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11 Project definition

11.1 Introduction

Part Two described the methods, tools and techniques for managing the five functions of project management – scope, organization, quality, cost, and time – and the risk inherent in all of them. We shall now turn to the second dimension of project management, the management processes for delivering the project, and describe how the methods, tools and techniques are applied to undertake projects. In Chapter 1, I explained that because projects are transient, they are said to have a *life cycle*, going through several stages of development from germination of the idea, to commissioning of the facility and metamorphosis into a successful operation. During this life cycle, management emphasis changes. The definition of the project evolves in a controlled way, so that the best solution to the owner's requirement is achieved, and money and resources are committed only as uncertainty is reduced. The life cycle followed in this part is the basic one described in Figure 1.5 and Table 1.2. Table 11.1 shows how the four stages are addressed in the three chapters of this part.

Table 11.1 The four-stage life cycle as addressed in this part

Stage	*Name*	*Chapter*	*Topic*
Germination	Proposal and initiation	11	Project definition Feasibility
Growth	Design and appraisal	11	Planning and design Appraisal
Maturity	Execution and control	12	Implementation Measuring progress Forecasting completion Taking action
Metamorphosis	Finalization and close-out	13	Project close-out

In this chapter, I describe 'proposal and initiation' and 'design and appraisal'. I start by describing *project start-up*, which may be used to initiate any stage of a project, even close-out. I then describe proposal and initiation, and explain how to conduct a feasibility study to achieve the objectives of this stage. I then describe design and appraisal, and close this chapter by explaining the use of initiation meetings and the Project Definition Report and Manual as tools to start project definition and record decisions made during that stage and design.

11.2 Project start-up

A project requires the undertaking of a unique task using a novel organization, which must be created from scratch at the start of the project. When new teams are formed, the members take some time to learn how to work together before becoming truly effective. Typically, a team goes through four stages of formation in which its effectiveness first falls and then rises[1] (Figure 11.1):

– *forming*: the team members come together
– *storming*: they find areas of disagreement
– *norming*: they agree principles of cooperation
– *performing*: they achieve the task effectively.

(A fifth stage, *mourning*, when the team is disbanded at the end of the *task*, is introduced in Chapter 17.) A project is subject to time constraints, and so this process of team formation must be undertaken in a structured way to ensure it happens quickly. Furthermore, it may be done at several stages throughout the project management life-cycle, since the team may change from one stage to the next.

The structured approach to creating the project organization is called *project start-up*.[2,3] The term 'project start-up' is used to differentiate from 'project start'; the former is a structured process for team formation; the latter is an action at an instant in time. Fangel[4] draws the analogy with starting the engine of a car, and starting-up the diesel engine in a ship. The former is achieved by flicking the ignition switch, the latter by a structured series of activities, a start-up process, which gives the most efficient and economical operation. The same applies to projects.

This section will clarify the concept of project start-up, and discuss its timing in the project management life cycle. It will describe the objectives of the process, show how these change throughout the life cycle, and review methods of start-up and their effectiveness for achieving the various objectives. It will show that the use of the methods will depend on the type of project, and, finally, it will describe how to schedule the start-up process.

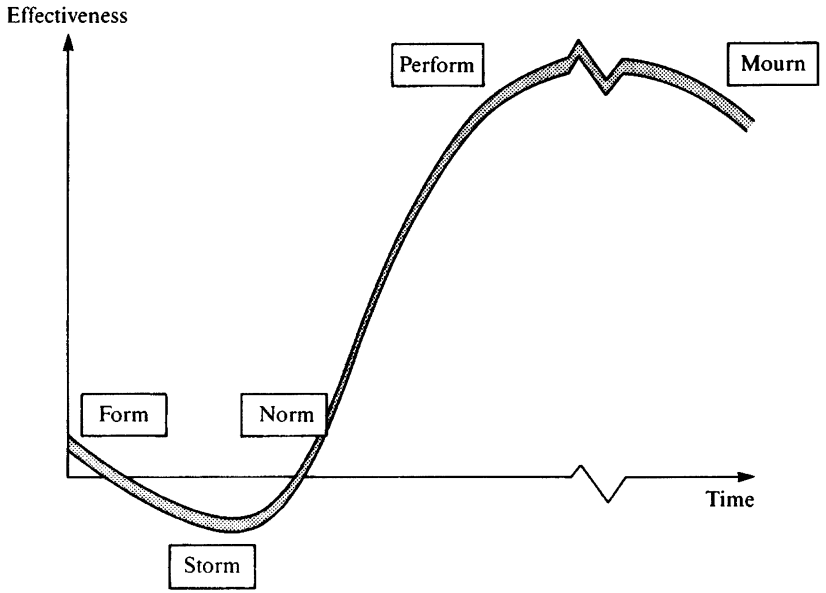

Figure 11.1 The stages of team formation

Initiating projects

It is now widely accepted that a structured start-up process is an essential part of project management.[4] It is necessary, on a unique, novel and transient endeavour, to improve the understanding of the project team of the task they face, and how they are to approach it, and to get them working effectively as a single unit. Research in Austria into benchmarking best practice in project management has shown that the start-up process can take between 1 and 40 days, depending on the size, nature and complexity of the project, with the initial start-up meeting taking between half a day and three days.[5] This process may be undertaken just once on a project, or several times, if there is a significant change in personnel at the start of a stage of the project, or even at the start of work on a milestone.

There has been an increasing need for effective start-up on projects, and this may be due to:

- the increasing complexity of technologies used
- the use of qualified project management earlier in the life cycle
- new patterns of cooperation in projects, including the need for team building and cross-cultural cooperation (Chapter 4)
- a need for increased effectiveness caused by shorter product life cycles

- changes in the way projects are managed, including the use of goal directed approaches,[6] which reinforce the setting of objectives and scope, the use of group methods for building cooperation, and the management of the team through the use of a clear and common mission.

Objectives of project start-up

For a systematic approach to start-up to be successful, the participants must understand what the objectives of the process are at any stage, and must be aware of what specific outputs are needed to achieve the necessary level of understanding. I said above these objectives might be:

- to create a shared vision for the project, by identifying its context, purpose and objectives
- to gain acceptance of the plans, by defining the scope of work, project organization and constraints of quality cost and time
- to get the team functioning, by agreeing its mode of operation and channels of communication
- to refocus the project team on to the purpose of the project, and the method of achieving it.

The first three objectives correspond to Parts One, Two and Three of this book, respectively; the fourth runs throughout. As they move through the stages of a project, the team's understanding of these develops in turn (Figure 1.13). At the start, the emphasis is at the top level, identifying the project's context, developing the shared vision and project strategy. As that is achieved, the emphasis shifts to the second level, developing the project model for the five project management functions, the first dimension of project management. In the third stage, the emphasis changes again into pulling the strands of the project model together, to undertake the work. This is done through the life cycle, the second dimension. Finally, as the facility is commissioned, and handed over to the client, the emphasis changes back to the purpose of the project, the benefit expected from the facility and the product it produces, to ensure that is achieved. Hence, the objectives of project start-up will be different at each stage of the life cycle (Table 11.2), although as you move from one stage to the next, you may review the objectives of the previous stage and look forward to those of the next.

