4th edition

PROJECT
MANAGEMENT

A practical guide to planning
and managing projects

STEPHEN HARTLEY

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'Incorporating practitioner insights, theoretical interpretations and popular methodologies, Hartley provides a practical framework for developing personal competence, professional capability and organisational maturity in project management.'

—Steven Boyd PhD FAPI GAICD, Program Coordinator, Property Economics and Development, University of the Sunshine Coast

'…suitable for any type of project, the text was relevant, the content easy to follow and it actually challenged and changed my thinking around how I have always managed my projects.'

—Paul McQuaid, Inspector, Queensland Police Service

'…combination of real experience, theoretical knowledge, practical suggestions and even humour (which I enjoyed), and written in an easy to understand and captivating manner.'

—Lisa Smith, Executive Manager, Human Resources, STEPS Group Australia

'…a practical and useful resource that added significantly to my understanding of the bigger picture with the tools to actually plan, manage and control the project instead of letting the project manage me like every other time.'

—Gabriel Oriti, Operations Manager, BEVCO NT

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The author refers to PMBOK, PRINCE2, MBTI, Disc and Belbin many times in the book.
They are all trademarked and the appropriate symbol appears against the names the first time they appear in the body of the text. Thereafter, they are used without the symbol.

For my parents, Alexander William Hartley and Kathleen May Hartley (née Kohn), for giving me what they never had: the opportunity to learn.

Contents

List of tables and figures

Tables

Figures

Acronyms and abbreviations

AC	actual costs
ADR	alternate dispute resolution
BAC	budget at completion
BAU	business as usual
CEO	chief executive officer
CIO	chief information officer
COO	chief operating officer
CPI	cost performance index
CPM	critical path method
CV	cost variance
D&C	design and construct
DCF	discounted cash flow
DSDM	Dynamic Systems Development Method
EAC	estimate at completion
EOI	expression of interest
EOT	extension of time
ETC	estimate to complete
EV	earned value
EVA	earned value analysis
EVM	earned value management
HRM	human resource management
IFB	invitation for bid
ISO	International Organization for Standardization

ITT	invitation to tender
KPI	key performance indicators
KRAC	keep, remove, add, change
MBTI	Myers-Briggs Type Indicator
MoSCoW	must have, should have, could have, won't have
MOU	memorandum of understanding
MSDS	material data safety sheet
NPV	net present value
PARIS	participate, approve, responsible, inform, signoff
PBOK	personal body of knowledge
PC	practical completion
PDCA	plan, do, check, act
PERT	Program evaluation review technique
PMBOK	Project Management Body of Knowledge
PMCD	project management competency development [framework]
PMMM	project management maturity model
PMO	project management office
PO	project office
PRINCE2	projects in controlled environments
PSG	project steering group
PV	planned value
RACI	responsible, approve, consult, inform
RBS	risk breakdown structure
RFI	request for information
RFQ	request for quotation
RFT	request for tender
ROI	return on investment
RPL	recognition of prior learning
SEAM	stakeholder engagement assessment matrix
SLA	service level agreement
SMART	specific, measurable, achievable, realistic, timeframed
SME	subject-matter experts

SMP	stakeholder management plan
SOP	standard operating procedure
SOW	statement of work
SPI	schedule performance index
SPMO	strategic management project office
SV	schedule variance
SWOT	strengths, weaknesses, opportunities and threats
TBC	total budgeted cost
TCPI	to-complete performance index
TOC	theory of constraints
TQM	total quality management
VAC	variance at completion
WBS	work breakdown structure
WHS	work, health and safety

About the author

Stephen Hartley is a leading practitioner, consultant, educator, researcher, author and coach in project management.

Drawing on 25 years' cross-industry experience, and with numerous industry, vocational and academic qualifications, Stephen is renowned for his expertise, refreshing honesty, personal insight, and an easy and engaging writing style that readers—both students, instructors and clients—find appealing and sometimes even entertaining.

Stephen has been 'doing' project management for over 25 years, 'training' in project management for over twenty years and 'writing' about project management for over fifteen years, with seven books published since 2002. He writes with obvious passion, professional credibility and a genuine interest in the educational value embedded in learning, transfer and application.

He works with projects every day: as the CEO of an education and training company, as a project manager and consultant, as a postgraduate MBA university lecturer in project management at the University of the Sunshine Coast, and is enrolling as a PhD student investigating how project management capability is learned in higher education.

Outside of project management, Stephen spends time with his partner and adult children, his Yamaha FJR 1300 and his German Shepherd. Stephen has a passionate interest in building project management capability in developing countries, and was the first unsponsored volunteer to lecture at the Souphanouvong University (Luang Prabang, Laos) in project management, along with systems development, English and Excel. As a director on a number of not-for-profit boards, Stephen finds time to give back to the community by supporting local charities with fundraising and working with a number of secondary schools, where he acts as a business coach for business and economics classes. He also delivers a series of free workshops for school

children of all ages to improve their confidence in developing and delivering classroom presentations.

Preface

Welcome to the fourth edition of *Project Management: A practical guide to planning and managing projects*. This revised text explores not only the principles, processes and practice of project management, but also the myriad challenges and opportunities created in trying to balance strategic initiatives (termed projects), organisational priorities and operational realities within project organisations.

The text continues the learning journey of how we plan and manage our projects, be they big or small, easy or complex, single or multiple, single-site or co-located. This new edition aligns with the Project Management Body of Knowledge (PMBOK®) and with industry requirements, international best practice and educational qualifications, as well as incorporating aspects of other well-known international (and lesser known) project management methodologies.

With the world continuing to do more and more business on a project management footing while pursuing shorter timeframes, cost reductions and performance innovation, there is also the reality of increasing compliance and transparency (welcomed or imposed), and the ever-present and pervasive impact of risk, which should, to the observant viewer, negate any organisation's attempts to rely solely on their technical mastery of budgeting and scheduling. Project management is so much more than the mere tracking, reporting and controlling of cost, schedule and performance variances. Yes, these are important, but not at the expense of the equally important cornerstones of project management.

For some, these cornerstones have essentially been 'borrowed' from industry and from the academic and government sectors, and they cover everyday business operations, finance, quality, risk, compliance, logistics, human resources, governance, administration, standard operating procedures,

communication, information technology, environment, work, health and safety, procurement, sustainability, life-cycles, legal issues, customer service and policy, to name a few.

While some researchers and practitioners interpret this as the project management discipline offering nothing new, I believe their argument is erroneous, as it misses the point. Surely the goal is the discovery, the acquisition, the development, the application, the testing and the evaluation of ideas, knowledge, techniques, tools, skills and abilities in terms of how projects are planned and managed successfully; thus a debate about source is largely irrelevant. As always, I welcome your feedback (both the good bits and the other bits) as you navigate your project management career, research or studies.

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Using this book

Project Management: A practical guide to planning and managing projects examines *both* project management theory and the reality of practising project management across a variety of contexts, industry sectors and qualification levels.

It has been designed and written around a single, fundamental goal: to enable and support your learning as you continue to build, revise and integrate your own unique and personal body of knowledge (PBOK) in project management that combines your personal research, trial and error, and lessons learned. There will always be projects, just as there will be learning challenges, frustrations, opportunities and improvements from each one, so don't rush the journey.

This book continues the conversational style that has proven popular in the last three editions and is written to engage and challenge you. And as you read through each of the chapters, you will come across sections called 'Critical reflections'. These do not introduce any new content; rather, a number of questions will challenge what you have read, understood and can apply in your own workplace. Theory isn't just for memorising and regurgitating: it is for applying, reviewing and amending.

For each reflection, refrain from simply listing what you have learnt. Instead, look back through the content and self-assess where the theories fit your project terrain and where they don't—in other words, what will and won't work in your project management approach and why. Your reflection should also address how you will implement the theory, any challenges you might face, whose support might be needed and the tangible benefits that might be realised.

Not only will these reflections critically assess your level of understanding and application; they will collectively contribute to you developing your project management capability (knowledge and skill), and maturity. So take your time when working through each of the critical reflections and get the most out of

these professional development opportunities.

In this edition there is something for students, instructors and practitioners:

For the student

In the book, you will find:

- project management life-cycle maps to help you integrate PMBOK® and/or your critical processes throughout your project
- critical reflections to capture all the learning as you progress through the text
- a glossary.

Go to the Allen & Unwin website for:

- 360-degree assessment tools for graphing your project management knowledge area competency, project management performance competency and project management personal competency
- fifteen project management templates (listed in Appendix 3) that you can use in your assessment and/or projects.

Tools available from the Allen & Unwin website can be downloaded here: https://allenandunwin.com/projectmanagement.

For the instructor

In the book, you will find new content covering PRINCE2®, Agile and Lean methodologies. Contact Allen & Unwin via academic@allenandunwin.com to request copies of the following supplements:

- Bloom's taxonomy of learning to promote higher level thinking (cognition)
- over 100 PowerPoint slides to reinforce the key points from the text, help you summarise the critical content and to get your students thinking about 'doing' project management and not just 'learning' project management
- solutions to the end-of-chapter review questions to assist student revision.

For direct and confidential access to the author, please email: stephen@creativecorporatesolutions.com.au. Student tools available from the Allen & Unwin website can be downloaded here: https://allenandunwin.com/projectmanagement.

For the professional practitioner

Regardless of your workplace experience or expertise, this book offers tangible and immediate benefits to project management professionals.
   Working through the book, you can:

■ critique your project success and failure against both the theoretical concepts and the pragmatic application of that theory in your workplace projects
■ validate your existing knowledge and skills, and self-assess your professional development needs
■ revisit the fifth edition of PMBOK® (which continues to expand), and review the ten knowledge areas.

Through the Allen & Unwin website, you can:

■ access 360-degree assessment tools for graphing your project management knowledge area competency, project management performance competency and project management personal competency
■ download an earned value table to calculate your project performance
■ download a self-report project management maturity assessment tool to determine your competitive edge as a project-driven organisation
■ access the fifteen essential project management templates (listed in Appendix 3) for use in your projects.

Tools available from the Allen & Unwin website can be downloaded here: https://allenandunwin.com/projectmanagement.

Getting the most out of this book

Reading, learning and applying can be a different journey. So, while there are no

hard and fast rules as to how to get the most out of this text, the following suggestions may prove helpful:

- Scan the headings in the chapter you are working on to get a feel for the key topics covered.
- Skim through the chapter before reading it thoroughly to 'get a feel' for how the text, figures and tables are used to illustrate the chapter content.
- Read with intent: to understand, to question, to apply and to reflect.
- Balance what you read with what you already know, to either validate your prior knowledge or to identify crucial gaps in your knowledge that you need to address.
- As you read, maintain a focus on your workplace projects.
- Take the opportunity to reflect on your personal knowledge and skills when assessing how to plan and manage projects.
- Create a bank of questions you think now need answering in the workplace as a result of the content covered.
- Take note of the new project management terms and expressions that you encounter in your studies, and start using them in your project communication.
- Take the time to research and find additional resources to broaden your overall understanding of project management.
- Develop a realistic study regime that works for you in terms of integrating work, family and other commitments that you will need to prioritise.
- At the end of each chapter, ask yourself: What have I learned? What is still missing? Where can I get this additional knowledge?
- Take every opportunity to convert content into practical procedures, practices and documentation aimed at improving how you plan and manage projects.
- If the theory doesn't fit your project terrain (reality), modify the theory first and then possibly modify the practice.
- Don't be afraid to ask questions of your instructor, your manager, or even your peers.

Finally, regardless of the methodology, framework or practice to which you align your projects (personal, proprietary or internationally recognised), remember that project management involves more than just the plan with its prime focus on the requirements, time and money (among others that we will explore in later chapters). Project management is about people, and people are seldom perfect in their intent, actions and outcomes, so take the time to find a balance between the processes, the paperwork, the practice and the people as you plan and manage your projects.

Enjoy and learn from all your project management experiences!

Project management life-cycle on a page

A lot is made of this life-cycle concept in project management (including in this text).

With life-cycles, there are agreed stages (or phases), a planned order, sequential evolution, checkpoints, approval opportunities and a whole lot more. I admit that there is more to life than project management life-cycles, but once you accept that every project (PMBOK®, PRINCE2®, Agile, etc.) evolves over a period of time from the assessment stage through to the completion (and possible evaluation) stage, it is the project management life-cycle that provides the necessary navigation to get you there.

Humans have life-cycles, economies have life-cycles, political parties have life-cycles, marketing goods and services follow a life-cycle—so why shouldn't project management have one too?

You should spend considerable time understanding the intent, process and benefit behind a life-cycle and how to construct one that both directs and controls the project's progression over time. While life-cycle concepts will be explored in more detail in a subsequent chapter, Tables 0.1 and 0.2 provide two examples below of what life-cycles could look like in terms of the information they capture throughout the project.

There is no right or wrong life-cycle template for how your project will unfold (three stages, four stages, six stages, etc.), just some practical ideas on what to consider when you put one together yourself. Feel free to amend mine, delete them or design your own life-cycle complete with however many stages your project requires and label each stage with whatever heading might be appropriate.

Table 0.1 Key project management life-cycle functions

	Assess	Prepare	Plan	Execution	Completion	Evaluate
Phase objectives						
Principal stakeholders						
Information needed						
Agreed deliverables						
Approvals required						
Budgeted cost						
Scheduled timeframe						
Project activities						
Major milestones						
Change control						
Relevant documentation						
Assigned resources						
Governance protocol						

Table 0.2 Project management knowledge areas

	Assess	Prepare	Plan	Execution	Completion	Evaluate
Scope management						
Time						

management	
Cost management	
Quality management	
Risk management	
Human resource management	
Communications management	
Procurement management	
Stakeholder management	
Integration management	

Project management

An adaptable body of knowledge

Risk management

Procurement management

Communications management

Integration management

Human resource management

Stakeholder management

Quality management

Scope management

Cost management

Time management

Key points

- What a project is and isn't
- Four interdependent project constraints
- Defining project management
- Comparing management and leadership
- Delegating by degrees
- Previewing four popular project management methodologies
- Navigating the project management life-cycle
- Factors behind project success and failure
- The Project Management Body of Knowledge (PMBOK)® knowledge areas

In practice

Why, these days, is nearly everyone working on one or more projects? Everything we do appears to be a project of one sort or another. People aren't simply working on tasks, files, activities or just 'work stuff' anymore—they are all, increasingly, on things called 'projects' for some reason.

Job advertisements are regularly populated with project management positions, while position descriptions are quickly being rewritten (sadly, not always well, despite the intent) with more of a project management focus to them. Business and industry are rushing to develop project management methodologies, processes, templates and software aligned to things called PMBOK®, PRINCE2®, Agile, Project ^{PRACTITIONER} (my own methodology), Microsoft Project, Primavera, along with a raft of other popular methodologies and tools. Academic qualifications, industry certification and public training in project management are increasingly in high demand.

Why the interest, why the focus, why the growing preoccupation with things loosely (and often incorrectly) called projects? Why is it that all this work will be (allegedly) better planned and managed with (allegedly) better outcomes merely by re-labelling it a project? Why is it that people believe everyone will become more committed and motivated to do the work because it is now called a project?

At the same time, look at what project work offers the organisation and the individual: strategic justification, executive mandate, operational prioritisation, not to mention a phased, controlled and approved evolution of performance, output and, one would hope, outcome. For the individual, it provides an opportunity to complete challenging work, to work with and or manage diverse stakeholders while also being part of a change initiative impacting the business. Perhaps the *true* question should be: Are they really projects at all? Further, having made this distinction, what actions does this then trigger? What benefits will be identified and measured? What deliverables will be planned, managed and handed over? How do organisations then begin to balance both these strategic initiatives with the constantly changing and competing operational priorities?

Chapter overview

Project management means different things to different people. For some, it represents a growing body of global knowledge, methodologies and best practice; for others, it is a borrowed set of methods, techniques, tools and tips modelled from the cornerstones of professional disciplines of accounting, risk,

finance, human resources, total quality management, or industry and business, and/or the government with its policy, regulatory and compliance frameworks.

Are projects strategic initiatives thought up by boards, CEOs and executive management? Are they initiatives that will drive the organisation forward in response to the challenges of global competition, market pressure, tight deadlines, limited budgets, contractual conditions or a heightened need for compliance, transparency and accountability? Or are they workplace priorities populated in the operational plans of the organisation? Clearly, projects are no longer the sole domain of construction, engineering and other capital works infrastructure projects. Projects have literally flooded into management, customer service, hospitality, sales, marketing, IT, operations, finance, legal, healthcare, banking, community services, economics, sport, real estate, logistics, education, manufacturing, tourism, aviation, insurance and administration, to cite just a few 'growth' areas across the private, public and not-for-profit sectors.

Should we embrace particular methodologies: the Project Management Body of Knowledge (PMBOK), PRINCE2 (projects in a controlled environment), Agile, Project ^{PRACTITIONER} (my proprietary methodology), or the myriad other options and solutions actively promoted to respond to the differing degrees of uncertainty, complexity, risk and value? Or does the solution rest with a raft of technical, people and conceptual management skills that will underpin the success of the project? Some projects will range from the ambitious to the mundane, from those sired and protected by 'sacred cows' to those that are underfunded, from projects that never should have been approved in the first place and those that should have had the 'plug' pulled on them a long time ago (if only the brave would step up!) to projects with unlimited funding (yes, unlimited funding still does exist in some commercial and government corridors —perhaps you know it as contingency funding). Some projects will require enormous resources, while others need only one or two people at most. Some projects will be political hot potatoes, attracting considerable publicity and controversy, while others will barely appear on the public radar. Some will have organisation-wide impacts; some will be driven by markets and competitors; others will be generated by external regulatory authorities demanding compliance. Some will be risky, some complex, others perhaps straightforward and still others perhaps mediocre in design, execution and management.

In recent times, the evolution of projects has increased exponentially to the point where the discipline, methods and tools behind projects (and their management) have reached giddy heights of application, sophistication and popularity. What is driving this modern-day development and interest in projects? Is it due to:

- the constant cycle of change within which business operates
- time-poor business driven by tight (sometimes impossible) deadlines
- advances in technology
- the increasing influence of market pressures
- global competition and the need to remain competitive
- greater rates of (financial) return required
- higher degrees of transparency, accountability and consistency
- an increased interest in measured outcomes (benefits accruing from the project)
- increased attention on legal and contractual obligations
- the need to deliver products or services meeting benchmarks, quality assurance or best-practice guidelines
- greater emphasis on businesses producing cost-effective solutions?

Perhaps the answer can be found in each of the points cited above, and the reason should be obvious. Projects have transformation at their heart as they create and deliver change of one type or another—small, easy, large, complex and over time—that must be managed effectively if the project is to succeed. In other words, projects provide the structure, the framework, the process—the perfect vehicle if you like—within which a change process is created and managed—however that change was initiated (a point that will be discussed in detail in later sections of this chapter). This is not to argue, though, that every change activity is in fact always a project.

However, irrespective of the known (and at times unknown) drivers and constraints behind each project, the project organisation will need to be clear about whether they are undertaking operational work (business as usual [BAU]) or strategic project work (change). Think about this crucial distinction for a moment because which would you do first: everyday operational routine work or time-specific project work?

Unwrapping project management

Organisations are rapidly becoming focused on a number of critical issues driving their continued success:

- the timing of decisions
- the costs driving the decisions

■ the impact that change will have on these decisions.

To deal with these issues, project management has grown both in academic stature and commercial acceptance as a technique, method or tool for successfully dealing with time-, cost- and change-driven decisions and their impacts. It is the perfect tool to deal with these issues. So the obvious question now is: What is project management? Let's start with a simple explanation. Think about any 'apparent' project (big or small) with which you are involved, with reference to the following:

■ the work required to be completed (scope)
■ who would be doing that work (resources)
■ the cost of the work being performed (cost)
■ how much time it would take to complete the work (time).

Now we can begin to bring our initial thoughts together. Project management in its rawest form essentially involves bringing together two over-arching and disparate (and at times conflicting) pieces of information—scope and resources —both of which have implications for costs and schedule. Put simply, something has to be done by someone within the constraints of time and budget. In other words, by combining all four, project management can be defined quite simply in terms of scope, resources, cost and time. Collectively, they represent the fundamental boundaries of the project (and 'boundaries' is a really great word that you will come to appreciate in all your projects), with each one intertwined tightly to the other three. That is, collectively they determine and communicate the project's configuration at any point in time as reflected in Figure 1.1. This point will be expanded on later in this chapter.
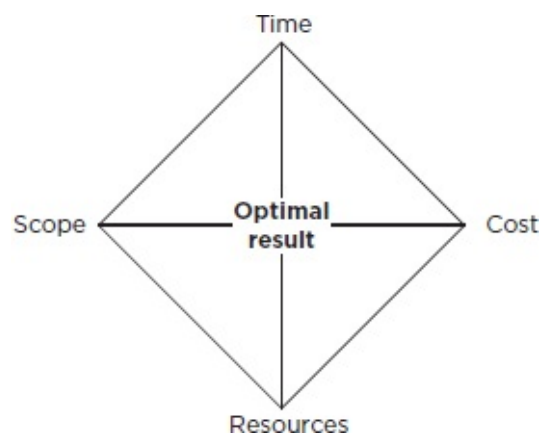
Figure 1.1 Getting the equilibrium

The scope: More than just the work required

All projects involve delivering something (often referred to as an 'output', 'outcome', 'benefit', 'asset', 'deliverable' or 'solution') to someone (often referred to as the 'client', 'sponsor' or perhaps 'business owner'). To achieve this 'something', a range of work first needs to be identified and then performed. But (and it is a big but), consider some of the additional information you need before you 'go live' on the project:

■ Will all this work be performed simultaneously or will some follow earlier completed work?
■ What other projects and/or work will impact on this work?
■ How long will each component of work take (commonly referred to as effort, sometimes mistakenly as duration or elapsed time)?
■ How accurate will these estimates be and how will this be communicated?
■ What impact will this work have on the planning, execution, management and completion activities of the project?
■ Can all the required work easily and correctly be identified, resourced and scheduled?
■ What risk factors might impact on the start or finish of the scheduled work?
■ Does the completed work comply with the required specification or standard?

The resources: More than just the team

Let's now bring in the remaining component of our early definition of project management: the resources. A considerable amount of resource information is required concerning the work needed to complete the project. Again, consider the following to start with:

■ Exactly what resources are required? (Remember that the word 'resources' in a project management sense is not limited to the subject-matter experts (SMEs) and other skilled people. Equipment, meeting rooms, vehicles, laptops, funding, materials, reference manuals, intellectual property and even a high-speed internet connection are all examples of project resources.)
■ Are these resources available (not to mentioned motivated) to be assigned to the project tasks?
■ Have these resources got the required skills, authority and power (if people), and the right technical features (if materials)?

- Do any of the human resources need training and development in particular skills?
- How much do these resources cost, and who will bear these costs—existing functional overheads or the project cost centre?
- Are there any substitute resources available if and when required?
- How will competing functional (operational) and project work conflicts be managed and by whom?
- What will indicate resource performance and achievement once the project starts?
- Will risk be a factor in assigning and tracking the performance of these resources?
- What impact will these resources collectively have on the planning, execution, management and completion activities of the project?

Going back to where this section started, project management essentially involves bringing together two components: work and resources. While we now know that work and resource information can contain myriad subsets and certain challenges, it still provides a valid and defensible starting point in understanding (and practising) project management. It does this by 'chunking' (or 'limiting', if you prefer) the underlying information and ultimate decision-making required by the project. The work must get done—and it must get done by someone (or something).

This is not to say that we should ignore other project considerations and issues, including stakeholders, risk, procurement, quality and communications (these will be explained in greater detail in later sections). Rather, it is an attempt to give the creation and management of projects a simple initial structure that enables senior management, project managers, teams and other internal/external stakeholders to 'sign on' to an immediate appreciation and understanding of two of the critical success factors underlying the key stages of the project's evolution —creation, planning, execution and completion (often referred to as the 'project life-cycle').

What exactly is a project?

Let's now 'beef up' our tentative (and changing) definition of project management. To achieve this, we will briefly examine the words 'project' and 'management' separately, then bring them together into a couple of meaningful

definitions and explanations.

To some people, projects are a little like a puzzle—too many pieces and not enough clues as to where they all fit in, how they interact and interrelate and who is responsible for piecing it all together. A project should be able to be defined in terms of a number of generally accepted criteria, which collectively distinguish it from an everyday activity performed by an individual or organisation. The criteria in Table 1.1 should be used as an illustrative guide.

So now you know what a project is (and, more importantly, isn't): a sequence of tasks with and without dependencies that deliver on the client's expectations within an agreed timeframe and budget. Sadly, far too many people rush to use the 'project' word for pretty much everything they do, while at the same time failing to implement the vast array of knowledge, skills, techniques and tools offered by projects.

Identifying the project boundaries

Much has already been said about project variables (often called constraints). They are the key criteria discussed above for identifying the essential differences between projects (in the true sense of the word) and recycled activities. Each variable is examined in greater detail in Table 1.2.

Table 1.1 Essential characteristics of a project

Criteria	Explanation
Scope	The work performed on a project will not be completed 'on a whim'. It will comply with a standard, a performance measure or a benchmark of some kind that explicitly defines and clarifies the exact nature of the work to be performed.
Cost	In most projects, cost is a finite resource. While contingent funding (in case the estimates fall short of true costs) should be available, the greater majority of projects will be constrained by funding (believed to be adequate).
Stakeholders	All projects are owned by their ultimate client, business owner or sponsor (the party to which the final deliverable is handed over) and all the other parties who

	either contribute to or are impacted by the project (e.g. staff, contractors, professional advisers, management, suppliers).
Resources	Projects require a pool of resources to achieve agreed deliverables. These could include any of the following: people, materials, equipment, facilities, tools, information, systems, policies, procedures, techniques, finances and knowledge, among others. These resources are often deployed on other projects and/or their normal work duties, which brings another degree of complexity and management to the project.
Time	Projects (must) have target start and finish dates that define (and constrain) the project window. That is, the project has a finite lifespan that is monitored, reported and (in many cases) amended.
Dependencies	All the required work will probably not be performed at the same time. Some work will precede other work, some might occur concurrently, while other work will follow earlier work. Again, this sequence must be planned and managed if the project is to succeed.

Think of it like this: nothing happens in a project that isn't related to one or more of these four constraints, as depicted in Table 1.3. Clearly, there is a direct and immediate dependency between these four project variables. Changes in one will potentially affect one or more of the other variables. And it is this 'effect' that has to be analysed, communicated and agreed (in writing would be good) before the project moves forward. In other words, every time one or more of these variables change, the project should have a 'time-out' until a detailed assessment can be carried out to discover what has triggered the *chan*ge, what the impacts will be and what resulting changes are required. These four variables (now you might see why they are sometimes called constraints) are that important.

Table 1.2 Common project variables/constraints

Variable	Key points
Time	■ Each project will probably have a prescribed (fixed)

	window from the initial idea stage through to the completion stage during which all stages and project work must be completed successfully.
	■ If there is no latitude or freedom in this time window, the project is said to be over-determined (in this constraint).
	■ The amount of time available will determine the schedule of work for the project.
	■ Projects can be completed ahead of time/schedule, on time/schedule or behind time/schedule.
	■ The amount of time available for the project can have a direct and often immediate effect on the project's other constraints.
Cost	■ Each project should have a budgeted and approved cost to fund the required work to the required standard during the required time allowed.
	■ Some projects are under-funded, some excessively funded, while others are adequately financed.
	■ Remember too that the finance available will impact on the other three project constraints.
Scope	■ Each project should specify exactly what work is, and is not, required.
	■ There should be no vague terms, ambiguity or missing requirements.
	■ The scope should state the standard of the end products whenever possible in quantitative terms, including tolerances, performance finish, reliability and maintainability.
	■ As with the two earlier constraints, the scope can also impact on time, cost and resource constraints.
	■ The scope will sometimes change once the project is underway, causing delays and increases in costs, or acceleration and/or decreases in cost.
Resources	■ Finally, each project requires that an appropriate range of resources be assigned to complete the scheduled work.
	■ Some human resources might require additional

training.
■ Resources are often over-allocated, causing scheduling conflicts, delays and cost overruns.

Table 1.3 Contrasting variable interdependencies

Variable	If increased…	If decreased…
Time	■ Resources could be reassigned to other projects. ■ Scheduled tasks could be delayed. ■ Costs could increase due to prolonged work activities. ■ More time could prove the catalyst in fine-tuning the specification.	■ Increased resources will be required to compress the work timeline. ■ More costs will be incurred to fund the compressed schedule. ■ The specification may come under review as the project team looks for ways to save time.
Cost	■ Higher skilled resources could be deployed. ■ More resources could be assigned, which could shorten completion times. ■ Additional funding could allow for the upgrading of the original specification.	■ One immediate way to save money is to shed resources. ■ Another way is to downgrade the specification. ■ With less money, the timeline might shorten if less work is now required, or it may lengthen if the resources now require additional time to complete all the work.
Scope	■ Additional finance could be required to fund the new features and/or the resources required. ■ Better skilled resources may be required. ■ More time may be needed to complete the project.	■ Money could be saved through the downgraded specification. ■ Resource assignments could be changed to allow less skilled resources to complete the tasks. ■ Time may be saved by taking less functionality from the project, although in some

		cases the less skilled resources might add time to the project.
Resources	■ With more resources, more money might be required. ■ Completion times could be shortened. ■ With the greater number (and diversity) of resources, opportunities might exist to upgrade the specification.	■ If resources are removed, the time required to complete the project will probably increase. ■ Money might appear to be saved, although the additional completion time may well erode any savings. ■ The agreed specification may not be completed to the same high level with fewer resources available.

Worse still, many projects begin their lives with one or more of these constraints already set (that is, not discussed and agreed with everyone involved) independently of the other constaints, and not amended following any changes in the *oth*er constraints. The following are typical examples that should strike fear and trepidation into the hearts of many project managers (be aware—they are all real examples):

■ A financial year budget surplus (which must be spent or it will be lost) is suddenly allocated to a project.
■ Finish dates are locked in, due to operational, regulatory and/or other calendar constraints.
■ Contractual arrangements are concluded before the project is fully understood.
■ Assumptions are made about existing resource availability and capability.
■ Reliance is placed on historical data that have not been properly assessed.
■ Inaccurate provisional estimates are made that are not reassessed and revised.
■ The scope of the project is poorly understood (e.g. we require the following [but not limited to] services…).

Critical reflection 1.1

I continue to be astounded at the number of (alleged) projects that organisations are creating, one on top of the other, with mixed results regarding how they are planned and managed adequately over time.
■ What is driving the increase in the number of projects your organisation creates?

- Are all these 'projects' genuine projects?
- How well are project terms like 'scope', 'time', 'cost' and 'resources' understood by your organisation?
- How would you seek to engage with and persuade your superiors that not all their nominated projects are in fact projects (if this were the case)?

What exactly is management?

