now task 7 cannot start until its predecessor (task 2) is complete. This will happen after five minutes. Since its duration is 30 minutes, the task will then end at 35 minutes at earliest. The rest of the table is filled out in the same way.

ID	NAME	DUR	PREDS	START	FINISH
1	Start	0		0	0
2	Open Wine	5	1	0	5
3	Boil Soup	35	1	0	35
4	Boil Rice	30	1	0	30
5	Boil Peas	15	1	0	15
6	Fry Chicken	15	1	0	15
7	Breathe Wine	30	2	5	35
8	Eat Soup	15	3	35	50
9	Bake Meal	15	4,6	30	45
10	Prepare Sauce	5	6	15	20
11	Eat Meal	25	5,7,8,9,10	50	75
12	Finish	0	11	75	75

The Case of Multiple Predecessors

The only other possible complications occur where more than one predecessor exists (see tasks 9 and 11). In these cases, the highest (that is, latest) of the earliest finishes of the predecessors must be used. In the case of task 9, the two predecessors are tasks 4 and 6, which finish after 30 and 45 minutes, respectively. Following the basic method box above, the 30-minute finish (task 4), known as the "driving predecessor" must therefore be used since it finishes last. Similarly, task 11 has five predecessors and the driving one (task 8) has the latest finish (50 minutes). The full earliest schedule is shown in the table.

The Critical Path

We have produced an "early start/early finish" schedule. From this we can predict that the entire product cannot be completed in less than 75 minutes. Consider Question Two in the exercise. We need to determine critical tasks.

Definition

A critical task is one which if delayed will cause the entire project to be delayed.

Which tasks in the list are critical? In order to answer this question most easily, it is best to show the schedule we have produced graphically, that is, by means of a Gantt chart. While our table above showing start and finish times is simple enough, the Gantt chart is the most popular and widely used method for representing project schedules.

Gantt Charts

In this diagram, a horizontal bar is drawn for each task, with a length proportional to its duration and placed in the correct time-frame. The Gantt chart for the schedule we have produced above is shown below. Note that the predecessors are shown as arrow links between tasks. This is an optional device, but quite useful unless the diagram becomes cluttered.

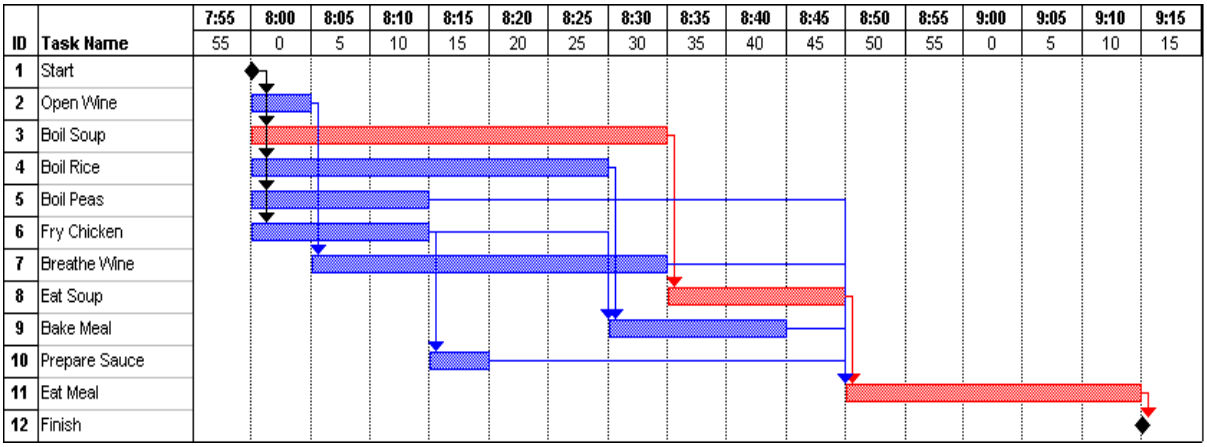


Diagram 4.4.2: "Food for Thought" Gantt chart.

To find the critical tasks, work from the last task in the timeline (that is, the one at the right most side of the Gantt chart). This task is critical by definition since any delay here would clearly delay the project, thus satisfying our definition. Therefore in our "unit notes" project, the "end" milestone (task 12) is critical.

Now any task that, when delayed, would cause the delay of a critical task, must itself be critical. Therefore it follows that the "eat meal" task (task 11) is also critical.

Continuing in this way, let us ask which task threatens "eat meal". This task has five predecessors, but only the driving one, that is, the one directly causing it to be placed where it is in time, is critical. The driving predecessor for "eat meal" is clearly "eat soup"(task 8), since all of the other predecessors finish earlier as can be seen by tracing back through the predecessor links that enter task 11 (eat Meal).

Working back up the schedule shows that the critical tasks are:

Event	Task	Duration
Start	Task 1	0
Boil Soup	Task 3	35
Eat Soup	Task 8	15
Eat Meal	Task 11	25
End	Task 12	0

These tasks form a path spanning the entire project. The length of the path is exactly 75 minutes, that is, the sum of their durations. Notice that milestones can be critical.

Total Float and Free Float

The remaining tasks are not critical, that is, they can each be delayed to some (different) degree before they too would have an impact on the 75-minute duration of the project. These latitudes, called total float or total slack, are the amount of time the tasks can be delayed before they too have global ramifications to the project.

Latest Start and Finish

Basic Method (Late Schedule)

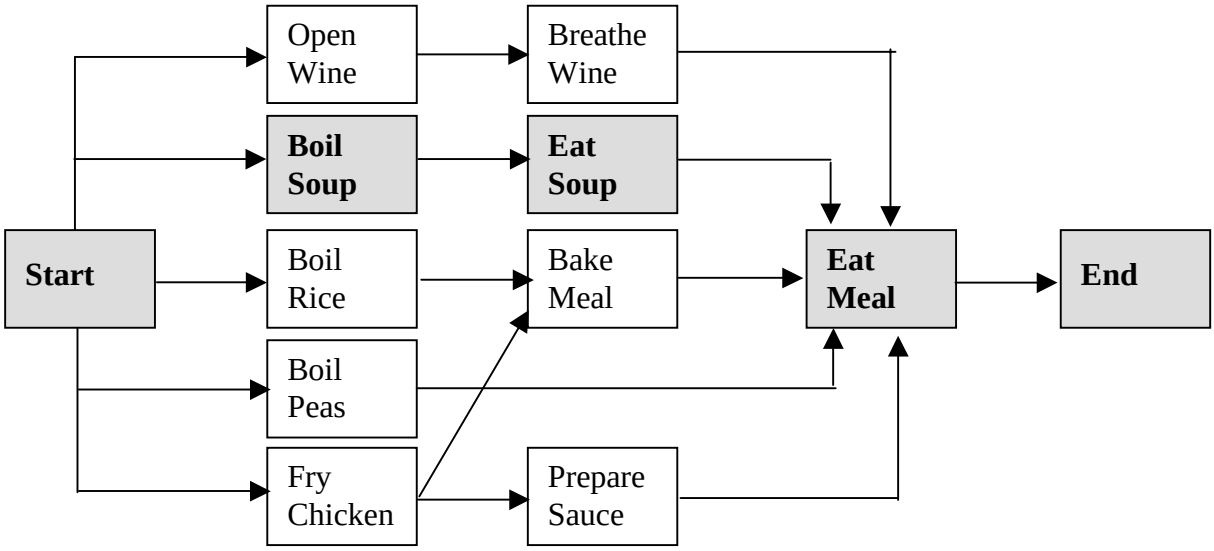
- The latest finish of each task is equal to the latest start of its successor (or the first of the last start times of its successors if there are more than one)
- The latest start time of each task is equal to the latest finish already found minus the duration

The total float is therefore the difference between the latest and earliest start for each task

The easiest way to find the float is use the Gantt chart and, starting with the latest tasks first, "slide" each task to the right as far as it will go without further delaying the new start of its first (earliest) successor. (Remember that this process might already have shifted successors.) This indicates that float is cumulative (hence the title "total float"), since a task may have its own float (the amount of time it can be delayed before if affects any other task – called "free float"), but also all of the free floats from its successors and their successors. The shifted positions of the non-critical tasks relate to their "latest" starts and finishes.

Since critical tasks cannot be moved at all – they are locked in position, trapped by the duration of the project they helped to define – they have no total nor free float. Thus the critical path method determines both extremes for the schedule. A Gantt chart, showing both earliest and latest start, is shown on the following page. The shaded bars show the "latest" schedule.

The late starts and finishes can also be worked out on the table, using a separate set of columns (late start and late finish), starting from the bottom of the tale and working upwards. For this, we would need a list of the successors, since latest finishes depends upon the latest starts of their successors. These are just the inverse of predecessors and can easily be identified. Alternatively, a PERT chart (see the next page) shows successors clearly.



Summary of the Method

- Find the earliest start for each task. For the very first task, this is just zero. For all others, it is the latest of the earliest finishes of all of its predecessors. Earliest finishes are found by adding durations to their earliest starts.
- Find the critical tasks. The latest finishing task in the list is always critical. Driving predecessors for critical tasks are themselves critical. Starting from the end, thread your way back through the Gantt chart, choosing the driving predecessor links to determine the critical tasks.
- "Shift" each task as late as it can go (subject only to the latest start of its successor. Starting from the latest finishing task in the list (the one which defines the project end), . Successors are easy to see on a Gantt chart showing predecessor links. The amount of shift available for each task is its total float. **Remember that critical tasks have no float**.