Below each of the four objectives are fifteen subsidiary objectives, Table 11.3. These in turn may influence the emphasis of the work of the project team depending on the type of activity undertaken and decisions taken. The emphasis of the team's work may be:

- *analysis*: of the project's context, previous plans, future tasks and management routines

Table 11.2 Shift of the start-up objectives throughout the life cycle

Objective	*Proposal and initiation*	*Design and appraisal*	*Execution and control*	*Finalization and close-out*
Context and objectives	Main	Review		Monitor
The project model	Draft	Main	Review	
The management approach		Draft	Main	Review
Commission and handover	Prepare		Draft	Main

Table 11.3 Ten subsidiary management objectives and their effect on the working of the team

Subsidiary objectives	*Analyse*	*Plan*	*Communicate*	*Motivate*
Context and objectives				
– Impact of context	A		C	M
– Business purpose	A	P		
– Objectives of project		P	C	M
The project model				
– Milestone plan	A	P		
– Responsibility chart		P	C	M
– Detail work plans		P	C	M
– Resource allocation		P	C	M
The management system				
– Management system		P		
– Principles of cooperation			C	M
– Control processes		P	C	
Commission and handover				
– Timely, efficient end		P	C	M
– Disband team		P	C	M
– Hand-over to client		P	C	
– Obtain benefits		P	C	
– Record data	A		C	

– *planning*: of objectives, scope of work, organization and routines
– *communication*: between participants of the results of the analysis and plans
– *motivation*: of participants to carry out work or make decisions.

Table 11.3 relates the emphasis of the team's work to the fifteen subsidiary objectives. When linked to Table 11.2, this shows that during the life cycle the emphasis shifts from analysis and planning to communication and motivation until the end when it switches back to analysis, which probably will match the experience of most people.

Methods of start-up

Another requirement of a systematic approach to project start-up is the use of appropriate methods. There are three standard methods of start-up:

- *project or stage launch workshops*: to develop project plans in a joint team building process
- *start-up or stage review reports*: to collate the results of analysis undertaken during start-up or from a previous stage in accessible form for use during the subsequent stage
- *the use of ad-hoc assistance*: to support and guide the project team.

These three techniques may be used individually or in any combination. The choice depends on several factors. First, the different methods require varying amounts of time, so you must ensure that key team members are willing to devote that time to it. Without it most methods will fail. Secondly, the methods have different efficacy in achieving the objectives in Tables 11.2 and 11.3. Table 11.4 shows the different impact of each method. Thirdly, through project start-up, you should try to build as much historical experience into the project definition as possible, to minimize the uncertainty. You should choose a method which does that for the case in hand. Other methods of start-up include case studies, study tours, social events, education programmes, and other media, such as videos.

Table 11.4 Effectiveness of the techniques for project start-up

Start-up technique	*Analyse*	*Plan*	*Communicate*	*Motivate*
Launch workshop	High	Medium	High	High
Review report	Low	High	High	Medium
Ad-hoc assistance	Medium	High	Low	Medium

LAUNCH WORKSHOPS

A *launch workshop*: held at the start of proposal and initiation is often called a *Project Definition Workshop*, and at the start of design or execution an *initiation* or *kick-off meeting*. The objectives of the workshop, the agenda and the people invited depend on the stage being launched, and are discussed more fully in Section 11.6.

STAGE REVIEW REPORT

The *Start-up* or *Stage Review Report* is prepared at the end of one stage to launch the next. A report for launching proposal and initiation may be a one- or two-page *Project Scope Statement* (Section 5.4 and Example 5.1). During the feasibility study, this is expanded into a Project Definition

Report or Client Requirements Definition, used to launch design and appraisal. At the end of that stage, a full Project Manual or Project Requirements Definition may be produced in support of the design package, and that used to launch project execution. The contents of each of these reports depend on the stage being reviewed, and are described in Section 11.7.

AD-HOC ASSISTANCE

This may be from:

- internal professionals, such as the Project Support Office
- external consultants
- team members from similar (earlier) projects
- organizational behaviour experts helping manage the team dynamic.

The external professionals can fill one of two roles. They may be there to facilitate the team dynamics, to initiate the storming and the forming. Or they may be invited to bring specific technical expertise relating to the project, to bring experience from having worked on similar, previous projects. The advantage of this method is it provides additional resources with special skills, who may motivate key people. Having someone to share ideas with can be stimulating. A disadvantage is that there can be some confusion over responsibilities, which can lead to wasted effort.

Start-up and the type of project

In Section 1.6, I introduced Turner and Cochrane's goals and methods matrix (Figure 1.15). This defined four types of project. The emphasis of start-up differs for each type (Figure 11.2).

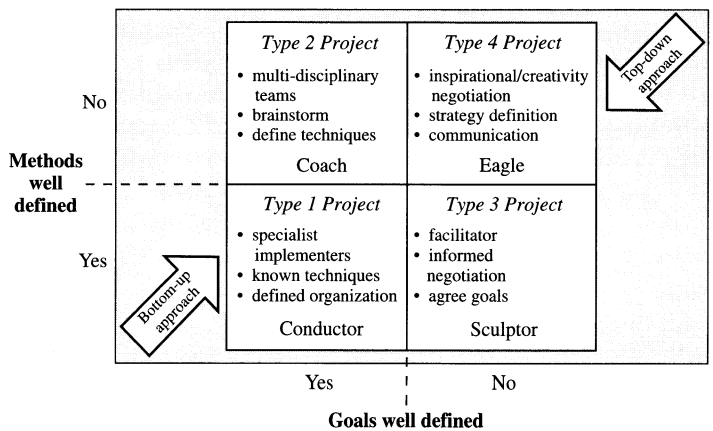

Figure 11.2 The changing emphasis of start-up by type of project

TYPE 1 PROJECTS

The goals and methods of delivery are both well defined, and the team will slip quickly into activity-based planning. These projects will usually be very similar to ones done in the past, (not so unique and novel). The emphasis of start-up will therefore be on briefing the team on the standard techniques. External facilitators who have done similar projects in the past may be used to brief the team. The role of the project manager here is something of a conductor leading the team through the predefined score, but putting his or her own interpretation on it.

TYPE 2 PROJECTS

The goals are well defined, but the methods of achieving them are not. The start-up workshop develops a milestone plan for the project, where the milestones represent the known products. It then develops a responsibility chart to define who is going to take responsibility for determining how to achieve the milestones. The workshop requires a broad cross-section of disciplines to be represented, including all the people who may have a contribution to make on how best to achieve the project. A facilitator may be used to norm the team's behaviour, gaining agreement to the milestones and responsibility chart. The role of the project manager is that of a coach. There is a clear objective of getting the ball in the goal as many times as possible in the next 90 minutes. The coach trains the team in standard plays, but leaves them to put them together as the game unfolds.

TYPE 3 PROJECTS

The goals are not well understood, but the project will follow a standard life cycle, and the definition of the goals will be refined as the project proceeds, using configuration management. The emphasis of start-up will be on agreeing the purpose of the project, the nature of the goals, if not their precise definition, and the life cycle and review points to be followed in reaching a better understanding. A facilitator may be used to help negotiate agreement to these. The role of the project manager is that of a sculptor, starting with a shapeless block of clay or marble. Somewhere in there is a statue. He or she will use standard techniques to cut away the clay or marble. However, they will need to avoid flaws, and so the precise nature of the statue will not be evident until it is finished. (I hope the sculptor is more like Michaelangelo, using an army of apprentices, than a hermit in a garret flat.)