Having distinguished a project from other work activities that are commonly 'recycled' (remember that a project is done once), let's now explore management. Much has been written about the need to manage the project. That responsibility falls to the project manager: the person appointed to bring the project in 'as scheduled', as 'specified' and/or 'on budget' or better. In achieving this goal, the project manager performs a variety of functions, roles and/or tasks, some of which might be far removed from direct management of the project (Wysocki, Beck and Crane, 1995). Traditionally, these planning, leading, organising and controlling functions—as depicted in Figure 1.2—help the (project) manager to achieve the organisation's goals by working with and through other people. That is, managers get things done with and through other people.

Figure 1.2 Traditional functions of management

Planning

By necessity, project managers must spend a considerable amount of time planning related activities. These could include (but are not limited to) meeting with stakeholders, outlining and defining goals, designing plans and developing management strategies to achieve the project goals. During this 'functional' responsibility, the project manager needs to work closely with all stakeholders to correctly identify the business problem or opportunity facing the client. Alternatives should be canvassed comprehensively, with careful evaluation of each one. Delivery milestones and other key outputs, and their specific acceptance criteria, should be discussed, clarified, agreed and documented. Time could also be spent on developing a tentative 'big picture' project plan to capture all the macro detail of the project. During this planning phase, it is critical to involve as many of the project stakeholders as possible, thus preventing the exclusion of any key information and the decision-makers. Only with their initial help can the project manager hope to present indicative deliverables, timelines, budgets and resource requirements.

Leading

Every project manager must be able to demonstrate leadership to all project stakeholders. To do this, they will need to be able to inspire and motivate, issue instructions and directions, resolve conflicts and disputes, delegate effectively, communicate openly and honestly, recognise achievement, share the workload (if required) and manage performance. When working with the project team, they will need to influence (where they can) the selection of the team members, take steps to involve the team in planning and decision-making processes (where possible) to a level deemed acceptable, clearly define and communicate the individual roles, functions and skills required, establish agreed performance standards, liaise between the team and all other stakeholders, acknowledge and reward individual and/or team performance and manage performance issues between team members.

Organising

Plans are in place and leadership competencies are present. Now the project manager must identify and schedule both the work to be completed and the resources required. They will need to ensure that all reporting and

communication channels are (and remain) open, that decision-making is timely and that the project and its requirements align with the project organisation's corporate and business priorities, direction and strategies. Clear lines of authority, responsibility and accountability will also need to be established, acknowledged and maintained.

Controlling

This function can only be performed if the other three are in place. To control the project, the project manager will need to closely monitor all aspects of the project to ensure (and reinforce) completion to plan while also acknowledging significant deviations that might dictate a specific response. The project manager can demonstrate their controlling function by 'walking through' the project, conducting performance reviews against the agreed key result criteria, managing scope changes, regularly meeting with the team and 'feeding' information to all the stakeholders.

What exactly is project management?

Bringing the two words 'project' and 'management' back together, what progress have we made? Project management refers to the management of project activities that lead to the successful completion and output of a project. The project requires the application of underpinning management principles in planning, organising, controlling and leading the resources of the organisation to realise a one-off specific goal. The management process brings together and optimises the necessary resources to successfully complete the project as agreed, scheduled and reviewed.

Managing projects differs somewhat from conventional and general management assignments, with the key difference being that a project is a limited concept that is usually more narrowly focused than traditional management goals. Other ways to define project management could include any of the following 'constructed' definitions:

- identifying, planning, scheduling and controlling the project requirements
- negotiating the agreed tradeoff between time, budget, resources and scope
- managing change initiatives over time

- managing changing stakeholder expectations
- scheduling an agreed solution to a specific need, problem or opportunity
- balancing task and resource decisions (Microsoft Project)
- creating a unique product or service through a temporary endeavour (PMBOK).

Let's not get bogged down with definitions, though. Instead, understand what triggers the project, why it needs managing and what it delivers. Remember the four prime constraints that drive the project: time, cost, scope and resources.

Project management principles

So we have reached the point where you (hopefully) understand projects, project life-cycles and project management. The question now is: What do you do with it all? How can the information covered be transferred, applied and developed in the workplace to make any credible inroads into how you plan and execute your projects? Perhaps the answer lies in finally distilling for you what could be called the key principles of project management excellence. Consider the following suggestions:

- identifying, analysing and communicating the real business need
- direct involvement and input from all key stakeholders
- commitment to planning the project in iterative and revised detail
- defining, agreeing and measuring the targeted benefits
- evidence of applied governance measures
- developing explicit, iterative and version-controlled project documentation
- allowing regular reviews, audits, adjustments and revisions (where appropriate and justified)
- agreeing on specified and measured outputs
- proactive decision-making involving all stakeholders (as required)
- direction, guidance and mentoring from a senior management project group/committee
- single point accountability with matching (and communicated) authority, along with visibility
- open, honest, complete and timely communication
- transparent processes, including roles, responsibilities and standard documentation

- compliance with an auditable change-control process
- cohesive and committed teamwork drawn from across the organisation's expertise
- balanced and demonstrable leadership from both the 'dance floor' and the 'balcony'.

Wanted: The ideal project manager

Managing projects differs somewhat from conventional and general management assignments, with the key difference being that a project is a limited concept that is usually more narrowly focused than traditional management goals. Through managing, project managers are involved in the process of identifying, planning, scheduling and controlling the true requirements of the project. They ensure that agreed tradeoffs occur to enable project deliverables to be handed over on time, on budget, as specified and with the work being performed using appropriate resources. But over and above the acknowledged traditional functions of management, what other (project) management 'stuff' do these people perform? Consider the following suggestions:

- They are appointed to manage the project throughout the life-cycle.
- They develop and monitor the iterative project plan and associated documents.
- They oversee the estimating tasks and scheduling activities.
- They manage, negotiate and communicate the project scope (inclusions and exclusions).
- They manage project resource assignments, training and reassignment.
- They manage the project schedule and project budget.
- They manage stakeholder expectations.
- They manage procurement and contracts.
- They manage quality requirements.
- They direct and motivate project team morale and performance.
- They manage all change requests and resultant impacts and approvals.
- They initiate corrective action and/or reinforcement where required.
- They track, document and communicate project performance, deliverables and outcomes.
- They identify, assess and manage project risks.
- They manage and report relevant issues.
- They facilitate regular performance meetings:
  - ☐ kick-off when the project first gets authorised and registered (concept stage)

□ kick-in when the project is underway (execution stage)
□ kick-out when the project is finalised (completion stage).
- They coach, mentor and support the project team and other stakeholders (as required).

Traditionally, the above functions have tightly prescribed what management should be. Today, while these anchored functions remain prevalent, the modern manager needs so much more: an active and logical understanding of their workplace systems, people and processes; to be technologically savvy with their information and communications platforms; commitment to continuous improvement and innovation; genuine empowerment of their teams; transparent performance management; and a participative leadership style.

Wanted: The ideal project leader

However, managing the project is not exactly the same as leading the project. To expand on this point, let's start with a definition. Leadership simply means using your innate or learned skills to influence (and modify) the attitudes and behaviour of an individual and to get them to willingly do something they may not want to do. Table 1.4 provides a snapshot (if not an 'extreme forced choice') of the prime differences between managers and leaders. Note that these differences in both managers and leaders are required in projects, although to different degrees and at different times with different people and in a variety of situations.

Essentially, leadership is the ability to influence the behaviour of individuals and to 'move them in a new direction'. While there are numerous theories of leadership, the collective wisdom of these can be summarised as follows:

- Leaders require a range of personal traits deemed to be worthy of effective leaders, including energy, integrity, empathy, intelligence and honesty.
- Leaders have two major ways to influence the behaviour of individuals. One is for the leader to focus on the task (getting the job done) while the other is for the leader to focus on the people (performing the tasks).
- Leaders should respond to situations and/or contingent factors and variables, and adopt an appropriate leadership style. These factors could include the surrounding culture, the urgency, the experience and maturity of the team, and the nature of the task itself.

While these theories (and others, such as charismatic leadership, referent leadership, transformational leadership) continue to enjoy popularity, Figure 1.3 compares four different styles that have been identified under the situational leadership theory. The four styles are:

1 *telling* (autocratic, with no involvement of others)
2 *selling* (largely directive, with limited attempts to explain actions and/or to convince others that the leader's actions are right)
3 *participating* (increasingly supportive, where ideas are called for and openly discussed with others)
4 *delegating* (highly democratic and supportive, where the direction and decision-making is left to the team).

In the situational approach, a 'sliding' leadership continuum ideally exists between the autocratic leader and the democratic leader. While a project manager needs both, the styles displayed are very different. Consider the comparison shown in Table 1.5.

Table 1.4 Separating managers and leaders

Manager	Leader
Administrates, regulates	Innovates and creates ideas
Maintains, reinforces	Develops, encourages
Controls, contains	Trusts, experimental
Systems, process	People, capability
Bottom line, figures	Horizon, results
Status quo, procedure	Challenges, improvements
Hierarchy structure	Synergy structure
Short term, immediate	Long term, future
Task focus	Solution focus
Formal authority, 'I'	Interpersonal skills, 'we'
Does things right every time	The right thing, learning
Solves problems, takes charge	Involves, autonomy
Adheres to direction	Supports and guides

Us and them mentality	Us together
Blaming	Actively listens
Coercive power	Cooperation
Rewards work	Rewards creativity
Seeks compliance	Values performance
Superior, legitimate status	Mentor, coach
Directive, forcing	Lead, sharing

Clearly, both management and leadership are required to plan and manage the project. Traditional functions of management should not be discarded too quickly as irrelevant in modern project management, nor should notions of leadership dominate the project landscape. The effective project manager needs to know when to manage and when to lead, as well as what management looks like in an operational context and what leadership looks like in a strategic context.
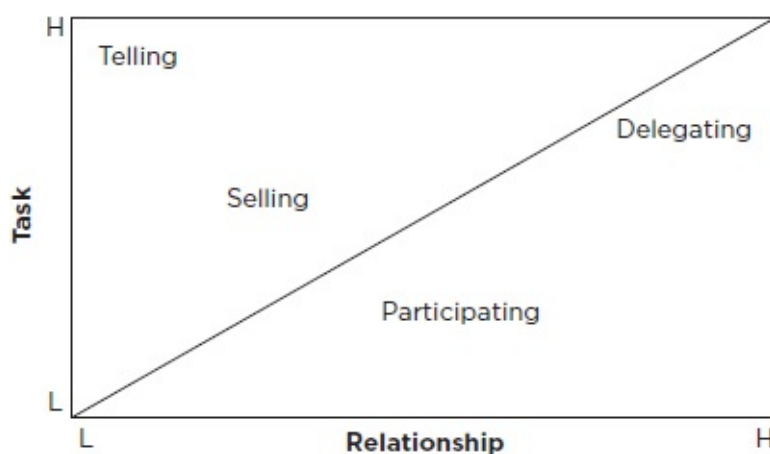
Figure 1.3 The continuum of situational leadership

Table 1.5 The leadership continuum

Telling (task focus)	Delegating (relationship)
Dictatorial (autocratic)	Democratic (laissez-faire)
Highly directive	Highly supportive
Task takes priority	Relationship takes priority

One-way communication	Two-way communication
Achieves results through directives	Achieves results through consensus
Limited need for rewards	Opportunity for rewards

Are all leaders effective?

Welcome to the dark side of leadership. While much of the positively biased literature supports developing effective leaders with an assortment of leadership theories, models and principles, there is another side of leadership prevalent within organisations of all shapes and sizes, including both project management and client organisations. With research suggesting that half of those in leadership positions fall short in leading others (not to mention the tenure of leaders is steadily dropping), the shortage of effective leaders in your projects should be a genuine concern for everyone involved. There is good news, though: the cause is not that hard to find, as it is a simple question of character. There is bad news too: character is one of the hardest things to accurately, precisely and individually define.

Recall that management and leadership are not synonyms for each other: they are different sets of knowledge and skills, making up the practices, behaviours and attitudes required when working with and through other people. So, as we focus on leadership, your understanding of leadership development (estimated to be worth well over $50 billion a year) and effectiveness will actually benefit from exploring the dark side of leadership failure, or the prevalence of bad leadership.

With Burke's (2006) help, let's jump straight in and reveal some of the common notions underpinning leadership failure, and see whether you are familiar with any of the 'failed leaders' described below. The leader:

- is stupid with little talent, intelligence or industry-specific knowledge
- has an inability (or lack of confidence) to execute direct and/or support plans
- displays incompatible ethics, beliefs, moral compass and/or values
- is resistant to working towards hard-to-achieve outcomes
- is insular, as they ignore the needs and welfare of their followers
- reveals that self-interest is the sole focus of everything they do
- lacks self-control, and is self-indulgent and unreasonable
- is unable or unwilling to adapt to new ideas and practices

■ engages in psychological or physical harm to others.

That was a little scary to say the least, as it wasn't a great list of positive behaviours. But these descriptions are often accurate for leaders who simply do not, or cannot, actually do what their leadership role requires. Collectively, the above list simply categorises leaders as either unethical (failing to distinguish between right and wrong) or incompetent (failing to achieve the desired results), but you can work out which description belongs where.

Recall that leadership is very much about 'owned' behaviour: who people are, how they act and what they say; it isn't about what they know or how bright they are. It shouldn't be about intelligence tests, talented and gifted people and winning popularity contests. Below are some additional behaviours that historically have resulted in leadership derailment—or, to put it another way, seven habits of spectacularly unsuccessful people (Finkelstein, 2003). These leaders have:

1 an over-optimistic and over-estimated view of how much control they had over the organisation and believe the organisational success was due entirely to their efforts
2 a lack of any clear and transparent boundaries between their personal interests and their organisational interests, believing the organisation is a natural extension of themselves in all respects
3 a fixated belief that they have all the answers—much like a control freak who listens badly, ignores advice and pushes dissent underground
4 an intense dislike of criticism, seeking to eliminate anyone not 100 per cent behind them
5 an innate belief that they are always right
6 stubbornness in doing what they have always done in the past
7 they tend to be consummate organisation spokespeople, as they obsess over the organisation's image in the public eye. They also under-estimate obstacles.

Clearly, dysfunctional leadership is prevalent in project management. And for some, the command and control mentality of some practitioners, along with overt pressure to adhere to the plan because the 'plan is everything in project management', may well contribute to leadership failure, among other contributing factors. Lombardo, Ruderman and McCauley (1988) believe that leadership should be more about exercising discretion, being organisationally savvy, dealing with organisational complexity, directing, motivating and developing subordinates, pursuing excellence, being self-confident, honourable

and composed, and even being sensitive.

Just as when you identified the leaders who you knew had failed, go on to identify the successful ones, the effective ones, the leaders who combine business knowledge with personal awareness, who are open to feedback, take risks, build genuine interpersonal relationships and model leadership that supports both innovation and creativity.

Critical reflection 1.2

Think about what leadership (effective or otherwise) actually delivers to your projects.
- What type of leader do you prefer to work with, and why?
- How did you react as you read through the section on the dark side of leadership?
- Were you mentally identifying different people in your project organisation?
- Why are both management and leadership important to your successful project outcomes?

Developing management and leadership attributes

In more specific terms, what types of skills, knowledge and abilities (attributes) are required by a project manager/leader? Are they generic or particular to project management? Can they be acquired or does a person need to be born with them? Are they possessed by everyone?

In many respects, the project manager does not have the time to become fully acclimatised to the job. In fact, they usually hit the ground running, with very little time—if any—to climb the 'learning curve'. Remember, projects have a sense of urgency, are time limited, and have precise objectives and influential stakeholders all riding on the project 'wave'. As depicted in Figure 1.4, the manager clearly needs to perform on a number of fronts. To do that, the following are of increasing and paramount importance:

- conceptual or transformational attributes to allow them to see the big picture and avoid getting bogged down in the finer detail:
  - ☐ thinking strategically to drive organisational renewal
  - ☐ arousing a sense of excitement, purpose and adventure
  - ☐ creating and embracing change
  - ☐ building intelligent, learning and adaptable organisations
  - ☐ transforming ideas and visions into reality through words, behaviour or symbolism

☐ investigating issues and problems, and initiating appropriate action
☐ building and inspiring trust by being consistent, dependable and persistent
☐ creating creative environments
☐ encouraging an entrepreneurial spirit
☐ managing the political agenda
☐ instilling a passion and drive for excellence
☐ understanding the operational systems and procedures within the organisation
☐ collaborating with diverse stakeholders

- interpersonal or people attributes to allow them to work with and through other people to get the job done (remember our earlier definition of management). These skills will allow the project manager to deal positively and effectively with project stakeholders:
  ☐ using written and verbal communication
  ☐ negotiating agreements
  ☐ resolving conflict and disputes
  ☐ seeking solutions through diplomacy and mediation
  ☐ offering coaching and mentoring
  ☐ giving individual attention
  ☐ practising active listening
  ☐ building trust
  ☐ influencing others
  ☐ facilitating consensus
  ☐ overcoming resistance to change
  ☐ being authentic, ethical and (intellectually) stimulating
  ☐ demonstrating humility, honesty, integrity and respect
  ☐ practising assertiveness and empathy

- technical or transactional attributes to allow them some intimate knowledge or understanding of the project processes and their actual work. Remember, though, that the project manager is not there to 'do the work'; they are there to 'manage the doing of the work'. These skills will allow the project manager to work closely with the product, service and/or processes involved in the project:
  ☐ knowing the standard operating system protocols
  ☐ tracking, reviewing, reporting on and controlling performance (scope, time and cost)
  ☐ proactively monitoring risk and treatment
  ☐ communicating with stakeholders
  ☐ promoting the project internally

☐ ensuring all work, health and safety requirements are complied with
☐ adhering to the required statutory and regulatory conditions
- a demonstrated managerial ability to perform the traditional functions of management—planning, leading, organising and controlling
- leadership to build and sustain a project vision for the team over time
- an ability to see the future while working in the present and learning from past mistakes. Strategic expertise is not the same as operational expertise.
- a background aligned with the desired project outputs
- a high degree of business acumen, covering areas of finance, marketing, HRM, contracts, procurement, logistics or other relevant disciplines
- a sense of entrepreneurial energy to drive and sustain the project through the change process
- project management knowledge (PMBOK or similar) and application expertise (real-world experience and skills)
- technological fluency with emerging technologies and platforms
- a commitment to coaching and mentoring.

Collectively, these attributes have one thing in common: they identify a project manager who possesses a range of skills, knowledge and abilities to deliver the project on time, on budget, as specified and using the prescribed resources. They also do one more important thing: they confirm the status of the project manager —status from an authority context, not from celebrity. In my experience, far too many project managers get suddenly promoted (sometimes from obscurity, sometimes from the position of business analyst or a functional manager) and are made accountable for the project without also acquiring the mandatory, documented and disseminated authority to actually 'manage' the project. Without authority, there is no visibility or accountability.

And let's be honest: a great many project organisations are yet to adopt detailed project management position descriptions that would help project managers achieve this status. The truth is that too many organisations still pretend that their projects are managed.
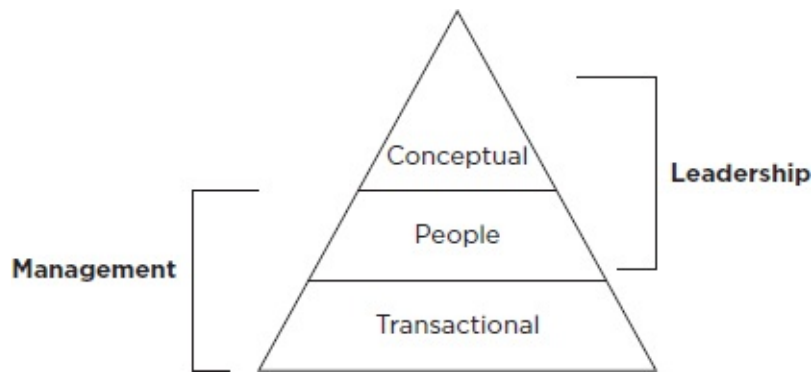
Figure 1.4 Management and leadership

The art of delegation

So managing and leading are both critical attributes required by the project manager (and associated roles). But what about the process of delegation? Delegation and dumping both start with the letter 'd', but are worlds apart in meaning and application from a managerial perspective, and should not be used as synonyms for each other.

Critical reflection 1.3

Traditional (linear or waterfall) project management is often criticised as involving too much command and control from those who manage the projects.
■ Having read about managers and leaders, think about your managers and whether they are guilty of this mindset. Is there a balanced approach to how they manage through their formal authority and how they demonstrate leadership through valuing capability, autonomy and performance, or do they favour one over the other?
■ How do their management and leadership practise impact your contribution on the project?
   Clearly, project management is crying out for competent managers and leaders—ideally rolled into the one project manager.

Delegation is about empowering subordinates to carry out their assigned tasks to achieve the required results within their area of responsibility. It involves giving subordinates the (visible) authority they need to complete the tasks. And while some might disagree, the subordinate is responsible while the project manager remains accountable for the completed task.

But is delegation simply handing over everything that needs to be done in one massive task bundle, or is it more of a staged delegation process—or what is commonly referred to as degrees of delegation? Consider the following example

adapted from Gido and Clements (2015), in which delegation expands over six different stages (and time periods) from the lowest degree of delegation (Level 1) through to the highest degree of delegation (Level 6). In this example, the task is to 'investigate a problem', although you will notice that the degree of delegated authority increases significantly with each level.

- *Level 1*: 'Report back all the information you collect and I will decide on the next step.'
- *Level 2*: 'Report back all the information you collect, let me know what the options are and recommend one for me to decide.'
- *Level 3*: 'Let me know what action you want to take and wait for my approval.'
- *Level 4*: 'Let me know what action you want to take and do it unless I say otherwise.'
- *Level 5*: 'Take action and let me know what you did.'
- *Level 6*: 'Take action and decide whether you need to tell me.'

See how the authority and responsibility increase from Level 1 through to Level 6. Imagine the empowerment, the trust and respect each party has for the other between Levels 1 and 6. Clearly, different degrees of delegation are appropriate for different people and in different (project-specific) situations. Never rush delegation or assume that everyone is ready for Level 6, as the reality will quickly show you otherwise.

In making these delegation decisions, you might also like to factor in someone's motivation, confidence, availability and willingness to accept the delegated role, as their technical competence (knowledge and skill) to perform the allocated task should never be the sole determinant in the decision. Your project may well be full of competent people; sadly, this doesn't mean everyone will step up when authority is delegated to them.

Competing project management methodologies

It is becoming increasingly difficult these days to work on any project, to read any project manager's job advertisement (or position description for that matter) or to provide any project management consulting services without coming across some reference or requirement pertaining to 'things' called PMBOK, PRINCE2, Agile, Lean, Project [PRACTITIONER] or some other suite of institutionally

endorsed, commercially marketed, proprietary IP or perhaps, in some cases, just generally (or loosely) accepted project management methods. While often project, industry or government specific, a methodology is a prescriptive way of conceiving, planning, executing, finalising and evaluating projects.

With new methodologies constantly being promoted, the choices are not only expanding but also possibly diluting the 'sausage behind the sizzle'. And while it is true that some project management methodologies present as metaphors for on-time, on-budget and in-scope delivery, it is important to remember that they must offer more than merely an illusory fabric of control. If—and it is a big if—the methodology aligns with both strategic initiatives and operational realities (if required), adds value to the project and is underpinned by targeted professional development initiatives that address technical, social and strategic knowledge and skills, and it is also constantly reviewed and adapted to reflect the (changing) strategic direction of the organisation, then the methodology will serve the organisation and the project well.

The 'right' project methodology plays a crucial part in guiding the project's success. Projects can't be allowed to merely meander from start to finish: they need to be planned, directed, executed and managed in line with a workable, agreed and communicated approach. So, if the methodology itself is wrong, missing in action, copied from someone else's website or an exact, unedited copy of PMBOK, PRINCE2 or another framework, then intuitive, siloed, fractional and disputed project management may well take over (sometimes, I should note, with incredible success!). Don't get me wrong though: simply imposing the PMBOK predictive or plan-driven approach, PRINCE2, the adaptive Agile model, Project [PRACTITIONER] or another methodology will not, by itself, ensure project success either. Clearly there needs to be some alignment between what is being delivered, how that will be delivered and who will be doing the delivery.

The Project Management Body of Knowledge (PMBOK)

PMBOK (try to get the pronunciation right—'pim-bock') stands for the Project Management Body of Knowledge and is the de facto global standard for project management. Revised every four years by the Project Management Institute (PMI, 2013) of America Standards Committee, PMBOK 'is an inclusive word that describes the sum of knowledge within the profession of project management and includes knowledge of proven, traditional practices that are

widely applied, as well as knowledge of innovative and advanced practices'. So what effectively started out as a basic reference (acknowledged in the first 1996 edition as being neither comprehensive nor all-inclusive), a body of knowledge or applicable practices has grown to become (for some) an international mark of project management best practice and, ultimately, excellence.

While the ten processes in PMBOK are presented as separate concepts and chapters, they interact with each other continually throughout the project life-cycle from start to finish, and cannot be studied and applied in isolation. Within each project in which you are involved, all ten will require initial and ongoing investigation, discussion, agreement, documentation, dissemination, review and updating.

Further, as the project evolves throughout the project life-cycle, the amount of information required by each will vary in both quantity and impact as different decisions are made by the project stakeholders. And while some practitioners find this interdependent relationship between all ten domains difficult to manage, your project management success is predicated on integrating all ten repetitiously throughout your project as decisions in any one may cause immediate ripple effects in the remaining ones (without your consent, let alone without your awareness that changes have in fact occurred). Table 1.6 fleshes out what the ten processes involve and, more importantly, what some of the critical success factors are for each one.

To make sure your projects don't get away from you (and regardless of your role on the project), remember that these are the ten 'things' that will either help or hinder your project management planning and delivery activities. While you don't need to be the qualified or incumbent procurement manager, or the quality manager, finance manager, communications manager or risk manager for the project, you do need to understand how each of these knowledge areas impacts in your project.

PRINCE2

While PMBOK appears to dominate the project landscape, another contender is also well known and used. Known as PRINCE (PRojects IN Controlled Environments), it is a structured method dating back to its origins in 1996 for effective project management with information and communication technology projects, among others (Office of Government Commerce, 2005). Today, PRINCE2 is a de facto standard used extensively in the United Kingdom by both government and the private sector, and is also gaining recognition

internationally.

As a methodology, PRINCE2 adopts a process-based approach to project management, with each process defining the minimum requirements for appropriate management activities and base components that must be carried out during the project. With its focus on aligning both projects and business, PRINCE2-style projects are always focused on delivering specific products to meet a specific business case. In this way, the definition and realisation of the business benefits continue to be the driving force behind the project.

PRINCE2 has eight distinctive management processes that cover all the project activities from beginning through to completion. They are:

1 directing a project
2 planning
3 starting up a project
4 initiating a project
5 controlling a stage
6 managing product delivery
7 managing stage boundaries, and
8 closing a project.

Table 1.6 PMBOK knowledge areas

Knowledge area	Interdependent processes	Critical success factors
Scope management (*requirements*)	Scope management includes the processes required to determine and manage project expectations and deliverables, including planning, authorisation and controls throughout the project.	■ Client engagement ■ Be realistic about your capability ■ Create a common understanding ■ Complete, unambiguous requirements ■ Formal change controls
Time-management (*schedule*)	Time management includes the processes required to determine and implement the project schedule and to manage the agreed timelines with appropriate intervention	■ Plan the work and work the plan ■ Activity is not the same as accomplishment ■ Measuring actual performance against planned

	strategies throughout the project.	performance ■ Report performance regularly ■ Authorising corrective action immediately
Cost management (*budget*)	Cost management includes the processes required to identify, analyse and refine project costs and to ensure project costs are managed, reported and controlled throughout the project.	■ Realistic and reasonable estimates ■ Time-phased cumulative budget forecast (cash flows) ■ Earned value reporting ■ Contingency reserves
Quality management (*technical excellence*)	Quality management includes the processes required to manage the quality planning, assurance, control and improvement processes and policies throughout the project.	■ Commitment to quality improvement ■ Regular monitoring, inspection and testing
Human resource management (*performance*)	Human management includes the processes required to determine the resource needs, assignment priorities, development needs, performance issues and evaluation throughout the project.	■ Establish trust, allow participation and build commitment ■ Encourage diversity, respect and ethical behaviour ■ Clarify roles and expectations ■ Value team member contributions ■ Performance manage and celebrate success ■ Provide opportunities for professional development
Communications management (*information*)	Communications management includes the processes required to ensure that timely and appropriate information is collected, disseminated and evaluated through managing	■ Established protocols for regular and open communication ■ Timely, concise, accurate, complete, free of jargon and not offensive

	formal and/or semi-formal structures throughout the project.	■ Establish a document control system (or communications register)
Risk management (*probability and impact*)	Risk management includes the processes required to manage the identification, assessment, treatment, monitoring, controlling and evaluation of positive and/or negative project risks throughout the project.	■ Have a step-by-step way of dealing with risk ■ Be proactive in identifying risks ■ Address high-priority risks ■ Assign treatment strategies to people with the appropriate capability and delegated authority ■ Watch out
Procurement management (*agreements and contracts*)	Procurement management includes the processes required to manage procurement activities throughout the project.	■ Realistic ■ Contract management
Stakeholder management (*vested interests*)	Stakeholder management includes the processes required to identify, plan, manage and control stakeholder engagement throughout the project.	■ Identification, profiling and engagement strategies
Integration management (*unified application*)	Integration management includes the processes required to integrate and balance the project management knowledge areas—scope, time, cost, quality, communications, human resources, risk, procurement and stakeholders —throughout the project.	■ Creating the project proposal ■ Developing the project plan ■ Directing and managing the work ■ Monitoring and controlling performance ■ Performing integrated change control ■ Closing down the project

Impacting throughout each of these eight processes are a further eight components: the business case, organisation, plans, controls, management of risk, quality in a project environment, configuration management and change

control. It is important to remember that neither methodology (nor other commercial offerings not cited here) will arrive in your project management office (PMO), meeting room, intranet, document management system or Gantt chart ready for immediate and exhaustive application.

The many proponents of PRINCE2 are quick to cite the many benefits the methodology provides as a comprehensive, consistent and repeatable set of best-practice protocols and practices that deliver project and business effectiveness and efficiency through:

- best-practice guidance
- a focus on business justification
- a well-defined project support structure
- manageable project stages
- regular progress reviews
- controlled decision gates
- explicit stakeholder involvement
- open communication channels.

Agile

As a popular methodology, Agile comes in different shapes and sizes, including:

- Scrum (a term derived from the game of Rugby)
- Dynamic Systems Development Method (DSDM)
- Extreme Programming
- Lean Development, and
- Feature-Driven Development.

Agile differs from what could be termed 'traditional' project management, where the requirement or specification is a well-defined, mandated (technical) solution that is agreed and recorded as the scope baseline when the project starts. While there will often be some movement in the client's expectations over time, the nominated deliverables remain (relatively) rigid in this traditional, plan-driven and sequential approach (also known as the Waterfall Model).