Why Identifying the Critical Tasks is Important

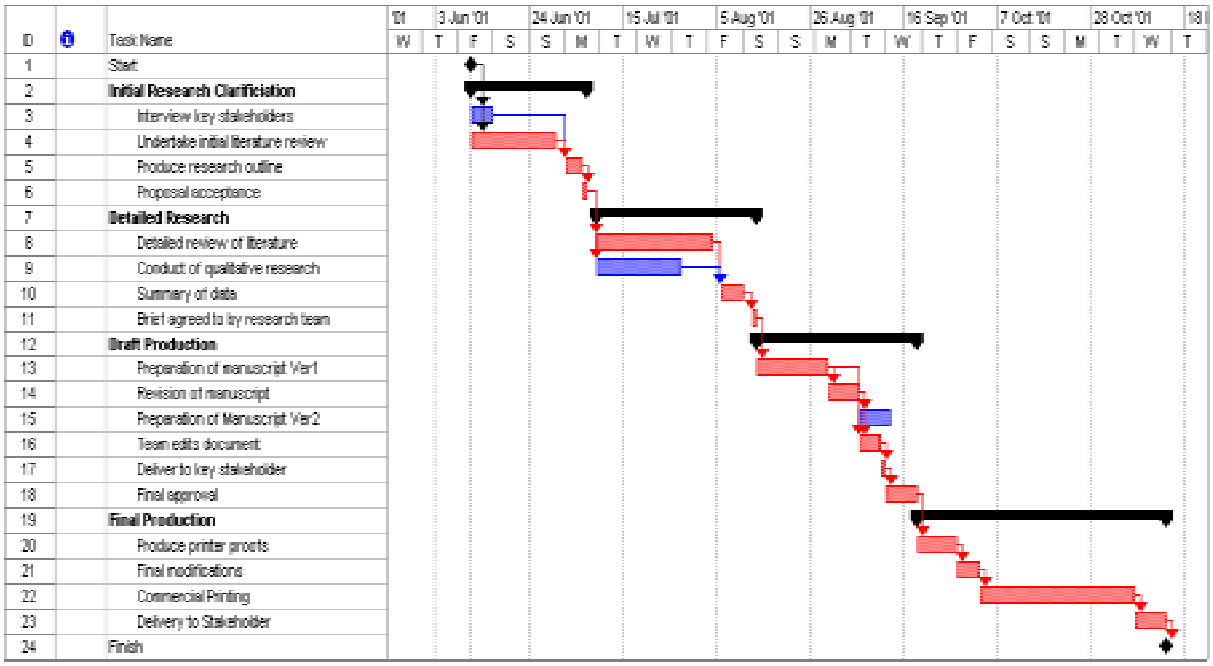
Since critical tasks dictate the project schedule, they indicate where the priorities lie for the project manager. Critical tasks should also receive priority when dealing with resource overloads. When a resource is assigned to more than one task occurring simultaneously, it is the non-criticals which should give way.

When estimating durations for tasks, accuracy is paramount on the critical tasks since any error made there immediately contributes to errors on the project duration. Errors made on non-critical tasks, provided they lie within the float available, do not have an impact on the project schedule. Thus, in cases where there is insufficient time to refine estimates on all tasks, the criticals again provide prioritization with regard to where to begin.

When a project has been scheduled, but the project manager is requested to shave further time off its duration, additional resources will be required. Since the critical path is the longest through the schedule (check the PERT chart above), it is these that must be shortened. However, be aware that, if the critical path is reduced by an amount less than the float available on another path, the tasks on that path become critical.

The *Food for Thought* example is a bit complicated which is why it is so much better to use software. With software you simply list the duration and predecessor relationship and the critical path is worked out for you. The above exercise is however useful for understanding the process.

A schedule for the *Simple University Research Project*, introduced previously, is represented below. We used MS-Project to work out the Gantt chart.



Step Three: Allocate resources and costs

The third step in project planning is to develop the detailed resource allocation schedule and subsequent costing associated with it. Many projects at University stop short of allocating resources and costs. While this is understandable in some instances, not using a full project management information system limits your capacity to make effective decisions.

As we mentioned earlier, resources include people, materials, machines, equipment, vehicles, and office space. In fact any asset that is required for the project can be considered a resource. The most common resource in teaching and learning projects is people. Resources incur a cost and therefore must be managed. You not only need to know when the resource is available but also how much they will cost.

This is best achieved through producing a resource and cost schedule. As we continually advise, we believe that project management software is a useful way to keep track of resources and costs. However, a simple spreadsheet in Microsoft EXCEL.

A resource schedule is nothing more than attaching resources to task dates. These can then be displayed in a table or as a histogram. Underneath this is the cost schedule, which to be of value, can be displayed in a number ways. These can include:

- costs over tasks;
- costs over resources; and
- costs over time.

Now let's consider our research project again. Firstly we need to manage the project team (resources). In the diagram below is a simple list of project resources (i.e team members).

ID	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Cc
1	Bill	Work		B		1	$28.00/hr	$0.00/hr	$0.00	Prorated	Standard	
2	Jenny	Work		J		1	$28.00/hr	$0.00/hr	$0.00	Prorated	Standard	
3	Susie	Work		S		1	$28.00/hr	$0.00/hr	$0.00	Prorated	Standard	
4	Project Manager	Work		P		1	$40.00/hr	$0.00/hr	$0.00	Prorated	Standard	
5	Printer	Work		P		1	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard	

You can see we have our project team members listed and we have even allocated a cost (hourly rate). Whilst we recognise many teaching and learning projects do not allocate costs for people unless they are a hired contractor, it is a good habit to get into.

Another useful display is the actual hours to be worked and money spent. In the table below we have listed the project team members (only Bill appears on this page) and the particular tasks they are involved with. The next column provides a summary of all money planned to be spent on Bill for that particular task. For example, Bill does $560.00 worth of work on *Interview Key Stakeholders* but none of it is done in the week displayed (which incidentally is the first week in September). On the right hand side we display the hours of work Bill is planned to undertake in a particular week. So, for that week in September, it is planned for Bill to spend eight hours per day on the revision of the manuscript at a cost of $224.00 per day. Note also that underneath the *Work* line is the *Actual Work* line. So when you are conducting the project you can compare the work you intended against the actual work that occurred.

ID	Resource Name	Cost	Details	M	T	W	T	F
1	Bill	$10,416.00	Work	8h	8h	8h	8h	8h
			Act. W					
			Cost	$224.00	$224.00	$224.00	$224.00	$224.00
	Interview key stakeholders	*$560.00*	Work					
			Act. W					
			Cost					
	Undertake initial literature review	*$1,680.00*	Work					
			Act. W					
			Cost					
	Produce research outline	*$448.00*	Work					
			Act. W					
			Cost					
	Detailed review of literature	*$2,240.00*	Work					
			Act. W					
			Cost					
	Brief agreed to by research team	*$112.00*	Work					
			Act. W					
			Cost					
	Preparation of manuscript Ver1	*$2,688.00*	Work					
			Act. W					
			Cost					
	Revision of manuscript	*$1,120.00*	Work	8h	8h	8h		
			Act. W					
			Cost	$224.00	$224.00	$224.00		
	Preparation of Manuscript Ver2	*$560.00*	Work				4h	4h
			Act. W					
			Cost				$112.00	$112.00
	Team edits document	*$336.00*	Work				4h	4h
			Act. W					
			Cost				$112.00	$112.00
	Final modifications	*$672.00*	Work					
			Act. W					
			Cost					

Your Project Management Information System

Remember, the first step is to breakdown the work (i.e. the WBS). Then using the critical path method produce a schedule and allocate resources and costs. The schedule combined with a clear table of what your people are doing and what it will cost you, is your project management information system. This system should have enough information to enable you to effectively manage your project.

Exercise Five

You may now wish to create a project management information system for a project which you are involved. To do this, you must collect a WBS, Gantt Chart, Resource Allocation and Resource Usage.

4.5 Accurate Estimation of Project and Task Duration

Before we move on to how we can tie all this information together and actually conduct the project we need to discuss how we actually determine how long (the duration) a task or project will take. Too often in project planning the duration of a project is a guess or it is based on when the project must be completed, rather than a logical estimate. Yet a logical estimate is always so much better than a simple guess. An entire plan can be rendered useless if it is estimated that a task will take two days and it ends up taking four weeks. The accurate estimation of task duration is critical to the project planning process. The more accurate that we can be in our estimation, the more useful and effective the project plan will be.

How do we know how long a task will take? What sort of system can we use to work out the duration of a particular task? When these questions are posed to workshop participants, they often come up with the following suggestions:

- Use the knowledge of others who have performed similar tasks or managed similar projects before. This may be your own experience or the experience of others.
- Base the estimate on a best and worse guess scenario.
- Conduct a rehearsal or trial (this is quite common in the case of software development).
- Look at the resources allocated to that task.
- Look at the risk associated with the task.

Rational Estimation

The suggestions above all make good sense. The technique we are proposing for determining the duration of a project task is termed Rational Estimation. Rational estimation is a method of estimating the time a task should take. Estimation of duration is a common source of error in the project management process. If the project manager, together with the project team, do not makes a serious attempt at identifying the times various tasks will take, controlling the project, its resources and its deliverables will be impossible.

There are six rules associated with rational estimation.

Rule 1	Nothing beats experience (either yours or someone else's).
Rule 2	Be realistic.
Rule 3	Estimate in terms of effort rather than duration.
Rule 4	Establish a benchmark to work out a final duration.
Rule 5	Look at the people involved in the project – experience, availability.
Rule 6	Use your common sense.

A Working Example

Now let's apply these rules to a workplace example. Let's say you have responsibility to produce a workbook for a unit in your faculty. Rule 1 says nothing beats experience; Rule 2 states that you need to be realistic and Rule 3 states that you need to estimate in terms of effort. So, let's begin by estimating that the job will take you 10 days of effort (remember effort equals resource by duration). Now that is how long it will take if you were to do it with no other commitments.

There is a big difference between effort and duration. Effort is the amount of work by resources. In other words, if there were five writers working on a workbook for two days, the duration of the project would be two days but the effort would be ten workdays.