TYPE 4 PROJECTS

Now neither the goals, nor the method of achieving them is known. The emphasis start-up is very much on agreeing the purpose of the project. In the early stages, the team will work on defining first the goals (turning the

project into a type 2) and then the methods of achieving them. Planning will be by defining a series of gateways (review points) that the project must pass through before they close forever. A facilitator may again be used to negotiate agreement, and then help with team formation as the project converts to a type 2. The project manager must now take the role of an eagle. He or she must be able to hover above the project and see how it fits into the overall context of the organization, but also be able to identify small problems (a mouse) and go down and deal with them. They must then be able to rise back above the project again, before going down to deal with another mouse.

Scheduling start-up

A schedule of the start-up activities helps to focus attention on the process, and acts as a means of implementing the chosen techniques. The schedule may take the form of a responsibility chart (Figure 11.3), with both a definition of roles and responsibilities, and a time scale. The schedule for starting-up design and appraisal may be included in the Project Definition Report. A comprehensive checklist of items which may be included in the project start-up schedule is suggested by Archibald.[7]

PROJECT RESPONSIBILITY CHART

Project:

X – eXecutes the work
D – takes Decision solely
d – takes decision partly
P – manages Progress
T – provides Tuition on the job
C – must be Consulted
I – must be Informed
A – available to Advise

Companies/Departments/Functions/Type of resource

Period: WEEK 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Issue/Date: Approved by:

No.	Principle/Milestone name	Environment	Purpose	Objectives	Work breakdown	Responsibilities	Detailed plans	Resource allocation	PM system	Co-operation	Information	Steering ctee	Project manager	Project office	Participants	Consultants
		PROJECT MANAGEMENT TASKS										PARTICIPANTS				
	Project description	o	●	●	●	●						DX	C	C	I	
	Definition workshop	o	o	o	o	o	o	o	o	o	o		PX	x	x	T
	Draft issue of plan	●	o	o	o	o	●	●	●	●	●	I	PX	x	I	
	Meeting with consultants			o		o				o			Px	x	x	A
	First issue of plan	●	●	●	●	●	o	o	o	o	o	I	PX	x	I	
	Invitations to start-up W/S													x		
	Start-up workshop															
	· Part 1	●	●	●	●	●	o	o				DX	PX	x	x	T
	· Part 2	o	o	o	o	o	●	●	●	●	●	DX	PX	x	x	T
	Final editing of plan	●	●	●	●	●	●	●	●	●	●	I	PX	x	I	
	Approval of plan	●	●	●	●	●	o	o	o	o	o	D	P	I	I	
	Issue of definition report	●	●	●	●	●	●	●	●	●	●	D	PX	x	C	

● Main issue
o Subsidiary issue

Figure 11.3 Responsibility chart used as a start-up schedule

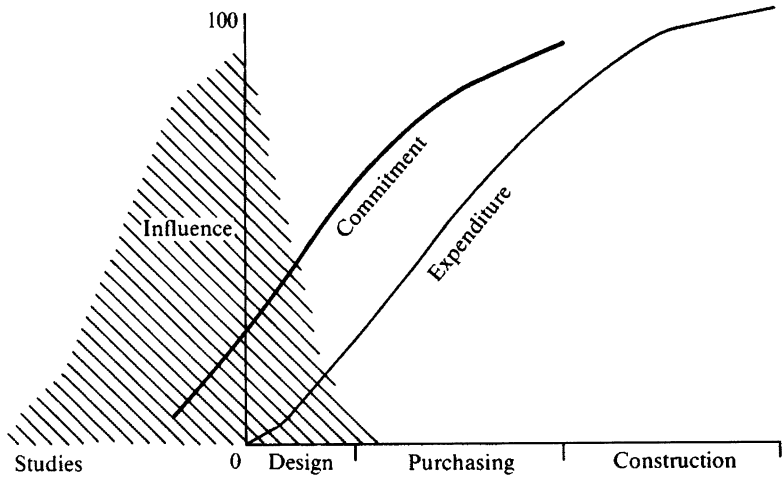

Figure 11.4 The time at which the out-turn cost of a project is set, and the ability to influence it

11.3 Proposal and initiation

The first stage of the life cycle is proposal and initiation, which deals with the definition of the project and its context (Table 11.2). Although the majority of a project's expenditure occurs in execution and control, the greatest influence over cost is during proposal and initiation. Decisions made here have a lasting impact on later expenditure (Figure 11.4). Hence, although only 0.1 per cent of costs may be incurred during proposal and initiation (Table 8.4) perhaps 90 per cent of the expenditure has actually been determined by the end of this stage. The ability to influence costs falls off rapidly during the design stage, so changes made later are impossible to implement without incurring considerable additional cost. This is the relationship between the life cycle and the quality and risk described in Chapters 7 and 10. Proposal and initiation are key to the later success of the project. It is at this stage that we set the bases for the project's success by determining the strategy for its management (Section 4.5). Three of the project management forces which need defining at this point are:

- setting project definition through its objectives and scope
- developing the project model at the integrative level
- defining the project organization.

The project definition

The setting of clear, unambiguous objectives is key to project success. The objectives and initial definition of the scope can be done using the

techniques described in Section 5.4. Section 3.2 described how people can have covert objectives that differ from the project's stated objectives. Even the sponsor can have a hidden agenda. Hence the interpretation of the sponsor's requirement is unlikely to be the subject of unanimous or even objective judgement. This makes even the first step difficult, and means it must be done in a way that leaves little margin for misunderstanding. The Project Definition Workshop (Section 11.6) is a powerful medium for flushing out covert objectives.

The project model at the integrative level

Having defined the project's objectives, we can set constraints for its cost and duration, and the performance of the facility. The purpose indicates parameters for the facility's value and the time window in which it has that value, and from these we determine the maximum cost and latest completion date of the project. The value of the facility depends on the completion date: the later completion, the lower the value (as calculated at the start of the project), as shown in Figure 9.2. The decrease in value represents two things: revenues from the facility having lower present value; and lost revenue if the product has only a limited life. This decrease may allow several build programmes, with a minimum achieved in some optimum time window (Figure 9.1). Three-build programmes were illustrated in Figure 9.2. There may be some indication at this stage whether these times and costs are realistic for achieving the objectives set, but it is not until the feasibility study is completed that you can begin to match the costs to the definition of the work to be done.

The project organization

The owner will consider the source of the resources, whether internal or external contractors, the type of project organization to be adopted (Section 6.3) and a possible project manager. It is better to appoint the project manager early, because that person will be more committed to the project strategy if he or she is involved in determining it. This is a very extensive area, and is best achieved using responsibility charts, (Section 6.4). Remember the process of project organization is one of negotiation, winning people's commitment to the project by demonstrating that it can be of benefit to them.