Popular with software developers, Agile supports the evolution of the client's prioritised requirements (or features and scope) as the project unfolds over time, while the resources and time allowed remain fixed in this value-driven approach. Advocates would argue that the approach enables a closer relationship between

the client and the developers, and fosters ongoing collaboration, creative input and less of the document-dependent and the command and control management style evident when the project is all about the plan, rather than the client's evolving requirements and solution.

Given the iterative nature of Agile projects, planning is delayed as late as possible within each of the multiple phases (or releases), as there is an acceptance that the client's requirements will change throughout the project and that these changes should be welcomed. To support these changes, client involvement in giving prompt feedback, making decisions, setting priorities and resolving problems is paramount. While some project practitioners may shy away from change, Agile projects focus on technical excellence, good design, continuous testing and quick results, with the client driving whether they have received enough functionality or benefit from the work completed to date.

Clearly Agile isn't going to suit every project—be that software development or something else. It certainly works with small software development projects, multiple-phased delivery with a short timeframe, projects with small and dedicated teams, and projects requiring the full involvement of the client.

Finally, while Carroll and Morris (2015) highlight some of the alleged differences between both traditional and Agile projects in Table 1.7 (along with my contributions), they are not exhaustive and have been written from an Agile perspective. That said, it should help you analyse how effective your own methodology might be when referenced against these same criteria.

Lean

Lean can best be described as a revolutionary way of doing business—whether making decisions about operational priorities or strategic initiatives.

With a legacy dating back to the quality movements in post-World War II Japan, the 1980s and 1990s, and other continuous improvement efforts, Lean focuses on satisfying the client's requirements through quality management measures that collectively reduce waste in the value stream (Kliem, 2016). By placing the client in the foreground, Lean changes how stakeholders interact and how materials are acquired, processed and delivered.

Table 1.7 Comparing traditional and Agile projects

Traditional project	Agile project

Directed team	Self-organising team
Take directions	Takes initiative
Rewards the individual	Rewards the team contribution
Competitive environment	Cooperative environment
Adheres to process	Seeks continuous improvement
Reactive	Proactive
Plan driven	Value driven
Sequential delivery	Frequent delivery
Fixed requirements	Evolving solutions
Change averse	Change responsive
Gantt charts	Burn-down charts
Scope, time and cost progress measurement	Working products as progress measurement

With globalisation one of the biggest drivers behind Lean (others include cost reduction, limited resources and information technology), clients want their expectations and requirements converted into competitive price and quality outcomes. As a customer-focused approach, Lean places the client in the centre of the project as it seeks to remove processes and operations that add little or no value.

So what does it take to manage and lead a Lean project? While the project manager doesn't need to be a Lean expert, the following concepts, techniques and tools will serve as an introduction to where their focus should be.

- Investigate the context (and the status quo) across both brownfield (existing) and greenfield (new) project environments.
- Map both the current value stream process in delivering a product or service to a client and the future value stream process to gain valuable insights into continuous improvement opportunities, potential waste removal and increased quality.
- Understand and define the client's requirements with specifications or even a model to try to avoid scope creep, cost overruns, schedule delays and constant rework (among other factors).
- Collect relevant and timely data in support of recommendations regarding

future value streams.
- Perform detailed analysis to locate the interrelated sources of problems, non-value-added waste or muda (the Japanese word for waste) as shown in Figure 1.5.
- Apply a variety of Lean techniques and tools to address one or more of the identified forms of waste. These could include increasing stakeholder motivation, defect prevention, safety enhancements and improved maintenance.
- Formulate and present appropriate recommendations that are 'mentally digestible' to different levels of management to gain their explicit approval.
- Develop and action the project management plan in which the client's requirements, waste removal and quality improvement are the centrepiece.
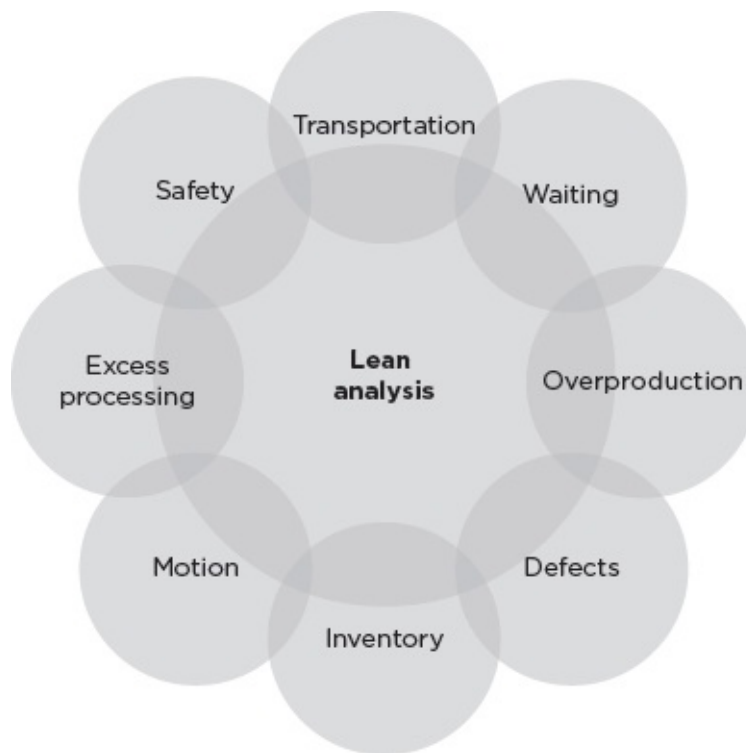
Figure 1.5 Performing Lean analysis

Advocates of Lean, including Kliem (2016), are not shy about promoting the promised benefits, including:

- understanding client values
- improving cycle time
- greater flexibility

- reduced capital expenditure
- leveraging technology
- lessening fear
- overcoming siloed mentality
- reducing overhead costs, and
- engendering creativity.

That said, Lean faces challenges (as with other methodologies) in creating and sustaining the value stream. These include:

- dealing with entrenched bureaucracy
- a lack of demonstrated management support
- a history of past failures
- legacy technology
- standard operating procedures with traditional accounting practices
- different management styles
- protected operational processes.

Clearly, Lean is capable of delivering many benefits to any project, although it does not present a default position. Like any other methodology, Lean on its own will not guarantee project success. For some, it will present another layer of documentation, process and approvals which will only serve to overlay the project with added steps and responsibilities. For others, Lean will bring a clarity to their projects in delivering on client expectations by fully understanding the environment, the processes and the outcomes the client is wanting for the project to be successful.

Project PRACTITIONER

By now you should be becoming more familiar with a number of different internationally recognised and/or proprietary project management methodologies, frameworks, processes and procedures, not to mention the progress you have made in developing your own tailored approach to planning and managing your projects. While operational activities—known as business as usual (BAU)—will continue to drive and sustain routine, everyday work for many organisations, there is growing pressure to create and facilitate medium- to long-term change in order to remain not only viable, but commercially competitive.

This change process is now known as project management: an approach to planning, managing and delivering projects. Projects are a unique set of activities that sit outside of everyday operational activities, which need to be completed to achieve a certain objective and/or benefit within an agreed scope, timeframe, budget and resource allocation. The discipline and practice of project management provide an over-arching framework (methodology or process) that facilitates the logical progression of an idea (change) into a project and thus into a deliverable (final product or service) that someone wants and will accept. Part theory, part intuition, part process and part 'what worked last time', project management must be supported by scalable, simple and easy to follow documentation (no two projects are identical in their uncertainty and complexity), if consistency, transparency, accountability, professionalism and visibility are to be demonstrated across each project and everyone involved in it.

My proprietary methodology, Project ᴾᴿᴬᶜᵀᴵᵀᴵᴼᴺᴱᴿ, is founded on a simple and centralised electronic platform with supporting documentation and procedures. All project information can be captured, displayed, refined, filtered, reported, updated and communicated in a step-by-step, secure and scalable format, providing both oversight and insight into all aspects of the project's performance against the plan. It offers:

- contemporary industry best practice
- practical and user-friendly documentation
- uniform project management language and practice
- a concise and scalable approach to planning, managing and delivering projects.

A raft of tools, templates, registers, training and support provides the foundation tools and a holistic approach for planning and managing the project from start to finish. Project ᴾᴿᴬᶜᵀᴵᵀᴵᴼᴺᴱᴿ integrates best practice drawn from a number of different competing methodologies, practical functionality and helpful tools to enable accurate and timely project tracking, reporting and controlling of schedule delivery, technical performance, budget allocation and contractual compliance.

Integrating all ten knowledge areas into a single document (which I call the project management plan, although its intent is far broader), Project ᴾᴿᴬᶜᵀᴵᵀᴵᴼᴺᴱᴿ enables the student and practitioner to create the following (with supporting evidence):

- all ten PMBOK knowledge areas 'on-a-page'
- an A3 template for mapping your 'life-cycle management approach'

- an ideas register for all organisational-wide suggestions and thought bubbles
- a business case with a complete assessment, justification and identified benefits, with supporting evidence
- a project register to communicate the project's official status
- a project charter with supporting evidence
- a work breakdown structure (WBS)
- a risk register with supporting evidence
- a project plan with supporting evidence
- a change request form
- a variation register
- a performance report
- a progress claim/payment form
- a completion report
- an evaluation (benefits realised) report
- a lessons learned register
- project management competency assessment maps
- a professional development plan
- a project management maturity self-assessment report.

These templates are not standalone templates that you complete once and in isolation from the other templates: each has some form of codependency or interdependency that must be maintained throughout the project from start to finish, as a change in one document may well produce a ripple effect (or something more serious) in other documents.

With Project ^{PRACTITIONER}, all the required documents live in the one place: the project management plan. Often misunderstood as simply the project schedule, this plan is an all-encompassing document that captures every original piece of information (perhaps known as baselines in some situations), all revisions, all performances and all outcomes. Formatted in conjunction with the life-cycle approach to project management, the Project ^{PRACTITIONER} project plan is a living document that will grow in detail exponentially (as it should) over the life of the project.

Choosing a methodology

So there is considerable choice when it comes to choosing one methodology over another. Each methodology clearly has its proponents, advocates,

champions and hard-core users, with probably just as many unaware and potential users. Perhaps they all need to be reviewed in terms of what your specific business needs and then scaled (where appropriate) to your projects. However, they all provide a scalable set of tools, techniques, processes and components that you will need to closely and carefully tailor to your particular project needs and perhaps equally, if not more importantly, to the needs of the project organisation itself.

This aligns with the case put forward by Cleland and King (cited in Nicholas and Steyn, 2008) that there are five general criteria to consider when determining whether project management methodologies are in fact required by your project:

- the degree of unfamiliarity with the project, as distinct from the ordinary and the routine (operational priorities)
- the magnitude of the effort required to plan and manage the project (resources, capital, equipment, facilities, etc.)
- the rapidly changing environment, due to client needs, innovation, shifting markets, consumer behaviour and many other factors
- the level of interrelatedness required by the project to build lateral relationships between functional areas and organisation wide, as distinct from self-serving and independent functional areas
- the potential loss of organisational reputation resulting from a project failure (financial ruin, loss of market share, damaged reputation, loss of future contracts, etc.).

Critical reflection 1.4

Much has been written about methodologies, what they are and what they offer project planning and management.
- What is your understanding of the different methodologies and the alleged value they deliver to your projects?
- Having read (and conducted further research) about linear, incremental or perhaps iterative methodologies for planning and managing your projects, which approach do you favour and why?
- Rather than using one of these methodologies, are you more inclined to develop your own methodology (and if so, why)?
- What genuine value will following your project management methodology deliver to your projects, and at what cost?

Navigating the project life-cycles

Irrespective of which off-the-shelf or proprietary methodology you end up using, all projects must adopt and follow a life-cycle, which is essentially a series of phased stages, or decision gates, or process reviews from project start through to project completion. This 'staged' project evolution is known as the project life-cycle, with each stage 'technically' triggering a number of key objectives, stakeholders, responsibilities, activities, decisions, outcomes and reviews over time.

For each project, there is an underlying evolution path followed—be it subtly or explicitly. And that project management path involves a number of stages—its life-cycle—with each stage integral to the overall success of the project. The obvious question would be: How many stages are there and what do we call each stage? This is an area where few project management authors actually agree, but the ramifications of this disagreement are not particularly destructive. There is no universal agreement on what the stages should be called, nor is there any agreement on how many stages there should be for the project, or what the activities should be that are performed within each stage.

To get you comfortable with the concept of a life-cycle, let's begin with a humorous example I have adapted over the years (though equally compelling and life-like). Perhaps you might be more familiar with this notion of project evolution than you think.

- Another great idea emerges, unencumbered by reality.
- The proposal is taken prisoner, isolated and denied natural justice.
- There is wild enthusiasm, verbal support and backslapping.
- This leads to reality testing, silent disillusionment, muted challenges.
- Uncontrolled chaos, sabotage, creeping indifference emerge.
- Reporting is misdirected towards activity and not achievement.
- Combatants are missing in action (cloak of invisibility).
- There is a search for the guilty (including the guiltless).
- The innocent and absent are punished.
- Promotion of non-participants and glory seekers occurs.
- Secret squirrels deny any knowledge or involvement.
- The franchised knowledge base is secretly and securely archived.
- Files and documents (if any) are scattered over multiple locations.
- Project overload prevents any review or lessons learned.
- All evidence of the project footprint is erased.

Amusement aside, what you have just read does in many cases mirror project reality in a number of businesses with which I (and probably you too) have worked. In these cases, the projects will often get up and running before too much investigation, clarification and understanding have actually taken place. And what starts out with a degree of enthusiasm and commitment often disintegrates into lethargy and disillusionment over time (and sometimes overnight). And let's not forget the buck-passing, glory seekers and sacred cows when it starts to go 'pear shaped'; on a bad day these can wreak considerable havoc on even the best-designed project. Then, where is the review and shared learning as a result of all this huffing and puffing? What lessons are learned? How does the project organisation get better at its projects next time or is history eagerly invited to repeat itself on the path to despair?

With so many discrepancies over the number of stages in a project's life-cycle (some have twelve, others five, seven…pick a number, while I have also seen a plain two-stage life-cycle: plan and do), I propose only five stages. With five stages, all the project work can be 'captured' and, more importantly, each stage can be transparently and effectively 'managed'. Remember: that is what project management is all about—ensuring that the project is completed as scheduled, on budget and as specified. Figure 1.6 depicts the five stages referred to in this text, revealing how they unfold over time as the project progresses while Table 1.8 explains the five-stage approach adopted throughout this book.

Critical reflection 1.5

Life-cycles represent one of the most compelling and central concepts project management offers.
- What is your take on life-cycles and their role throughout your project?
- Do the theory and rhetoric live up to the reality of your projects?
- What learnings did you take away from the life-cycle approach to planning and managing your projects?
- Test your understanding and draw up both the traditional PMBOK (linear and incremental) and Agile life-cycles and reflect on which one best suits your project.
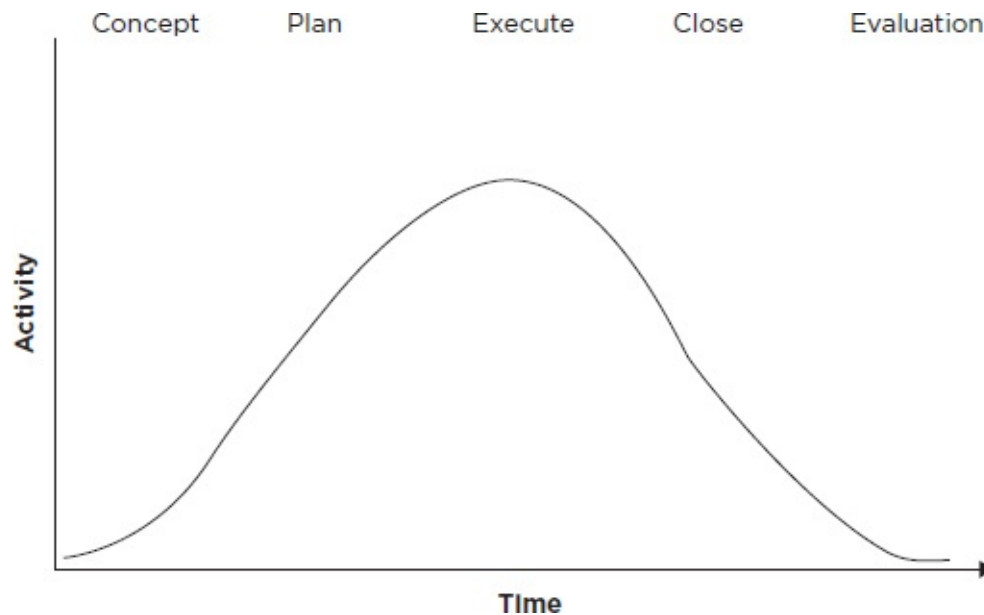
Figure 1.6 The five-stage project life-cycle

Identifying life-cycle inputs and outputs

We will now examine these five stages in greater detail. These stages provide not only a controllable framework for each project, but also the navigation framework to be followed throughout this book. As the project evolves, each stage has its own particular characteristics, representing a mix of the four principles and initial project variables (or constraints) cited earlier: scope, time, cost and resources.

At each stage in the project, information about these constraints will need to be collected and decisions made. In addition, the logical sequence of events surrounding these constraints throughout the project will need to be planned and managed with skill. As the project progresses through each stage, inputs (meetings, stakeholders, opportunities, etc.) will produce outputs (approvals, forecasts, documentation, etc.) as the end of one stage signals the commencement of another. Remember, though, to align each stage with a major decision, authorisation or approval point (perhaps a 'handover' point) to formally advance the project to the next stage.

In effect, a conscious decision needs to be made about moving on to the next stage. A number of input and output examples (not an exhaustive list, nor in any set order) have been provided for you in Tables 1.9 and 1.10.

Table 1.8 The project management life-cycle

Stage	Explanation
Concept	Think of this as the 'idea' stage, in which the project is conceived. Preliminary goals are discussed, problems raised, potential benefits identified, alternative approaches researched and provisional costings determined. Also known as the 'idea', 'initiation' or 'feasibility' stage.
Planning	Following the decision to proceed (in the concept stage), all the work required by the project is planned and scheduled. Objectives are finalised, resources assigned, quality signed off on, final costings approved, the timing agreed and all other administrative matters determined. Also known as the 'schedule', 'preparation' or 'development' stage.
Execution	The project has commenced during this stage and the emphasis is moved to tracking actual progress using the schedule developed in the previous stage as the comparison point of reference. All work is monitored, controlled and corrected where necessary, with schedules being reviewed, revised and updated as required. Also known as the 'implementation', 'production', 'control' or 'execution' stage.
Finalisation	The project has been completed and the deliverable handed over to the client. Resources are disposed of or reassigned, the contract closed out, reports are written and presented and the administration arm of the project is closed. Also known as the 'completion', 'termination', 'finalisation' or 'handover' stage.
Evaluation	While not every project has this stage, those that do are interested in measuring the return/benefits that the project delivered. Also known as the benefits realisation stage.

The benefits of using project life-cycles

It would appear that even though the notion of a project life-cycle is both intuitively appealing and (one would hope) easily understood, it must also deliver some immediate and tangible benefits that demonstrably aid all project planning and management activities. A number of these benefits are listed below

including those proposed by Healy (1997).
    The project life-cycle:

- provides an overriding narrative of the total project
- limits and orders the project's progress through clearly defined stages (some might call these decision gates)
- provides points of reference against which stakeholders can assess progress
- facilitates appropriate levels of governance throughout the project
- enables an overview of the total project to be maintained and in perspective
- allows for all project tasks to be correctly identified and partitioned under the appropriate stage of work
- fosters the sequential management of the project schedule through all stages
- promotes a sense of urgency throughout the schedule
- assists in identifying when resources (SMEs, contractors, etc.) will be required
- works towards integrating all the project activities along a continuum
- provides tangible evidence of the planning process
- acts as a guide for all project activity
- helps to detail responsibility among project stakeholders
- divides the project into manageable portions.

Table 1.9 The project life-cycle inputs

Concept	Planning	Execution	Finalisation	Evaluation
■ Project selection	■ Project variables reviewed and redefined	■ Ongoing progress review and control	■ Document client acceptance	■ Conduct post-project assessment
■ Problem or opportunity trigger			■ Document project outcome	■ Capture lessons learned
■ Alternative solutions discussed	■ Breaking down the project into activities	■ Progress, status and forecast reports		
			■ Contract close-out	■ Monitor and report benefits
■ Consistent with organisational capability	■ Schedule developed, revised and baselined	■ Manage change requests	■ Team and stakeholder debrief	
■ Project benefits identified	■ Estimating contingency factors	■ Managing contracts	■ Resources reassigned	
		■ Dealing with team issues	■ Retentions, certificates and	
■ Critical	■ Identify	■ Corrective		

success factors identified	critical path	and/or reinforcement action	warranties
■ Risks identified	■ Source and assign resources	■ Managing escalation issues	■ Archiving and recording
■ Expectation agreed	■ Quality measures in place	■ Managing meetings	■ Celebrate team's success
■ Project sponsors located	■ Procurement specifications finalised	■ Controlling and reporting progress	■ Decision to close out
■ Essential stakeholders confirmed	■ Contracts formulated	■ Explicit decision to commit more time, resources and money in proceeding to next stage	
■ Explicit decision to commit more time, resources and money in proceeding to next stage	■ Control measures identified		
	■ Explicit decision to commit more time, resources and money in proceeding to next stage		

Table 1.10 The project life-cycle outputs

Concept	Planning	Execution	Finalisation	Evaluation
■ Client brief	■ Stage, task and milestone detail—including duration, sequencing and resources	■ Performance standards	■ Handover	■ Complet report
■ Business case		■ Inspection and monitoring/testing plan	■ Acceptance testing	■ Benefits realisati report
■ Feasibility study			■ Project audit	
■ Risk assessment		■ Purchase orders	■ Completion checklist	■ Lessons learned register
■ Scope documentation		■ Performance reports	■ Feedback and evaluation	
■ Stakeholder analysis	■ Revised timelines (PERT/Gantt)	■ Change of scope requests		
■ Budget		■ Progress claims	■ Approvals	

forecasts	■ Revised cash	■ Corrective action
■ Procedures	flows and	■ Contracts
and policies	budgets	■ Revised schedules
■ Meeting	■ Resource	■ Approvals
minutes	matrix	
■ Approvals	■ Baseline	
	project	
	schedule	
	■ Approvals	

Tracing failure and success

Successful projects are a carefully planned and managed event, with success built in from the start of the project life-cycle—be that in the project definition, conception, planning or concept stage (or whatever you end up calling it). It will not automatically appear by default in the later stage of production, execution or implementation either, as many project practitioners seem to hope for, given the inordinate number of projects that are fast-tracked straight to the execution stages of the project life-cycle. Table 1.11 captures some of the more common causes of project failure and success.

Figure 1.7 also illustrates the disparity between good planning on the one hand and poor planning on the other. Perhaps the concept of rolling wave planning is the ideal solution, where continual planning and elaboration iterations form the basis of the project life-cycle.

Mapping project processes

Given that projects tend to evolve over time through a phased life-cycle approach, it is possible to (loosely) map each of these processes against a phase in the life-cycle. The mapping in Table 1.12 is an example of how this could be carried out, although the phased cut-offs and the apparent exclusivity between each phase will not be as pronounced as in the example provided. Rather, it should serve as a model reminder to always consider each competency not in isolation, but rather as a subset of a greater plan to deliver the project on time, on

budget and in scope.

Table 1.11 Sourcing causes behind project failure and success

What can lead to project failure?	What can lead to project success?
■ Lack of executive management mandate	■ All projects aligned strategically to business operations
■ Poorly understood scope (requirements, specifications)	■ Endorsed, communicated and consistently applied methodology
■ Lack of end-user involvement	■ Engaging and managing diverse stakeholder interests
■ Lack of formal methodology (an approach, process or framework)	■ Transparent approvals, decision-making and accountability
■ Inability to measure, report on or adjust performance	■ Controlling time, cost and performance variations
■ Lack of communicated, visible and demonstrated authority	■ Appropriate and timely review gates
■ Functional conflicts between operational and project priorities	■ Tracking, reporting and controlling performance
■ Poorly defined and communicated roles and responsibilities	■ Over-arching project management steering group
■ Reliance on reactive and remedial corrective action	■ Acceptance of the iterative nature of projects (particularly estimates)
■ Unauthorised scope changes (variations)	■ Continued development and refinement of organisational maturity
■ Poor management skills (misguided, misinformed and missing in action)	■ Demonstrated visibility, authority and accountability
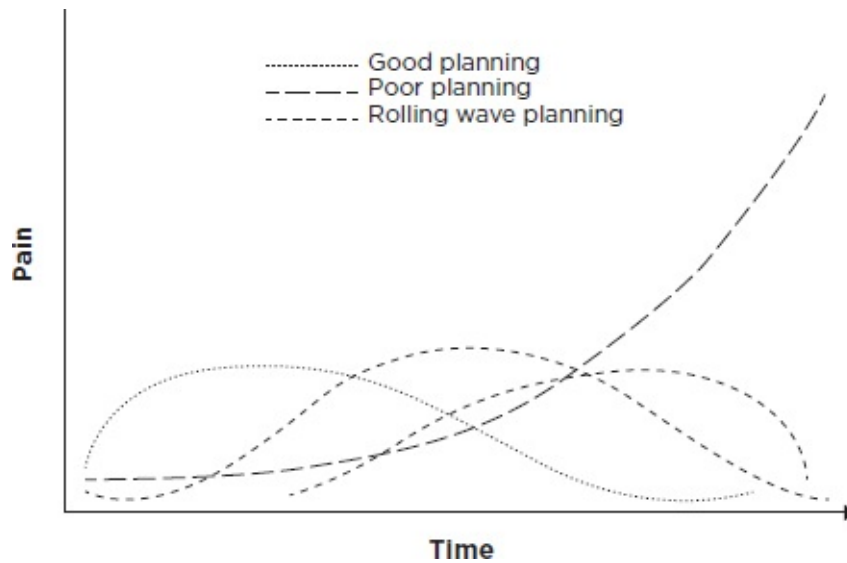
Figure 1.7 The planning pain scale

Table 1.12 An illustrative matrix of the project management processes

	Concept	**Planning**	**Execution**	**Finalisation**	**Eval**
Integration	Strategic alignment	Project plan	Project performance reports Project change control	Project finalisation report	See resea activ
Scope	Scope identification	Scope refinement	Project change control	Project finalisation report	See resea activ
Time	Provisional forecasts	Schedule development	Schedule control and reporting	Project finalisation report	See resea activ
Cost	Provisional forecasts	Budget development	Cost control and reporting	Project finalisation report	See resea activ
Quality	Quality planning	Quality planning Quality assurance	Quality assurance Quality control	Project finalisation report	See resea activ

			Quality improvement		
Human resources	Capability determined	Resources assigned	Performance monitored	Reassignment Project finalisation report	See resea activ
Procurement	Procurement planning	Procurement planning Solicitation planning	Solicitation Source selection Contract administration	Contract close-out Project finalisation report	See resea activ
Risk	Identification	Identification Assessment Analysis	Management	Evaluation Project finalisation report	See resea activ
Communications	Stakeholder identification	Strategy development	Project performance reports	Project finalisation report	See resea activ
Stakeholders	Identify stakeholders	Plan stakeholder management	Manage stakeholder engagement	Evaluate stakeholder engagement	See resea activ

Review questions

1.1 What is meant by the term 'project management'?

1.2 How does project management differ from project leadership?

1.3 What are the four variables/constraints forming the initial project boundary?

1.4 How do methodologies assist in the planning and management of projects?

1.5 What are the benefits in following a life-cycle approach to project management?

Case study

The last thing everyone wanted was yet another project. But why would this executive meeting be

any different from the last one, the one before that and all the other meetings the managers had sat through?

After all, it wasn't as though they didn't have enough to do already with their operational work, not to mention the fire-fighting and other daily priorities that kept on popping up. To say everyone was simply overloaded was an under-statement, though it didn't seem to register with the CEO as she walked in to the Monday meeting.

Bypassing anything resembling a meaningful agenda, Barbara launched straight into the new projects she had for the organisation to implement. Devoid of any prior discussion with her managers about the feasibility of any of these alleged projects, her executive managers knew only too well that these ideas (at best) would more than likely drift off into a state of inaction within a month or two as the CEO would subsequently find newer projects to over-write the last lot.

As the managers listened (or perhaps pretended to), Chris, the facilities manager and the newest member of the executive management team, opened his notebook and readied himself to take notes. He tried hard not to get caught up in the euphoria that Barbara projected about her projects as she explained her ideas to everyone. What surprised Chris, though, was the lack of any details about the projects, apart from a vague sentence or two about what Barbara wanted done. How odd, he thought.

> 'There was no description of what the project's objective was, its justification, what it was going to deliver (apart from kudos for Barbara, it seemed) or how much funding was needed, let alone how long the project would take or who would be involved.'

There was no description of what the project's objective was, its justification, what it was going to deliver (apart from kudos for Barbara, it seemed) or how much funding was needed, let alone how long the project would take or who would be involved. Chris knew this was the information everyone needed if they were going to be involved in any constructive dialogue with their CEO.

Chris sat quietly as the other managers tried to question the CEO, with little success. Appearing to grow ever-protective of her projects, Barbara became increasingly defensive as she allocated projects around the room. Any backbone the executive management team had walked in with was being quickly eroded as project files were tossed in front of them.

Somewhat bemused, if not a little disillusioned, Chris continued watching and waiting patiently for his turn. It turned out that Chris was swamped with four new projects in addition to his current operational workload, which was nowhere near up to date. So his reality was that very little would get completed any time soon, projects or not.

As he and the others prepared to leave the meeting—all equally deflated and frustrated—Chris recalled something one of his former bosses had instilled in him:

An idea is simply that—an idea. So don't go calling it a project unless you have done some preliminary investigation as to what is required, how much will it cost, how long will it take and who will do the work. If you can answer those questions, you have yourself a project. If you can't, all you have is another thought bubble crowding someone's to-do list.

Chris knew his boss was right then, and he was right now. The whole meeting had been unproductive; it had been wasted on fast-tracked ideas unencumbered by any attempt to reality check. Chris knew it was so simple to correct this enthusiastic sponsorship of one's own ideas, but

like the other managers, he felt unable to speak up.

Questions

1. Why do you think the CEO's projects can't yet realistically be classified as projects?
2. What is wrong with escalating thought bubbles, ideas and suggestions to project status in order to get them up and running?
3. Over and above the suggestions Chris's boss made, what other advice would you give the managers with regard to assessing the projects put forward by Barbara?
4. How would you describe Barbara's management and leadership style? Justify your answer.
5. In the above scenario, what stage of the project management life-cycle would you say Barbara and her managers are in, and is it the right stage? Justify your answer.