A common problem in Universities is that the project manager estimates that they can complete the project in 10 days. However, this estimate is actually 10 days of effort and not 10 days of time. In our example above while you have been tasked with producing the manual, you have other responsibilities therefore cannot spend 10 days straight only on this task.

It is now necessary to look at the resource implications. Firstly, let's say for the sake of the exercise that you are too busy to work on the project so you decide to appoint someone else to produce the workbook. Your 10 days is now the benchmark effort. You may appoint someone who lacks your expertise and you need to add a loading of 50% to the original effort. So now you have an effort required of 15 days. Next, you need to take into account contingencies such as availability. Let's assume with availability it's now up to 30 days. Then risk, time of year and so on all contribute to a final estimate of effort of 45 days. This is a long way from the original estimate of ten days. It is far better to accurately estimate a task duration than guess and render your plan meaningless.

A Final Word on Estimation

Estimates should be made as objectively as possible and should be realistic. The people making the estimate should consider the task in isolation and try to determine how long it will take to complete it without considering any outside influences. It is often tempting to present a spectacular estimate when one feels that one's professional reputation is attached to it.

Once you have made your estimation, there are three other tricks to ensuring that your rational estimations continue to meet your needs.

1. **Document Your Estimates**. Always document your estimates and how you arrived at them. What factors did you take into consideration in making your estimate? What assumptions did you make? This will make it easier to revisit your estimate later on when the project changes and to revise your estimate as a result or to apply the estimates to similar projects later on.

2. **Refine Your Estimates**. Having made your initial estimates, it important that you continually review them. Things change regularly and new information becomes available which may affect the estimates you have already made. The project manager is responsible for refining and updating the estimates on a regular basis, until it is 100 per cent accurate – when the task has been completed!

3. **Track Your Estimates**. To help you improve your estimation skills, it is suggested that you graph your original estimate and any subsequent revised estimates against time. You should also include notes in relation to why the estimates were revised. This will allow you to track how well you are estimating and hopefully assist you in improving this skill.

It is important to note that a good estimate is not necessarily one that ends up being close to the actual result. Rather a good estimate is one which is refined a number of times and to such an extent that it quickly converges on the actual value. Therefore estimates must be reviewed and updated on a regular basis, in light of any new information which has arisen.

4.6 Module Summary

- The project plan converts the outcomes of what we want in a project to a concrete reality by providing us with the specific actions that are required, the timeframe in which the actions need to occur, who will do them, how much they will cost, what is needed to complete them and to what level of quality.

- The detailed work breakdown (WBS) forms the basis to develop a project schedule using the critical path method (CPM) and an allocation of resources and costs. This schedule can be represented as either a Gantt or Program Evaluation Review Technique (PERT) chart.

- The Gantt and PERT charts are ways of depicting the project plan in a clear and unambiguous pictorial representation.

- Never guess when it comes to estimating task duration. Be rational and realistic in your estimations.

- All the planning techniques outlined above can be undertaken by hand. However, we recommend the use of project management software to develop a more flexible and effective project plan.

- Ask the question – Do I have a detailed enough plan to maintain control of the project?

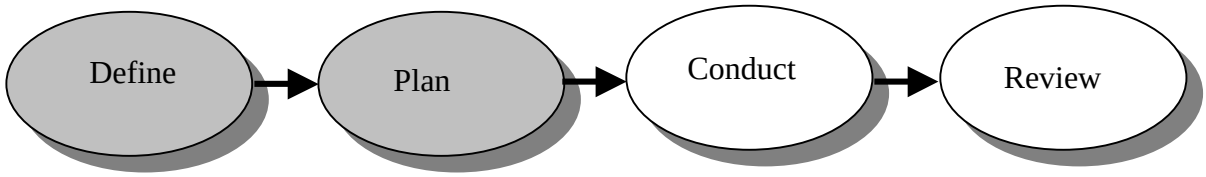
Section Five
Learning Module D:
Conducting and Reviewing the Project

5.1 Module D: Objectives

At the conclusion of this module you will be able to:

- implement a project plan;
- keep control of a project plan;
- effectively review a project.

5.2 Content of Module



This module concludes the project management life cycle. You will learn about the **Conduct** and **Review** phase. You will also explore the issues of project control and identify what should be included in a project review.

5.3 Overview

After all this project planning, we now have to actually do something! Conducting the project is normally the longest phase of the project management cycle. It follows on from a good project plan. The quality of the project plan is usually a good predictor of how your project will run. This does not mean that an effective, realistic plan guarantees smooth sailing. In fact it may be anything but that. What an effective project plan should mean is that the project manager has enough information at hand to be able to maintain control of the project in spite of the turbulence thrown up by the real world.

A classic story to illustrate this is the tale of the Apollo 11 space journey. During the entire journey to the moon, it has been said that Apollo 11 was only ever on track for 2% of the time. Does this mean that they were lost most of the time? Obviously not. The computer guidance systems were always in total control, making constant adjustments to ensure that Apollo 11 remained on course. So too in project management, you may not always be on track, BUT you should have enough information in front of you to make constant adjustments, enabling you to maintain control and keep on course.

Exercise Six

Consider the project plan for our *Simple University Research Project*. Let us assume you are comfortable with the quality of your plan. You are now ready to undertake the project. Before you start, there are a number of issues associated with control which you should consider. *You may wish to write down your thoughts on this before reading on. Please note that you should only spend about 5 to 10 minutes on this exercise.*

Question 1 What do you need to do throughout your project to ensure that you maintain control?

Question 2 How are you going to communicate?

Question 3 How will you know you are behind or ahead in project progress?

Question 4 How do you actually ensure you achieve what you say you will?

During workshops when participants have been asked this question, their responses have included:

- Conduct regular meetings of the project team.
- Establish milestones and deadlines so that the project manager can tell when the plan is not proceeding according to schedule.
- Update the progress of the project and the milestones on a regular basis.
- Acknowledge accomplishments within the project both formally and informally (social activities etc).
- Identify champions of the project who will sell the project and its outcomes.
- Establish a communications system – meetings, faxes, email etc.
- Use program management software.

All these ideas are valid. The key to success is to turn these ideas into a process. This process can be broken into three areas:

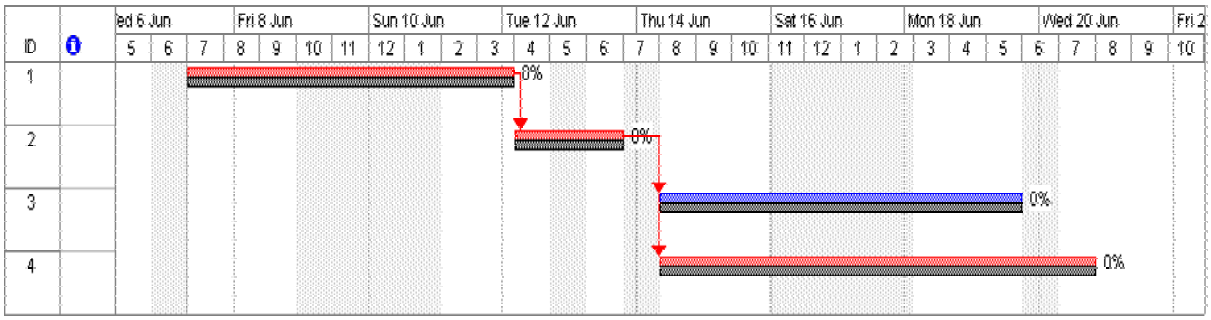
- **set-up**
- **monitor and**
- **control.**

5.4 Set-up

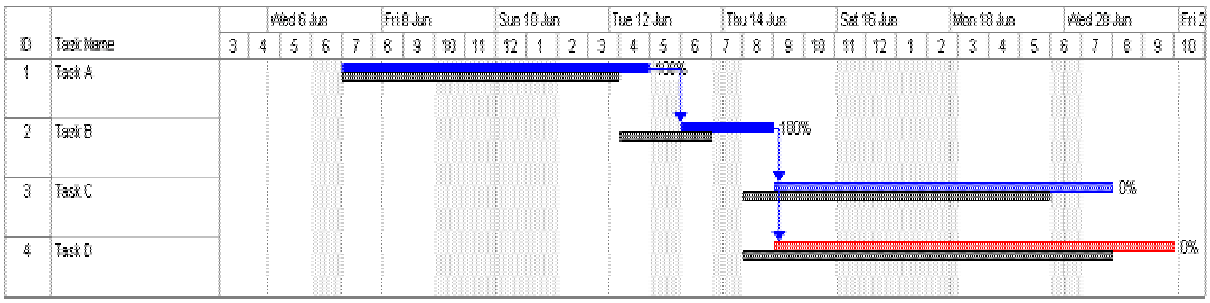
Once you have your plan in place you need to ensure that it is workable and has a chance of succeeding. You should establish a baseline, organise the project team infrastructure and set your team guidelines.

Baseline

The baseline (or baseline plan) is the initial approved plan to which deviations will be compared. A common use of the baseline plan is to display it on a Gantt chart, along with the current or expected schedule values. This provides a graphic representation of this comparison. If you use a software program like MS-Project, the baseline appears as a grey line on your Gantt chart as shown in the diagram below.



Note the simple project above the dark baseline underneath the Gantt chart. When there is a delay in a task as in diagram on the next page, the task may move but the baseline remains fixed.



Project Infrastructure

With your plan firmly established, the project infrastructure needs to be addressed. Project infrastructure includes practical considerations such as the physical location of the project team, cost account codes, passwords and establishment of a web page. It is the myriad of administrative details necessary to ensure effective and smooth conduct of the project.