11.4 Conducting the feasibility study[a]

Much of the above work takes place at the start of proposal and initiation, and leads to the project proposal (the first line in Table 8.4). To initiate the project and so commit resources to systems design, it is necessary to develop the definition further, and refine estimates to the level of the second line in Table 8.4. This is done through a feasibility study. During the

feasibility study the range of possible options is examined, and potential issues identified. The aim is to narrow the range of options, provide an assessment of each one remaining, and propose solutions to issues confronting the project. In this section, I describe the objectives of the feasibility study and the factors which should be addressed. I also describe how to set up the study, manage it and bring it to a successful conclusion.

Aims of the feasibility study

Feasibility studies involve time and money, and so it is essential they are well managed. By understanding the aims of the study and the criteria for its success, we can focus our effort. The objectives of the study will be specific to the project, but the following are usually significant:

- exploring all possible options for implementing the project
- achieving a clear understanding of the issues involved
- producing enough information to be able to rank the options
- obtaining a clear picture of the way forward.

THE OPTIONS

As many ideas as possible should be explored. Each option must be thoroughly reviewed to determine whether it can be improved, within the limitations of market and technical conditions. The original specification can act as a guide to the study, but it should not stifle imagination and creativity.

THE ISSUES

The feasibility study must give a clear understanding of the issues. In particular, associated with each option still being considered should be: estimates of costs and revenues; an understanding of the views and objectives of the various sponsors and institutions involved; confirmation of both technical and financial viability; and estimates of the likely economic and financial returns, as described above.

RANKING THE OPTIONS

The study should produce enough information to rank options. The criteria used are based on the strategic factors, described above. Their weighting in the overall ranking of options depends on the sponsor's goals; the public sector will usually give more weight to social and environmental factors than the private sector (Section 2.4).

THE WAY FORWARD

The study should result in a clear idea of future stages. It helps to think of the feasibility study as a funnelling and filtering exercise, directing a wide range of possible ideas into a much narrower range of options, with those

which clearly fail to meet objectives sifted out. The study should aim to provide for the next stage – design and appraisal – both a new, refined specification and a work plan. It may also result in a draft plan for the design or execution stages (Example 11.1).

I worked on a three-month feasibility study to assess the efficacy of a new process. We launched the study with a two-week workshop. At the end of the workshop we had a clear objective for the feasibility study, but we had produced no plan, not even at the strategic level, neither for the study nor the year-long systems design stage which followed. The first plan produced was at the end of that year, for the detailed design of the plant.

Example 11.1 Producing a clear definition of the way forward

The factors addressed

The study must provide an understanding of factors influencing success, and assess the advantages and disadvantages of each option to enable them to be ranked. The following factors influence feasibility.

MARKET CONDITIONS

Expectation of returns depends on satisfying demand for the project's product at a certain price level. Usually neither future demand nor future prices can be predicted very accurately. If there is a limited portfolio of potential buyers, or the market is volatile, or demand is price-sensitive (as with commodity products), the project is vulnerable to many adverse circumstances over which the project manager has little influence. However, the existing market environment provides a wealth of information on which to base sales forecasts, establish price structures, understand potential purchasers and consumers, evaluate expected trends in demand and the actions of potential competitors, and learn about the expected quality of the product or service.

SUPPLY CONSIDERATIONS

Existing supply conditions are also important sources of information. The feasibility study should assess the cost, quality and availability of capital equipment, raw materials and labour. Different technical options should also be explored, and specialist technical advice obtained on their feasibility.

FINANCIAL PROSPECTS

The profitability of the project can be analysed by applying economic evaluation techniques (Section 2.4).[8] The financial feasibility also depends on whether the expected return from a project is sufficient to finance debt

and provide shareholders with an adequate return to compensate them for their risk. Financial feasibility is influenced by economic conditions such as interest and exchange rates prevailing when costs are incurred and income received. The approach differs for projects in the private or public sector. The latter often take account of non-monetary benefits and costs, as well as factors such as environmental impact. Shadow prices are used where the market price is considered not to reflect the economic cost or benefit of an input or output of the project. The private sector usually places more weight on purely monetary return, although legislation, tax benefits or subsidy, and public relations considerations may encourage it to place value on non-monetary factors.

Adequate consideration must be given to risk and uncertainty (Chapter 10). Risk and uncertainty cannot be eliminated, but they can be managed and reduced by prudent project design and management, and taken into account in comparison of project options. You should also remember that the shareholders' evaluation of the project, and hence the share price of the company, depends on their assessment of the risk.

Initiating the study

The following five steps are required in setting up a feasibility study.

MANAGEMENT TEAM

Appoint an experienced manager and management team. The make-up depends on the nature of the project. For the feasibility study, it should include technical, financial and marketing expertise, and for larger projects may also have economists, legal and environmental experts, human resources experts, etc. It is essential that a good balance is struck between specialists, as assessment of the options may be biased if one specialism dominates. For example, if technical experts dominate, they may emphasize technically exciting options that may not provide the required financial return. It is often helpful to limit the size of the core management team, as far as the size of the project allows. Compact teams are usually easier to organize and coordinate than larger groups. The manager of the study will usually not be the project manager for subsequent stages. However, it is usually a good idea for the latter to be a member of the management team for the study, and thus have greater ownership and commitment to the results of the study, the decisions made and the strategy set.

SCOPE THE STUDY

Examine the scope of the study to assess the work involved and any constraints imposed (quality, cost, time, etc.). The manager must determine exactly what the decision makers require to guide them in their choice of

the project options, and in what form the information is needed. A work plan with the delivery time and content of interim and final reports should as far as possible be agreed in advance with the decision makers. Remember, project management is fractal management; the study needs planning as much as the implementation of the project.

EXTERNAL ADVISERS

Appoint external advisers to supplement the expertise of the core team. It might also be necessary to obtain certain permission and consents, if only on a provisional basis. It would be prudent, for example, to obtain outline planning permission for any construction work envisaged in the project.

PLAN THE STUDY

Draw up a plan for the study, including a milestone plan and responsibility chart. The milestone plan should identify key stages for the study; interim and final reports, meetings, data collection, etc. The plan can highlight different lines of enquiry involved and their interdependence, enabling the different aspects of the study to be coordinated. It should be robust, but sufficiently flexible to cope with any unexpected changes. Adequate allowance should be made for the time required to request and collect data as well as processing and interpreting results.

SCHEDULE THE STUDY

Set the timetable and budget for the study. These must be sufficient to enable options to be properly explored and refined, without endangering the feasibility of the whole project. It is important to budget for an adequate exploration of the options without going to the depth of investigation required for the design and appraisal stage.

The Project Definition Workshop (Section 11.6) can be used to undertake the fourth and fifth steps, as well as developing the initial project definition and strategy.

Managing the study

Once it has been planned, the following are the three main elements to managing the feasibility study

ORGANIZATION

This involves the adoption of a clearly focused but flexible structure based around the milestone plan. The team should be aware of what is expected, and by when. They should understand how they fit into the study framework, and to whom they should report. Hence, roles and

responsibilities must be clearly defined. The responsibility chart is the tool which effectively achieves this.

IMPLEMENTATION

This requires efficient communication within the team. The manager should maintain frequent contact with sponsors to ensure the study remains on target, and any change in requirements is identified. The team should maintain good internal communications to ensure delays are reported, to minimize knock-on effects, to avoid duplication, and to confirm all information received has been made available to all members of the team. It is particularly important that good communication is maintained between team members in different fields of expertise to ensure any inter-dependencies are taken into account.