Organisational capability

Emerging strategy, justification and capability

Key points

- Not every idea is a project
- Separating strategic initiatives (projects) and BAU (operations)
- Conducting a SWOT analysis
- The eight-stage change-management model
- Numeric and non-numeric project justification models
- Project justification with numeric and non-numeric models
- Developing the business case
- Separating projects, programs and portfolios
- Organisational project management maturity
- Individual project management competence
- Project management organisational structures
- The role and application of project governance
- Culture and its organisational impact

In practice

Have you ever worked on a project (in any capacity) and wondered why the project got the green light to begin with? Or worse still, have you been on a project that should have been stopped, but for some inexplicable reason remained on life support long after its 'use-by' date? Or one that continued to change from one requirement to another with few, if any, checks and balances in place to ensure that the changes were in fact feasible in the first place?

We all know and relate easily to these types of projects and the countless other examples out there of projects that have been developed and executed with little justification, alignment or direction, let alone with control and accountability measures in place. The obvious question must be: Why does this happen? With industry literally awash (or perhaps even adrift) with notions such as organisational excellence, quality management, best practice, frontline management, mergers and acquisitions, workplace competency, organisational capability, risk management, human capital, knowledge management, corporate governance and the increase in regulatory compliance, how is it that some projects can still be found stumbling and bumbling around the landscape? And remember, the birth rate for projects is increasing exponentially every day, as more and more organisations rush to confer project status on each and every seed of an idea.

Reflect on your organisation and examine where the migration trail might be that takes each idea and critically assesses it against some justification criteria while it is still an idea or proposal. How does it become project worthy, who makes that decision and why? And once a project is confirmed, find out who will ensure it stays on track on any number of agreed performance criteria—for example, schedule, budget, scope.

Chapter overview

Anyone can have an idea, although an idea by itself doesn't automatically qualify to become a project. This is why some organisations have 'idea registers' where staff can readily post their latest and greatest ideas. Then management investigates the ideas, culls some, postpones others and may even give a few

surviving ideas 'legs' and invite the owners to put forward some further clarification and possible justification.

Ideas are linked to change, change is linked to strategy and strategy is linked to both project and operational work. Not quite a vicious circle, but clearly a 'justification' overlap exists, if not a competitive (and at times conflicted) dilemma as to where the priority should be. Or can project and operational work be delineated clearly and managed cooperatively within the project organisation, and between both the operational and project agendas? Then there are the issues of classifying projects and determining what the dividing criteria should be, as 'one size' doesn't fit all.

At their heart, projects should support and demonstrate the strategic direction and dialogue of the organisation. Through a change-based process, ideas get justified and become projects, and then get planned and managed to deliver results—although not everyone climbs on board at quite the same pace (many people are, in fact, change averse). The progression through this process may also be influenced by existing levels of capability (both individual and organisational) and inherent governance protocols framing the project over time.

Isn't change awesome? In fact, it is the only constant we have.

Escalating thought bubbles to projects

As you read in Chapter 1, why is it that someone's thought bubble can quickly become another's project? The idea, the suggestion or the initiative (whatever it is called) 'magically' gets clothed in project management speak, and another project lands on someone's desk. So project management continues to grow on a number of levels: as a 'body of knowledge', as a discipline and as a scalable methodology. Much of this growth has been driven by academic research, industry application and feedback, published papers and conference presentations, together with a move towards global standards.

As highlighted in Figure 2.1, are these projects strategic imperatives driving through organisational change in some format or other? Or are they operational priorities, or business as usual (BAU) activities that will impact parts of the organisation? Is there an overlap between strategy and operations that assists in project planning and management, or are they disparate functions? And what of the justification criteria: are projects randomly created and scheduled, or is there some implicit process complete with a justification narrative driving their point of origin?
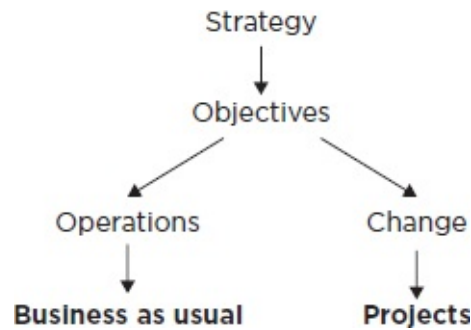
Figure 2.1 Deconstructing strategy

Within this research, development and growth, a new lexicon of project management-related terms begins to filter through, including: strategy, value management, investment, governance, integration, project management office (PMO), stakeholder management and project maturity. Be they a unique discovery, a value-added proposition or simply an attempt to overlay one body of knowledge with another, they each present an opportunity to more closely examine the natural linkages between the organisation, people and processes, and the projects undertaken. Equally, they highlight the direction and some of the additional challenges and benefits that need to be clearly assessed and communicated as the project footprint extends. Some serve as useful signposts to the organisation, providing the right justification and direction; some signal caution, assessment and review; while others encourage the development and demonstration of best practice and ongoing continuous improvement.

Consider for one moment exactly what is at risk here. A small leap of faith should convince you that the project's success or failure is directly linked to the project organisation's success or failure. The 'lost' investment dollars injected into the project failure alone could potentially cripple the organisation financially, not to mention possible lost market credibility. And the cost is not just tied to financial interests. Resources assigned to projects that are not viable represent a gross misuse of people, equipment and infrastructure that may already be stretched to the limit across a number of projects. Add to this morale problems, functional loyalties and communication bottlenecks, and suddenly poor project-selection techniques appear almost criminal (a little exaggerated, perhaps, but it does make the point).

Add to this the time wasted in meetings, inspection and reporting processes, the procurement rules that ended up being overkill, the project stakeholders that have lost their professional credibility and the loss of confidence throughout the project organisation. It isn't a pretty sight. Think of the project-selection requirement as one of aligning the project's results with the project

organisation's future—both must be intertwined. With finite time, budget, scope and resources, it may not be an option for an organisation to pursue every project that comes its way. Some will get the nod, some will get postponed, while others may get the chop. And each of these decisions can be documented, justified and actioned without the risk of any other potential damage to the project and/or the project's organisation through poor project-selection techniques.

Then there is the question of priority. As crucial (and hopefully obvious) differences exist between urgent and important work, not all work can be scheduled at the same time. Multiple projects, operational work and competing resources make for a priority challenge regarding what gets done first. Perhaps a PMO holds the answer, or the maturity level of the project organisation itself. And don't forget the primacy of operational managers and their own priorities.

Regardless of the organisation, they have one thing in common: survival (note, however, that there are degrees of survival, depending on how it is measured—for example, by profit result, market share, product diversity and so on). Every organisation in the private, public and not-for-profit sectors develops and communicates 'survival' strategies that may be framed around market positioning, revenue growth, competitive advantage, shareholder return, regulatory compliance, return on investment, global domination or whatever their particular focus is. And with survival comes change—from where the organisation currently is (known as the 'current state') to where it would like to be in the future (known as the 'future state'). In short, projects are all about change, both in a physical deliverable sense of the word and in the expectations of the stakeholders that also change. In other words, project management is about facilitating change and moving organisations, people and processes from the current state to the future state.

The role of an inspiring strategy

Anything to do with management involves a dynamic and often constructed mix of both scientific principles (some mandated) and other more discretionary and personal input (known as the 'art' part). Strategic management is certainly no different. While this text refrains from becoming a book on strategic management (or operational or change management), in order to ensure that all projects are aligned strategically to the needs of the organisation, we need to begin our journey by defining strategy, strategic management and the overall framework it presents. Having done that, we can then move on to justify the

change process needed to deconstruct strategy into projects.

It should come as no surprise that everyone has their own definition of strategy. PMBOK gets in on the game with its reference to a project being the delivery vehicle through which the organisation's strategic plan is achieved. Perry, Gibson and Dudurovic (1992) define it as 'a comprehensive and consistent pattern of decisions and actions…to gain a competitive advantage'. A variation on this is offered by Newman, Logan and Hegarty (1989), who acknowledge strategy as a vital management tool used by senior managers to shape the future course of their organisation. Irrespective of the subtle variations cited, it is clear that strategy should deal with or do the following (although feel free to add your own suggestions):

- involve corporate management
- identify and exploit differential strengths, weaknesses, opportunities and threats
- be future, value and results oriented
- be integrated organisation wide
- provide coherence and momentum
- be qualitative in design
- have a 'relative' long-term focus
- target action-oriented, measurable activities.

The notion of an inspiring strategy is fundamental to designing the future for any organisation, as it lays the pathway to the ultimate and desired end point (Cole, 2010). Integral to this is the prerequisite that the organisation creates and delivers sustainable value for its stakeholders. Irrespective of which terms are used—values, vision, mission—strategy sounds important. Now let's turn to defining strategic management, and in doing so get closer to our goal, in this section, of aligning strategy and projects. In its most basic form, strategic management manages the organisation's strategy through its formulation, implementation and, one would hope, evaluation stages.

Much like a project management life-cycle, strategic management evolves through a number of predefined stages, guiding and integrating the organisation as it operates within its continually changing environment (both internal and external). Pearce and Robinson (1994) also provide a useful, although conceptual, definition that identifies strategic management as 'the set of decisions and actions that result in the formation and implementation of plans designed to achieve a company's objectives'. Yet another (notably more comprehensive) definition is put forward by Stoner, Collins and Yetton (1985),

who suggest that strategic management is 'a process of selecting an organisation's goals: determining the policies and strategic programs necessary to achieve specific objectives *en route* to the goals; and establishing the methods necessary to ensure that the policies and strategic programs are implemented'. In other words, strategic management is a formal and integrated process that identifies, communicates and measures change over time. For many, those changes will either add or subtract from the organisation's triple bottom line: the economy, society and the environment.

One of the common tools when working with strategic analysis (and the ensuing decisions) is the popular strengths, weaknesses, opportunities and threats (SWOT) grid. Essentially comprising four quadrants, the SWOT analysis compels the organisation to move beyond mere navel gazing, favouring its sacred cows (pet projects) and a preoccupation with its own marketing collateral in focusing its analysis both internally (what can be controlled: strengths and weaknesses) and externally (what can't be controlled: opportunities and threats).

The organisation can continue to practise and build on its strengths over time as they represent what the organisation does well. Any of the following could constitute strengths internal to an organisation:

- proprietary expertise
- product/service knowledge
- workplace location
- internal communications
- innovative practices
- excellent staff
- effective marketing strategies
- efficient production.

Weaknesses also remain internal to the organisation, as they are under its control. Examples include:

- dated market research data
- manual record-keeping processes
- cash-flow problems
- high rates of staff turnover
- a limited product/service range
- a remote location
- inefficient operating practices
- poor management.

Opportunities and threats are both external to and beyond the control of the organisation. With opportunities, the organisation can build on or take advantage of any of the following examples:

- a loyal client base
- increasing market demands
- few competitors
- economic prosperity
- seasonality
- market trends.

The challenge for the organisation is to minimise threats wherever possible, including:

- increased competition
- falling demand
- economic downturn
- rising interest rates
- political policies.

The SWOT analysis can be used in any number of situations, including strategic analysis, portfolio alignment, project assessment and justification, competitor analysis and/or where any comparative assessment has to be made. A suggested format for the SWOT analysis is provided in Figure 2.2.

Figure 2.2 SWOT analysis

Critical reflection 2.1

Conducting a SWOT analysis is never a one-off activity, as the internal and external factors impacting any

organisation remain dynamic and fluid at any given time.
- Identify what the strengths and weaknesses are for your organisation.
- Develop strategies to maximise the strengths, and to reduce (or remove) the weaknesses.
- Similarly, identify what the opportunities and threats are for your organisation.
- Develop strategies to maximise the opportunities and to reduce (or remove) the threats.
- How does this SWOT approach assist in your ability to plan and manage your projects?

Revisiting operational reality

While little is certain in life, the work environment will inevitably continue to change. Regardless of the driving forces—climate change, economics, social pressures, politics, technological enhancements, consumer demand, global competition or increased regulation and compliance—new workplaces and new workforces are changing the traditional operational footprint within organisations.

While strategy identifies the road (direction) the organisation wants to take, the task of navigating that road becomes the operational reality. New terms— goal, objective, target and activities—enter common language as operational management becomes the successor to strategic planning. Considered by some as the 'backwater of corporate activities', managing functional or work-unit level operations on a daily, weekly or annual basis is essential to lift the productivity of the organisation—the true measure of how well operational areas perform. This performance is often measured against a number of planning, monitoring and reporting techniques, with the two most notable being budgets (numeric plans) and schedules (timeline plans).

Table 2.1 provides an example of possible criteria that could be useful in differentiating operational reality and strategic initiatives. While the suggestions are not meant to be exhaustive, they are reasonably comprehensive in providing you with a 'line in the sand' with which to make this crucial decision.

Another way to get your head around what operational work involves is to examine it from a management perspective. What is it that operational managers do that strategic managers don't? Possible answers lie in the points below, suggesting where the focus of the operational manager and team should be. Adapted from Cole (2010), these are aspirational and educative in nature, and not exhaustive or prescriptive, so you certainly have discretion regarding how you apply them and in the amount of information and detail you capture:

- Practise and reflect proactive management, not reactive management.
- Encourage management by exception, reporting only on important deviations.
- Involve an iterative process of moving, changing, revising and updating.
- Set a projected course of action aimed at achieving future goals, vision, mission or strategy through providing clear objectives, with activities mapped against these so they can be realised effectively and efficiently.
- Communicate what is to be done, why it is being done, who is to do it, where it is to be done, when it is to be done, how it is to be done, how it will be monitored and how it will be measured.
- Evaluate against objectives that are SMART: specific, measurable, achievable, realistic and timeframed.
- Crystallise your thinking: follow the verb–what–why formula (e.g. 'to develop and implement a plan to increase alternate funding sources by 25 per cent to reduce reliance on government funding').
- Circulate precise, concise and flexible documents that can be understood easily, implemented and managed—not vague statements of intent.
- Incorporate a range of potential resource requirements—equipment, facilities, funding, materials, people, space, time and training—in your planning and reporting.
- Constantly ask four questions to assess the plan's viability: What could go wrong? What would indicate it is about to happen? What could prevent it from happening? What should be done if it does happen?
- Identify where monitoring is needed, what specific monitoring measures will be put in place, what is happening compared with what should be happening (variation) and what corrective action (if any) is required.

Table 2.1 Separating operational reality and strategic initiatives

Operational reality (business as usual)	Strategic initiative (change)
Seen as a routine request	Finite budget determined and monitored
Few known or crucial constraints	Allocated priority status
Limited risk involved	Specialised resources required and sourced
Functional and localised impact only	Sequenced tasks involving change
Managed with standard operating	Requires proactive managing and

procedures	reporting
Degree of flexibility in the output	Multiple stakeholders involved
Variable effort acceptable over time	Defined stages of both process and work
Component of your ongoing performance	Multi-functional (organisation-wide) impact
Likely to attract frequent interruptions	Sense of communicated urgency
Little sense of urgency evident	Benefits (outcomes) may be measured
Prone to inertia, delays and postponement	Change approvals required
May be poorly defined and/or explained	Agreed and monitored start and finish time
Potential for delegation is high	Documented and detailed scope

Clearly, overlaps can and will occur between what strategy and operations involve. However, despite strategy being set by boards, executives and/or senior management, and operations set by middle- and lower-level managers, there should still be a clear line of distinction between what is strategic and what is an everyday operational focus. A useful dividing line between strategy and operations is the tried and tested effectiveness versus efficiency measure, where one looks at whether the organisation is doing the right things (effectiveness) or is in fact doing things right (efficiency). Table 2.2 (adapted from Stoner, Collins and Yetton, 1985) examines this explicit difference in more detail to again reinforce that, while both are required, each serves a different purpose.

Critical reflection 2.2

Routine work, operational priorities and strategic initiatives (projects) pretty much make up everything you come across on a daily basis at work.

■ Review Table 2.2 and see whether you can offer any more criteria to help separate operational and strategic 'stuff' in your workplace, as my list is not exhaustive.
■ Why is this differentiation important?
■ Do you think everyone in your organisation 'gets' this distinction when projects are created and handed out to already busy (and perhaps overloaded) employees? You might like to review and/or amend your critical reflection from Chapter 1 too.

To project managers, projects always come first. They must come with an executive mandate when they are first conceived, assessed and planned, right through to when they are executed, completed and handed over. This presents a number of potential issues, problems or straight-out conflicts between different managers, functional work areas, and policies and procedures, as different work areas struggle with increasing project workloads in workplaces that continue to downsize their personnel to the extent where many staff are required to do the equivalent workload of two or three people (who are no longer with the organisation). This is further compounded by the reality that culture 'will eat strategy for breakfast every day'. Remember that culture is the invisible hand that silently and sometimes innocently shapes workplace behaviour through a set of established and adopted patterns, including beliefs, customs and practices.

Table 2.2 Separating strategy from operations

Differentiating criteria	Strategy	Operations
Organisation focus	Long-term survival, development	Operational excellence, compliance, performance reporting
Over-arching objective	Growth, diversification, dominance, return on investment	Operational targets, performance against plan
Investment measurement	Revenue, margin and profit growth	Historical returns, present profits, controlled costs
Leadership profile	Visionary, inspirational, supportive	Conservative, directive, controlling
Organisational environment	Entrepreneurial, flexible	Bureaucratic, stable
Information requirements	Qualitative, conceptual detail	Quantitative, technical detail
Risk profile	Risk seeking	Risk averse
Management style	Encouraging and supporting innovation	Maintaining the status quo
Ongoing constraints	Changes in the internal or	Operating procedures,

	external environments	policies, skills, legacy systems
Demonstrable rewards	Effectiveness, future potential	Efficiency, stability
Problem-solving	Proactive, learns and applies lessons	Reactive, reliance on past experience
Capability management	Succession planning, flexible workforce, partnering, performance management	Position descriptions, exception reporting, functional task priority
Learning approach	Proactive, targeted competencies, objective driven	Reactive, generic competencies, deficiency driven

And it isn't only culture that can spoil the party. Standard operating procedures (SOPs), the bane of work life for some, often set the protocols for operational planning, implementation, reporting and compliance regimes. While delivering benefits in the form of an established and agreed framework, equally these well-intended protocols can impinge on the sense of urgency that projects bring, their deadline-driven schedules, the required change process and approvals, and the focus on tracking, reporting and controlling technical, time and budget variations, as distinct from simply reporting variations.

Maintaining the credibility of change

Change, with its pervasive and complex nature, is ever present at both the strategic and operational levels in all organisations. In fact, you could call it the crucial conduit translating the strategic dialogue of the organisation into the operational reality.

With powerful macro-economic forces at work (new products, productivity gains, emerging technologies, growth, profitability, survival), change can be intrusive, disruptive and traumatic. Caught up in the press of everyday operations, invisible assumptions and unconscious behaviour (played out as organisational behaviour), change requires both courage and hard decisions. As it challenges the operational mandate to keep the current system operating (as

opposed to creating an all-new system), balancing both continuity and the credibility of change demands responses outside of the defensive routines, traditional and formal boundaries, SOPs, redundant practices and expectations of the organisation (Kotter, 1998).

With an emphasis on stimulating mental work and not replicating physical work, you need the vision before the plans and programs. Without a sensible vision, any change initiative can easily dissolve into a list of confusing and incompatible projects, taking the organisation in the wrong direction—or, in fact, nowhere at all (Duck, 1998; Kotter, 1998).

Modelling the process of managing change

As organisations continue to move through what could be called 'organisational transitions' in moving from something old to something new (structural change, employee empowerment, downsizing, right sizing, reform or reengineering), the opportunity and/or challenge remains to provide navigation beacons along the way to lead and sustain the change. While there are numerous models of change management, two are examined in detail here. The eight-stage Kotter (1998) model is presented below, followed by the Kübler-Ross (1969) five-stage 'grief cycle' (remember that for many people, change is personal and fraught with loss and grief).

The eight-stage Kotter model can be summarised as:

1 establishing a sense of urgency:
- taking on the challenge of fighting both complacency and lethargy
- bombarding people with information about future opportunities and insisting that people talk to disgruntled clients and stakeholders
2 creating a guiding coalition:
- directing change efforts through membership based on positional power, expertise, credibility and leadership (not cautious management)
- recognising that change is fundamentally about feelings, trust and conviction (managing people is about managing feelings versus an intellectual commitment)
3 developing vision and strategy:
- articulating vivid and coherent descriptions of audacious goals to combat complacent lethargy
- thinking about what is strategically feasible and recognising patterns, and

anticipating problems and opportunities before they occur
4 communicating the change vision:
- without credible communication (words and deeds), and a lot of it, the hearts and minds of the employees are never captured (information vacuums will only create gossip)
- creating metaphors, analogies and examples that enhance the two-way credibility of complicated messages quickly and effectively
5 empowering employees for broad-based action:
- remembering that empowerment does not mean abandonment, and allowing employees to be creative and innovative by removing the operational obstacles
- facilitating critical conversations discussing the undiscussable—what Duck (1998) refers to as 'pity city' (a bitch and brag session) or the popular Japanese practice of *waigaya* (Goss, Pascale and Athos, 1998)
6 generating short-term wins:
- developing measures to plot progress towards victory and a new strategic language to describe it and build on what works, while discarding what doesn't
- directing effort towards results-driven improvement programs (a focus on achieving specific, measurable operational improvements) and not activity-driven improvement programs (feel good, adrenalin rush, delusional measurement)
7 consolidating gains:
- project management and leadership from below in recognising enthusiasm, acceptance, commitment and celebration to keep the momentum going (and the 'forces of tradition' at bay)
- allowing instructive lessons to be learned through exploring options, taking risks and making (critical) mistakes
8 anchoring new culture:
- constantly watering the shallow roots (and the greenery) of change to ensure its 'deep roots' correspond to reality
- resetting the new practices with new norms of behaviour and shared values, and working from the individual to the organisation.

Figure 2.3 reflects the progressive evolution of effective change management.
So the challenge remains in creating a compelling context for change while equally remembering that, in any attempt at change, the organisations can never legislate its employees' feelings, even if it does rent their behaviour (Duck 1998). This concept is crucial in the next model. Based on the research of

Elisabeth Kübler-Ross (1969), first published in *On Death and Dying*, the five-stage 'grief cycle' model (based on terminal illness) adds another dimension to and level of understanding of the 'staged' journey, and of people's emotional reactions, in response to change:
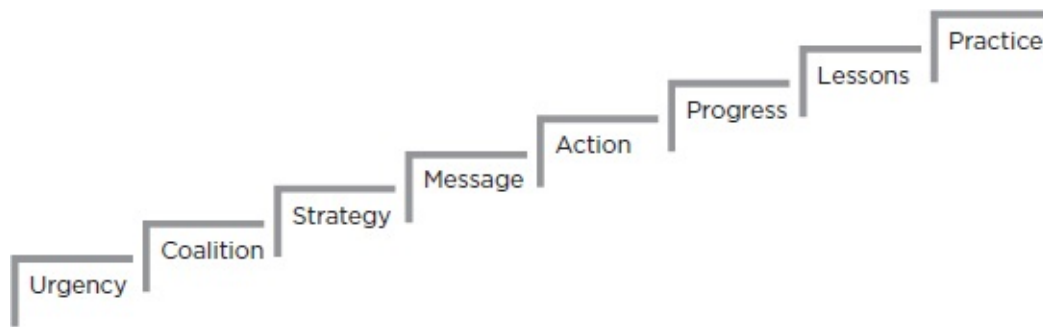
Figure 2.3 Change management process

1 *denial*—trying to avoid the inevitable: demonstrated by a conscious or unconscious (and natural) refusal to accept the facts, information and reality of the change context or situation
2 *anger*—frustrated outpouring of bottled up emotion: demonstrated by anger, rage, aggression or envy directed at themselves and/or others, especially those close to them
3 *bargaining*—seeking in vain to find a way out: demonstrated by attempting to bargain or seeking to negotiate a compromise in the guise of a short-term, unsustainable solution
4 *depression*—final realisation of the inevitable: demonstrated by acceptance of the certainty of change along with emotional detachment, sadness and fear in beginning to accept the reality
5 *acceptance*—finding the way forward: demonstrated by a deeply personal, singular and final belief in having to get on with the change.

Implications for the project organisation

Change, the by-product of strategic direction and the forebear of operational reality, continues to drive the project management landscape in many organisations. Regardless of the rationale, logic, business case or other applicable justification, change will continue to pressure organisations in the future as managers attempt to transform their organisations into competitive, flexible and sustainable organisations. Remember, by definition projects produce

lasting change, which might not be welcomed by all. So while the project organisation, stakeholders and project manager may all believe that everyone is on board through their (explicit or implied) actions, such a blind belief could be premature. People's response to change is not universal; it is purely and selfishly personal—and has to be encouraged and supported on a one-to-one basis. Nor will people's response to change be intellectually driven, linear (in line with the models above), convenient or expeditious from the perspective of the project's objectives.

Project (change) management should be about engaging both the heart and the mind, and not just about the great job it does in engaging the mind in concepts, schedules, reports and deliverables. Often it only links objectives and results in the scoping/proposal stage in assessing 'what will benefit the company', as opposed to trying to establish a sense of personal purpose that engages and transitions stakeholders (Lang-Cork: adapted from online resources).

Justifying the strategic decision

We know that strategy is geared around change and that projects are often the appropriate vehicles for delivering significant change. So let's now align these two by getting the project into the right gear. Because strategy represents a future mindset, any resulting attempts to justify the project investment decision strategically must be equally forward looking.

Consider the following triggers as possible strategic justification criteria for any number of projects:

- competitive activity
- customer advantage
- regulated compliance
- operating necessity
- enhanced capacity
- product mix diversity
- cost efficiencies
- capital management
- investment return
- comparative benefit
- political importance
- organisational impact

- interrelated projects
- profitability growth.

Each of the above offers a genuine opportunity to drive the true strategic needs of the organisation, its environments and the intended result of the project. Regardless of whether the competitive activity example is in response to a competitor initiative, represents an aggressive, proactive move to increase market share or is an example of gaining increased efficiency, the project that delivers these results can always be fully justified, funded, prioritised, resourced and managed. This is achieved through the ownership, direction and support of the corporate strategic management team—many of whom often end up being project sponsors themselves.

Figure 2.4 shows how easily different assessments can be made against the objective criteria of return on investment (ROI), technology, efficiency and/or market factors.

Clearly, these drivers and subsequent decisions will look potentially different for the private, public and not-for-profit sectors, as each responds both strategically and operationally to the environment in which it competes. This difference could be reflected in the communicated priority levels for their projects. Remember, not everything we do is critical or urgent, and it doesn't need to be done immediately. Think about the routine administrative or discretionary tasks we have each day—timesheets, emails, updates, meetings, personal calls, surfing the web—and it is easy to see that few, if any, of these carry any high level priority. Perhaps some are important, although many could be done at any time under a low level priority setting.
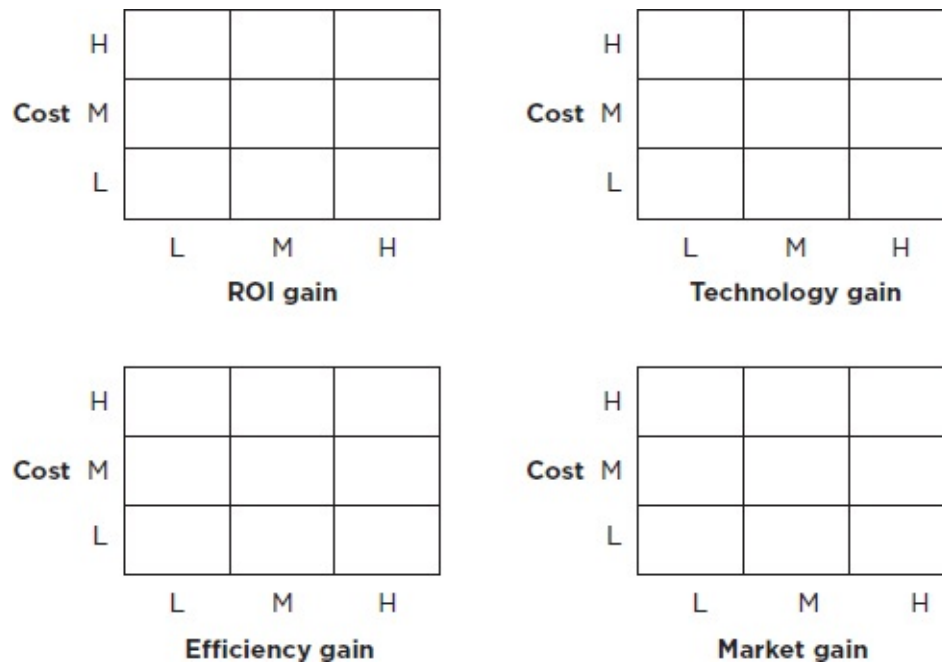
Figure 2.4 Analysing project selection

So what is an appropriate priority scale to use for our projects? Is it:

- a Likert scale with numbers from one to five
- a descriptive scale of critical, important or routine
- a list a pre-coded alphabet letters A, B, C?

If you have never considered establishing a priority scale for all those strategic initiatives and operational realities, you are confounding and compounding the chaos, reactive decision-making and management of these projects.

Non-numeric selection models

Meredith and Mantel (1995) identify six popular and simple non-numerical models that many project stakeholders still find appealing today, given the absence of mathematical modelling and analytics.

The sacred cow

As the name suggests, this selection tool enjoys the acknowledged 'protection' of a senior manager whose comments on and/or endorsements of an idea (perhaps a new product development project or a market penetration project) provide the necessary trigger to create the project. As Meredith and Mantel (1995) suggest, the project is sacred in the sense that it will be maintained until successfully concluded, or until the boss personally recognises the idea as a failure and terminates it. Clearly there is an element of self-interest, subjective decision-making and personal risk in this model; however, the obvious and public patronage of senior management should not be written off altogether.

The operating necessity

In a crisis, maintaining operational functionality becomes more important than the cost–benefit exercise. Redundant systems, a lack of support for technology and/or an impending natural disaster will all push a project to the top of the pile without too much formal evaluation. With such driving forces, there is room for distortion and rushed (and perhaps emotional) decision-making, with a lack of structured checks and balances.

The competitive necessity

Having gained market share, often at great cost and time spent, few organisations would be willing to sacrifice this in the light of a competitive threat. In these cases, a quick and decisive response is called for that again can bypass more independent evaluation processes. Furthermore, this response is entirely reactive, making it difficult for the project to be aligned with the strategic goals of the organisation. In effect, the project's organisation may spend all its project investment on playing 'competitive catch-up'.

Product line extension

In marketing terms, products and services progress along what is termed a 'product life-cycle curve' (an imaginary S-shaped curve portraying an idealised evolution of the product or service from market launch to market removal). As the products and services move along the curve, their appeal ultimately starts to

diminish, giving marketing professionals the opportunity to try 'product extensions' or 'product modifications', which effectively reposition the product or service favourably with the consumer. In many cases, these decisions could be made intuitively without requiring too much analysis. Supermarket shelves, television and other media channels are full of product line extensions (sports, nutrition and health-related industries are perfect examples of this project-selection model).