Establishment of the Project Team

The final and most important consideration is the establishment of the team. The start of the implementation phase offers another opportunity to harness the benefits that accrue from good team building and bonding. It is not uncommon for teams to form around a project and then, as it nears its end, to dissolve and reform around new ones as they start up. It will be important for team members to get to know each other. Effective team briefings, meetings and communication plans are vital to project success. **We will address team issues in Section Six.**

5.5 Monitoring

Monitoring is sometimes referred to as monitoring and tracking. It is essentially asking questions about the progress of the project, the use of resources, the completion of tasks and subtasks etc and recording the information from these questions in your project management information system. Monitoring is about checking on the status of a project and recording information in such a way that decisions can be made from the information.

It does not matter how detailed or sophisticated your plan is, it is after all, just a statement of what you want to happen. As the project progresses, you may deviate from your original intentions. This interaction between what is planned and what actually happens and how you manage this, is what will ultimately determine the success of the project.

The progress is recorded as ‘actuals’; in other words the actual work that is being undertaken. It is normal to choose a standard reporting period, for example every second Friday. This reporting period is determined by the duration of the project, the number and frequency of milestones and the level of critical tasks. Thus for a short project of say three to six months, it may be weekly but for a longer project of a year of more, it may be monthly.

At each reporting period we want to know the following:

- Actual completion dates (when did people start and finish?)
- Actual effort (how many hours of work were expended?)
- Actual cost (how many dollars were expended?)
- Actual progress (how far along has the work advanced?)
- Problems (what unexpected problems or issues have arisen?)
- Projections (what is the current completion and expenditure forecast?)

The 'actuals' can be gathered in a number of ways. You may choose to have team members report progress on their particular tasks at team meetings. Alternatively, they may report to you directly (e.g. fortnightly email progress). MS-Project has an on-line facility that allows project managers to update their 'actuals' from the net.

Monitoring implies that the values are recorded and reviewed over a period of time. This is the only way that trends can be detected and problems headed off before they impair the progress of the project. Of course, in teaching and learning projects, the monitoring process can be quite simple. For instance you may just set a series of milestones and monitor how you progress towards them.

Remember, the key is for you to have enough information to be able to maintain control.

5.6 Control

Control means exactly that, CONTROL; you have enough information to make appropriate decisions. How you use the reports and information will affect the end results of your project. Here are some tips to help you maintain control.

- Use your project plan as the primary guide for co-ordinating your project.
- Monitor and update your plan regularly.
- Document progress and changes.
- Conduct efficient and effective meetings.
- Remember the only reason you have a project plan is so you can get out and **do the work. Never lose sight of the fact that the plan is designed to make life easier for you – not 'bog you down' in paperwork.**

Ultimately, it all comes down to the control stage. In other words, the decisions you make as you progress through your project are what determine your success. All we have done up to now is set you up with enough information to make the right decisions.

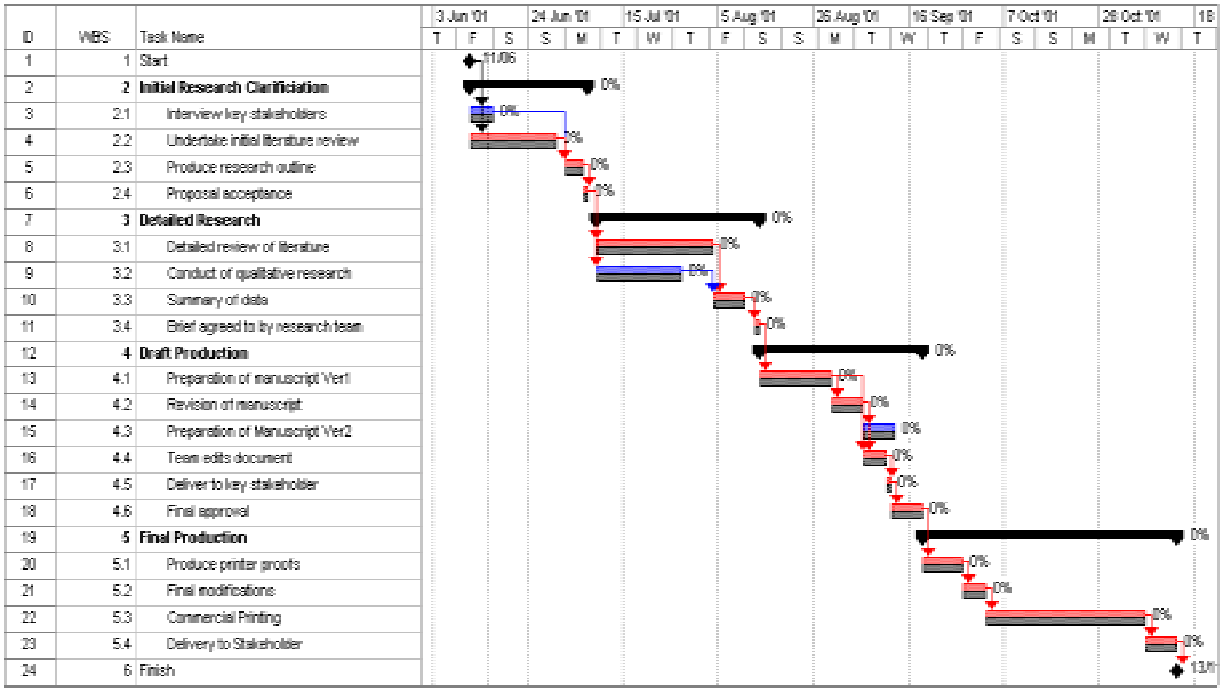
From a project planning perspective there are only a few things you can really do at any given time to maintain control.

- Extend the duration of a task.
- Add resources to a task (either current or future).
- Overlap tasks (revise or remove the predecessor link).
- Re-scope the project.
- Re-negotiate the end date with the owner.
- Increase resource productivity.
- Do nothing!

In the final section of this manual, we have included a number of case studies from the projects conducted at UNE. These will provide examples of the type of "control" decisions which are made by other project managers and the timings of these decisions. These will give you some insights into what decisions you may have to make and when it may be necessary for you to make them.

5.7 Your Project Management Information System

Below we have combined your Project Management Information System. Notice the Gantt chart with the baseline in dark and the actual Gantt bars with % complete.



ID	WBS	Task Name
1	1	Start
2	2	**Initial Research Clarification**
3	2.1	Interview key stakeholders
4	2.2	Undertake initial literature review
5	2.3	Produce research outline
6	2.4	Proposal acceptance
7	3	**Detailed Research**
8	3.1	Detailed review of literature
9	3.2	Conduct of qualitative research
10	3.3	Summary of data
11	3.4	Brief agreed to by research team
12	4	**Draft Production**
13	4.1	Preparation of manuscript Ver1
14	4.2	Revision of manuscript
15	4.3	Preparation of Manuscript Ver2
16	4.4	Team edits document
17	4.5	Deliver to key stakeholder
18	4.6	Final approval
19	5	**Final Production**
20	5.1	Produce printer proofs
21	5.2	Final modifications
22	5.3	Commercial Printing
23	5.4	Delivery to Stakeholder
24	6	Finish

Underneath is a list of available resources and their cost.

ID	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Cc
1	Bill	Work		B		1	$28.00/hr	$0.00/hr	$0.00	Prorated	Standard	
2	Jenny	Work		J		1	$28.00/hr	$0.00/hr	$0.00	Prorated	Standard	
3	Susie	Work		S		1	$28.00/hr	$0.00/hr	$0.00	Prorated	Standard	
4	Project Manager	Work		P		1	$40.00/hr	$0.00/hr	$0.00	Prorated	Standard	
5	Printer	Work		P		1	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard	

At a quick glance you can quickly see the entire project. Below is a snapshot of one week for one of the resources (Bill). It shows the baseline costs and planned work. As the project progresses "actuals" can be filled in and at any given time you can see the plan versus the actual time, workload and costs.

ID	Resource Name	Cost	Baseline Cost	Variance	Details	M	T	W	T	F
1	Bill	$10,416.00	$10,416.00	$0.00	Work	8h	8h	8h	8h	8h
					Act. W					
					Cost	$224.00	$224.00	$224.00	$224.00	$224.00
	Interview key stakeholders	*$560.00*	*$560.00*	*$0.00*	Work					
					Act. W					
					Cost					
	Undertake initial literature review	*$1,680.00*	*$1,680.00*	*$0.00*	Work					
					Act. W					
					Cost					
	Produce research outline	*$448.00*	*$448.00*	*$0.00*	Work					
					Act. W					
					Cost					
	Detailed review of literature	*$2,240.00*	*$2,240.00*	*$0.00*	Work					
					Act. W					
					Cost					
	Brief agreed to by research team	*$112.00*	*$112.00*	*$0.00*	Work					
					Act. W					
					Cost					
	Preparation of manuscript Ver1	*$2,688.00*	*$2,688.00*	*$0.00*	Work					
					Act. W					
					Cost					
	Revision of manuscript	*$1,120.00*	*$1,120.00*	*$0.00*	Work	8h	8h	8h		
					Act. W					
					Cost	$224.00	$224.00	$224.00		
	Preparation of Manuscript Ver2	*$560.00*	*$560.00*	*$0.00*	Work				4h	4h
					Act. W					
					Cost				$112.00	$112.00
	Team edits document	*$336.00*	*$336.00*	*$0.00*	Work				4h	4h
					Act. W					
					Cost				$112.00	$112.00
	Final modifications	*$672.00*	*$672.00*	*$0.00*	Work					
					Act. W					
					Cost					

The charts included in this section were created using project management software. If you do not have such software, you can create these charts manually and still use them for your project management information system. We have included a Resources Usage and Gantt Chart form in Section Seven.

5.8 Productive Meetings

It seems strange to be talking about something as simple as a meeting. However meetings are such an integral part of project management. Our experience has been that they are often not conducted well. Participants undertaking the 'Enhancing Project Management Program' often complained about wasteful project meetings.