CONTROL

This is the responsibility of the manager who must ensure that milestones are being reached on time, and that the milestones adopted leads to punctual report delivery. Likewise, costs should be monitored to ensure the study remains within budget. Control involves both monitoring of timing and budgets, and rapid and effective corrective action when targets are not met, either by revising targets, or by restructuring present plans within the existing targets. The detail of how work is assigned to people and their progress monitored and controlled, during the feasibility study or any other stage is discussed under execution and control in the next chapters.

Completing the study and transition to the next stage

The feasibility study should act as a springboard for design and appraisal, ensuring it is able to commence in a focused way. The end product should therefore comprise a clear, concise report, the Project Definition Report (Section 11.7), which presents the original specification and objectives, with the conclusions and recommendations for use in the next stage. The report should highlight advantages and disadvantages – cost, revenue, strategic considerations, economic benefits, etc. – for each of the options which deserve further consideration and the proposed solutions to issues confronting the project. Furthermore, the report should indicate sensitivities to variations from the assumed base case.

11.5 Design and appraisal[b]

The second stage of the life cycle is design and appraisal. The primary emphasis in this stage is the development of the project model (Table 11.3). The original outline requirements as expressed by the client in the Project

Definition Report are subjected to more rigorous examination to define exactly what is to be done to achieve the project's objectives. A systems design is developed for the facility, the product it will produce, and the method of building it. This last defines the scope of work for the project at the strategic level (Chapter 5). The project organization is developed at that level, and roles and responsibilities of departments, functions, disciplines, or their managers, are described (Chapter 6). The quality specification, the cost of the project, the time scale and the risk are all planned and estimated at the corresponding level of detail (Chapters 7,8, 9 and 10). From this information we determine whether or not the project is viable and represents a good investment at the accuracy implied by the third line in Table 8.4. This appraisal process is vital, as it is the last chance the sponsor has to decide whether to proceed with the project before committing scarce resources to execution (Figure 11.4). Many of the issues investigated in design are the same as in the feasibility study, but at a lower level of detail. It is not my intention to repeat the discussion of what is investigated, but to focus on special management problems arising in the design and appraisal process.

The design is developed at several levels of the project and stages of the life cycle (Table 11.5), corresponding to different levels of accuracy listed in Table 8.4. It is common to show the life cycle as a serial process, beginning with feasibility and continuing through design and construction, until the facility is commissioned and producing the desired output. Most of the life cycles described in Chapter 1 follow this model. However, the reality of many projects is different. Design in particular is an iterative process, proceeding through these several levels, as our understanding is refined. At each level, the designs must be checked back to the assumptions set in the project's strategy. Even at one level, there may be several iterations, as the

Table 11.5 Life cycle of the design process

Design stage	*Design name*	*Activities*
Definition	Customer requirement	Appointment and problem definition Establishment of solution criteria
Feasibility	Functional design	Evolution of alternative solutions
Appraisal	System design	Evaluation of alternatives Selection of preferred solution
Detailed design	Detail design	Detailed design of selected solution
Delivery	As-built design	Manufacture and assembly Facility construction

design proceeds through several formats. In ship-building, the paper design is converted into a plastic model, then into a wooden model from which fabrication jigs are made, before the first vessel of the class is made. The ship is thus made four times before it is completed: once each in paper, plastic and wood, and then the first time in metal. The design process is therefore not a single activity, but a set of activities ranging from the outline requirements to the detail design, and these cover all the stages of the life cycle. The computer industry has developed a spiral model of the life cycle (Section 18.6), which reflects the reality of the design process, and perhaps has applications elsewhere.

The concerns of the project manager during the design process include:

- managing the design process
- managing the urgency
- managing the user
- design, estimation and risk
- managing the appraisal process.

Managing the design process

Design involves the production of information to enable a solution to be selected from a series of options and to allow one scheme to be manufactured or constructed. Information can be in the form of drawings, calculations, computer output, bills of quantities, specifications or fabrications. The target for a good design manager is to produce the right amount of information, using the right people, at the right time, to budget and to the client's satisfaction, while making a profit for their employer. This balance is not easy to achieve. Engineers are notorious for trying to satisfy the client's requirements, while forgetting the need of their own company to make a profit! The application of good project management procedures to the design process can help to ensure the balance is achieved. It can make the process more flexible, allowing the design to proceed efficiently within a framework of gentle control, in which all the designers know what they are doing, why, when it is needed and what to do if the answer they come up with is not the one originally envisaged.

While on paper the application of a project management to the design process may seem to solve all ills, reality is often very different. The project manager not only has to deal with the vagaries of their company's management structure but that of the client and fellow consultants as well. In a busy commercial environment, they rarely have exclusive use of all the experienced designers they require, and so must draw on external resources, competing for the expertise they need. They also often have to deal with heavy pressure from the client to produce action and results. The need for

careful planning before quantifiable results are produced is often not understood.

A good design project manager needs to recognize the problems of working in the real world, and be able to tailor their management style to suit the environment. Some projects may be large enough for a task force to be developed with a good working relationship, making communication and management easier. Others may be multi-disciplinary, involving short-term input from many different parts of the company which have to be very highly controlled to ensure that the correct product is produced. Yet other projects may be small with very swift programmes which have to be fitted in between the longer running projects cutting across other deadlines. The busy project manager will normally have to deal with all these types of project at the same time and for different clients.

We saw above that the design process has four key stages (Table 11.5), which apply for each work package within a project as well as for the project as a whole. Prior to starting work on any of the stages, the design project manager should consider how the project will be planned and controlled. There are those who say that design as a creative process cannot be controlled. However, to be of value the facility must be obtained by a certain time (Figure 9.2) and so the process must be managed. Examples 11.2 and 11.3 contain checklists for planning and control of the design process produced by a firm of design consultants. The design manager has to be as much a juggler of resources, costs and time as managers in any manufacturing or production process. In some ways the problem is more complex because the 'product' is unique and can change many times prior to completion. The manager must strike a balance between too much planning and not enough control and too much control and not enough planning, in all aspects of the design process.

PLANNING THE DESIGN PROCESS

P1 Examine the problem carefully with the client and, if possible, with their advisers. Establish what exactly the task is and agree a fee structure for the work, covering various stages of design and taking note of the often highly variable nature of the initial design studies.

The fee arrangement may also include a collateral warranty. This is now commonplace in the construction industry as a result of recent case law on the question of latent liabilities. This must also be recognized and dealt with as a milestone, because the client frequently cannot get funding released for the project from the backers until the document is signed and completed. The time necessary to complete these procedures is often underestimated, which can cause delays.

P2 Establish the basis of a planning network, identifying key milestones to be achieved in design. Plan to do the detailed planning of each phase only when it is necessary, that is on a rolling basis.

P3 Confirm the work breakdown, and identify the packages of design work. Seek to use of the appropriate work-package managers and teams from within your company. Select the right people for the right job, and match personalities to the nature of the task. A careful, meticulous detailer cannot drive a high-pressured fast-track project forward, but should be used to give support to the innovators and strong managers.

P4 Assess time and resource requirements for each phase of design work (at the appropriate time) using your own experience combined with that of the work-package managers.