Comparative benefit

One of the most appealing non-numeric models is the comparative benefit model. It is suited to those organisations tackling multiple projects, all of which offer differing degrees of benefits to the organisation. Selection is made by a team of managers who collectively decide to pursue those projects that offer the greatest value (even though this value cannot be defined accurately). Some weighing of the pros and cons of each project is mandated; however, the final choice can still be highly subjective.

Qualitative checklist

Despite some genuine criticism of this technique (limited ranking, comparison, prioritisation and non-financial criteria), checklists still offer an opportunity to scrutinise potential projects in assessing their viability (Wysocki, 2014). The checklist is easily created, as it is nothing more than a series of standalone questions posed against a number of criteria and asked for every project. The quality of the answer depends on the criteria, and common criteria include strategic alignment, benefits, risk, objectives, resources, timeline and funding.

Critical reflection 2.3

Any number of non-numeric selection models are available for use when assessing whether the proposed project will be accepted or rejected, with the weaknesses of the checklist approach already covered.
- Review the other non-numeric models (and perhaps others you research) and note their weakness.
- Which of the models does your organisation use and how does it justify this?
- Can you suggest other models against which your projects could be assessed (and why)?
- Construct your own checklist model, complete with suitable criteria and questions. Trial it with your next proposed project and evaluate its suitability.

Numeric selection models

A number of popular numeric selection models are also used, all of which reflect the profit capability of the project under evaluation. The four we will look at here are the payback period, the return on investment, the net present value and the project weighted evaluation matrix.

Payback period

One of the simpler models is the payback period. Under this model, the time taken to repay the original investment is the all-important criteria to consider. For instance, a potential investment in new plant will cost $100,000. Assuming that the annual cash flows from the project have been determined at $25,000 per year, it can be 'calculated' that it will take four years for the original investment to be returned. Clearly, this model requires information on anticipated cash flows that will last long enough to repay the investment. Any additional cash flows after this payback period are of no further use under this model.

Return on investment (ROI)

This is one of the most popular models. It evaluates the project's profitability by first calculating the average annual profit of the project, then dividing that by the number of years for which the project investment is required. Expressed as a percentage, the return on investment model takes into account the entire cash-flow period of the project. For instance, consider the earlier example where the project investment was $100,000 repaid over four years. Assume now that the project returns cash flows for another two years at $20,000 per year. The average annual profit would be the total gain or profit of $140,000 less the original investment of $100,000, or $40,000. To calculate the return on investment, simply divide the $40,000 by the original investment to determine the 40 per cent return (rather healthy in this example).

Net present value (NPV)

This model is one of two discounted cash flow (DCF) models commonly used to

evaluate projects (the other one being the internal rate of return). The NPV takes into account the future value of investment money from the second year onwards by discounting the project cash flows by the required rate of return (sometimes known as the 'hurdle' rate). Any positive NPV values would signal that the project is acceptable. The formula used to calculate the NPV is:

$$NPV = \text{Discount factor} \times \text{Cash flow}$$

The discount factor is calculated from $1/(1 + i)n$ where i is the forecast interest rate and n the number of years from the project start date. A complete list of all discount factors can be obtained from an annuity table found in most statistical, finance and/or management texts.

Project weighted evaluation matrix

Representing a combination of qualitative and quantitative criteria, this model suggested by Wysocki (2014) uses weighted criteria, assigned scores and multiplied totals to effectively rank multiple projects for consideration. Projects returning the higher rated scores represent better options than the lesser scoring projects, and are more likely to be prioritised as likely project contenders.

Much like an evaluation matrix used by recruitment organisations and tender evaluations, the weighted matrix is easy to construct and does provide a reasonable level of objective comparison (all things being equal).

Evaluating the models

Burke (1999) proposes five criteria to be used when evaluating the project-selection models, be they numeric or non-numeric:

1 a degree of realism reflecting the manager's current situation with regard to facilities, resources, risk and other relevant decision-making criteria of the organisation
2 the capability to deal with multiple time periods while simulating a number of variable internal and external situations facing the project
3 whether it can quickly and easily be put into place
4 an element of flexibility that allows for modification as the project

organisation's environment changes

5 ideally, a low-cost regime relative to the cost of the project and well within the potential benefits of the project.

These, and some additional suggestions, are summarised in Tables 2.3 and 2.4.

Project classifications

Projects come in all shapes and sizes—as they should. No two projects are alike in any dimension, be that time, cost, risk or quality. This obviously has direct implications, as the project will need to be scaled appropriately against some independent, objective and robust criteria.

With classification comes the ability to scale the methodology itself, as not every project requires the 'full-blown' set of project processes and templates. A relatively small project might only require some initial and brief documentation, followed by minutes of meetings and a final email confirming completion. Other large projects, however, might well need an initial brief followed by a thorough business case and requirements document before the project proposal gets signed off. The hard question, though, is: What should the classifications look like in terms of terminology and criteria?

Table 2.3 Advantages and disadvantages of non-numeric project-selection models

Model	Advantages	Disadvantages
Sacred cow	■ Supported by senior management	■ Probability of empire building ■ Project tied to a manager's tenure ■ Lack of organisation-wide support
Operating necessity	■ Driven by situational realities ■ Fast-tracked decision-making (can also be a disadvantage if rushed	■ Pressure to conform with operational pressures ■ Limited budget provision ■ Insufficient time to plan ■ Few alternative options

		decision-making results in a poor outcome)	canvassed ■ Limited functional impact
Competitive necessity		■ Ability to match competitors	■ The likelihood of playing catch-up ■ Little analysis of competitor actions
Product line extension		■ Taking advantage of market conditions and opportunities ■ Gaining economies of scale from plant and personnel ■ Increased market penetration	■ Often hard to defend rationally ■ No guarantees of market success ■ Possibility of eroding existing product market share and/or profit results
Comparative benefit		■ Discussion and capture of all project benefits ■ Increased visibility for all projects under evaluation	■ Lack of focus on projects warranting independent approval ■ Potential to overlook low-visibility projects
Qualitative checklist		■ Opportunity to pose a number of relevant questions framed around key aspects of the project ■ Invites rich descriptive information	■ Opinion-based only ■ Time consuming to verify and quantify responses

Table 2.4 Advantages and disadvantages of numeric project-selection models

Model	Advantages	Disadvantages
Payback period	■ Simple to use and understand ■ Highlights projects with the shortest payback period ■ Uses financial data already available	■ Assumes cash flow will last for the life of the project ■ Ignores the time value of money (future cash flows) ■ Focuses only on cash-

	■ Does not require any sophisticated software ■ Reduces project risk by supporting projects with the fastest payback	flow projections ■ Fails to quantify risk exposure ■ Is not suited to long-term projects where changing inflation and interest rates could dramatically alter the results
Return on investment (ROI)	■ Takes into account the total cash flow of the project ■ Easy to use ■ Acknowledges the project profit and the percentage return on investment ■ Aligns with existing investment management techniques	■ The profit is averaged out over the project ■ The challenges of determining what percentage of return is acceptable by management
Net present value (NPV)	■ Uses the time value of money with all future cash flows in today's values ■ Can simulate different scenarios by changing the values used ■ Considers the whole project, year by year ■ Can be structured to allow for inflation	■ Uses a fixed interest rate over the life of the project ■ Estimated future project cash flows may differ dramatically from actual results ■ Accuracy is driven by interest rate predications and forecast cash flows
Project weighted evaluation matrix	■ Focuses on a finite number of key criteria ■ Agreed weighting scale ■ Answer scoring protocol	■ May exclude other criteria equally, if not more important ■ Not everything can be summarised in a numeral ■ Weights and scores can be manipulated

Table 2.5 provides some guidelines for and illustrative examples of how projects could be scaled and classified. There can be no right or wrong options, as each organisation and project will dictate different criteria and classification cutoffs. Nor are the criteria mutually exclusive of each other, which only serves to compound the classification guide all the more. Irrespective of these obstacles, a classification guide should be developed and communicated across the project organisation.

Table 2.5 Project classification guidelines

Criteria	Classification		
	1—Lean	**2—Lite**	**3—Large**
Planning	No	Limited	Extensive
Scheduled time	No	> Month	> Month
Budget forecast	No	< $50,000	> $50,000
Risk exposure	Low	Moderate	High
Stakeholders involved	Few	Many	Multiple
Organisation impact	Slight	Low	High
Benefits measurement	No	Monitored	Evaluated
Formal evaluation	No	Yes	Yes
Contractual obligations	Rarely	Occasionally	Often
Quality standards	Few	Required	Required
Scope revisions	Minor	Moderate	Extensive
Project manager	Functional manager	Part/Full time	Full time
Methodology	Abridged	Complete	Complete
Communications strategy	No	Basic	Organisation-wide
Change controls	No	Explanation	Justification

Critical reflection 2.4

Project classification remains a bit of a mystery to many, with any number of criteria available to assess the scale or magnitude of the project. After all, no two projects are the same and projects will need to be structured differently depending on how they are classified.

■ Review the classification guidelines in Table 2.5 and add additional criteria that you think are important for your projects.
■ Consider different classification headings too, as 'lean', 'lite' and 'large' might not quite work for your organisation; however, the examples I cite do provide an insight (on some level) into the scale or enormity of the project.

Building the business case

Based on what you have read, you might now have a project being initiated. What was once a thought bubble, a sacred cow or, worse still, a crazy idea devoid of any reality check that then became a strategic objective has (ideally) survived an extended process of rigorous assessment involving justification selection, classification and/or prioritisation stages. And while this assortment of information could be captured in any number of documents, the business case is where most organisations elect to populate this data.

The business case documents whether or not the 'idea' is viable in terms of the required investment (which doesn't just have to be financial). The business case will define the business need, problem or opportunity in detail, analyse the different options, identify the costs, benefits and risks, and put forward a recommendation to proceed with or postpone the project. A number of potential options are evaluated against a set of criteria to help determine the viability of a particular option proceeding. And in the case of multiple project initiatives, the business case can be used to prioritise each one. Once approved, the business case will trigger the project proposal or charter.

In framing the business case process, perhaps a number of rather relevant questions need to be asked of the organisation first. The PRINCE2 methodology is particularly focused on the business case and I have included some of its preferences (and my own):

■ Has the business need been stated clearly?
■ Have the benefits been clearly identified? How will they be measured, and when?
■ Does the project align with the organisation's strategy?
■ Is it clear what will define a successful outcome?
■ Have a number of options or alternative being assessed, and the preferred

option identified?
- What level of organisational impact will there be?
- Can the project be funded adequately?
- Are the risks faced by the project explicitly stated? What plans are in place to mitigate those risks?

So it would seem you have some degree of discretion as to what the business case reflects. Let's try to narrow down the choices to reflect the following considerations, including:

- executive summary
- organisational background
- vision, values and mission
- business need (or opportunity)
- strategic objectives
- options appraisal
- market conditions
- performance capability
- organisational impact
- the risks involved
- indicative timeline
- financial investment
- life-cycle costs
- expected benefits
- the level of project maturity
- stakeholders involved and committed to the project (internal and external)
- current operational and/or project commitments
- interdependencies with current projects, programs and/or portfolios
- the project management approach
- the cost of doing nothing
- recommendations
- approval (signature block)
- the next step.

Collectively, these (and other) headings will not only justify and initiate the project; they will provide a subsequent framework for the planning and management of the project once it starts. In other words, the business case will remain the static reference against which the project's performance and benefits can be monitored and assessed. However, remember that you will need to adapt

your business case to your organisation in getting the right fit and feel.

Critical reflection 2.5

The point has been made that not all project justifications have to be based on sound financial returns on investment.
- What other (non-financial) information from an organisational perspective would warrant a project being worthy of initiation?
- How would the subsequent benefits from such a project be measured clearly and accurately?
- Should projects always include both numeric and non-numeric selection and/or justification criteria? Justify your answer.

Programs and portfolios

As flagged above, the project endorsed by the business case may also impact one or more other projects, which are being planned, performed or finalised by the organisation.

It may be that the project forms part of a program that simply means it is one of a few other projects that are managed separately but share a common goal. Road construction is a great example where a number of projects are being completed, with each project (with separate objectives, contracts, contractors and deliverables) comprising a different part of the overall construction program. In some cases, large projects could be broken up into more discrete and smaller sub-projects, creating a project program with multiple project resources required. They could be planned and managed separately while still delivering on the overall program objectives. A program manager (or some other non-project functional role) will be appointed to manage the whole program.

A project portfolio takes the concept to another level, where all the projects the organisation has on at any one time could be termed a portfolio, in which all are linked to the strategic plan or some other strategy. They may sit within a particular business unit and have a common objective, or be scattered across the entire organisation with different objectives. Given the potential scale of projects, a portfolio manager (or similar) will be appointed to manage the portfolio (Figure 2.5).

Organisational maturity

Kerzner (2001) suggests that another link also exists between the notions of strategy and projects, believing that the project management maturity model (PMMM) provides general guidance on how to perform strategic planning for project management. The model, built on five stages of escalating organisational-wide project management development, serves as the 'foundation of excellence' in baselining, nurturing and evaluating project maturity over time.

Project maturity is (and will always be) an evolving concept, and in principle it is a lot like any linear life-cycle approach, with one level of maturity triggering the next level. However, the maturity models differ in one key area: maturity levels can, and often do, overlap. This is certainly true in many siloed project organisations, where each department or section operates largely independently of the others, with different approaches and templates for managing their projects. And the degree of overlap will be a function of the alignment of projects, ownership issues, scaled methodologies, governance and myriad other variables—mostly invisible and uncoordinated in any systemised way. Let's now explore exactly what project maturity actually means, and the different target levels and evidence pool that would demonstrate and validate project maturity.
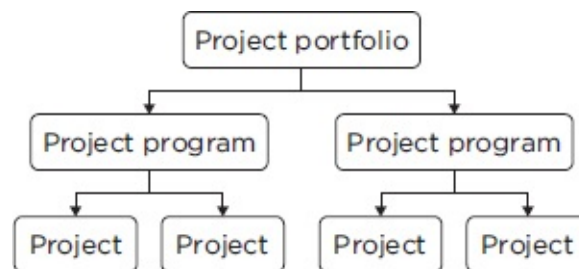
Figure 2.5 Projects, programs and portfolios

The word 'maturity' may well mean different things to different people (as one would expect). Defined generically, perhaps it means wisdom, adulthood, experience, reliability or even development. If someone has 'maturity', perhaps they are in the prime of their life, ready to take on whatever life throws their way. Swinging the definition back to project management, the term 'maturity' is, more often than not, broadly defined as excellence (or degrees of excellence). And as you would appreciate, excellence, more often than not, develops at different times and to different degrees over time. The popular terminology for tracking these 'degrees' of excellence are: immaturity, maturity and excellence.

As reflected in Figure 2.6, each of the five maturity levels enable the project organisation to assess their project performance and level of maturity against a number of generally accepted criteria.

Each of these levels is examined in Table 2.6. It includes some of the terminology and signposts from Kerzner (2001), along with some additional examples to help you identify your current level of maturity.
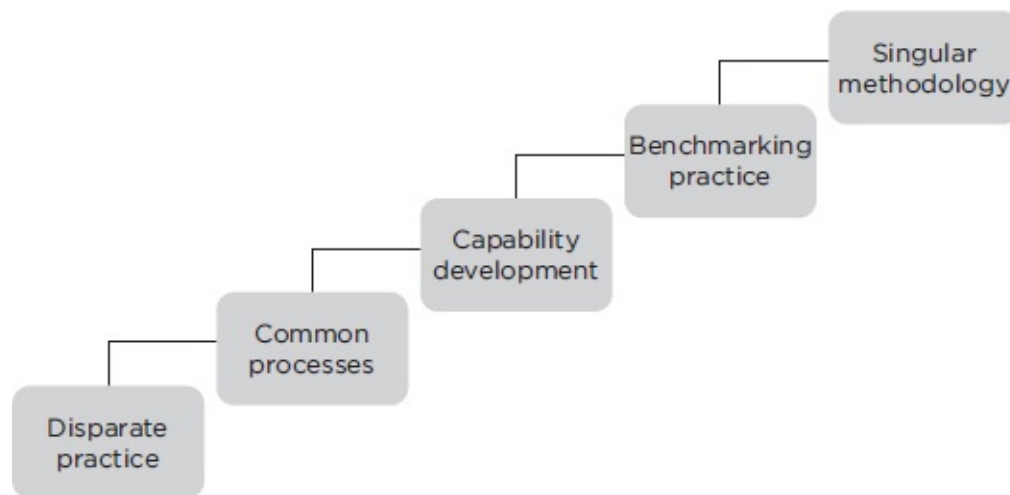
Figure 2.6 The pathway to project management maturity

Table 2.6 Project management maturity levels

Maturity	Alternative naming options	Common signposts (behaviour and practices)
Level 1	Siloed language Initial process Basic understanding Immaturity	■ No established (or endorsed) standards ■ Work is performed in an ad hoc fashion ■ No agreed, repeatable process in place ■ Minimal documentation ■ Individual and informal practices ■ Performance is reactive ■ Siloed self-interest ■ Little training or education ■ Lack of executive support ■ Sporadic use of project

		management techniques
		■ Recognition of the need for, and importance of, project management
		■ A basic understanding of project management principles
		■ Attempts to develop a common project management language
Level 2	Common processes Structured process Agreed standards Coordinated effort	■ Basic documented process ■ Focus on large or highly visible projects ■ Standard scheduling developed ■ Senior management visibility increases ■ Organisational commitment grows ■ Training focus shifts to competency and capability development ■ Focus on managing time, cost, specification and resource constraints ■ Recognition of the application of project management principles ■ Definition of common project management processes ■ Expectation of repeatable project success ■ Identification of tangible benefits from project management principles and a unified approach
Level 3	Singular methodology	■ Fully documented processes

	Institutionalised process Organisational standards Managed methodology	■ Adoption from most projects ■ Compliance monitored and reported ■ Organisational standards followed ■ Integration of all corporate methodologies into a single (project management) methodology ■ Organisation is totally committed to project managing its projects ■ An adaptive and cooperative culture ■ All layers of management visible ■ Capability development aligned with maturity
Level 4	Benchmarking standards Integrated processes Best practice Maturing expertise	■ Recognition that process improvement is a competitive advantage ■ Adoption of continuous analysis and evaluation ■ Establishment of a project office (PO), project management office (PMO) or strategic management project office (SPMO) ■ Quantitative and qualitative benchmarking ■ Integrated and accountable decision-making ■ Organisational-wide impacts integrated into projects ■ Strategic planning is the focal point of project management
Level 5	Continuous improvement Optimised process	■ Evaluation of benchmarking activities

Process improvement Ongoing excellence	■ Ongoing refinement of singular project methodology
	■ Critical assessment and dissemination of lessons learned
	■ Knowledge-transfer and mentoring initiatives
	■ Guidelines developed to feed improvements back into the process
	■ Value-based performance metrics measured and managed
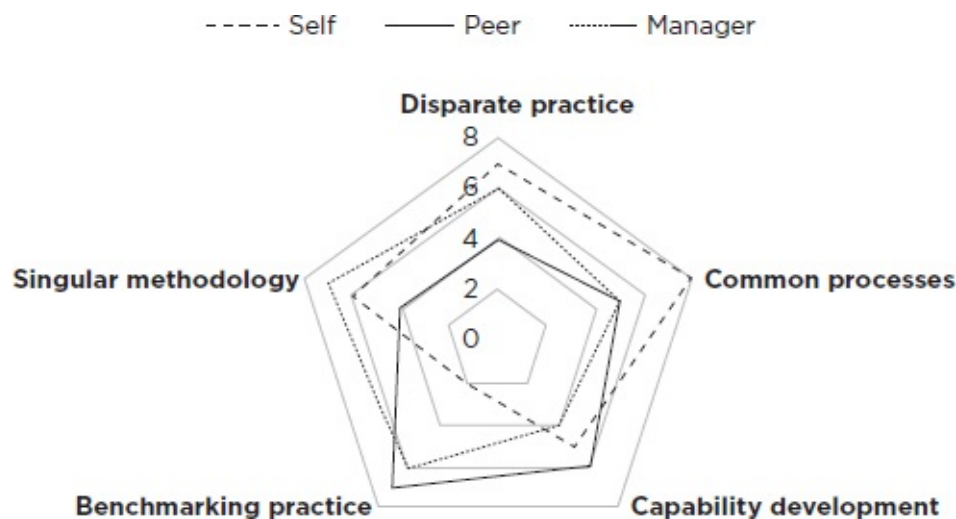
Figure 2.7 Organisational project management maturity

Once you are comfortable with this notion of project management maturity, you might like organisational assessment of your level of maturity. Figure 2.7 illustrates how your results can be displayed using a 360-degree self-report assessment.

Critical reflection 2.6

Project management maturity doesn't happen overnight, with many organisations failing to rise above the first few levels. And while there is no 'rule' that states you must reach Level 5, developing progressive project maturity will deliver tangible benefits to how you plan and manage your projects.

- What level of project management maturity does your organisation have?
- What impact (if any) does this have on your projects?
- What steps are required to consolidate your current level of maturity?
- What steps are required to improve your maturity to the next level?

Individual competence

Sitting within the boundaries of the project organisation's maturity level is the personal level of competence held by its employees.

The project management competency development (PMCD) framework is endorsed by the Project Management Institute. By linking PMBOK knowledge areas with individual competence, the PMCD has rightly focused on the importance of developing and demonstrating competence across three interdependent areas:

1 *knowledge:* what is known about project management theory, practice, processes, tools and techniques for all project activities
2 *performance:* how this knowledge is applied throughout the project
3 *personal:* what behaviours, attitudes and personality characteristics are on display when these activities are performed.

While acknowledging that these generic competencies are most likely universal in most, if not all, projects, this framework does not reference particular technical, environmental, political, social, information technology competencies that might be required in some projects, as these forms of specific competencies depend on the industry and/or organisational context. Figure 2.8 depicts the relationship between the three competencies and their progressive relevance to developing a professional development plan.
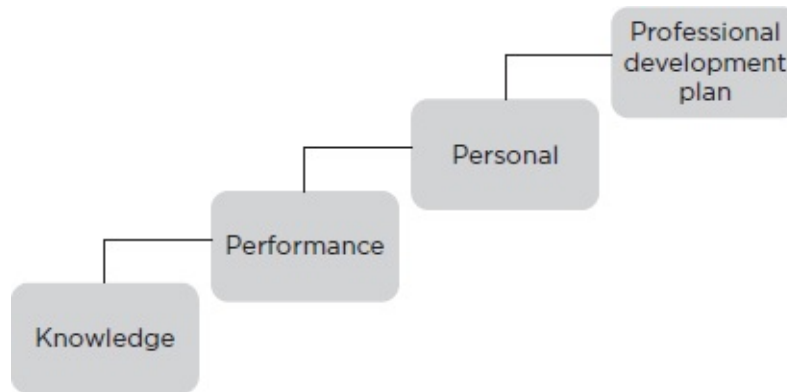
Figure 2.8 Project management generic competencies

Knowledge competencies

Within PMBOK (as with other methodologies), a finite number of knowledge areas or domains must be known in order to demonstrate competency. Under the PMBOK mantle, some of these knowledge areas could include:

- project management body of knowledge
- project life-cycle management
- project management process groups
- projects, programs and portfolios
- project management office (PMO)
- project management knowledge areas:
  - ☐ scope management
  - ☐ time management
  - ☐ cost management
  - ☐ quality management
  - ☐ risk management
  - ☐ communications management
  - ☐ human resource management (HRM)
  - ☐ stakeholder management
  - ☐ procurement management
  - ☐ integration management.

Critical reflection 2.7

Each project management methodology promotes its own 'unique' knowledge area. Choose from PRINCE2, Agile or Lean and record what knowledge areas a competent project manager (or some other project role) would ideally need to know about.

Performance competencies

These competencies relate to how that knowledge is actually being applied throughout the project, as knowing the theory and doing the theory can be worlds apart.

Again referencing PMBOK, the five units of performance competence relate to their five process groups:

1 initiating a project
2 planning a project
3 executing a project
4 monitoring and controlling a project
5 closing a project.

Think about what performance is required for initiating a project and for facilitating the development of the business case. In the planning processes, what are you doing to confirm the project's scope, budget, timeframe and resourcing decisions? How are you mitigating potential risk, designing quality in from the start, establishing the communications protocol and working through team roles and responsibilities (just for starters)? Moving to the execution process, what are you doing to ensure that the agreed scope is achieved, that the team is performing as it must and that the plan is being managed effectively?

Critical reflection 2.8

The examples above cover some of the performance competencies needed in the first three process groups under PMBOK.
■ What performance competencies would be displayed during the monitoring and controlling of a project, and in closing a project?
■ Revisit the initiating, planning and executing process groups above and see whether you can identify further examples.

Personal competencies

Now let's get up close and personal. You know and understand the knowledge, and you can apply it with varying degrees of success as you work on developing your individual capability over time and through each evolving project success or failure.

While realistically there are any number of personal competencies to draw from, PMBOK flags the following six:

1 *communicating:* matching intent with outcome with all stakeholders
2 *leading:* balancing direction and support
3 *managing:* administering compliance
4 *judgement:* using perception, discernment and cognition
5 *results:* being effective in realising activities and objectives
6 *professionalism:* demonstrating ethics, respect and honesty.

Table 2.7 provides examples of where your focus could lie in developing each of these areas. While the suggestions are generic examples only, read through them carefully but try to identify many more from a personal perspective as only you know where you need to improve.

Table 2.7 Project management personal competencies

Communicating	■ Actively listening
	■ Being honest
	■ Adjusting for your audience
	■ Encouraging contributions
	■ Providing appropriate feedback
	■ Avoiding premature evaluations
	■ Aiming for consensus
	■ Keeping accurate records
Leading	■ Developing a team identity and spirit
	■ Maintaining appropriate relationships
	■ Delegating responsibility while retaining accountability
	■ Being prepared to lead and follow
	■ Encouraging ideas
	■ Rewarding innovation

Managing	■ Documenting the project ■ Assigning project work ■ Working the plan ■ Managing performance ■ Resolving conflicts
Judgement	■ Taking the big-picture view ■ Staying close to the project ■ Considering opinions, beliefs and values ■ Being sensitive to others ■ Valuing experience ■ Respecting insight
Results	■ Maintaining momentum ■ Resolving problems ■ Monitoring performance ■ Motivating and rewarding ■ Being assertive
Professionalism	■ Having a visible commitment ■ Operating with integrity ■ Supporting diversity ■ Acting ethically ■ Being transparent ■ Undertaking full disclosure

In the resource supplement for this book, you will find a self-report template for a 360-degree assessment of your project management competencies. Figure 2.9 captures how your competency scale can be displayed.
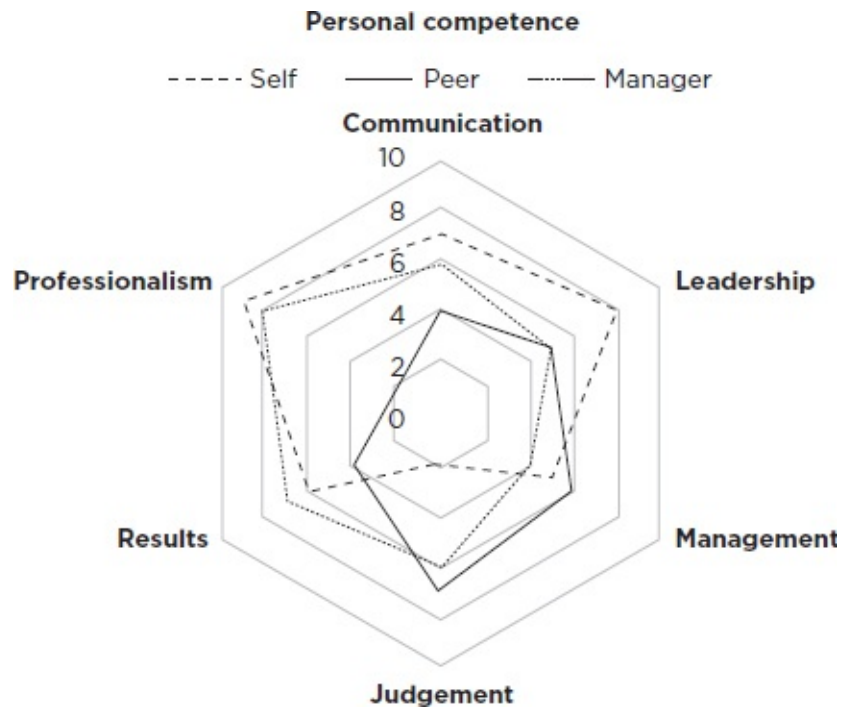
Figure 2.9 A 360-degree competency assessment

Project organisational structures

A key ingredient (or necessary infrastructure) supporting the project's success is the organisational structure housing the project, which formally identifies, communicates and manages all the relationships between all the stakeholders and the work they perform. Common sense would dictate that, if the structure is sufficient for the project and/or tasks imposed upon it, it will endure and 'guide' the project. However, should the organisational structure inhibit performance, pressure will build until the project outcome finally becomes compromised.

While there are a number of hybrid organisational structures from which to select, let's focus on the three most popular structures adopted by the project fraternity.

1 *Functional:* A traditional structure aligned with the existing organisational department or functions (in effect, an overlay of the existing organisational chart). Under this structure, the project is subsumed within an existing and relevant department or function most aligned with and capable of directing and supporting the project. Few, if any, changes are required to fit the project

into how the department does things. (Can you see the potential benefits and dangers of this structure?)

2 *Matrix:* A blended structure supporting both the existing functional authority, priorities, performance and accountabilities with the (at times) competing and conflicting authority, priorities, performance and accountabilities from the project. In other words, the project resources which are assigned and managed under this structure will often end up taking direction from two or more superiors—their functional manager and the project manager. (This contravenes a major tenet of good management—a subordinate should only ever report to one manager.)

3 *Projectised:* A separate and discrete structure that technically sits outside the existing organisational structure with dedicated full-time resources assigned to the project. Answering directly to senior management, this type of structure removes the need to compete with other departments for limited resources (people and/or equipment), or to get caught up in the day-to-day operational minutiae.

Figure 2.10 depicts three project organisational structures, while Table 2.8 summarises the major advantages and disadvantages of each structure. Feel free to add your own ideas to the list.

Choosing the right project organisational structure

Each one of these structures is an ideal structure, one that will work and can support and guide the project's success. People run into trouble with these when they align the wrong structure with the wrong project (and it doesn't work) and/or they simply do not understand the rationale behind each structure and the potential benefits or dangers lurking there. The structure must match the project.