Yet, a meeting is an amazingly simple process. If managed correctly, a meeting can be a useful project management tool. There are a few simple steps which can be taken to ensure that a meeting is effective. You should always determine who has to be at the meeting; there is no requirement to have all team members at all meetings. It is important that a project meeting has an agenda and that the meeting follows this agenda. The meeting has been called for a number of reasons and if the discussion "wanders", then some or all of the meeting objectives will not be achieved. (We have included two example meeting agendas in Section Seven for you to consider.) It is also important that minutes of a meeting are recorded and that these prescribe actions, where appropriate, to definite people to perform within defined times. There should also

be follow up action to ensure that the tasks are undertaken. We have included a list of hints for writing effective meeting minutes in Section Seven.

It is important that the project manager establishes the way he/she wants the meeting conducted. If you are definite and precise early on then it will be possible to relax further into the project. We probably all have experienced the frustration of poorly conducted and time wasteful meetings. For example:

- Attendees who arrive late
- Discussion which strays from the subject area
- Chairperson and/or attendees who are poorly prepared
- Questionable meeting effectiveness
- Poor listening skills
- Long duration
- Lack of participation

By following some simple rules, you can make sure you conduct efficient meetings.

- **Always plan your meetings and ALWAYS use an agenda.**
- **Always use a checklist (like the one provided by us!) for efficiency sake.**
- **Only invite people to a meeting who are totally essential to the planned outcome you desire.**

Remember that at meetings, people should be expected to give their full attention. It is up to the Chairperson to keep the conversation on track, precise and to the point.

DON'T LET YOUR MEETINGS TURN INTO TIME WASTERS.

It does not matter whether you are simply attending a meeting or organising one, always plan what you're going to do in the meeting, and most importantly, decide what YOU want to achieve from it. On the following pages we provide a simple meeting checklist and planner.

A MEETING CHECKLIST

BEFORE

CHAIRPERSON	ATTENDEES
• Determine Objectives • Determine Participants • Prepare Agenda • Organise Meeting Place • Do any preparation required	• Confirm Your Attendance • Decide what is required of you • Decide what you want from the meeting • Do any preparation required

DURING

CHAIRPERSON	ATTENDEES
• Be punctual • Stick to the Agenda • Retain Control • Ask questions • Keep the meeting brief • Summarise results	• Be punctual • Listen • Participate • Don't wander off the subject • Ask questions

AFTER

CHAIRPERSON	ATTENDEES
• Assess your performance • Follow up promptly on any items you are required to action • Ensure others do the same	• Assess your performance • Follow up promptly on any items you are required to action

MEETING CONDUCT SHEET

MEETING PURPOSE			
DATE:	START:	END:	LOCATION:
Attendees:			
Apologies:			

No	Time	AGENDA	ACTION		

Related Issues:

5.9 The Review Phase

The final phase of the project management cycle is the evaluation or review. The purpose of the review is to appraise your performance during the project. Ask yourself what you did well and what needed to be improved upon. Only through an evaluation of your project can you learn from the process and improve the management of your next project. As the old saying goes "those who cannot remember the past are condemned to repeat it" (G Santayana, A Life of Reason (1905-06)).

A review is rarely planned for in teaching and learning projects. **The key to ensure one is undertaken is to include it in the project plan with a budget**. Reviewing a project should be quite straightforward. If you are clever the majority of work is done prior to the project completing. This is where project management software is vitally important. The use of the notes function in MS-Project coupled with judicious and timely saving of files, ensures a thorough record of the project is available at the end for very little effort. Alternatively, a simple journal will achieve the same result.

A carefully constructed review can provide a template for an even more successful project in the future. The review should cover **technical** performance of the project, such as how software performed, information availability etc. It should also include the **project management** issues. These include questions about the validity of your initial project definition, the accuracy of your estimation process and the effectiveness of your decision-making. The project review can provide not only a template for your next project but also substantial information relevant to your final report.

The Project Report

The inevitable final report is your final history of the project. In this manual we do not intend to discuss final reports in any detail. This is because the actual template for a report is often prescribed for you. This will depend on the type of grant or project you are undertaking (e.g. DETYA provides a report template for projects that it funds. For your information, we have included the prescribed project report format for this project as an example in Section Seven).

There are just two points we wish to make with regards to project reports. Firstly, effective project management is more likely to result in a favourable and on time report. Secondly, if you keep good records during your project, then the report is essentially done.

5.10 Why Projects Succeed

Listed over the page are a few reasons why projects succeed. This list includes our personal experience and also includes a list of pointers from such important project management texts as 'The complete Idiots Guide to Project Management' (incidentally we thoroughly recommend the 'Idiots Guide' as a no nonsense reference for the aspiring project manager).

NB: These are not in any particular order.

1. **A realistic plan**
2. **Clarity of goals**
3. **Careful reporting and monitoring**
4. **Strong and conscientious leadership**
5. **Commitment from stakeholders**
6. **Commitment from team members**
7. **The right people in the right position**
8. **Effective and meaningful use of the project management process**
9. **Risk is recognised and managed**
10. **Team work is taken seriously**

At the end of the day project management provides a system that should free you to get on with your work.

5.11 Module Summary

- The quality of the project plan is a good predicator of how smoothly the project will run.
- The key to the successful conduct of a project is set up, monitoring and control.
  - Setting up involves establishing a baseline, creating the project infrastructure and establishing the project team.
  - Monitoring involves comparing what was planned with what actually happened
  - Control involves gathering enough information to make appropriate decisions
- For effective meetings you should always plan your meetings and ALWAYS use an agenda; always use a checklist for efficiency sake and only invite people to a meeting who are totally essential to the planned outcome you desire
- The purpose of the review phase is to appraise the process and performance and to improve the management of the next project
- Ask the questions:
  - Am I in control?
  - What can I learn?

Section Six
Learning Module E:
Enhancing the Project

6.1 Module E: Objectives

At the conclusion of this module you will be able to:

- develop a personal leadership plan;
- explain the theory behind team development;
- work through a number of case studies on project management.

6.2 Content of Module

This module looks at issues that are important in enhancing the success of projects. You will explore the importance of project leadership as well as the dynamics of project teams. The section concludes with some case studies of teaching and learning projects that were conducted at UNE.

6.3 Overview

There are a number of fundamental skills involved in project management that really cut across many aspects of what we do in our work life. These include the effective use of communications, promoting a team, conducting meeting, resolving conflict and so on. It is a sad indictment on workplace attitudes that these skills are often referred to as 'soft skills'. Yet the mastery of these so-called 'soft skills' often leads to hard results. This section is designed to discuss some of the issues that are important in ensuring that project teams work effectively.

As has already been stated, the 'Enhancing Project Management' program at UNE addressed many team issues through the action learning process. The common issues in teaching and learning projects that seemed to come up time and again at UNE were:

- dealing with conflict
- University politics
- time management
- communication problems
- the nature of influence and dealing with difficult people.

It is not our intention to provide a module covering these issues in detail as these skills are covered in many other forums. **The aim of this section is to provide an opportunity for you to think about the importance of these factors as they relate to your projects.**

6.4 The Project Manager and Leadership

The project manager (as was mentioned in Part 2.8 of Module A) has many responsibilities. This not only requires a thorough appreciation of the technical aspects of project management but also an understanding of leadership and team dynamics. Project Managers in many projects (if not all projects) must provide leadership. This notion of leadership extends beyond the 'visible' team and can include people who have only indirect or a marginal interest in the project as well as stakeholders such as department heads. All of these people have a vested interest in the project and may from time to time come under your influence in addition to the project team members.

We are not going to attempt a leadership course here, although we thoroughly recommend project leaders undertake some form of leadership training. The Paul Hersey Situational Leadership model (Hersey P., 1984) was used during the 'Enhancing Project Management' program to enhance the understanding of participant of leadership. What we want you to do here is to stop and think about how you would go about providing leadership in the academic environment.

In our workshops we asked a simple question of participants, namely "What is it that makes an effective project leader?" This often generated great debate amongst participants. More importantly, it forced people to think about the leadership issues that are important to them.

Exercise Seven

You are asked to pause for a minute and consider what you believe makes an effective leader in your work environment. Write you answers in the space below.

NB: This is a great exercise to do in a group

We could spend a considerable amount of time debating what makes an effective leader (in my leadership programs we often do!). The subject is worth a workshop in its own right. From our experience and research we [at least] attribute some or all the following factors with successful leaders:

- Vision
- Passion
- Integrity
- Curiosity
- effective communication skills
- pro-activity
- energy
- task competence
- confidence
- flexibility and
- assertiveness.

What a list! We are sure you can think of others. To make the list more useful we have distilled the above information into seven key responsibilities. From our experience in the conduct of teaching and learning projects we (humbly) offer the seven keys to successful project leadership.

Successful Project Leadership

Generate Meaningful Direction

A key function of leadership is to articulate the meaning and purpose of what the project is about. The successful project leader can clearly articulate this to the team. All individuals within the team understand and are working towards the same goal. Furthermore your project systems and structures support this alignment.

Generate Empowering Beliefs

Team members feel a sense of belief in themselves and the project. This comes from your technical competence in the your area of expertise, your communication skills and your willingness to let your team get on and do the job.

Make it Happen

Successful leaders have a capacity to get things done and follow through on required actions. They are action-oriented. Furthermore, they encourage this action-oriented approach in their team members through strong direction when required.

Energy

Leaders have to be energetic. However, maximising energy is more than running fast. Anyone can work sixteen-hour days. The world is full of people who have mortgaged their future health against current work. The key to energy is to spend your time **effectively** and enthuse others.

Flexibility and Openness to Learning

A project leader must be able to adapt to changing situations and circumstances.