P5 Check each stage resource allocation against the fee available prior to undertaking the work. If the fee is too small re-evaluate the amount of design proposed, and reduce or delay applying resource or renegotiate the fee arrangement. Aim to do the right amount of work at the right time.

P6 Establish the resources available for each stage are sufficient to meet the programme, using your master design plan as a basis. Introduce contingency allowances at a fairly high level in the plan so that you can control slippage. Try not to build contingency in at each level or else you will never create a workable programme.

P7 Establish, jointly with the department managers in your company, whether your use of their staff (particularly when the project is multi-disciplinary) is compatible with their other commitments and schedule the resources accordingly. Tie this back to the basic network and evaluate any overall effect on the programme. As far as possible smooth out resource peaks to enable easier overall company staff planning, and seek to adjust project priorities to suit. A balance always has to be struck.

P8 Establish work packages, and, if at all possible, write down a brief for the managers as clearly and in as much detail as possible. This is often difficult to achieve, but is very important because it establishes a firm criteria against which success can be measured in each design package. Ensure this brief is a living document, and that it is continually referred to and updated by mutual agreement of the project manager and work-package manager as the design evolves.

P9 Establish the critical path from your network (using rolling-wave planning). In theory your critical path should be determined from the outset by the production of a stable network plan within which variations can take place. In practice, this may not be so easy to achieve as there are usually many unforeseen events which erode your contingency allowance and cause the path to shift. It is, however, always these key activities which dictate whether or not the project is completed on time.

Information and the resources needed are the keys to the well-being of the whole project. It has been suggested that 80 per cent of design problems come from 20 per cent of the activities. However, an over-preoccupation with

activities currently identified as critical can also backfire by reducing your awareness of other non-critical areas which can suddenly become critical. A balance has to be achieved and progress on each facet of the network must be regularly monitored and controlled.

Example 11.2 Planning the design process

CONTROLLING THE DESIGN PROCESS

C1 Establish communication systems. Decide which level of designer should talk to which level in the client or consultant teams. Ensure that you are always in the picture as to progress. Ensure that work-package managers are aware of their responsibility to control communication. Only correct, considered information should be released to avoid incorrect action by outside bodies which would destroy confidence in the design team's abilities.

C2 Establish a design review procedure. Regular (fortnightly) design reviews should take place to ensure the whole package is moving towards its target. An open forum in which package managers can discuss problems should be encouraged. People must not to hide major problems but discuss them and seek help before they get out of hand.

C3 Establish a design-checking procedure to interface the review process. Some projects need a full quality assurance (QA) system. This must be identified at the outset to ensure a quality plan is written and implemented incorporating project management systems identified. Some projects (e.g. bridges designed for the Department of Transport) have checking procedures established for each stage. These may include formal checks by other firms.

The checks and consequential alterations must be programmed at each stage of the design, and adequate resources and time allowed. If QA is required, you must remember this is only an aid to sound design office procedures and not a substitute. QA should only help formalize those procedures already being undertaken.

C4 Establish a regular system of meetings to interface the usual client/consultant design team meetings. These meetings may be held instead of or as well as design reviews, depending on the complexity of the job, and should bring together internal design issues and a review of external influences on the design. Following these reviews a short statement of progress addressing key issues and problems should be prepared for issue to the client. Areas where information is required or where instruction is needed should be identified.

C5 As changes occur ensure that the reasons are communicated if appropriate down to the people doing the draughting. There is nothing more demoralizing than facets of the design being repeated when the reason is unclear. Although this may be tedious for the work-package managers, the project manager must encourage the team to keep communication lines open. One must always be

conscious of the needs and desires of the individual as well the objectives of the project or else neither will be achieved.

C6 Once the design has begun, check expenditure against forecast costs and fee income regularly. Often delays cause an increase in resources to recover the programme. Delays may require you to move staff from one project to another to avoid overloading one and underresourcing another. While your plan and control systems should allow you to accommodate this, the financial side of your company must not be forgotten. Computerized monthly job cost summaries are out of date before you receive them so ensure you know what the projected cost effects are before they occur.

C7 Changes to the design brief are often made by the client as the design develops. This is a natural part of the design process as the client begins to understand the impact of earlier decisions. While some change should be tolerated, major changes must be controlled, and additional fees sought before embarking on the additional work required. If the client is not aware of the financial implications of the decisions, they will request changes without a second thought, which can rapidly cause your company to make a loss.

C8 Establish which outside bodies (stakeholders) must be consulted, and obtain their approval prior to commencing. These may be statutory bodies, environmental groups, planning authorities, etc. Time to obtain such approvals must be allocated and milestones recognized. You may also require discreet input from the consultant team at regular intervals, and vice versa, depending on the product. You must identify and programme this flow of information as a strategic part of your design process.

Example 11.3 Controlling the design process

Managing the urgency

There is often a tendency to try to shorten the design process to begin work on a project. We saw in Chapter 1 that people tend to jump from perceiving a problem to selecting a solution, or worse to implementing one. They then never truly determine the cause of the problem and the best method of solving it; they just paper over cracks. It is always important to put adequate time and effort into the design process, and the way to ensure this is to have a proper project plan for the design stage, which measures the progress of the design towards completion against a series of milestones. Those people who are keen to begin execution can then follow this plan and progress their work accordingly.

There can also be a tendency to overlap implementation and design to make better use of available skilled resources. This is what was described in Section 4.4 as *fast build*, *fast track* or *concurrency*, which are associated with increasing risk. The importance of allowing the design stage to take its course cannot be overemphasized. However, we shall now see that the project manager must guard against the opposing risk, namely the desire of

the designers to develop the ideal solution or prolong the design period because of the inherent job interest it offers.

Managing the users

Throughout design, designer, client and end user must remain in close dialogue to ensure that the design meets the user's needs. In Chapter 7 we saw that this is the ultimate measure of the quality. However, it is important that the designer and user are not allowed to change the requirements so frequently that no progress is made. Managing the user is vital. The challenge is to ensure essential changes are incorporated, but 'nice to haves' are avoided. Many people suggest freezing user requirements at an early stage. However, that can lead to ineffective solutions, as the process of designing the facility and its product can help to clarify user requirements (Section 19.3). What is actually needed is the application of effective configuration management so that the design moves steadily forward, until a viable design is produced which also meets user's needs.

Managing the appraisal process

Appraisal is the process by which the viability of the project is finally checked before money is committed to its implementation. If the appraisal process results in approval for the project, the sponsor gives authority for the project to proceed and raises finance for it. The appraisal of the project is based on many of the issues identified in the feasibility study, and the methods of analysis outlined in Section 2.4. The project may be compared against quantitative criteria: first that it meets certain minimum investment criteria; and secondly that it compares favourably with other projects competing for the same scarce finance. However, it may also be compared against qualitative criteria, such as its impact on the business, its impact on the environment and its popularity with the stakeholders.

At this stage it is important to perform a thorough analysis of the risk so that appropriate risk reduction measures can be implemented (Chapter 10). It can be useful to appoint an independent team to audit the risk, as the people who have performed the design and undertaken the initial appraisal may be too close to the project to take a dispassionate view. They may be unable to see the obvious risks. The team of auditors may be external consultants, or a separate team of internal designers who have not been involved with the project to date. This issue was also discussed in Section 7.2.