The selection of an appropriate organisational structure to maintain the project should be determined by situational factors—that is, the variables underpinning the project. Generally, there are no step-by-step procedures, rule books or generic guidelines (other than intuition and history) to guide and influence the selections. Some clues could be located in the organisation's culture and the variables for each project, with the aim of a 'best fit' structure given the current circumstances.
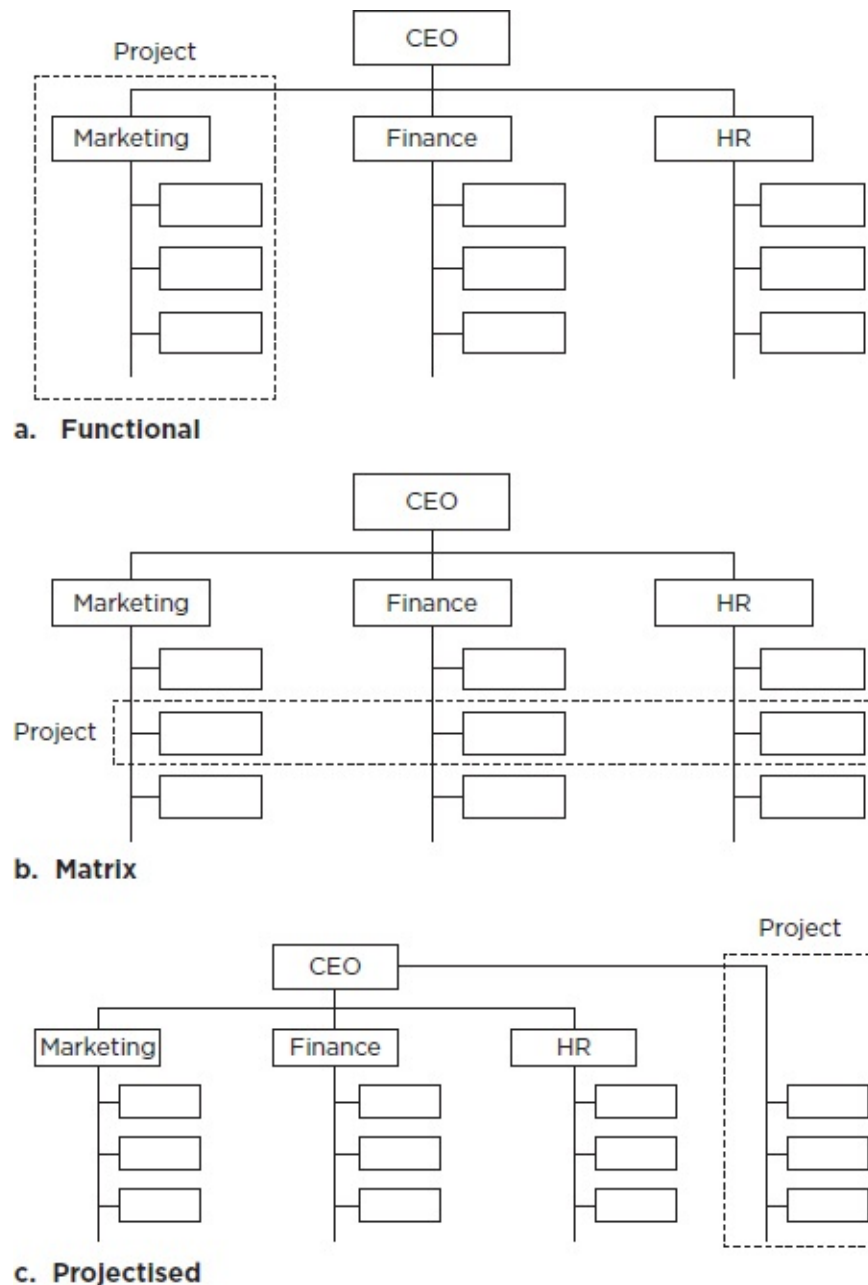
Figure 2.10 Three project organisational structures

The reality will often be that project sponsors, project steering groups, executive management and/or other project stakeholders will already have determined and prescribed many of the project constraints (time, budget, resources, specification), which in many cases negates any opportunity for the project manager and/or the project team to align with (or create) the optimal project organisational structure for their project. Some contributing factors might be:

Table 2.8 A comparison of project organisational structures

Organisational structure	Advantages	Disadvantages
Functional	■ Already in place ■ Resident technical expertise ■ Normal career path ■ Defined responsibility and authority ■ Known reporting lines ■ Fast response times ■ Staff flexibility ■ Access to backup resources ■ Ease of reassignment	■ Lack of coordinated effort ■ Client is not the focus of activity ■ Compartmentalises the project ■ Confused priorities ■ No clear project manager ■ Failure to pinpoint responsibility ■ Existing protocols drive the project
Matrix	■ An appointed project manager ■ Tailored to the project's needs ■ Shared personnel, facilities and equipment ■ Clear return path to reassign resources ■ Access to organisational-wide expertise ■ The project is the point of emphasis ■ Opportunities for training and development ■ Multi-skilling across functional environments	■ Greater complexity to work within and to manage diverse input ■ Results in confusion, divided loyalties and unclear responsibilities ■ Staff commitment can be variable ■ Multi-layers of decision-making ■ Staff reporting to multiple managers ■ Cross-functional conflict ■ Missed promotional opportunities within normal function
Projectised	■ Project manager has absolute authority ■ Clear chain of reporting ■ Resources dedicated full-time ■ Resident experts ■ Timely decisions	■ Duplication of facilities, equipment and effort ■ Costs in setting up ■ Replacement costs in taking staff 'offline' ■ Sheltered environment could cut corners

■ Holistic approach taken	■ Uncertainty post-project
■ Project team has separate identity	■ No opportunity for cross-fertilisation of ideas with other functions
■ Strong motivation and commitment	■ Development of 'us and them' mentality

■ blind adherence to traditional project management principles, processes and practices
■ a lack of clarity regarding how the project aligns across the existing business
■ working within known organisational reporting constraints
■ the degree of secrecy limiting the project's whole-of-business exposure
■ limited inexperience and/or exposure to the known and hybrid project organisational structures
■ an over-reliance on known, proven and limited resources
■ projects that are not properly conceived, planned, executed and finalised.

All the organisational structures presented offer the project and the project parent organisation some value and the key to success. The obstacle is not aligning the right project with the right structure. However, blaming executive dictates, bureaucracy, paradigms or inexperience is not the answer. What is needed is open and frank communication, assertive project personnel and teams that fully appreciate, accept and demonstrate their full responsibilities imposed by the project scope in conjunction with their existing operational commitments.

Remember that project management is all about creating order out of chaos through change. It is about scheduling solutions for success, and it is about managing change. To achieve any of these, the organisational structure must be right. Projects are about bringing resources together to realise a shared outcome. They are about:

■ *vision:* where are we going?
■ *team ownership:* buy-in, what's in it for me?
■ *balanced skill sets:* people ready to replace each other
■ *appropriate team roles:* the right person doing the right job
■ *accepted and delegated responsibility and accountability*.

Critical reflection 2.9

Given the different options you have in working under a particular project organisational structure, little

thought is sometimes given to what the appropriate structure might actually be.
- Should the organisational structure fit the project or the project organisation?
- Is your current project being established under the appropriate organisational structure?
- What are the obvious benefits of choosing the right structure and the equally obvious disadvantages of getting the structure wrong?
- With the advent of virtual teams and new technology platforms, are there any other types of organisational structures that are appropriate to planning and managing projects?

Project governance

While successful projects need thorough planning as one of their essential prerequisites, Gardiner (2005) recounts four fundamental pillars of governance that collectively work towards addressing direction and control in projects:

1 *accountability:* the capacity to call people to account for their actions
2 *transparency:* visible and open processes
3 *predictability:* uniform compliance and enforcement within laws and regulations
4 *participation:* stakeholder input and reality checking.

Cole (2010), in referring to the ways in which organisations are managed and controlled, argues that the focus of good governance is that boards and executives use due care and diligence by:

- acting independently
- appointing auditors
- evaluating senior management
- approving, scrutinising and monitoring strategies, performance and key decisions
- complying with legal and statutory obligations
- demonstrating oversight on external communications
- actively monitoring risk
- seeking professional advice.

These could equally be extended to a project management scenario, as they are relevant to version control, traceability, document management, validation, integrated change control and any other review, audit and/or approval processes required by any particular project or sector. In fact, it could be argued that

successful projects do not occur in isolation from any of these. We also know that projects require ongoing and demonstrated evidence of realistic expectations, thorough scoping, iterative planning and suitable resources—together with visible, strong and effective management support. Further, we know that any methodology provides both the necessary structure and appropriate rigour to manage any project, with the amount of documentation scaled and tailored appropriately. Overarching any project management methodology is the requirement that ultimate and final authority and accountability for each project are defined, accepted and communicated by the management team to everyone associated with the project. This is the clear intent and role of project governance: to plan and manage the project effectively throughout its life-cycle.

In the corporate sense of the word, governance historically entails executive management, committees, decision-making protocols, voting, financial transparency and reviews, among other aspects. They invariably take the form of a governing board of directors, together with both non-executive and executive directors (and often committees), each charged with complying with either an internal or industry code of corporate governance best practice. In essence, a corporate governance framework ensures positive, consistent direction, and becomes what Newman, Logan and Hegarty (1989) term 'the top arbitrator of strategy'. Through adherence to a governance framework, organisations acknowledge their commitment to being accountable for their decisions and actions as they oversee the future direction of the organisation.

Corporate governance frameworks often refer to a range of different functions, responsibilities and performances in line with setting the strategic direction, recognising and managing risk, approving organisation plans and guiding the policies of the organisation, while also enabling executive and senior management to oversee and monitor the organisation's affairs.

A quick internet search on project management's application of the term 'governance' returned the following interpretations and definitions:

- the act, manner or function of governing
- regulating the proceedings of a corporation
- assigning the decision rights and accountability framework to encourage desirable behaviour in the project
- defining roles and responsibilities for all project stakeholders
- determining the decision-making structure for the project
- describing the processes required for a successful project
- an active role performed by committed senior management, not just a

controlling one.

It would appear, then, that governance in projects differs little from corporate governance, as each is predicated on governing both process and outcomes.

Justifying the governance framework

Turning to a project-specific application of governance, a number of interlinked organisation drivers can clearly be identified as reinforcing the adoption of a governance framework. They could include the need for:

- an agreed, formal and reported alignment between strategic organisation and all projects
- appropriate and communicated investment decisions
- ongoing performance reporting requirements
- measured organisation value analysis
- organisation-wide compliance, coherence and commitment
- identification and proactive management of all forms of risk
- a matching of capability with requirement
- independent and informed oversight of project performance and progress.

In other words, with a project governance framework in place, the project automatically receives transparent accountability with detailed, iterative, rigorous project plans based on critical path analysis, defined success factors, performance milestones, and go/no go decision gates. Further, an internal audit capability and accountability will exist to provide regular, timely, unambiguous and results-driven reports on project performance, deliverables and outcomes. Additional benefits could also include any of the following:

- Stakeholders could be identified, communicated with and managed effectively.
- Risks could be identified and managed.
- Project documentation could be stored in a central repository.
- A process could exist to review and evaluate project documents and deliverables.
- An agreed specification for all deliverables could be developed, endorsed and managed.
- Clear assignment of project roles, authority, responsibilities and accountabilities could be communicated.

- An assessment of deliverable compliance against original objectives could be made.
- Comprehensive project plans documenting inclusions and exclusions could be drawn up.
- A suite of documentation for all project stages could be published.
- Improved predictability of project outcomes would be possible.
- The organisation's project-delivery capability would be developed.
- There would be demonstrable steerage of the project by harnessing support, removing obstacles and monitoring results.
- Processes and procedures for managing projects would be standardised.
- The timely flow of information to all stakeholders would be managed.
- Appropriate reviews of issues encountered within the project would be conducted to ensure that the required information, approvals and direction for the project were obtained at each appropriate stage.

Governance stakeholders and accountabilities

Remember, in the corporate world governance is often the domain of the board, executive management or a specific governance section. Similarly, project governance rests largely with sponsors, steering groups and the project manager, with each having a number of principal accountabilities (although overlap does occur). These accountabilities are outlined in Table 2.9.

The project management office

The original premise made earlier in this chapter, and others, that projects deliver change and that project managers and their teams help to facilitate this change is still paramount. We know from the above that strategy and governance should work in sync with any project that is planned and delivered. But the question still remains of how these two elements can be bound together cohesively and productively to actually produce a benefit to the project.

One answer may lie within the notion of the PMO, or the portfolio or program office, as they are increasingly being termed. The PMO's pedigree can be traced back to the US Army in the early 1980s, when it was used to coordinate major theatre of war operations. Since then, the role of the PMO has continued to grow

in both importance and application. However, as is often the case with new models, terminology and best practice, the PMO can be defined and explained in any number of ways, depending on who the advocate, process owner and/or guru might be. Taking the neutral ground, the PMO in its simplest form can be described as an attempt to establish a centralised repository for the project management methodology. In other words, it may well be a functional position within the project organisation through which all project requests, scheduling, reports and close-out activities proceed. In some organisations, the PMO is both positioned and works from a pure (and somewhat limited) administrative perspective, effectively relegating the role to more of a 'process owner', 'version control manager' or a distant, siloed and de facto command centre. Largely reactive, this type of PMO will have little credible input into aligning strategy and operations across projects.

Table 2.9 Key governance stakeholders and accountabilities

Stakeholder	Governance accountabilities
Client, sponsor	■ Ensure strategic alignment with the needs and goals of the organisation ■ Determine the overall organisation objective for the project ■ Ensure project outcomes meet the needs of the customer's organisation ■ Ensure project organisation benefits are realised ■ Approve changes to project scope and deliverables ■ Provide resource to represent client's interests ■ Monitor performance, compliance and outcomes ■ Responsibility for obtaining ongoing funding ■ Maintain the organisational capacity to resource the project ■ Obtain organisational commitment to undertake the project ■ Recommend project completion and/or evaluation ■ Provide high-level support and visibility for the project
Project steering group	■ Ensure continuing strategic alignment and management of all projects ■ Ensure transparent and robust justification process ■ Assist balancing competing priorities and/or resources ■ Approve appointment and responsibilities of the project manager ■ Provide guidance, support and monitoring of project

	management methodology
	■ Ensure committed effort and expenditure are appropriate to stakeholder expectations
	■ Arbitrate emergent whole-of-organisation issues that may impact the project
	■ Authorise start and finish of each progressive life-cycle phase
	■ Advocate for the project's deliverables, outcomes and benefits
	■ Provide overall guidance and direction to the project
	■ Review all benefits delivered by the project
	■ Coach, mentor and support project manager
Project manager	■ Develop the iterative project plan
	■ Estimate, assign and manage project resources
	■ Manage project schedule and project budget
	■ Manage stakeholder expectations
	■ Manage procurement and contracts
	■ Manage quality requirements
	■ Direct and motivate project team morale and performance
	■ Manage all change requests and resultant impacts and approvals
	■ Initiate corrective action and/or reinforcement where required
	■ Track, document and communicate performance, deliverables and outcomes
	■ Identify, assess and manage project risks
	■ Manage and report relevant issues
	■ Coach, mentor and support project team

The PMO role can be characterised by the following indicative functions:

■ supporting the project life-cycle activities
■ focusing on functional impacts
■ maintaining the project management software system and tools
■ providing capability development (e.g. accredited training, recognition of prior learning (RPL) or mentoring)
■ processing and responding to queries and requests
■ providing ongoing advice, support and guidance
■ coordinating all lessons learned
■ reporting on project performance, trends and escalation issues
■ maintaining all the methodology documentation, processes, standards and

procedures.

The administrative positioning of the PMO is not, in itself, a failing of substance that makes the role largely superficial and/or redundant, as each organisation will individually define the role and expected service levels. Rather, it serves to again remind us of the need to always align projects against strategy. To do that well, the PMO may need to be more strategically located.

The strategic project management office (SPMO), or enterprise PMO, differs from the PMO discussed above in more than just name. At this level, the PMO is well placed to have a significant involvement in all corporate and strategic issues, in project management processes, in decision-making, in portfolio assessment and management, and in governance—not to mention the opportunity it presents to establish and model a best-practice project management culture. At this level of visibility, the SPMO is also well placed to carry out the following additional activities:

■ developing, integrating and refining the essential components of the project management methodology
■ coordinating planning, resourcing, prioritisation across multiple projects
■ breaking down the siloed communication and ownership mentality
■ applying consistent tracking and reporting formats for all projects
■ providing (as in owning) all the project resources and project managers
■ providing ongoing quality control checks and audit points
■ developing organisation-wide project maturity
■ selecting and prioritising competing projects.

Clearly, there is a role for a project management office, be it purely functional or strategic in design and implementation, with the decision of whether to have one resting with senior management. While a well-placed PMO serves the dual roles of coordinating the organisation's project work and strategic vision, its immediate and enduring legacy will largely be contingent on the project maturity levels of the organisation in which it operates.

Critical reflection 2.10

Regardless of the project selection criteria and ultimate classification, you need to think about where the project 'sits' in your organisation in terms of its governance and maturity.
■ What governance protocols are in place at both the organisational and project levels?
■ Where is 'command central' for your projects: operational managers, executive managers or some other management level and location?

- Does this management location enjoy sole project management authority or is it shared with competing operational issues?
- What changes (and why) would you suggest with regard to where your projects sit within your organisation?
- What cultural considerations would you need to be aware of in advocating for central command, as organisations (and some projects) have their own unique way of doing things?

Culture and its organisational impact

If you were asked to describe the 'culture' of your office, sporting club or home, what would you say? Would your answers be positive, reinforcing the great atmosphere in that environment, or would they be less than enthusiastic in describing a place that really challenged you on some level?

Culture is like an invisible hand that guides the way an environment operates. It reflects the organisation's values, rules and regulations; how people are treated; acceptable behaviours; how decisions are made; what is ethical and what is not; how tolerant the organisation is of different social rituals; the dress code; the level of personal commitment required and much more.

So while it might mostly be an invisible framework of reference with a mixture of formality and informality, culture can (and does) make or break how successful projects will be. Kloppenborg (2015) highlights four different forms of culture under which the project parent organisation can operate, and what the ramifications might be for the project itself.

1 *Power culture:* the practice of formal, hierarchical authority to manage the political landscape, competition, conflict and communication.
2 *Role culture:* the practice of formal, designated accountability and responsibility, adhering to regulations, laws or other operating procedures.
3 *Task culture:* the practice of knowledge management, merit-based assignment, self-motivation and performance review.
4 *Personal culture:* the practice of recognising needs, professional development, collaboration and satisfaction.

Obviously an organisation can have one or more cultures guiding how things are done at any one time—some more powerful than others. With rules, actions, decisions, symbols, stories and norms all evidence of a culture, Figure 2.11 reveals a number of suggestions (again, examples only) around positive cultural

characteristics that would underpin project success.
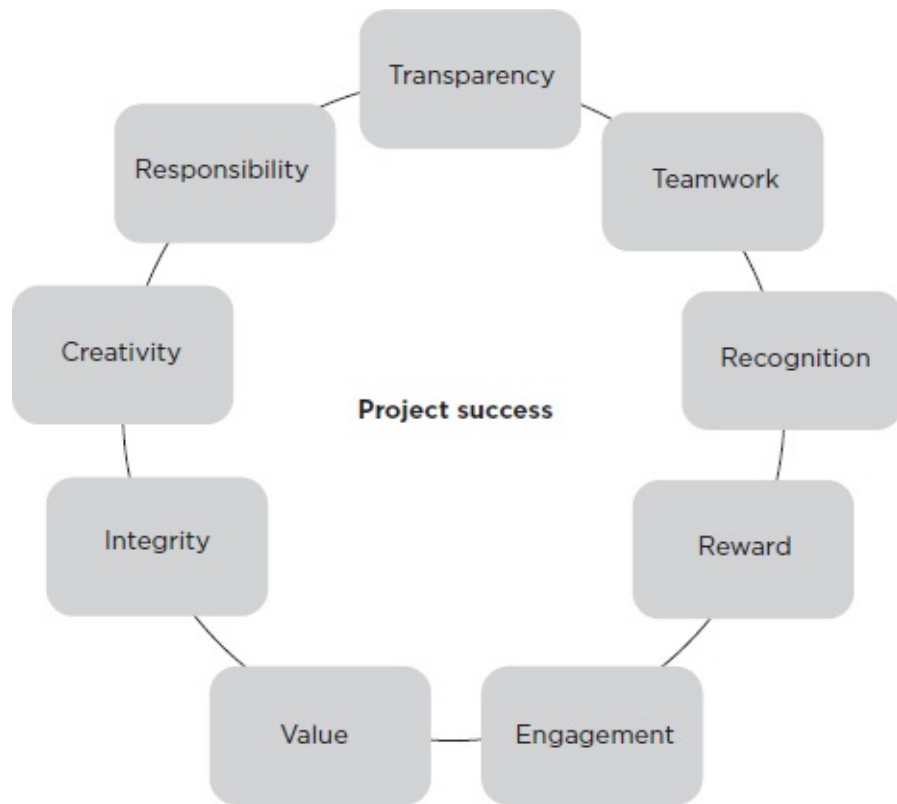
Figure 2.11 Connecting culture and project success

Critical reflection 2.11

Culture comes in many different shapes and sizes, collectively creating the working and living environment within which we find ourselves operating.
■ How would you describe the culture within your last or current project?
■ Has it supported or undermined the planning and management of your project?
■ How difficult would it be to change the culture and what benefits would you expect?

Review questions

2.1 Define strategic management and its relationship to project management
2.2 What are the challenges involved in trying to balance operational work with project work?
2.3 What are some examples of possible justification criteria in selecting

projects?

2.4 What role does governance play in project management?

2.5 Explain how project organisations can demonstrate maturity. Why is this important, and what are some of the possible benefits accruing from the maturity model concept?

Case study

Everyone thought they were pretty good at what they did; the only problem was that everyone did something quite different in the way they planned and managed their projects.

To an outsider, it looked as though each business unit and their franchised project management knowledge base were secretly and securely archived in the nearest basement. And whatever the project footprint actually was, it seemed to be well and truly hidden in an apparent cloak of invisibility.

As the contracted project management consultant, Justin was justifiably frustrated at how the organisation was even able to operate in the project management space, let alone promote itself as a centre of project management excellence.

So where to start?

Justin began by reviewing as much project management collateral as he could locate (given the basement mindset he had already encountered). Finding a meagre paper trail, he then selected key managers and staff to interview, circulated his questions in advance and proceeded to elicit as much information as he could from each of the one-hour sessions. Finally, he invited himself in to the boardroom and attended a number of operational and strategic meetings (as a silent observer) while making extensive notes on what transpired.

Back at his desk, Justin laid out all the corporate promotional literature, project documents, interview records, meeting minutes and anecdotal information he had collected wandering the corridors and lunch room during his first week onsite. As he reviewed what he found, he made the following notes:

- Projects sprang up randomly and were quickly endorsed with little if any apparent justification process or criteria.
- There was no attempt to classify (or scale) each project or to position it within the strategic plan.
- Projects resided in their operational location with little consideration given to possible organisational-wide commitments and challenges.
- Existing standard operating procedures were the sole repository of any attempt to apply best-practice project management principles and practice.
- Various generic governance protocols (applicable to the not-for-profit sector) were apparent; however, issues of oversight, independence, accountability, performance management and reactive risk management were evident.
- The documented audit trail for each project was minimal, with much produced spontaneously on the fly as the project was delivered.
- As Justin reread his comments, he felt comfortable describing the project management maturity of the organisation as being at Level 1 on the five-point maturity scale. While he was confident in this analysis, he still marvelled at how some of the projects he had reviewed had actually been deemed successful by the organisation, despite their ad hoc practices, little opportunity for professional development, reactive performance and siloed self-interest.

> 'As Justin reread his comments, he felt comfortable describing the project management maturity of the organisation as being at Level 1 on the five-point maturity scale.'

Questions

1 What factors would have triggered the organisation to engage a project management consultant in the first place?
2 What recommendations do you think Justin should put forward and how would each one benefit the project and the organisation?
3 Is it really such a major issue that standard operating procedures are used 'exclusively' in planning and managing projects? Justify your answer.
4 Justin identified a number of governance issues impacting the organisation's project management practices. How could each of those cited be improved and what would be the direct benefit to the project and the organisation?
5 What might the organisation look like when it achieves Level 2 project management maturity?

Stakeholder management

Strategies for continuous engagement

Key points

- Identifying project stakeholders
- Scaling stakeholder power and interests
- Developing tailored stakeholder strategies
- Mapping the stakeholder management matrix
- Tracking stakeholder engagement with RACI and PARIS
- Managing stakeholder engagement
- Evaluating and controlling stakeholders

In practice

I guess it would be pretty much impossible to undertake any project without any input (direct or otherwise) from someone. That could be the CEO, CIO or COO, end-users, steering groups, financiers, executive and/or functional management, advisory bodies, government departments, suppliers, project manager, external associations and agencies, subject-matter experts (SMEs), workplace personnel and others.

And each and every one of these 'stakeholders' has, at their discretion, the option of supporting your project (in a champion or advocate role) or perhaps passively or even actively undermining it in some form. And that is exactly what gives this group of people their power, influence and control (in many cases). For this reason, it is crucial to work closely with these people; however, they also need to be operationally, tactically and strategically managed, as their input (or, in some cases, the lack thereof) often has a direct and immediate impact on projects.

Little should get initiated, approved and/or completed without stakeholders being involved. Their expertise, commitment, influence and drive can help maintain momentum and urgency throughout the project's life-cycle. As well, there will be opportunities to manage these stakeholders to either enhance their input or, in some cases, to limit it. And herein lies the rationale and challenge in managing stakeholders.

Chapter overview

Projects come into existence for a reason: to provide someone with something. This goes by various names, but is commonly called a deliverable. It is 'produced' and handed over to the someone, also known by various names and usually referred to as the client, sponsor or business owner.

Collectively, these parties are referred to as stakeholders—or sometimes project stakeholders—because they hold a stake in both the planning and the management of the project. Stakeholders are the parties with a vested interest—positive or negative—in the success (or otherwise) of the project. That interest can be observed in two discrete ways: first, through the influence or power they exert (at the front end of the project) in driving decision-making and related activity; and second, through the direct impact the project has on them (at the

back end of the project) and the implications of this. It would be wise to remember that not every stakeholder must actively support and promote the project's success. While this would normally be appreciated by other stakeholders, workplace reality and case study research suggest that each project has its own unique mix of champions, workers and protagonists, every one of them driven by a particular agenda. Along with their agendas, project stakeholders also bring to the table a dynamic mix of organisational and/or political leverage, primacy, expertise, influence, experience, seniority, commitment, business acumen, personality, negotiation abilities, communication styles, motivation and, one would hope, high levels of intelligence. It would also be advantageous if they possessed a reasonable understanding of project management principles, processes and practice. Given such rich stakeholder diversity, the exact nature of the challenge faced in working with and through these people should now be apparent.

What of the processes involved in actively engaging with and managing these diverse and disparate people, groups and entities? PMBOK (2013) proposes a four-step process: involving stakeholder identification; planning stakeholder management; managing stakeholder engagement; and controlling stakeholder engagement. So the question becomes: Do you have a formal process for identifying, planning, managing and controlling these stakeholders, or do they remain largely free-ranging and positive, or potentially divisive and challenging?

Identifying stakeholders

PMBOK (2013) defines a project stakeholder as 'a person or entity that may or may not gain and benefit from the project, but can materially affect its outcome'. Stakeholders in any project are found internally and externally to the project itself and are known by different names: business owners, investors, team members, sponsors, suppliers, councils and contractors to name a few. While there is no exhaustive list of stakeholders (or their correct titles), or their roles and functions within each project, Table 3.1 should serve as a useful (though preliminary) guide to some of the principal stakeholders found within the parent project organisation.

While not included in the table, let's not exclude some additional examples of the other stakeholders you are likely to meet (and will perhaps have to manage):

■ board members

- executive management
- senior and/or functional managers
- staff
- third-party providers
- external consultants
- federal, state and/or local government departments
- financial institutions
- contracting businesses
- regulatory agencies
- industry associations
- insurance companies
- manufacturers and commercial suppliers
- trade unions
- customers
- media outlets
- lobby, community and/or special interest groups
- competitors.

So while attempts to 'correctly' prescribe clear-cut roles for project stakeholders can be difficult, a useful tool might be a refinement on the traditional roles taken by the various stakeholders, as captured in Table 3.2. (Room has been left for you to complete the table based on your project-specific environment.)

Figure 3.1 adds another dimension to the different challenges each stakeholder can make to any project. While each 'challenge' should not be viewed as a negative (to be avoided or diminished), they all warrant rigorous attention, engagement, management and control.

Table 3.1 Principal project stakeholders

Differentiating criteria	Strategy
Sponsor (client, owner)	Known by many names, they will often identify and/or confirm the business need and initiate the project. They also invariably provide seed funding, resource allocations and (change) approvals.
Project (parent) organisation	All projects are performed within an organisational structure, which must align with, and support, the project directive—especially with those projects that

	have organisation-wide and cross-functional impacts.
Project management office (PMO)	Depending on whether this is strategically or operationally (administratively) located, they can act as the central repository for all 'things' project—registration, documentation, training, resourcing, approvals, change controls and/or reviews.
Project steering committee (group, board)	Often comprising organisation-wide senior and/or executive management, they 'sit' across multiple projects (akin to portfolio managers), providing a governance role to ensure all projects align with both corporate objectives and strategic direction. They can also approve, prioritise and stop projects.
Portfolio manager	As senior managers, they work strategically, either overseeing all projects currently being completed or those within their particular functional area. Their interest lies more in strategic alignment, client liaison and management, performance (outcome or benefits), measurement and reporting.
Program manager	Managing a number of related and/or interdependent projects, they coordinate a series of related and/or interdependent projects.
Project manager	Appointed to manage the project—the process, output and, in some cases, the outcome (benefit) accrued by the project. They have the 'single point' authority, accountability and visibility to manage the project from start to finish. They also have to identify, influence (at times) and manage the changing expectations of all the other stakeholders.

Table 3.2 Stakeholder classification by role

Executive	Managerial	Operational	Technical	Team
Board	Project manager	Finance manager	Subject-matter experts	
Chief executive officer	Risk manager	Quality manager	Legal counsel	

Managing director	Contracts manager	Procurement manager	
Chief financial officer		Human resource manager	
Sponsor			
Client			
Steering committee			
Portfolio manager			
Program manager			

With PMBOK (2013) now referencing stakeholder management as one of the key processes involved in planning and managing projects (with the focus being on continuous communication between everyone), the value and role of project stakeholders have now been acknowledged formally. We now know that the list of potential stakeholders in any project can be quite large—but surely management must involve more than merely naming a range of stakeholders. It must require something further to be done with this collection of personalities, expertise, contributions, egos and interests.