Integrity

Stand by your principles. In a University environment this can be difficult to do at times. However, your strength of character will generate respect amongst team members.

Communicate Simply and Clearly

The quality of your communications will equal quality of your project. It's simple, it's obvious and most people take it for granted. Yet few people do it well. Successful leadership requires successful communications.

Like any 'what should be done lists', identifying what needs to be done is the easy part. Transforming theoretical words on a page to practical implementation is the true challenge.

Your Leadership Approach

How do you rate yourself in the above areas? Can you think of any to add? The key here is for you to take the time to think about the leadership you provide and work out what works best for your team.

Exercise Eight

To assist you with the process of identifying the gap between your existing leadership style and your desired style, we have provided a leadership strategy sheet. Simply work through the sheet below and answer the questions about your leadership approach. Hopefully by the end you will have clarified some of the behaviours that are necessary for you to be an effective leader.

Your Leadership Recipe

You

Question 1 What are your strengths as a leader?

Question 2 What are your leadership weaknesses?

Culture

Question 3 How does the culture at your organisation impact on you and your team?

Question 4 Describe the culture you desire in your project team

The General Work Environment

Question 5 What problems and what opportunity does your work environment provide? (For example, the fluid nature of academic work might provide you with an opportunity)

Team Members

Question 6 What are the strengths, weaknesses and opportunities associated with your team members? The team are your resources through which you influence, understand their needs and you will be able to provide effective leadership)

Communication Plan

Question 6 How can I ensure clear, open unambiguous team communications?

Leadership Plan

Question 7

What are <u>you</u> going to <u>do</u> to be a more effective leader? (For example, you may identify clarity of communication as an appropriate strategy and the behaviour associated with that strategy is regular, effective meetings. In other words the leadership strategy is the general concept and the behaviour is **what you must actually do.**)

<u>Leadership Strategy</u> **<u>Behaviour</u>**

6.5 The Nature of Project Teams

> "When spiders webs unite, they can tie up a lion."
>
> (Ethiopian proverb)

Project team leaders, to be effective, need to understand the nature of team building. In workshops we often hear comments such as 'teams are different at Universities', 'project teams are not really teams' and many other 'excuses' as to why we shouldn't focus on people issues. All these comments have some elements of truth in them which is why it is so important to focus on team development. Universities **are** unique; team member **usually** have many other responsibilities **and** we need to determine a strategy to enable our team members to work together effectively.

We have already suggested that any opportunity to develop teamwork should be taken. Producing the project definition is an obvious opportunity to get members working together, as is a joint brainstorming exercise to develop the WBS. The development of the project team should be part of your personal strategy as a project leader. Remember, the best way to resolve conflict, deal with difficult people and solve problems – is not to have them in the first place! The development of an effective, supportive team is your best bet for minimising people problems.

There are three aspects of teamwork we will consider here. Firstly, what is a high performing team? After all if we don't know what it entails how do we know how to get there? Secondly, the group dynamics of a project team. Teams often progress through stages of development. By recognising these stages we are in a position to be able to manage them more effectively. Thirdly what are the skills necessary to achieve them?

What Makes a High Performing Team?

It may seem obvious why we have teams. After all being in a team means not having to go it alone. We can use the talents of a diverse group of people and we can achieve far more with a team than we can with individuals. Yet while it may be obvious, people working well together, is not always common practice. The reason why it is not common practice is really quite simple - **it is hard work**. As Pat Riley, the famous American basketball coach observed:

> "Teamwork isn't simple. In fact, it can be a frustrating, elusive commodity…Teamwork doesn't appear magically just because someone mouths the words [and] it doesn't thrive just because of the presence of talent or ambition."

We need to make teamwork happen. One of the keys to successful teamwork is to understand group dynamics and how people relate and work together. The members of a team are interdependent; they will "win" or "lose" only as a group. Communication amongst members is critical. It is essential for all members to understand the group goals, the procedures or processes to use in reaching them, and the roles they are to play. A project team's chances for success are best when each member's strengths are understood and used.

Ken Blanchard identified a number of characteristics of high performing teams. These characteristics are listed below. In our workshops we often get participants to rate their own teams on a scale of 1-5 in each of the areas below (5 being highly effective whereas 1 requires more work).

Characteristics of a High Performing Team

Purpose

1. Members can describe and are committed to a common purpose
2. Goals are clear, challenging and relevant
3. Strategies for achieving goals are clear
4. individual roles are clear

Empowerment

1. Members feel a personal and collective sense of power
2. Members have access to the necessary skills and resources
3. Policies and practices support team objectives
4. Mutual respect and willingness to help each other

Communications

1. Members express themselves openly and honestly
2. Understanding within the team
3. Members actively listen to each other
4. Differences of opinion and perspective are valued

Flexibility

1. Members perform different roles and functions as needed
2. Members share responsibility
3. Members are adaptable
4. Varying ideas and approaches are explored

Performance

1. Output is high
2. Quality is excellent
3. Decision making effective
4. Clear problem solving process is apparent

Recognition

1. Individual contributions are recognised by the leader and members
2. Team accomplishments are recognised by the members
3. Group members feel respected
4. Team contributions are valued

Morale

1. Individuals feel good about their membership of the team
2. Individuals are confident and motivated
3. Members have a sense of pride and satisfaction in their work
4. There is a strong sense of cohesion and team spirit

(adapted from Carew D. et al, 1990)

Stages of Team Development

The main issue for us is how do we get to the stage where we are comfortable with our team?

Numerous studies have highlighted that groups tend to progress through a number of stages of development. When a project team is first formed the roles and interactions within the team are not well established. Gradually a process of development occurs where members understand their roles and learn to work with others in the team. Many models describe this process. However, they all tend to divide the process into four stages. Understanding these stages may help you to clarify the interactive process that occurs when people come together to work as a project team and therefore be in a better position to manage the process.

You may have heard the old saying that teams work through the stages of 'forming, storming, norming and performing'. Ken Blanchard further refined these stages. He called them: orientation, dissatisfaction, resolution and production. Each stage builds on the preceding one. The implication is that it is useful for teams to develop through this sequence if they are become fully functioning. Furthermore, teams may cycle through these stages as new members join, problems arise and goals change.

Stage 1: Orientation (Forming)

When a team is forming, members cautiously explore the boundaries of acceptable group behaviour. This is a transition from individual to team member. Productivity is usually low. This stage is characterised by:

- feeling moderately eager with high expectations;
- feeling some anxiety;
- testing the situation;
- depending on authority and hierarchy; and
- needing to find a place to establish oneself.

Stage 2: Dissatisfaction (Storming)

This can be one of the most difficult stages. This stage is characterised by:

- experiencing a discrepancy between hopes and reality;
- feeling dissatisfied with dependence on authority;
- feeling frustrated;
- possible feelings of confusion;
- negative reaction to leaders and other members;
- competing for power and/or attention; and
- experiencing divergent views (polarities).

Stage 3: Resolution (Norming)

By this stage members are reconciling competing loyalties. They have probably accepted team ground rules and their role in the team. Team members are usually supportive by this stage. It is characterised by:

- decreasing dissatisfaction;
- resolving discrepancies between realities and expectations;
- resolving polarities and animosities;
- developing harmony, trust, support and respect;
- developing self-esteem and confidence;
- developing more open approach;
- sharing responsibility and control; and
- using team language.

Stage 4: Production (Performing)

The team by stage four has usually settled relationship issues. They can really begin performing - diagnosing and solving problems. The team is now an effective cohesive unit characterised by:

- feeling excited about participating in team activity;
- working interdependently;
- feeling team strength;
- showing high confidence in accomplishing tasks;
- sharing leadership;
- feeling positive about task; and
- performing at high levels.

The duration and intensity of these stages vary from team to team. Sometimes stage four is achieved in a meeting or two, other times it may take months. Understanding these stages of team development will keep you from overreacting to normal problems and setting unrealistic expectations of your teams.

 Question 1 Where do you believe your project team is at the moment?

Knowing about the stages a team may pass through should relieve stress and concern during the progress of a project.

Exercise Nine

Developing a strategy to assist teams in working through the different stages of development can make an enormous difference to the success of a project. Consider the description of the stages of team development described in the previous pages. For each stage, identify what you believe should be the key strategy that will encourage the team to progress to the next stage.

For example, it would not be unreasonable to assume that a project manager would be more directive during the initial forming of the team and far less directive once the team are performing well.

Forming

Storming

Norming

Performing

Progressing Through the Four Stages

In the **forming** stage productivity is usually low and relationships are still developing and can often be guarded. It may be useful for project leaders to focus on sharing information, encourage dialogue, ensure they are open to generate trust amongst the team, provide structure and to be directive if necessary.

Storming is an important stage in project team development. The key here is for the project manager and the team to ensure the conflict is ultimately positive and does not become destructive. Here project managers must ensure the team discuss and debate issues, clarify individual roles within the team, encourage two-communication, support collaborative efforts and keep the team progressing forward.

During the **norming** stage productivity is increasing as the team settles down to the task. It is important to talk openly about concerns and issues, give positive and constructive feedback and delegate to team members. Finally it is worth noting that some teams never get past this stage. Yet the rewards of being part of a performing team make the extra effort worth it.

When a team is **performing** it usually has a strong sense of identity. Team members by now should be committed to the project. The project leader should be in a more supportive role at this stage. For the leader it is the encouragement phase.

Team Communication

If there is one word that summarises the fundamental issue in project team development it is the word ‘communication’. During the Enhancing Project Management program at UNE, the project management workshops gave participants structure to manage their projects BUT it was the action learning that provided a forum to explore the nature of communication. Communication effectiveness in a team can only be developed over a period of time.

Effective team communication requires encouragement from the project manager but is the responsibility all team members. Here are a few questions you should ask about the communication processes in your team (adapted from Kaye, M 1997, p8).