11.6 Initiation, launch and kick-off meetings

Launch workshops were introduced in Section 11.2 as a way of initiating the current stage. Indeed, mini-workshops may be held at the start of work

packages, in accordance with the rolling-wave principle. A workshop held at the start of proposal and initiation is called a *Project Definition Workshop*, and at the start of design and appraisal a *design initiation* or *kick-off meeting*. (A similar meeting, a project initiation meeting, may be held at the start of execution and control.) In this section, the objectives, attendees, agenda and timetable of these workshops are described.

Workshop objectives

The main objectives of the workshop are given below:

1. *Gain commitment and build team spirit*: this is the primary objective of a workshop. Many of the others can be achieved by people working alone or meeting in smaller groups. By coming together, they may develop a common understanding, and resolve items of confusion, disagreement or conflict through discussion. If people are briefed after a meeting, (presented with a *fait accompli*), they may nod their heads in agreement, but you often find they do not truly accept what they are told. If people agree to a course of action in a meeting, you usually find they have internalized that agreement, but if they have not, it is difficult for them to avoid their commitments later because several people have heard them make them.
2. *Ratify earlier project definition*: whatever stage is being launched, it is vital for the team to agree what the current level of definition entails, and that it truly represents the user's requirements.
3. *Plan the current stage*: the workshop is used to launch the current stage, and so producing a plan for the stage is key. This should at least consist of a milestone plan and responsibility chart.
4. *Prepare preliminary plans for execution*: it is usually worth while to prepare a draft milestone plan for execution, as this can be a useful basis for the feasibility study or design, even if the subsequent project follows a slightly different course.
5. *Prepare preliminary estimates*: this gives the project team some idea of the expectation of the cost and benefit of the project. Although their subsequent work should not be constrained by the estimates, it can help to set the basic parameters.
6. *Assess risk and develop risk reduction strategies*: Preliminary risk analysis should be undertaken, and risk reduction strategies developed.
7. *Start work promptly*: the workshop should be used to plan the initial work of the current stage, so that the team members can make a prompt start.
8. *Agree a date for reviewing the stage deliverables*: ideally the plan should contain a time scale and budget for the stage. An end date, at least, should be set for completion of the stage, so that it is not left open-ended.

Workshop attendees

The workshops should be attended by key managers, including:

- the project sponsor and champion
- the manager of the current stage
- the manager designate of future stages, especially execution
- key functional managers whose groups are impacted by the project, including technical managers, user managers and resource providers
- a Project Support Office manager
- a facilitator.

The sponsor may attend the Definition Workshop, but not later ones. Possible attendees for a Project Definition Workshop on the CRMO Rationalization Project are given in Example 11.4.

The *sponsor* may be a main board director or regional managing director
The *champion* may be the regional managing director, the operations director, the financial director or the technical director
The *manager of the feasibility study* may be the champion
The *project manager designate* may be the customer services manager, the network manager or the IT manager
Key *functional managers* will include these three, the estates manager, the finance manager, and the sales and marketing manager
There may already be a *Project Support Office* in the IT or networks department, otherwise a field Planning Office could fulfil the role

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Example 11.4 Project Definition Workshop attendees for the CRMO Rationalization Project

Workshop agenda

A typical agenda for a workshop is:

1. Review the current project definition.
2. Define the objectives of the current stage.
3. Develop solutions and criteria for evaluation.
4. Assess risks and assumptions.
5. Prepare a milestone plan for the current stage.
6. Prepare a responsibility chart against the plan.
7. Estimate work content and durations for the work packages.
8. Schedule the work packages.
9. Assess risk and develop reduction strategies.
10. Prepare initial activity schedules.
11. Prepare a management and control plan.

Most effort goes into the milestone plan and responsibility chart, as that is

the most effective use of group working. Sections 5.4 and 6.3 show how to develop them using whiteboards, flip charts, Post-Its and an overhead projector. Involving everyone present around a whiteboard, gains their commitment to the plans produced. Working around a table with pen and paper can isolate members of the team from the working process. Estimates and schedules are best agreed through a process of negotiation immediately after the workshop. The initial activity schedules are prepared so that the team members know what to do immediately following the meeting; it is an initiation meeting (Example 11.1). The management and control plan agrees the approach to be used in managing the project and the mechanisms, priorities and frequency of the control process. It may be the basis of the management approach outlined in the Project Manual.

Workshop timetable

A workshop typically lasts one to four days. I usually allow two hours per item, except items 5 and 6 for which I allow four hours. However, it is important not to stick rigidly to a timetable, but to allow discussion to come to a natural conclusion, as people reach agreement and a common understanding. I sometimes include project management training as part of the timetable, which extends the duration by about a day. I find it useful to schedule a break in the middle of agenda item 5. When developing a milestone plan, people often reach a blank; the plan will just not make sense. However, when left for a while, it just seems to fall into place.

11.7 Project Definition Report and Manual

In Section 11.2, I introduced the Start-up or Stage Review Report, which gathers the results from the work of one stage, and is used to launch the next stage. The report produced at the end of proposal and initiation is called the Project Definition Report, and that at the end of design and appraisal the Project Manual. In this section, I describe the objectives and content of these two reports.

Objectives of the Project Definition Report

The Project Definition Report, sometimes called the Client's Requirements Definition or Statement of User Requirements, gathers the results of the feasibility study into a readily accessible document. It is a handbook for the management, design and execution teams, which defines what the owner expects from the project, and the reasoning behind the chosen options and strategies. This reasoning can always be open to questioning. It is healthy that the teams involved in later stages question earlier decisions. However, by having earlier reasoning recorded, the project teams can avoid repeating

work, and more importantly avoid following previous blind alleys. The Project Definition Report will also be used to launch design and appraisal, and may be the input to a kick-off meeting at the start of that stage. Hence, the objectives of the Project Definition Report are:

- to provide sufficient definition, including costs and benefits, to allow the business to commit resources to design and appraisal
- to provide a basis for design and appraisal
- to provide senior management with an overview of the project's priority alongside day-to-day operations and other projects (both proposed and on-going)
- to communicate the project's requirements throughout the business
- to define the commitment of the business to the project.

Most of these objectives look forward; the report is not produced as a bureaucratic exercise to record the feasibility study, but as a basis for the future stages.

Contents of the Project Definition Report

The suggested contents of the report are:

I *Preface*: outlines the objectives of the document, as described above.
II *Management summary*: a one-page summary for senior managers.
1. *Background*: sets the context within which the project exists, and may describe the purpose of the higher level programme of which the project is a part.
2. *Purpose, scope and objectives*: the reason for undertaking the project, with expected returns, the sort of work needed to achieve that, and the product to be produced by the project in order to achieve the returns.
3. *Work breakdown structure*: initiates work breakdown, stating with areas of work and including a milestone plan. A target schedule may be included.
4. *Project organization*: defines the type of project organization, including:
   - organizational units within the business involved in the project
   - their involvement in different areas of work
   - managerial responsibility for different areas of work
   - the type of project organization to be used
   - the location of project resources
   - the source of the project manager
   - their source and limits of authority

   and describes the responsibilities of key managers and groups in the business, including:
   - project sponsor, champion and manager

- work area and work package managers
- project steering board
- quality assurance board and Project Support Office manager

It may be necessary to include a tentative resource schedule, so the project can be assigned priority. This schedule is derived from high-level assumptions, applied to areas of work or work packages. It should not be based on a detailed definition of work, except in areas of high risk, because that requires an investment in planning resources before the business has agreed to commit it.