Remember, stakeholders come in two types: those that contribute to the project output (could be direction, technical advice, professional services) and those that are impacted by the project output (could be a benefit, application or change). In both cases, the contribution could be either in a positive or a negative manner. Before examining how stakeholders can be engaged and managed, let's first explore the unique and individual contributions of the four key stakeholders to the project in more detail so that we can begin to get a 'feel' for who they are and what they do throughout your project. As you read, contemplate the influence, power and direction that they can constructively or destructively wield, and ultimately how the project might impact them as well. Assess their dominance, their strategic or operational roles, and the changing expectations each presents—both to the project manager and to the team.
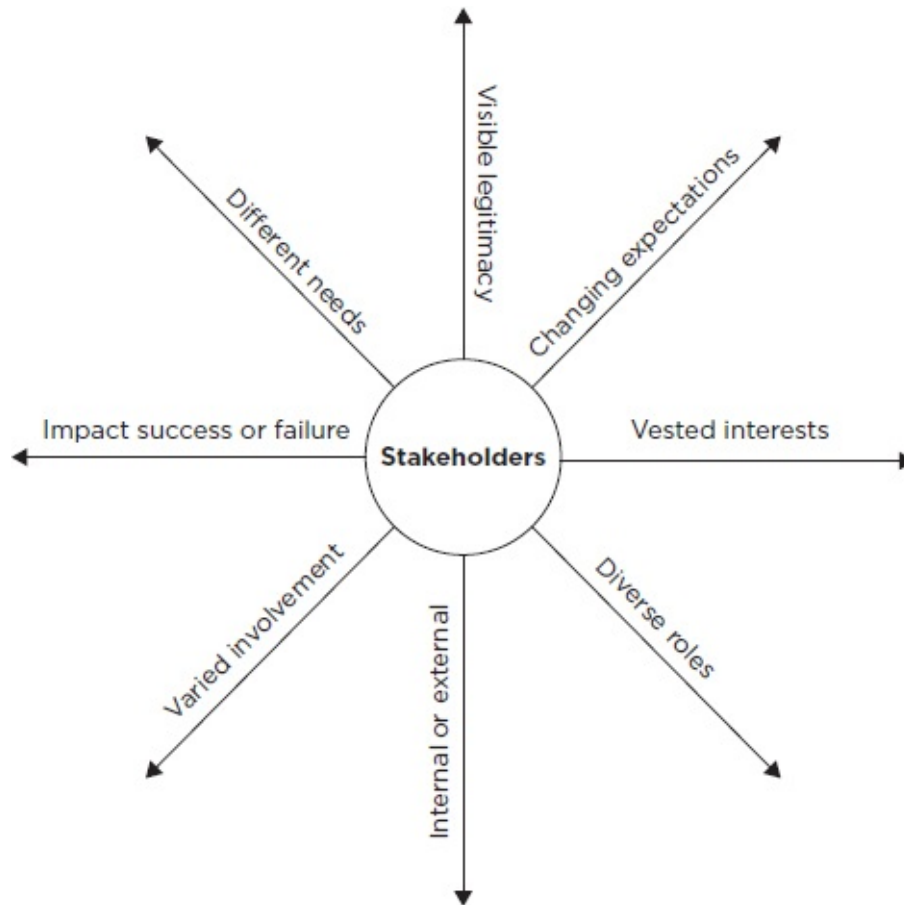
Figure 3.1 The challenge of stakeholder management

Sponsor (client or owner)

In some projects, sponsors, clients and business owners may well be the same person; in others, they will be quite different and distinct people with significantly different roles. The project sponsor has ultimate authority, accountability and responsibility for the project on behalf of the organisation undertaking the project. They determine the overall business objectives for the project, provide high-level support and visibility for the project, and ensure that the project is aligned with the strategic needs and goals of the project organisation, and that the project output and/or outcomes meet the needs of the customer's organisation.

In other words, they ensure that the project's business benefits that were first identified in the initial conception and planning phases are actually realised in the later execution and completion phases (measured, reported and delivered).

They invariably have responsibility for obtaining ongoing funding throughout the project, for approving and funding changes to project scope and deliverables, and for regularly monitoring costs, risks, performance and compliance. Sponsors also identify and maintain both organisational capacity (resources) and commitment (visibility) throughout the project. They will also recommend and approve project completion and/or evaluation.

Let's now attempt to capture a number of key features from these sponsors (something we will repeat for the other key stakeholders examined here). Table 3.3 describes the (probable) activities and how these might be mirrored in the expectations of project sponsors.

Table 3.3 Sponsor activities and expectations

Activities (what they do)	Expectations (what they want)
Strategic planning	Project will be a priority
Setting goals and objectives	Performance will mirror plan
Conducting financial analysis (ROI, NPV)	Solutions will be cost-effective
Negotiating	Change will be readily accommodated
Leadership	People will listen and respond promptly

Project steering group (PSG)

This is an executive and/or senior management group or committee that essentially ensures the robust justification for, and ongoing prioritisation and strategic alignment of, all projects (often as part of a portfolio of projects). Perhaps meeting monthly, the PSG will often nominate and approve the appointment, authority and accountabilities of the project manager. Once appointed, its members can also act as coaches and mentors in supporting the project manager. In addition, they will provide guidance, support and monitoring of all project processes and documentation (often in conjunction with the project management office (PMO) personnel or as the de facto PMO responsible for the adoption, deployment and uniform application of the project management framework).

The organisation-wide seniority of the PSG enables it to identify all emergent whole-of-business issues impacting the project, and to advocate for the project's

deliverables, outcomes and benefits. It balances competing priorities, resources, guidance and direction for the project while also authorising the commencement and signoff at the end of each life-cycle phase. Table 3.4 describes the (probable) activities and how these might be mirrored in the expectations of the PSG.

Table 3.4 Project steering group activities and expectations

Activities (what they do)	Expectations (what they want)
Prioritise project schedules	Organisation-wide support
Establish governance protocols	All rules and procedures followed
Confer project status and registration	Full justification of project benefits
Monitor performance reports	Timely and accurate data summaries
Oversee multiple projects	Consistent planning and reporting

Project manager

As noted in Chapter 1, the project manager's role and responsibilities are integral to the project's success in ensuring the project remains aligned with the organisation's strategic direction and intent, while also ensuring that the organisation has the operational capability to meet the objectives, timelines and expectations of those stakeholders involved. The project manager plans, tracks, reports and controls the project schedule, cost and technical performance from start to finish. Having developed the project plan, the project manager in turn manages and leads the project team in performing the required work.

Often seen as the primary bridging gap between the project team and the client (and combining knowledge and practice drawn from general management along with the unique knowledge, tools and techniques of project management), project managers develop close relationships with the nominated stakeholders to ensure the key constraints of scope, cost and time are delivered to a level accepted by the client. It is also becoming increasingly common (unfortunately) for the term 'project manager' to be applied generically to describe anyone given overall responsibility for completing part or all of a project. However, given the variability of levels of full project responsibility and full project authority, these titles can actually mean little, and in these cases the notion of being the project manager is mostly symbolic. Better titles may well be project administrator, coordinator, lead, facilitator or expeditor. Table 3.5 describes the (probable)

activities carried out by the project manager, and how these might be mirrored in the expectations of the role.

Table 3.5 Project manager activities and expectations

Activities (what they do)	Expectations (what they want)
Exert authority over all project work	Hope others will listen and respond accordingly
Track, report and control project performance	Accurate, real-time, complete data
Escalate issues and problems to senior people	To be listened to and taken seriously
Conduct regular meetings	Open and honest updates
Initiate corrective action	Realistic and approved changes

Project team

Let's not forget the project team members—after all, they are the subject-matter experts who invariably perform the project's required activities.

The primary function of team members (sometimes known as the subject-matter experts, although in different project organisations they may be altogether different from the team members) is to provide resident expertise in the execution of the deliverables in line with agreed standards, quality definitions, regulatory compliance and/or other business rules and requirements.

They should willingly identify and report all emergent issues and risks, while also offering 'qualified' suggestions for how to resolve related technical problems. Much of this information will be communicated through their active attendance at regular project meetings organised by the project manager. Table 3.6 outlines the (probable) activities and how these might be mirrored in the expectations of the project team.

Table 3.6 Project team activities and expectations

Activities (what they do)	Expectations (what they want)
Answer to multiple managers	Management to prioritise their

	conflicting work
Perform project work	Will be left alone to get on with it
Attend project meetings	Timely decisions, approvals and support
Assist in calculating estimates (time, budget, etc.)	Acceptance that estimates are often inaccurate
Perform corrective action	'If you had given me more time at the start…'

Critical reflection 3.1

We have identified some nominal generic stakeholders (and traditional roles and titles) found in most projects; however, these roles do not capture all the different stakeholders you will encounter on your projects.
■ Record all the stakeholders in your current project and think about how much you know about them: their role, expertise, information needs and the decisions they make.
■ Can you identify any missing information on stakeholders that might actually be a benefit to the project organisation? Record the information and the accruing benefit.
■ How will this information contribute to a successful project?

Is stakeholder identification enough?

Merely identifying each stakeholder is not enough; their needs (stated and unstated) and particular interests must be identified prior to the start of (and throughout) the project. This enables information and decisions to be relevant and directed towards the appropriate stakeholder—particularly at times of delays, cost overruns, variations and other escalating issues. You should ask the following questions whenever stakeholders are involved (which will be always):

■ What degree of power (or influence) do they have?
■ What (conflicting) interests do they have?
■ Are they likely to support or hinder the project?
■ What level of involvement will they have?
■ What information do they need?
■ How will they make decisions?

- What interdependencies might exist between the different stakeholders?
- What are the 'right' channels of communication, and what protocols should be observed?
- Who are their allies and enemies?

Remember that the success or failure of the project rests on the contribution of each stakeholder involved, however remote their interests, influence or work effort may be. Ignorance of their role and of the information they need to make decisions that directly affect the project is one mistake you simply cannot afford to make. After all, the key benefits in identifying the stakeholders and analysing their expectations (process or deliverables) is to identify the appropriate focus for each stakeholder as they are engaged and managed in project execution and decisions (PMBOK, 2013). Remember that not everyone is as excited about your project as you might be. Some stakeholders may well be outspoken and critical opponents, others may be indifferent and some will be innocent bystanders on the project footpath watching events unfold through to those actively driving and championing the change project activities.

As we already know, diverse ideas, contributions, support and challenges are all by-products of working with project stakeholders. Put simply, projects cannot be commenced and/or completed without them, and it is through their (variable) support, commitment, confidence, urgency, direction, ownership, decision-making, problem-solving, inclusion and involvement that projects are able to deliver outputs and/or outcomes over time. While we shouldn't attempt to narrowly define their capability to either support or block project initiated change, the project manager (and other stakeholders) must be able to communicate continuously and openly with each stakeholder on a personal and relevant level.

Mapping potential power

Let's now change our focus to identifying, managing and evaluating stakeholders' power. The key is that each stakeholder's power or directive (or whatever we call it) needs to be actively managed—although each would require different 'handling' strategies and different degrees of interaction. The advantage of scaling stakeholder power should be obvious: one size doesn't fit all. Given hierarchical positions, project complexity, risk, benefits and other investment criteria that trigger and challenge projects, each stakeholder needs to be treated uniquely where possible.

So what does power mean and why should project managers be aware of it from a management perspective? If someone has power, they may have potential influence, persuasion, authority, weight and/or control over the project's investment decisions, direction, deliverables and, ultimately, over the project's benefits. They can therefore exert considerable sway over how the project unfolds, the challenges and obstacles presented and the possible ease of resolution. They can either champion the work or impede its progress. Clearly, a positive stakeholder warrants a different management strategy from a negative one. Positive power could manifest itself as any of the following:

■ running political interference for the project manager
■ endorsing the decision-making procedures
■ supporting the change-control process
■ modelling appropriate behaviours
■ supporting SMEs and other team members
■ escalating appropriate issues
■ responding promptly to all communication requests
■ approaching all performance variations in a collaborative manner.

Think of the automatic goodwill that positive power generates, the urgency, consistency and ongoing support throughout the project and the benefits that the project manager can consolidate from harnessing all of this. And what of the negative power? Consider the following as examples of negative power:

■ short-circuiting agreed procedures
■ circumnavigating change-control processes
■ bullying other stakeholders
■ creating disruption
■ being critical and judgemental
■ not attending meetings
■ undermining the project manager's authority
■ having a track record of raising issues and complaining
■ completing work poorly
■ ignoring instructions and directives
■ not following through on information requests
■ 'white-anting' the project.

Let's not rush into harnessing this negative power. Perhaps the challenge is to negate, override and/or mitigate it in some way. Clearly you will never totally

remove negativity (from any activity—project or otherwise), which means it will remain a constant factor on all projects in some shape or form. Some negativity can be overcome, some will be minimised and some will simply need to be managed, or 'contained'. Table 3.7 provides an example of how stakeholder power could initially be scaled (scored and described).

Table 3.7 Mapping stakeholder power

Score	Descriptor	Stakeholder
5	Extreme degree of power	
4	High degree of power	
3	Moderate degree of power	
2	Slight degree of power	
1	No measured power	

Mapping potential interest

Whereas power represents more of an input and driven variable into the planning and execution of projects, stakeholder interest may be an output variable as the project has a measured impact for each of the different stakeholders involved. Interest can be the by-product of either process or output deliverables. (Recall that whichever methodology you subscribe to will define project deliverables as either process deliverables—for example, risk register, scope document, issues log, etc.—or as output deliverables—the staggered and/or final product or service being delivered.) Projects deliver outputs, which clearly affect the interests of stakeholders—be they users, support stakeholders, operational areas, training departments or process owners, not to mention anyone else involved in working within the new changed environment that projects invariably create.

As with power, interest comes in two formats: those accepting of the interest (positive interest) and those who resist and work around the interest (negative interest). Some stakeholders will have been actively involved in supporting the project all along, and will therefore be equally supportive of the resultant interest it will deliver. Examples of positive interest would include:

■ adhering to new operating procedures
■ attending training workshops

- demonstrating visibility and involvement
- contributing ideas and feedback
- reading the handover documentation
- promoting the change to other stakeholders
- demonstrating appropriate change agent behaviours.

The negative interest can often be demonstrated in somewhat more subtle, if not invisible, ways (Cole 2010). And it shouldn't be too hard to (almost) sympathise with some of these stakeholders, given that the project's interest could involve any of the following scenarios: loss of routine; change in the culture, work practices or team environment; loss in benefits; or a loss of power, position or influence.

While negativity can be demonstrated in any number of ways, the following are the more 'popular' actions to watch out for:

- passivity
- public apathy and indifference
- malicious compliance
- constant challenging and questioning
- outright non-compliance
- conscious activity leading to damage and disruption
- vocal, disrespectful resistance
- secretly fuelling and promoting dissent.

As with power, Table 3.8 provides an example of how stakeholder interest could be initially scaled (scored and described).

So with power as one dimension (or measure) and interest as the other, we can now consolidate and display the analysis graphically (Figure 3.2). Quadrant analysis simply takes two scaled axes and enables four quadrants to be created to allow further analysis and labelling.

Table 3.8 Mapping stakeholder interest

Score	Descriptor	Stakeholder
5	Extreme degree of interest	
4	High degree of interest	
3	Moderate degree of interest	
2	Slight degree of interest	

Figure 3.2 reveals how both power and interest scales (both scored from 1 to 10) can help position each project stakeholder while also assisting to group the four generic, although targeted, stakeholder-management strategies:

- *minimal effort:* low interest, low power—informal, unstructured, updates as required
- *keep informed:* high interest, low power—semi-formal, structured, observe and respond as required
- *manage closely:* high interest, high power—formal, structured and scheduled consultation and engagement
- *keep satisfied:* high power, low interest—regular formal, structured communication to maintain and reward confidence.
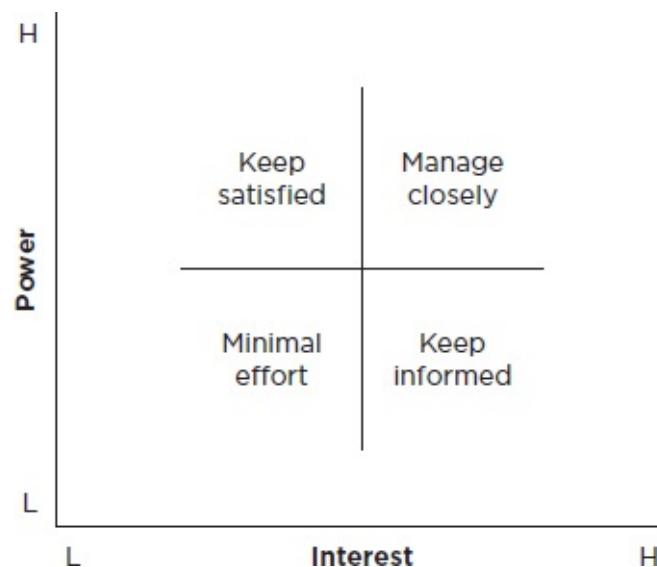
Figure 3.2 Stakeholder power and interest matrix

Let's now expand these four classifications in Table 3.9 by providing a little more detail. Remember that no two stakeholders are alike and that each needs to be closely and constantly monitored to ensure their changing expectations are in fact being identified, assessed and managed.

As PMBOK (2013) advocates, the intent behind stakeholder identification is to locate and confirm the 'people, groups and entities that could interest or be interested by the project, to analyse stakeholder expectations and their interest in the project, and to develop appropriate management strategies for effectively

engaging stakeholders in project decisions and execution'. Thinking back over a number of projects on which I have consulted, I have often been concerned at the low level of stakeholder identification and analysis conducted, documented and communicated. In many cases, the only information captured was limited to the stakeholder's name, title (if lucky) and contact numbers, including an email address. A contact list is *not* stakeholder identification.

Critical reflection 3.2

It is clear that it is not possible to engage and manage each and every stakeholder in an identical fashion (though many continue to try and fail horribly).
- For each of the four strategies recorded above, develop your own unique responses for how you would approach the different stakeholders.
- What challenges can you identify in treating stakeholders differently? Is there a downside to this approach?
- How would you work to overcome any of the challenges you just identified?

Plan stakeholder management

The challenge now is how to develop and document appropriate management strategies to communicate effectively with these people, groups and entities that comprise the moving target known as project stakeholders.

Table 3.9 Evaluating stakeholder strategies

Strategy	Approach	Evaluation
Minimal effort—informal, unstructured, updates as required	■ While no personal relationship is required, periodic contact is needed—perhaps through email distribution lists, bulletin boards and other mass media ■ Monitor with minimum effort	■ Any pockets of dissent or non-compliance with directives

Keep informed—semi-formal, structured, observe and respond as required	■ Direct contact is needed ■ Opportunities to solicit their ideas ■ Feedback mechanisms ■ Meet their needs and keep satisfied	■ Level of feedback received ■ Degree of consensus and approval ■ Number of objections and challenges identified
Manage closely—formal, structured, scheduled consultation and engagement	■ Develop a close relationship ■ Work together ■ Actively seek out and use their expertise ■ Try more personal contact (face-to-face communication) ■ Create a 'coalition of allies' ■ Actively use as promoters ■ Use them as role models ■ Manage closely ■ Update regularly	■ The leadership they display ■ The working relationship ■ Transparency and quality of information
Keep satisfied—regular formal, structured communication to maintain and reward confidence	■ Keep informed ■ Show consideration ■ Work around their possible defence ■ Resolve their issues ■ Access their technical expertise	■ Continuing confidence demonstrated ■ Benefits accruing from this confidence ■ Confidence in driving change

Given their interest in the project, a clear, actionable plan is required to now reach and interact with these stakeholders in support of the project's interests (PMBOK, 2013). By knowing how the project will impact the stakeholders and how the stakeholders will impact the project, individual expectations and project objectives will need to be managed throughout the project life-cycle. Ad hoc communication will not work, nor will standard operating procedures address each and every piece of information required. Yes, stakeholders can be difficult in their interaction with and demands on the project and its personnel, but they equally create enduring relationships throughout the project that need to be

maintained if the project is to be planned and managed successfully.

The key to relationship management is relatively simple in design, if slightly more challenging in execution. Call it a plan or a table: the relevant stakeholder information identified earlier should be documented in a suitable format that can be readily disseminated, tracked and updated, as the project progresses, to all who need it. The sample data in Table 3.10 reveal other proactive ways to capture relevant information from each stakeholder based on who they are and their different responsibilities. As you progress through the table (from left to right), the depth and usefulness of the actionable information increase dramatically.

In this format, we can track who the stakeholder is, what their responsibilities are, the information they require, in what format they require it and when. Do these headings capture enough information to enable the project team to meet the stakeholder's changing expectations? Can this format be monitored and updated easily as the project and expectations change?

When formatting the table, consider the following:

- Identify the stakeholder by name, position and title—it provides an insight into exactly who they are and their level of power and interest.
- Identify what their responsibilities are—this could be through their actual role or tasked responsibilities.
- Identify the information they need to make their decisions and/or to perform their work.
- Identify a suitable format (medium), including the opportunity to experiment with new technology platforms:
  - ☐ video conferencing
  - ☐ Skype
  - ☐ podcasts
  - ☐ blogs
  - ☐ internal magazines or newsletters
  - ☐ questionnaires, leaflets and surveys
  - ☐ memos, emails, letters
  - ☐ forums
  - ☐ webinars
  - ☐ training sessions
  - ☐ web-based discussion databases
  - ☐ social events
  - ☐ personal meetings
  - ☐ teleconferencing

□ project briefings
□ satisfaction survey
□ formal presentations
□ social media (informally, perhaps; formally, definitely not)
■ Identify the frequency and timelines required to keep stakeholders up to date with current information.
■ Identify which person will be responsible for carrying out these actions (to plan).

Table 3.10 Stakeholder management matrix

Stakeholder	Responsibilities	Information required	Format	Frequency	Who
Sponsor	Determine the overall business objective	■ Schedule delivery ■ Budget ■ Expenditure ■ Priority status	Meeting	Monthly	Project manager
Project manager	Manage project performance	■ Cost overruns ■ Delays ■ Team issues	Meeting	Weekly	Team SME
SMEs	Design and installation	■ Technical performance issues	Walkthroughs	Daily	Project manager
Contracts manager	Contract administration	■ Performance breach ■ Variations	Meeting	Monthly	Project manager
Quality manager	Quality assurance	■ Inspection data ■ Defect lists ■ Replacement details	Inspection test results and reports	Weekly	Project manager Auditors

Table 3.11 is a variation of the above approaches, as it displays the major input each stakeholder is required to make in the project. Their input is usually defined

to include a number of essential activities, including what is referred to as RACI. (Note: these data are for illustrative purposes only.)

- **R**esponsible (nominate the stakeholder charged with doing the required activities)
- **A**pprove (nominate the stakeholder who needs to approve all decisions)
- **C**onsult (nominate the stakeholder who needs to be consulted prior, during or after an action)
- **I**nform (nominate the stakeholder who needs to be kept informed of progressive actions).

Another acronym is PARIS, suggesting the following stakeholder activities:

- **P**articipate (nominate the stakeholder charged with doing the required activities)
- **A**pprove (nominate the stakeholder who needs to approve all decisions)
- **R**eview (nominate the stakeholder charged with conducting the review)
- **I**nform (nominate the stakeholder who needs to be kept informed of progressive actions)
- **S**ignoff (nominate the stakeholder who provides official signoff).

Another possible format to include is PMBOK's stakeholder engagement assessment matrix (SEAM). Using an agreed classification, the matrix scales engagement as:

- *unaware*—no awareness of project and potential impacts
- *resistant*—aware, but resistant to change
- *neutral*—aware, although neither supportive nor resistant
- *supportive*—aware, and supportive of change
- *leading*—aware, and actively engaged in contributing to project success.

Don't necessarily limit your stakeholder management planning to any of these classifications—invent your own acronym and table if it helps. The key, though, is first to capture every stakeholder and ensure they contribute to compiling the information, and second—and perhaps more importantly—to ensure they agree to abide by the recorded activities. Just remember that the more information you can collect and analyse on each stakeholder, the better chance you will have of engaging and managing them effectively.

Table 3.11 RACI matrix

Strategy	Activities		
	Finalising budget	**Developing project plan**	**Appointing vendors**
Sponsor	A	C, A	I
Project manager	C	R, A	A
SME	I	C	I
Contracts manager	C	C	A
Production manager	I	C	I
Vendor	I	C	C

Yet another option is to produce a more formal and structured document known as a stakeholder management plan (SMP). Some would argue that this is approaching what others would call a communications plan; however, there are some notable differences between the two. The format of an SMP could be quite formal and structured, with a lot of detail captured, or it could be simple, semi-formal and based around the needs of the project.

Building on the valuable information captured from identifying stakeholders, consider the range of additional information that could be captured in this plan:

- justification for using the plan
- supporting information on language, format, content and level of detail
- confirmation of the distribution membership
- recording any underlying assumptions
- information regarding the project's background
- the relevant phase of the project requiring the stakeholder's involvement
- the engagement level required to manage the stakeholder
- potential overlaps and interrelationships
- the timeframe and frequency of distribution
- benefits accruing to the project through this engagement
- the identification of high-risk situations
- reference to the project's schedule and budget (with timely updates)
- determining who has access to this potentially sensitive material
- the process for updating and re-circulating the plan as the project progresses

- identifying the escalation process.

Manage stakeholder engagement

Congratulations! You are now the owner of a stakeholder management plan. So what do you propose to do with it? The options include acting on it, delegating it, filing it or deleting it.

Given the iterative nature of communicating back and forth with stakeholders, let's assume you have selected either of the first two options (although it does also need filing). And remember that all project progress evolves over time throughout the life-cycle, so the reality is that this document should be as 'live' as the project schedule. With constant monitoring and tweaking, the project manager is demonstrating their genuine commitment to working with the people, groups and entities that either impact or are impacted by the project. Further, as this is a plan, actual performance in responding to stakeholder resistance and/or support can be clearly monitored, evaluated and adjusted.

However, managing engagement means more than simply running through and ticking off the line items in the stakeholder management plan (as easy and tempting as this may sound). It means using the plan to increase the chances of delivering the project to plan and, ultimately, of project success. So what would managing stakeholder engagement look like? Consider the following crucial activities:

- gaining ongoing commitment at appropriate project stages to the success of the project
- ensuring the achievement of project goals through negotiation and communication
- anticipating future problems and associated risks
- clarifying, resolving and/or escalating issues
- anticipating reactions to different situations
- liaising with the project sponsor
- reviewing and re-communicating project goals, objectives and benefits
- updating the change register/log and their impact on scope, time, cost and risk
- updating the project management plan
- updating other project management documents: project register and lessons learned log.

It should be obvious to all that the range of skills, knowledge and abilities identified earlier in this and other chapters is crucial to how effectively and efficiently stakeholders are managed. With situations ranging from rage to compliance, fluid expectations, issues surrounding authority, moving goalposts, the political climate, organisational structure and an adaptive workplace, this is not the playground for the feeble and naive. It is an incredible opportunity to work with, and bring together, diverse and disparate stakeholders to plan and manage a successful project.

Control stakeholder engagement

As with many processes in project management (and other disciplines), it is necessary to control what has been agreed 'in principle' (by many) and put into 'practice' (by some). In the same vein as quality management, what has been planned and assured still needs to be inspected, tested and controlled.

Obviously, stakeholders, plans and strategies will require ongoing evaluation and adjustment to ensure that the original justification for working with these stakeholders is still being satisfied. Given that the project will evolve, the environment will change and stakeholders will come and go, the effectiveness and efficiency of stakeholder engagement has to be tested (PMBOK, 2013). Attention should be paid to the following whenever you seek to control stakeholder engagement:

- determining the current stage of the life-cycle
- nominating periodic review timeframes
- knowing what it is you actually want to measure
- assessing whether roles, responsibilities or information needs have changed
- determining what the percentage of work/project complete is
- determining what performance variations (scope, time, cost) have been approved
- determining what issues are still current
- revisiting the project communication register/log
- identifying what has led to low/high engagement
- recommending corrective/reinforcing changes
- gaining stakeholder buy-in
- documenting and circulating the amended plan.

Once you have taken this final step, what benefits can be expected to accrue? Obviously, you will have consistency in all the project communication protocols; all plans, schedules, registers and other supporting project management documentation will be current and accurate; continuous engagement will be embedded within the project processes and culture; and accountabilities will continue to be clearly delineated.

Ignorance of stakeholder involvement will never be a viable defence. While many will be in your face, others will be found (or will hide) in the background of the project. Some will fade in and out of the project over time as their roles, input and output change. Still others will grab the spotlight and be hard to get off the stage. Some might never be found at all. So a useful rule of thumb: if you cannot identify all the project stakeholders, don't start the project yet, or at least call 'time-out' if needed. (Your authority to take this action might also help you determine whether you are in fact the project manager and not just a project or team 'leader'.)

Critical reflection 3.3

You have just read that stakeholder management isn't exactly the same as stakeholder control, although the distinction between the two can be slight in some cases (you will find this distinction in all the PMBOK knowledge areas in this text).
■ What evidence do you have that your project stakeholders are being managed effectively?
■ What evidence do you have that your project stakeholders are being controlled effectively?
■ Is there a discernible difference between your two answers (after all, control is a subset of managing)?
■ How do you feel about this distinction: is it justified or simple semantics, playing with words?
■ What improvements could you make in both managing and controlling your project stakeholders?

Review questions

3.1 Define what is meant by the term 'stakeholder management'.
3.2 Why is it important to identify the stakeholders in any project?
3.3 What information would a stakeholder plan contain?
3.4 What are examples of different stakeholder engagement strategies?
3.5 Why does the process of stakeholder management need to be controlled?

Case study

The simple truth was that Marty didn't like that many people.

Okay, so he was an introvert—not that that should have had any direct bearing on how he engaged his project stakeholders. After all, he could socialise, knew lots of people and generally felt comfortable contributing to the meetings he attended.

With limited frontline experience, Marty was nominated for this project given his policy credentials and attention to detail. And as head of his state government policy unit, Marty certainly got things done. Of course with a stable team of only three, there was very little dissent as everyone seemed to get along just fine, which certainly created a productive working environment.

As Marty prepared for his first stakeholder meeting, he knew exactly how he would engage with, manage and control this cohort of project stakeholders. Not only did he need to work with the government ministers, advisers, the governance committee, project board, different department heads across the state and industry bodies; he would also be dealing with senior managers, consultants, SMEs and junior staff from different departments—in short, a dynamic mix of roles, egos, agendas and influence.

Over dinner the previous night, his partner Ellen had tried to help by encouraging Marty to map out who this diverse pool of people were—to which Marty had tersely replied, 'I need to know a whole lot more than just who they are.' Realising that Marty had missed the point, Ellen politely suggested he try the following:

- Record who they are.
- Understand what role they play.
- Confirm their level of involvement.
- Identify the information they need.
- Develop a targeted communication strategy.

Once Marty came to realise how his fear of engaging with these 'powerful' people could be broken down into just a couple of steps, he felt more at ease. All he needed was a couple of columns on a page where he could record the points Ellen had suggested. A quick Google search produced myriad designs for stakeholder management, communications management and stakeholder engagement.

> '…much of the information would be gathered progressively throughout the project, given that some stakeholders came and went as the project progressed. '

With a little 'poetic licence', Marty created his own design and went to work filling in the blank columns and rows with what he knew about each stakeholder. It wasn't long before Marty knew that he actually didn't know a whole lot about the people at all. Sure, he could make something up or try to guess the information but he knew he was only kidding himself if he did that. But if he didn't have the necessary information to profile these people, what would he do?