6.6 Important Communications Questions

- Is my understanding of the project goal clear enough that I know what I need to do to achieve it?
- What are my roles and responsibilities within the project team?
- Have I communicated honestly and openly to others in the team and do they understand my role?
- Do others in the team give me feedback on my performance?
- Do I take notice of this feedback and modify my actions as a result?
- Do I understand the roles and the needs of others in the team.

We recommend you use a communication plan to assist in the communication process. A communication plan identifies the key roles of the team members (it builds on the initial project definition form) and lists their respective communication responsibilities. A team communication format is provided on the next page.

Team Communication Plan

Team member	Role	Preferred method of communication	email /phone

Responsibilities

Meeting times (electronic/in person)

Potential communication issues

6.7 Case Studies

During the course of the Enhancing Project Management program we learnt much from the issues and problems that arose during the program. Some of the lessons are represented in the case studies below. We have purposely not identified specific projects and have instead chosen to simply identify a particular project problem. This approach obviously retains anonymity for project participants. More importantly, it distils the main issue into chunks small enough that someone might actually bother to read them. You may wish to consider whether you have had similar experiences in your projects.

Case Study One: Project Team Selection

We have already included this case study in the text of the workbook. We called it the 'last person standing in the tea room' method of project allocation.

The Head of Department announced to colleagues at morning tea that he had decided a research unit was required. All the experienced staff disappeared immediately and the last staff member still in the room was given the job of project managing this unit development project. Needless to say this person lacked commitment and time to give the project the attention it deserved, consequently it did not progress well.

Lesson

One issue that came up constantly in the 'Enhancing Project Management Program' was the issue of project ownership. In this example, the project experienced a number of problems because no individual had responsibility for the project. At the time of producing this workbook this particular project had still not commenced.

The project definition phase is an ideal opportunity to clarify roles within the project. Also, a project instigator or stakeholder does not cease involvement once the project has been allocated. A project stakeholder (such as a faculty head) should continue involvement and act as a mentor to the project team.

Case Study Two: Project Leadership

A common issue that arises in projects is the dichotomy of responsibility. In teaching and learning projects at UNE there was often confusion as to who was the project manager. Was it the particular academic responsible for a particular course or unit or was it the allocated Instructional Designer (ID) from the Teaching and Learning Centre (TLC)?

In a number of instances the ID assumed responsibility for the project. This tended to suit the TLC as they could then ensure the project was managed effectively. It often suited the academic responsible as they had less work to do. It also ultimately caused tension and created communication problems in the projects.

Lesson

It is most desirable for the person responsible for a particular project to be the project manager. In teaching and learning projects this is normally the academic responsible for the course or unit. The project manager may choose to delegate some of the management responsibilities BUT should retain overall project leadership.

Case Study Three: Project Member Roles

In a particular project at UNE there were three senior academics involved in an exciting initiative to produce an interactive CD-ROM for a cross discipline program. Initially there was much confusion as to who was responsible for what part of the project.

The project manager was the most junior member of the project team. The other two academic team members were Professors and in charge of their respective departments. The two senior members did not really want to get involved in the detail of the project as they were 'too busy'. This caused friction between project team members.

Lesson

It is common to have unrealistic expectations at the commencement of a project. Again the key here is to clarify the roles and responsibilities of people in the project team. It is not uncommon to have external and internal team members. In this particular case, the professors became external team members with specific inputs and responsibilities. The project manager became the main internal team member. Once the roles and work commitments were clarified the project progressed well.

Case Study Four: Team Workload and Expectations

An energetic and popular academic was responsible for the establishment of a new program. Because of her popularity and the high esteem in which she was held amongst colleagues, there was no shortage of volunteers to be involved in the project.

The project commenced with much enthusiasm. Unfortunately as it progressed, and the workload grew, the less experienced members (generally new associate lecturers) started to miss project meetings and deadlines. Their initial enthusiasm gave way to lack of interest as other priorities tended to take over.

This created enormous pressure for the project manager as her workload kept increasing. Furthermore, her initial popularity gave way to resentment as she attempted to keep the team members focused.

Lesson

This is a classic tracking and control problem. How do we maintain enthusiasm amongst academic staff? Whilst the project manager was senior in rank, as we know, it doesn't tend to mean much in an academic environment. The project manager initially did some of the extra work herself. However, after a number of stressful and tense project meetings she got the team together and gained agreement for a continuation of work.

There are two things she could have done. Firstly, ensured that project team members understood the workload commitments early on in the project, secondly managed with a more directive style early on in the project. It is much easier to start with solid direction and ease off later in the project than it is to try and 'tighten up' work practices once the project is underway.

Case Study Five: Unrealistic Time Expectations

In this case, an enthusiastic academic committed her project team to a very tight deadline, based on her assumptions of how the work would progress. Whilst team members expressed concern at the deadlines, they all agreed in the early project meetings that the workload was achievable.

One of the project team members became pregnant and later in the year embarked on maternity leave. Another team member took study leave. By the end of the year the project was only fifty percent complete. So reluctantly, the project manager sought and received an extension of time. She claimed unforeseen events had impacted on her original plan.

Lesson

There are numerous lessons to emerge from this case. Firstly, set realistic deadlines! Just because the project manager is capable of undertaking a task in a certain timeframe, does not mean that less experienced team members can achieve in the same time frame. Refer to the section on rational estimation and be sure to set realistic deadlines. Secondly, an effective project definition process would not only avoid unrealistic estimation of duration but also flag the potential problems such as study leave. The study leave should have been listed as a constraint in the project definition process. Finally, there will always be unforeseen situations arise (such as team members going on maternity leave). Potential absenteeism from the project should be flagged in the project definition phase.

Case Study Six: University Power Politics

Problems with organisational politics are not limited to universities. This particular incident we have seen enacted across many organisations. An academic and her team had developed a particular program, investing a substantial amount of time and effort on the course. A senior colleague, then took the program, modified it for overseas consumption and assumed responsibility for the project.

The impact of this was that the project team became extremely de-motivated and disillusioned. As the project was just about over this had little impact on the project outcome. However, it had a significant impact on future projects. This was because a negative climate had been created that discouraged participation in projects.

Lesson

Recognition is a fundamental motivational issue. Not to recognise effort is a serious failing in leadership. Alternatively, recognition of effort is a simple yet powerful motivational tool. A famous example of this is the project team involved in the original Macintosh computer. They were recognised by having their names on the inside of every [early] Macintosh produced. An extremely powerful motivator, which no doubt contributed to even greater productivity in the future!

The other issue is that of culture. Culture is a powerful force. Once negative thinking (such as in the example above) has been created it is very hard to fight. Effort should be expended in creating a positive supportive culture in the first place.

6.8 Putting It All Together

From the outset of this program we have emphasised the practical nature of project management. This workbook has hopefully provided you with some valuable tools and a few good ideas to assist you in your projects. If you have diligently progressed through this workbook you now have enough of an understanding of the principles and techniques of project management to effectively define, plan and conduct a project.

All the techniques covered in this course can be undertaken manually. We have provided a set of planning sheets for just that purpose. However, to plan a project manually is a bit like going back to writing an academic paper without a word processor. We have emphasised throughout this program the value of project planning software. The one we use at UNE is MS-Project. However, there are many available and they are all capable of assisting you in project planning.

Once you (and your team/stakeholders) have identified the objectives, tasks, durations, predecessors, resources and costs, project-planning software will facilitate the documentation and production of a plan. Software can produce task, resource and cost schedules; reports and forecasts. Once your project has been documented and approved, software will then assist you with monitoring and control.

Of course, all the planning systems and software programs in the world will not work if you are unable to provide effective leadership to your project team. We have emphasised the systems in this workshop because that is essentially what this program is about. However, the systems will not work without the people! So your project planning must include team and communication development.

Finally, project management is nothing more than systems and processes that make it is easy for you to get on with what you do best. In teaching and learning projects sometimes we get so caught up in the detail of what we do that we fail to manage our projects effectively. Use the systems covered in this workbook so you can get on and enjoy your work.

We are often asked for a quick list for successful project management. Whilst there is not such thing as a quick fix, the list on the next page is our recipe of project success.

Good luck with your projects.

A Recipe for Project Success

- **Clear goals/outcomes**
- **User-friendly system support**
  - **MS-Project**
  - **Useable Gantt**
- **Clear roles within the team**
- **Clarity and openness in communications**
- **Positive team culture/behaviour**
- **All team members contribute**

This workbook is a first draft (hence Version 1 at the bottom of the page). After it has been out 'on the streets' for a few months we intend to review it and make any changes that people may feel necessary. So please send your comments on the usefulness of the material to pharrell@metz.une.edu.au. Version 2 will encompass suggestions from users and be available before the end of 2001.

Section Seven

Planning Sheets and Forms

The following planning sheets have been discussed in various sections this manual. For your convenience, we have collected them together and placed them in this section so that they are easy to find. Please feel free to photocopy them and use them in your projects.