5. *Project management system*: defines the tools and techniques for planning and controlling the project, and supporting computer systems. This may include preliminary quality plans and control procedures.
6. *Risks and assumptions*: stated for future reference, and to allow adequate account to be taken in the investment appraisal. This section should record the results of the risk analysis, the risks, their impacts and potential reduction strategies. It is also possible to record solutions discounted, with reasons, to stop future people joining the team from following blindly others previously discounted.
7. *Project budgets*: the initial estimates for the project, and a statement of the maximum amount which can be spent to justify the expected benefits.
8. *Project justification*: an investment appraisal performed using the estimates as they exist, against defined investment criteria. This will justify the commitment of resources to the design and appraisal stage.
9. *Appendices*: contain many of the preliminary plans.

Example 5.1 contains items 1, 2 and part of 3 for the CRMO Rationalization Project. Item 3 may also include a milestone plan, and work-package scope statements, (Example 5.2). Item 4 will be partly descriptive, but may include a responsibility chart. Item 5 may also include responsibility charts, such as that in Figure 6.9, and a recommendation of how to use a computer-based project management information system. Chapter 16 of this book covers the contents of item 5.

The report is typically 10 to 40 pages long, depending on the size and complexity of the project, and its impact on the organization. It is developed throughout proposal and initiation. However, once ratified by senior management at the end of that stage, it should be sacrosanct, and only modified by formal change control.

Objectives of the project manual

The results of design and appraisal are recorded in a Project Manual. This is a definitive document which explains how the owner's requirements set out in the Project Definition Report are to be delivered by describing the

objectives, scope and management strategy for the project as they are defined at the end of the stage. It is used as the briefing document for all people joining the project team in execution and control.

The manual is developed progressively by the project manager from the Project Definition Report throughout design and appraisal. The draft manual is reviewed by the owner and project manager together, until it is signed off at the end of the stage as reflecting their mutual understanding of how the owner's requirements are to be delivered. When the manual is signed off, the project manager must accept responsibility for delivering the project as defined in the manual, and from that point on changes to the manual can only be made through strict change control. The development of the Project Manual, and the master plan it includes, often represents the largest proportion of the project manager's efforts during design after the management of the actual design process itself.

Throughout execution and control, the manual is extended down to the work-package level, as part of the start-up of individual work packages. The manuals at the work-package level must be derived from the Project Manual, but they may highlight the need for modifying the Project Manual.

Contents of the Project Manual

The contents of the manual may include the following items:

1. *Project description and objectives*: summarizes the Project Definition Report, as modified by the design and appraisal process (Example 11.5).
2. *Master project plan*: forms the major part of the manual. The design and appraisal process will result in this master plan for the project. The contents of this plan, which cover the definition of scope, organization, quality, cost and time in the project model, are summarized in Table 1.7.
3. *Management plan*: describes how the project is to be planned, organized, implemented and controlled, although the first two now only need to be done at lower levels of work breakdown.
4. *Performance specification*: defines the required levels of performance of the facility and its product. This is one of the major elements of the quality specification of the project, and will have been developed and refined during the design process.
5. *Functional specification*: explains the technology to be used in the development of the facility, and how that will function to deliver the required output.
6. *Acceptance tests and acceptance criteria*: are derived from the previous two, and are an important part of the manual. They must be defined before work starts for two reasons. First they must be independent. The project team members must not be allowed to develop testing procedures

which match the facility built. Secondly, the project team must know how they are to be judged, if they are to deliver a quality product. In Chapter 7, quality was defined as meeting customer's requirements. These must be defined in advance so that the team members know what their objective is, and they do not produce a product which is either over- or under-specified.

7. *Project constraints*: are derived throughout the first two stages, and so must be recorded for all people joining the project at a later date.
8. *Risks and assumptions*: must also be recorded for two reasons. So people joining the project later know what has been addressed, and so others, especially owners, sponsors financiers and auditors, can see they have been properly addressed and that adequate weight has been given to them.

I had a discussion with managers attending a course at Henley Management College about whether the manual would contain the Definition Report in its entirety, or whether it would be summarized into a single section as a background. We decided on the latter for two reasons. First, it is the job of management to summarize the instructions from the level above when passing them on to the level below, so the next level down can focus on those things which enable them to do their jobs effectively. You inform people on the next level on a need-to-know basis. This does not mean you need to be excessively secretive. You tell the next level enough to motivate them, and make them feel part of the overall management team, without overburdening them with unnecessary information. Secondly, taken to the extreme, you would include the entire corporate plans in the briefing documents to every project.

Example 11.3 Summarizing the Project Definition Report in the Project Manual

11.8 Summary

1. Part Three follows a four-stage cycle:
   - proposal and initiation
   - design and appraisal
   - execution and control
   - finalization and closure.
2. There are four stages of team formation:
   - forming
   - storming
   - norming
   - performing.
3. Project start-up is a structured way to moving the project team quickly

and effectively through these four stages, so as to:
- define the project's context and objectives
- develop the project model
- define the management approach
- commission the facility and hand it over.

4. The methods of project start-up include:
   - stage launch workshops
   - start-up reports
   - ad-hoc assistance.
5. The foundation of the success of the project is secured during the proposal and initiation stage by:
   - setting project objectives and scope
   - developing the project model at the integrative level
   - defining the project organization.
6. A feasibility study is an initial study into the solutions for achieving the objectives and has four objectives:
   - to explore all options
   - to understand all the issues
   - to rank the options
   - to plan the way forward.
7. The feasibility study will address the following issues:
   - market conditions
   - supply considerations
   - financial prospects.
8. The concerns of the manager during the design process include:
   - managing the design process
   - managing the urgency
   - managing the user
   - managing the appraisal process.
9. Appraisal is the process by which the viability of the project is finally checked, and is the last chance to stop the project before significant amounts of money are spent on its delivery.
10. A stage launch workshop may be held with the objectives:
    - to gain commitment and build the team spirit
    - to ratify the project definition as produced in the previous stage
    - to plan the current stage of the project
    - to prepare preliminary plans for the execution stage
    - to prepare preliminary estimates for the project
    - to ensure work starts promptly
    - to agree a date for review of the stage deliverables.
11. A Project Definition Report may be prepared with the objectives:
    - to commit resources to design

- to provide a basis for design
- to set the project's priority
- to inform all those affected by the project
- to gain commitment.

12. The contents of the report may include:
    - background
    - purpose, scope and objectives
    - work breakdown structure
    - project organization
    - project management system
    - risks and assumptions
    - project budgets
    - project justification.
13. The systems design produced during the design and appraisal stage may be summarized in a Project Manual, which may have as its contents:
    - project description and objectives
    - master project plan
    - management plan
    - performance specification
    - technical specification
    - acceptance tests and criteria for acceptance
    - project constraints
    - risks and assumptions.

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Notes

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b. Section 11.5 incorporates material from the first edition based on contributions made by Mahen Tampoe and David Topping.