1. Project Definition (from Section 3 *Focusing on the Outcome*)
2. Risk Management Analysis (from Section 3 *Focusing on the Outcome*)
3. The Six Rules of Brainstorming (from Section 4 *Planning for Project Success*)
4. WBS Sheets (from Section 4 *Planning for Project Success*)
5. Resource Usage (from Section 5 *Conducting and Reviewing the Project*)
6. Gantt Chart Forms (from Section 5 *Conducting and Reviewing the Project*)
7. A Meeting Checklist (from Section 5 *Conducting and Reviewing the Project*)
8. Meeting Conduct Sheet (from Section 5 *Conducting and Reviewing the Project*)
9. Meeting Agenda (from Section 5 *Conducting and Reviewing the Project*)
10. Meeting Agenda – Email Format (from Section 5 *Conducting and Reviewing the Project*)
11. Hints for Effective Meeting Minutes (from Section 5 *Conducting and Reviewing the Project*)
12. DETYA Project Report Format (from Section 5 *Conducting and Reviewing the Project*)
13. Team Communication Plan (from Section 6 *Enhancing the Project*)

Project Definition

Project Name:

Faculty/School/Project ID:

Projection Description, Rationale and Scope:

Page one

Project Stakeholders:

Name	**Project Role**	**Contact details**

Project Team **(first name listed is person responsible for the project):**

Name	**Project Role**	**Contact details**

Project Objectives: **(the project outcomes)**

Project Deliverables: (how you will know when the project is completed)

Project Constraints: **(definite obstacles that will impede progress)**

Constraint	**Strategy**

Project Risks: **(factors that might impact on project progress)**

Risk	**Strategy**

Page three

Broad Work Breakdown (WBS): **(a broad list of tasks that are needed to be done to complete the project).**

WBS	**Task Name**	**Duration**	**Predecessor**

Dependent Projects:

Page four

Resources Available:

Budget Issues:

Further Detail/Action:

Project Start_____ Project End_____

Page five

Risk Management Analysis

Project Name

Project Manager

Date_____

Part A Project Risk

Factor	Likelihood	Impact	Strategy

Page one

Part B Strategic Risk

Factor	Likelihood	Impact	Strategy

Part C Summary of Key Risks

Page two

The Six Rules of Brainstorming

1. There Should be No Criticism

No person should be criticised for any ideas offered. Judgment should be suspended until later when **all** ideas generated during the brainstorming session are evaluated. If a person's ideas are criticised he/she is unlikely to contribute freely to the session and will be more reluctant to suggest other ideas.

2. Freewheeling Should be Encouraged

The wilder the better; offbeat, zany and impractical suggestions should all be accepted. These wild suggestions often "trigger" off practical ideas that may not otherwise occur.

3. The More Ideas the Better

The greater the number of ideas, the greater the likelihood of finding a solution. When all ideas seem to have dried up, go around the group again and ask for one more suggestion from each person. It is easier to reduce a long list than expand a short one.

4. Everyone Should Have an Equal Chance to Participate

In order that the more confident members of the group do not dominate the others; everyone should be allowed to contribute in turn. If someone has no idea to offer at that moment they should say "pass". On the next time around they may have a worthwhile idea to contribute. It is good idea to jot down any good ideas while waiting so they so they are not forgotten.

5. All Ideas Should be Recorded

One person should act as the recorder so every idea is written up in full view as the session proceeds. The recorder should not change the wording of the contributor, or alter the meaning if it is necessary to shorten something.

6. Let the Ideas Incubate

The result of the brainstorming session should be allowed to incubate. It may be a good idea to allow people time to absorb the various ideas until the following meeting. This also allows time for any additional ideas.

The next step is to eliminate all the "wild" ideas from the brainstorming list, then from the remaining list set up a priority list from the ideas that are related to the problem.

Work Breakdown Sheet

WBS	TASK NAME	DUR	PREDS

Resource Allocation Worksheet

RESOURCE ALLOCATION																	
RESOURCE	**TASK NAME**	**DUR**															

Gantt Planning Sheet

WBS	Tasks	Dur	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
WBS	Resources	Hrs																				
	Total																					
	Cumulative																					

A Meeting Checklist

BEFORE

CHAIRPERSON	ATTENDEES
• Determine Objectives • Determine Participants • Prepare Agenda • Organise Meeting Place • Do any preparation required	• Confirm Your Attendance • Decide what is required of you • Decide what you want from the meeting • Do any preparation required

DURING

CHAIRPERSON	ATTENDEES
• Be punctual • Stick to the Agenda • Retain Control • Ask questions • Keep the meeting brief • Summarise results	• Be punctual • Listen • Participate • Don't wander off the subject • Ask questions

AFTER

CHAIRPERSON	ATTENDEES
• Assess your performance • Follow up promptly on any items you are required to action • Ensure others do the same	• Assess your performance • Follow up promptly on any items you are required to action

Meeting Conduct Sheet

MEETING PURPOSE			
DATE:	START:	END:	LOCATION:
Attendees:			
Apologies:			

No	Time	AGENDA	ACTION		

Related Issues:

Notice of Meeting

Attention

- Julie Armstrong
- Basil Flemmings
- Sue Richards
- Ross Wilson
- Hassan Omar

A meeting will be held on 10 October 2001 at 10.00 a.m. in meeting room 1 for the Psychology on Line project team.

Agenda

1. Apologies

2. Minutes of Last Meeting

3. Matters arising
   - Progress on computer trials
   - Programming efficiencies

4. Issues for this meeting
   - The results of the software trials
   - Managing study leave commitments
   - Report on Monthly progress to TLC
   - New course structures

5. Any other business or issues

6. Date of next meeting

Jo-Anne Smith
Project Manager
10 October 2001

Notice of Meeting

For

- ……..
- ……..
- ……..
- ……..
- ……..
- ……..

A meeting will be held on …… at ……. a.m./p.m. in……

Agenda

1. Apologies
2. Minutes of Last Meeting
3. Matters arising
4. Issues for this meeting
5. Any other business or issues
6. Date of next meeting

Signed …….

Position……..

Date…….

Hints for

Effective Meeting Minutes

1. **Take concise and appropriate notes to ensure an accurate record of the meeting**
2. **Prepare minutes so they reflect the true and accurate account of the meeting**
3. **Format minutes to include Actions**
4. **Make sure Actions are signed off by nominated participants**
5. **Give everyone a copy of the minutes …. At the meeting**

Take notes:

DETYA Project Report Format

Title page

Executive Summary

Project Overview

Introduction

Justification Rationale for Project

Target Group

Details of Program

Overview

Sequence of activities

Project Conclusion

Evaluation

External Project Dissemination

Conclusion

Appendices

Team Communication Plan

Team member	Role	Preferred method of communication	email /phone

Responsibilities

Meeting times (electronic/in person)

Potential communication issues

Section Eight
References and Websites

8.1 Other Areas of Information

Project Management Body of Knowledge (PMBOK)

If you were to eavesdrop on a group of Project Managers discussing project management, one of the terms which you will hear them using consistently is the "Project Management Body of Knowledge" or "PMBOK". The PMBOK is the term used to describe the "sum of knowledge within the profession of the project management."

The PMBOK includes proven traditional practices which have been successfully applied around the world as well as innovative and advanced techniques which have had limited use and exposure. It is produced by the Project management Institute (PMI) and draws its knowledge from a diverse range of bodies of knowledge including:

- general management;
- technical or industry;
- supporting disciplines.

The PMBOK is a reference for a basic project management techniques and practices and is used by project management associations such as the Australian Institute of Project Management (APIM).

Numerix Pty Limited

Numerix Pty Ltd is s a commercial consulting organisation that we recommend, particularly for MS-Project Training. The contact details for the company is:

Numerix Pty Limited
Suite 2 Level 1,
160 Clarence Street
Sydney NSW 2000
numerix@comcen.com.au

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Internet www.unepartnerships.com.au

8.2 Websites

Project Management – LINKS

Magazines –Project [Project Management Home Page [Serendipity] Updated 30 August 1996. Copyright 1996 Asterisk Design Partnership

http://www.asterisk.co.uk:80/project/Pmlinks.html

Project Management

This site contains items of interest to the project management community, but it is primarily the home of Project, the magazine of the Association for Project Management (APM). For a full copy of the magazine you will need to be a member of the APM, or you can subscribe to the magazine without being a member.

http://www.asterisk.co.uk:80/project/Pmgen.html

Trends in Project Management Systems

Trends in Project Management Systems Trends in Project Management Systems A White Paper by HMS Software Author: Chris Vandersluis President, HMS Software © 1994 Heuristic Management Systems Over the

http://www.cam.org/-hms/wp/prntrends.html

Choosing Project Management Software

Choosing Project Management Software Choosing Project Management Software for Your Organisation A White Paper by HMS Software Author: Chris Vandersluis President, HMS Software © 1994 Heuristic Manage

http://www.cam.org/-hms/wp/choosing.html

Project Management and Project Risk

Project Management and Project Risk. Project Management Project Risk Introduction End-User (and management) Perception Management Challenges Portfolio Analysis Effect on implementation risk. Tools of Project Management Maximising potential project success Comparison of System Development approaches System Development Life Cycle. The Prototyping Process Other approaches.

http://www.channell.com:80/users/francis/CSS118/project/index.htm

8.3 Journals

Australian Project Manager

Australian Project Management

Australian Institute of Project Management

The British Institute of Project Management

International Journal of Project Management

European Project Management

PMI Network

American Project Management

Engineering Management Journal

8.4 Useful Project Management Organisations

Project Management Institute - Melbourne Chapter	http://www.pmi.org/chapters/australia/
Australian Institute of Project Management (AIPM)	http://www.aipm.com.au/head/portal/home
Project Management Institute	http://www.pmi.org/
International Project Management Association (IPMA)	http://www.ipma.ch/

8.5 Useful Project Management User Groups and Resources

Project User Group	http://www.mpsug.com/
The Web site for Users of Microsoft Project	http://www.msproject.com/
The Project Management Forum	http://www.pmforum.org/warindex.htm
Project Management Resources	http://www.jump.net/~hollyt/PM.html
ProjectNet 0 the world of Project Management	http://www.projectnet.co.uk/
ProjectZone	http://www.projectzone.com/
The Busy Person's Project Management Book	http://www.ozemail.com.au/~thomsett/book/busy_book.htm

8.6 Useful Project Management Software Downloads

Microsoft Project 98	http://www.microsoft.com/office/project/default.htm
Primavera Systems	http://www.primavera.com/
Project Schedules 7	http://www.scitor.com/ps7/

Add your own websites here:

Address: _____

Description: _____

Address: _____

Description: _____

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