As he discussed this dilemma with Ellen, Marty realised that much of the information could be gathered by reviewing past project documentation (project plans, communication plans, risk registers, lessons learned logs) with which these stakeholders had been involved, accessing their position descriptions, direct interviews, informal conversations and/or as part of the initial and ongoing project meetings he had scheduled. After all, much of the information would be gathered progressively throughout the project, given that some stakeholders came and went as the project progressed.

As the night wore on, Marty knew he could in fact begin the process of identifying, engaging,

managing and controlling these stakeholders.

Questions

1 What is the connection between stakeholder management and project success?
2 Why does Marty think that simply identifying project stakeholders isn't enough in order to ultimately engage, manage and control them?
3 Planning for stakeholder management implies that ad hoc communication will not work. Justify this assertion.
4 Why does Marty think stakeholder management is a process over time and not a point in time?
5 What information would Marty capture in a stakeholder management matrix?

Chapter 4

Scope management

Delivering on changing expectations

Key points

- Planning project scope management
- Techniques for gathering the requirements
- Writing functional and non-functional requirements
- Navigating the decision-making continuum
- Recording scope inclusions and exclusions
- Matching client expectations with project capability
- Creating the WBS
- Validating the approved scope
- Controlling the project scope creep

In practice

In everyday life, many people are directed, and perhaps in some cases driven, by pursuing any number of dreams, strategies, objectives and tasks. Be it the focus they present, the energy they create or the commitment they build, people's lives are constantly evolving and being shaped by personal action plans such as these.

So too are your projects. Visions are communicated, commitments made, capabilities assessed and plans developed and managed in response to someone's idea, proposal or change request. Every project, regardless of its constraints and/or justification criteria, requires a process and document that captures, documents and articulates what the project is all about—in other words, the project's initial boundaries.

In project terms, you might know this focus as the project proposal, the user requirements, the grant application, the letter of engagement, the business requirement, the request for tender (RFT), the customer brief, the business case, the project proposal, the commercial quotation, the scope, the memorandum of understanding (MOU), the scope of work, the specification and so on. The list of possible names goes on and on. Think about the value this focus should bring to your project planning and management processes. It not only creates a baseline from day one against which to compare and evaluate all subsequent changes; it also anchors understanding, commitment and capability. Moreover, it removes the temptation to plan and manage projects 'intuitively', to rigidly defend the silo mentality, to keep your cards close to your chest, and to chop and change delivery as the project progresses.

Regardless of the project—be it an organisational restructure, a home extension, a governance review, a restaurant launch, a sporting facility refurbishment, a construction site, a funding grant or even the next Olympic Games—the project proposal (or its proxy) is the defining document in the concept stage of the project. Why not locate yours? Keep it handy, but don't get too emotionally attached to it—it will change (as it should).

Chapter overview

Project management is sometimes vilified as a bureaucratic process over-burdened with unnecessary paperwork. Having seen some appalling examples of alleged methodologies at first hand, I would have to agree. Equally, and more importantly, I have seen (and developed) some very concise and integrated

processes and templates that do not impose an onerous burden on the organisation or their personnel at all.

PMBOK (2013) reinforces that the scope management plan serves as a guide, directing exactly how the scope will be dealt with throughout the project. Through a six-step process, all the work that needs to be performed in order to complete the project successfully is clearly defined, refined and controlled. In many cases, it is not uncommon to see additional work being performed—and for a variety of valid and not-so-valid reasons, ranging from formal and authorised scope changes through to uncontrolled scope creep.

And as with all the other nine PMBOK processes, adhering to the processes themselves should be straightforward—after all, it just needs process and matching behaviour. Starting with planning for scope management, the steps flow through to collecting the requirements, defining the scope, developing the work breakdown structure (WBS), validating the scope and finally, as with all other processes, having measures in place to control the scope.

Planning scope management

In an operational sense, no such plan exists to clearly define, develop, monitor, control and verify the work that we accomplish. No doubt, while standard operating procedures (SOP), position descriptions, key performance indicators (KPIs), operational plans, action plans, meeting minutes and performance reviews might provide some general sense of direction, they are not a direct equivalent of a scope management plan (or other project management documentation), which has as its focus the protocols, behaviours and approvals required to manage scope.

A scope management plan documents 'how the project scope will be defined, validated and controlled' (PMBOK, 2013). In other words, it establishes the direction and guidance parameters for how the scope itself (project or product/service) will be managed. Given the high probability that the scope will change over time, and given the technical (if not emotional) attachment some stakeholders will have to 'their' proposed changes, some formal mechanism is required to limit, assess and authorise these changes on a consistent and transparent basis.

In many projects, there is no formal or informal process or system in place to manage scope changes—they simply get actioned, with any (objective) assessment being postponed until a later date. After all, it is argued, let's not

delay the project unnecessarily waiting for the required approval. Add to this practice the primacy some stakeholders enjoy and the power they wield over the project manager and team. In these cases, it may be very difficult to rein in some stakeholders as they try to drive through their changes (whether or not they are in the project's interests). So something has to be developed that not only establishes the rules, but also clearly communicates that change to the scope only occurs within an agreed change-control process.

Ideally, by drawing on lessons learned, organisational-wide historical knowledge and project-specific requirements, the scope management plan could reference the following process-based information:

- agreeing the format to record the scope
- nominating the stakeholders responsible
- capturing, managing and controlling the scope
- establishing the level of decomposition in the WBS
- ensuring transparent traceability and ownership
- identifying all required information justifying any proposed changes
- assessing prioritisation conflicts
- identifying all supporting documentation
- flagging associated processes and/or documentation that should be updated to reflect any scope changes
- specifying how formal reviews will be actioned
- adhering to a formal and integrated change control
- promoting scope management as an endorsed and practised component of the project.

Organisational culture will also play a crucial role in how comprehensively this plan is designed, developed and auctioned, as it directly impacts on people's 'way of doing things'—and not everyone likes to be told how to do things! For some, a plan (of any kind) may suggest to them that they forfeit their (real or perceived) autonomy, discretion or ability to manage their part of the project. Plans of any type are always put together with the best intentions and, more often than not, in isolation from reality. Accordingly, the scope management plan is developed as a live blueprint for working with the scope to ensure that the fluid expectations of disparate stakeholders do not decay or 'morph' into unauthorised and ongoing project scope creep throughout the life of the project.

Collecting the requirements

Remember: it started with a strategy, became an objective, and then evolved into something more expansive—the project scope. Known also as requirements, specification, statement of work (SOW), deliverables, inclusions, or scope statement, the scope baseline (the first cut) is one of the crucial steps taken when defining the project's initial boundaries (the others being time, cost and resources).

One of the most common reasons why projects fail is the initial (and ongoing) lack of clarity and understanding between strategy, expectations, progress, performance, output and outcome. This is because many project stakeholders ignore the basic tenet of project management: identify the problem before you schedule the solution. In other words, take steps to ensure that the project is correctly justified, investigated, assessed and approved—the documenting of which will ultimately be critical to its planning, management and success.

Knowing what information to gather is one thing; having the right array of collection methods to discover and decompose that information into agreed requirements is quite another. So gathering requirements, data or information in baselining the scope requires more than mere documentation. Requirements need to be elicited, analysed and recorded in enough detail to not only set the scope baseline, but to provide the foundation for the WBS, not to mention potential implications for cost, schedule, quality, risk and the procurement process (PMBOK, 2013).

While there seems to be little agreement about the exact terminology, some assistance can be provided from the business analysis field, where requirements are the lifeblood of the business analyst. Stated simply, a requirement is a 'capability' (performance) that is required under certain constraints (condition or standard). However, requirements need to be classified appropriately if they are to be managed and controlled later in the project.

Classification enables further identification, elaboration and refinement, and could include any of the following:

- business requirements (higher-level needs)
- stakeholder requirements (people, group or entity needs)
- functional or technical requirements (required behaviour)
- non-functional requirements or quality of service requirements (reliability, support, safety, security, etc.)
- transition requirements (how to move from a present state to a future state)

■ quality requirements (validating criteria).

More often than not, having an appropriate requirement classification can prime the requirements-collection technique from the beginning, although personal preference will play a large part in which techniques you ultimately use. And you need to be aware of only recording what the client has explicitly requested (inclusions) and not other requirements that the project team think are a great idea (exclusions). Remember, requirements are all about the 'must haves' in the first place and possibly some 'should haves' if the client is open to changes regarding time, money and resources.

Regardless of the classification system used, requirements information can be collected using many different techniques (and formats)—verbal, written and the type commonly guarded jealously in some people's minds and/or in franchised circles of operations. Table 4.1 previews what these techniques are, along with reasons for and against their use.

Regardless of which technique is adopted, requirements need to start at a high level, become progressively more detailed and be unambiguous (measurable and testable), traceable, complete, consistent and acceptable to key stakeholders (PMBOK, 2013). The result should be the identification of only those requirements explicitly included in the project scope baseline, as well as those requirements that will be explicitly excluded (at this stage).

Table 4.1 Techniques for collecting requirements

Requirements-collection technique	Advantages	Disadvantages
Interviews	■ Direct access ■ Private conversation ■ Prepared and spontaneous questions ■ Clarification of answers	■ May be expensive ■ Time consuming ■ Lack of confidentiality ■ Require experienced interviewers
Focus groups	■ Guided conversation ■ Access to large groups ■ Ability to record ■ Targeted stakeholders	■ Venue and facilitator costs ■ Trained moderator required ■ Peer pressure to conform
Questionnaires	■ Inexpensive ■ Anonymity	■ Lack of respondents ■ Little targeting

	■ Prepared questions ■ Large dissemination ■ Statistical analysis	■ No avenue to clarify or probe
Brainstorming	■ High energy ■ Involves everyone	■ Peer pressure to conform ■ Lengthy, repetitive process ■ Can exclude voting or prioritisation
Workshops	■ Reconciling stakeholder differences ■ Interactive nature ■ Foster relationships	■ Trained facilitator ■ Venue and facilitator costs ■ Personality conflicts
Storyboards	■ Visual images of sequence and navigation pathways	■ Not everyone relates to visual images ■ May omit important low-level details
Observations	■ Direct contact with the workplace ■ Overcomes hesitation in describing how things work ■ May uncover hidden requirements	■ Pressure to ensure processes and tasks are carried out 'correctly' ■ Different people observed may perform differently
Prototypes	■ Provides a working model ■ Enables experimentation ■ Allows progressive elaboration, feedback and revision	■ Time and cost constraints may limit modelling ■ May become dated in rapid change environments
Context diagram	■ Visually appealing ■ Depicts process flows ■ Identifies stakeholders (actors)	■ Extreme simplification ■ Discussion limited to an abstract representation
Document analysis	■ Existing evidence ■ Primary research (desk audit)	■ Time taken ■ Currency of the information

|	
■ Generates a question bank	■ No interaction with stakeholders

Many people, especially those working as business analysts, use a requirements traceability register (or matrix) to link the requirement origins with the project deliverables that satisfy them (PMBOK, 2013). As Table 4.2 shows, not only does the matrix compile the requirements, it also enables all requirements to be:

■ grouped under functional and non-functional headings
■ linked back to organisational strategy
■ referenced to relevant objectives
■ assigned against the owning stakeholder
■ matched with WBS activity
■ tracked through version control (development, testing, etc.)
■ tracked in line with status (provisional, approved, deferred, etc.).

Table 4.2 Requirements traceability register

#	Requirement	F/NF	Stakeholder	Objective	WBS	Priority	Status

Given access to all these techniques, it might appear that gathering requirements is quite easy and just a formality. Think again. Not only does it involve many different people with a lot of divergent ideas on what they want in the project; it also involves interacting with all these stakeholders in trying to get unambiguous decisions on exactly what is, and is not, part of the project. With multiple alternatives being proposed, debated, deleted or accepted, one of the biggest decisions to be made will be prioritising requirements. Within any group, these decisions can range from simply announcing what has been decided (this one doesn't sound too democratic) through to taking all the time in the world to get everybody on side. While Figure 4.1 captures this challenge, it should be said that all styles along this continuum are perfectly fine, although they should be project specific. Urgency, the amount of available detail and the power of stakeholders may also have an impact on which decision is used (and how successful it will be).
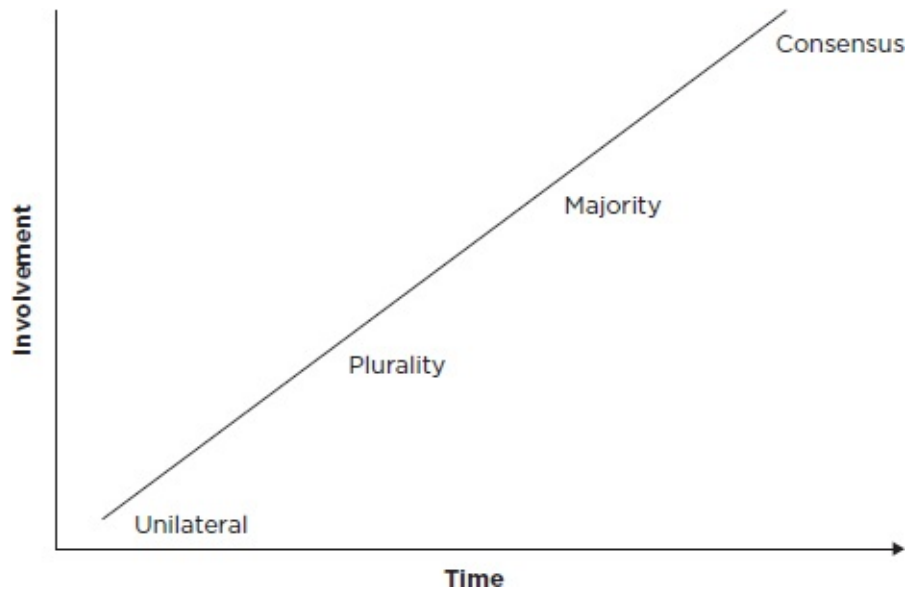
Figure 4.1 Decision-making continuum

Critical reflection 4.1

Client expectations (scope or requirements or any other suitable term) are fluid with precise definitions (specifications or deliverables or outcomes) sometimes difficult to lock down.

■ When scoping a project, should you retain a healthy degree of scepticism as you document the client's requirements? If so, why?
■ What are the dangers in commencing a project with poorly understood requirements?
■ What should the relationship be between the client's expectations and the capability of the project organisation?
■ How can your scoping activities be improved throughout the entire project life-cycle as your clients will probably change something at some point in the project?

Defining the scope

It would now be perfectly acceptable to believe that gathering the requirements will automatically enable the scope-definition process to be fairly straightforward, given the information presented above. However, Young (1996) suggests that it isn't quite so easy, and lists the following characteristics of what may be a confusing and fuzzy startup period:

■ unclear direction from different stakeholders
■ ongoing uncertainties about the real and unstated needs

- no clear methodology for how to achieve the required results
- multiple expectations
- an inability to assess the project costs (however 'rough' at this early stage)
- vague analysis of the benefits and business value the project will deliver
- no clear information about the resources required (in management, support and/or deployment capacities).

Careful attention also needs to be paid to discussing, deciding and recording two specific pieces of information when documenting the project scope:

- inclusions: explicit, written confirmation that the deliverable is required
- exclusions: explicit, written confirmation that the deliverable is not required.

As Figure 4.2 reflects, inclusions and exclusions pull in different directions, and the failure to exhaustively capture both can be detrimental to any project. Inclusions are obviously what has been agreed by all the project's stakeholders, costed, scheduled and resourced accordingly. In essence, the client gets what they have paid for and the schedule reflects this. However, with exclusions, the present danger is that these are 'assumed' by the client to be included in the project when in fact they would incur additional funding time and require further resourcing decisions to be made. Ultimately, unless you expressly take these off the table, the client believes they are included.
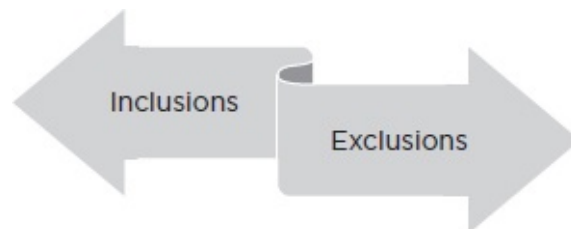
Figure 4.2 Separating inclusions and exclusions

A real project example might make this crucial distinction more obvious. Let's call the project the 'Roadside Garden Renewal Project' (the green strip you see on roadways separating lanes that are full of dead grass and plants). In this project, the scope simply stated what you read above: Roadside Garden Renewal Project. So what work would the client have a reasonable expectation of being carried out as part of this project? Consider the suggestions below:

- landscape design

- planting guide
- grass mowing
- weed removal and spraying
- soil replacement
- wetting agents and fertiliser
- irrigation repairs
- replanting plants, shrubs and trees
- mulching
- line marking
- traffic control

and the list could go on.

Now what if the client only really wanted the weeds sprayed but the contractor priced all the above in and built a schedule around it? How smart would that be? Or what if the client wanted all the above work carried out but the contractor only sprayed for weeds and priced only that in, then built a schedule around it? How smart would that be? In both cases, this project isn't very smart (but it did happen).

Another effective technique to clearly delineate the requirements (borrowing from Agile) is known as MoSCoW:

- **M**ust have
- **S**hould have
- **C**ould have
- **W**on't have.

The lesson should be obvious: what you fail to explicitly take off the scope table bounded by time, money and resources at any point in time, you may well end up donating to the client with your own time and money. However, the reality doesn't have to be that bad every time. If the exclusions are such great ideas, options or solutions, discuss them with the client and vary the scope, time, budget and resourcing decisions accordingly. This way, the client is happy with the added value and is prepared to pay for it in full.

So what can you expect to include whenever the scope is defined? Consider the following suggestions—although, as with other chapters, reflect on your own project objectives and modify the information where necessary. Table 4.3 flags some of the information that should be discussed and documented.

Together, this initial information will form the foundation of the project plan and the basis from which other related plans are developed. Hopefully you

noticed the use of the word 'initial' above, too. At the start of any project, it can be extremely difficult, if not impossible, to get 100 per cent understanding, accuracy or commitment to what, one moment before, was just another idea or proposal (and not a project). Perhaps, over time, an initial assessment of some of these concept components might become a provisional forecast, then a revised estimate, and finally an actual result that can be planned, executed and finalised. In other words, the high degree of uncertainty and risk will (should) reduce over time as further iterations of the project proposal occur.

Having identified the information required (however provisional much of it might be at this stage), it is time to consider the types of decisions that can now be made that will ultimately form part of the project planning, progress, finalisation and evaluation. The following decisions are mandatory:

- Is the project consistent with the organisational mission?
- Does the project complement the competencies of its human resources capability?
- Will the project deliver value (benefit) to the business?
- Is the project aligned and prioritised strategically?
- Has the outcome been communicated, agreed and documented?
- Is the project timeframe acceptable (don't forget to review the risks)?
- Will the project budget be sufficient to deliver the outcome?
- Are all approvals, administrative issues and processes that are required in place (or will they shortly be in place)?
- Can the resources be deployed as required?
- Will the project operate as expected?
- Do the benefits exceed the costs?
- Is the level of risk acceptable?
- Can the project be delivered on time?
- Is the project ready to proceed to the next stage?

Table 4.3 Elements of an initial scope (requirements) baseline

Essential element	Why it is important
Initial justification	One of the most important elements of this first stage is to justify the project coming into being. The more information, alternatives and expectations that are examined, the greater the probability of the project's success.

This may include being internally motivated (upgrading user software), externally mandated (the introduction of compliance legislation), as a result of requests from customers (development of learning materials), due to a commercial initiative (launching a new product) or being market driven in response to external opportunities or threats from technology, competition, social factors, the environment and the like.

Clearly, if you know the origins of the project, you are in a better position to contribute to and manage its success. Don't waste your time inventing and chasing solutions if you do not acknowledge and understand the problem(s) or opportunities you face.

Identify both the stated and 'unstated' problem, energise the stakeholders and provide an opportunity to create and maintain a viable and visible rationale for the project.

Objectives	Regardless of whether the project is framed around a strategic initiative or an operational priority, it requires one or more concise and unambiguous statements (of intent) that serve as the project's continual over-arching frame of reference. Objectives are the 'moving parts' (or legs) of the expectation. Put simply, objectives get things done by breaking down the strategy or priority into activities (tactics) that must be performed in order to achieve the objective.
	There are a number of well-known characteristics of objectives. These are included below with some personal improvements added: ■ specific (concise and to the point) ■ measurable (able to be quantified) ■ achievable (able to be performed) ■ relevant (related to the project) ■ time limited (able to be performed within a set time) ■ written down (don't leave it to memory, seniority always wins otherwise) ■ jointly agreed (bipartisan buy-in)

	■ regularly monitored and reviewed (are you delivering on them?) ■ openly communicated (no 'secret squirrels' and silos).
Deliverables	Wouldn't it be great if you knew at the start of the project what the finish of the project would look like? A rule of thumb: if you don't know, don't start the project. In other words, if you cannot accurately describe and/or visualise in detail the scope in its finished 'as built' or deliverable state, keep your hands off the project. You are identifying, investigating, clarifying and ultimately agreeing on the 'final expectation'—what the sponsor/client/asset owner actually pay for and get at the end of the project (and not necessarily what you are capable of giving them). And this must include explicit reference to both inclusions and exclusions.
Assumptions	Simply, these are things that are held to be true but cannot be tested. Adequate funding, ample time, prompt decisions, resource availability are all examples of assumptions that may well impact the project—positively or negatively.
Acceptance criteria	These are the pre-set conditions that must be met in order for the client or asset owner to accept the deliverables.
Resource capability	■ Does the organisation have the resource capacity, maturity and other capabilities to take on the project? ■ What additional resources (internal or external) will be required? ■ How will the resourcing decisions impact on the daily operations of the organisation? ■ Will professional development opportunities be required? ■ Does the project organisation have the internal capability to deliver the scope? ■ What level of procurement and outsourcing will be required? ■ How will operational priorities and conflicts be managed?

	■ Are there any key (or preferred) supplier arrangements in place?
Constraints	Examples of these limiting factors that may affect the project include a predefined budget, imposed dates, contractual clauses and resource working hours.
Priority	Not every project will be urgent and important at the same time. Some will have internal or external dependencies impacting when they can be started, others will sit across the organisation while yet others will be found within a particular division or section.
Schedule	Project management is driven by the availability and progression of time—a finite constraint. Therefore, it is necessary to capture as much relevant information as you can to appreciate fully its impact on the project. The following questions are useful: ■ When is the project expected to start and is there any latitude (float)? ■ When is the project expected to be completed and is there any latitude (float)? ■ Who has determined the timelines and how were they determined? ■ What sources of risk might impact the successful completion on time? ■ What contingencies need to be considered? ■ What milestones need to be acknowledged? ■ Under what conditions will time extensions be considered? ■ Who will be required to approve these extensions? ■ Are there any benefits in completing the project ahead of schedule? ■ Has a WBS been developed as a top-level dissection of the project's scope (the key project stages, major decisions, approval points and other important milestones) without the finer detail of all the actual work required?
Budget forecast	Cost is another finite resource in the project (unless you have a bottomless pit of money—and yes, some

projects do). To bring the project in on budget requires information as well—and that information is needed long before you start the project, way back in the concept stage. Consider the following suggestions:

- What is the budget for the project (however provisional)?
- How was the estimate determined?
- Who derived the budget estimate and what is their confidence level?
- Has contingent funding been provided?
- Under what circumstances can the contingent funding be accessed?
- Who will be required to approve this contingency?
- What are the drawdown (access) procedures for spending the budget?
- Have the 'true and complete' costs of the project been captured?
- What accounting, reporting and control measures need to be followed?
- Are progress payments and retentions required?
- What are the statutory compliance costs?
- Who will bear the costs of changing (upgrading) the scope?
- How will changes to the specification be proposed, assessed, approved and managed?

Risks and issues	Few projects begin their life as a single idea delivered through a single approach. As the idea takes shape, alternative courses of action should be considered carefully, the advantages and disadvantages discussed, the options evaluated and the final decision made, all within the domain of identifying the risks, issues and barriers that might impinge on the project's success. (Formal risk assessment techniques will be introduced in a later section.) Most projects, if not all, have their issues—problems of increasing magnitude that if left unchecked and unresolved may escalate into damaging situations and risks. Often these issues are coded with yellow, blue

	and red flags depicting their intensity. While no one can predict the future and identify these possible issues in advance, it is wise to exercise 'due diligence' to preclude damage later in the project.
Approval process	One of the dangers of defining the scope is the inherent risk of vague estimates, unstated assumptions and ambiguous information. So someone must take responsibility for reviewing the scope baseline to eradicate as much of this flotsam as possible. Is it the project manager (possibly not, as they are often not even nominated at this early stage), the steering committee, executive management?
Performance measurement	Why are we discussing measuring performance in this first stage? By the time you get to the third stage of the project (progress), each stakeholder must be measuring the same dimensions of the project to get the 'true' picture of performance. If one person is measuring money committed, another orders placed, another deliveries to site and yet another invoices logged, the project has some real structural problems. Agree exactly how performance will be measured.
Reporting requirements	Recall from the stakeholder section that different stakeholders want different types of information at different times. Some want progress, some want status and some want forecast information. Identify these needs now, not when the reports are due. That way, you generate information that is targeting the specific decision-maker—and that can only help your project.

As Figure 4.3 depicts, there won't always be a perfect match between what is asked for and what can be delivered. Expectations can be wonderful, woolly, wild or weird, so don't expect to always automatically have the capability to deliver these.

Client expectation		Project capability	
Expectation 1	✓	Capability 1	✓
Expectation 2	✓	Capability 2	
Expectation 3	✓	Capability 3	✓
Expectation 4	✓	Capability 4	
Expectation 5	✓	Capability 5	
Expectation 6	✓	Capability 6	✓

Figure 4.3 Expectations don't always match capability

Decomposing the project scope

Having put together the scope management plan, collected the requirements and defined the scope baseline, the next stage is to plan and capture all the work required by the project in order to deliver the agreed result. The most popular tool to begin this process is the WBS. The approach taken by the WBS is quite simple. Drawn pictorially, it can almost be mistaken for an organisational chart, as it shows the relationships between all the parcels of work required by the project, stage by stage and level by level.

However, its more practical 'table' format is more widely adopted. The WBS begins by identifying the total project as one top-level activity, then breaks down the project, level by level, into several smaller, more manageable activities. This traditional 'top-down' process is continued until the activities can no longer be broken down. At this lowest level of activity breakdown, an estimate of the activity's duration, cost and resource requirements can be made. The intent behind completing a WBS is to ensure that the entire project can be identified and subdivided into more detailed components to support future project management processes involved in planning, executing, controlling, closing and evaluating.

As a scheduling tool, the WBS begins to answer some fundamental project questions:

■ What work must be performed (identifies all required activities)?
■ How long will each activity take (determines the activity duration)?

- What resources can perform the work (determines what resources are assigned)?
- How much investment is required (determines what budget is needed)?

PMBOK (2013) states that the intent behind completing a WBS is to ensure that each major project deliverable is subdivided into smaller, more manageable components until the deliverables are defined in sufficient detail to support future project activities (planning, executing, controlling and closing). Each level of detail in the WBS refers to the degree of 'decomposition' or 'granularity'. That is, the further you break down the project, the greater the granularity (or detail) you get in the task. The obvious question to ask here is: How many levels of 'decomposition' do I need? The answer depends on a number of considerations, including:

- the complexity of the project
- the exhaustive information captured (inclusions and exclusions)
- the accuracy required in the estimates
- the extent of quality definitions, standards and requirements
- the amount of management required (e.g. supervision, autonomy)
- the degree of risk involved
- the extent of any contractual performance obligations
- the required level of measurement and control
- the amount of prescriptive detail required.

Defining and documenting the activities

While the WBS is intuitive enough (especially in a graphical format), the project manager and team may need to access internal or external subject-matter experts (SMEs) and others to identify all these activities.

It is important to state upfront that this initial stage can, in fact, be one of the first triggers for scope creep. Think about it: these SMEs may well be the experts in particular activities, although they were not part of the initial scoping activities and signoff. Yes, it might have started with a scope baseline and subsequently got elaborated along the way, but most SMEs are not privy to these early discussions and now run the real risk of (accidently perhaps) inflating or distorting the activities required. However, remain positive. You must involve them, unless you have all the prerequisite expertise yourself.

The activity list created with the WBS format may be the decomposed subset

of work packages, stages or any other heading classification used by the project. The point is to refrain from simply listing activities from one to 100 in numeric order. A little more rigour, along with more imagination and structure, is called for. Consider the following recommendations when recording these activities:

- Consider brainstorming the list of activities before recording them sequentially in the WBS. This frees up the linear thinking in which some people may be caught up when completing the WBS. Brainstorming is also a good technique for bringing the team together, providing a sense of ownership of the activities and building commitment to the project.
- Try to group related activities together under an appropriate stage, section, phase or other related heading. This not only chunks much of the project together, but it also helps with managing and reporting activity performance.
- Use descriptive activity names that clearly identify the work to be performed. An activity called 'finance' gives very little clue as to the type of work to be performed by the resources. Use a verb–noun convention where possible (e.g. write report, prepare draft, approve plan, etc.). The key is to ensure that the project team members can clearly understand what activities have to be completed.
- Consider also including some milestones within the list of activities. A milestone is a flag, a point in time or a significant event in the project that might signal the commencement and/or completion of some part of the project. Milestones are useful for scheduling approvals, inspections, payments, or possible reporting requirements. They are shown with zero duration, zero resources and zero costs.
- Adhere to the technical requirements of the plan. Ignore the resource reality— just identify the activities required, irrespective of whether or not you have the available resources. The reason is that we need to see what the plan could look like before the resource reality kicks in. In other words, you will end up with two schedules: the optimistic one driven solely by the technical work, and the possibly pessimistic one based on the true resource capability.
- Each stage, activity and milestone should be uniquely identified with reference numbers that could be numerical, alphabetical or alphanumerical. This enables accurate identification and tracking back to a risk register and/or a cost chart of accounts. The codes do not need to be sequential—just unique.
- Consider additional activity attributes that may be useful in putting the schedule together (e.g. assumptions, constraints, logical relationships, lead and lag time, geographic location, or project calendars reflecting working time).
- In some cases, the WBS evolves from a bottom-up aggregation of lower-level

tasks into top-level tasks. In this instance, the project personnel performing the tasks are in a position to estimate the task duration and costs, then to pass this information up the chain to senior project managers. It must be remembered that, because the WBS captures all the work required by the project, work not included in the WBS falls outside the project's scope. While a graphical representation of the WBS is useful when first coming to terms with all the project work, a more suitable (and simple) table format, spreadsheet or MS Project 'entry table' might work better in terms of understanding all the different levels of the project, as shown in the two different projects in Figure 4.4 and Table 4.4.
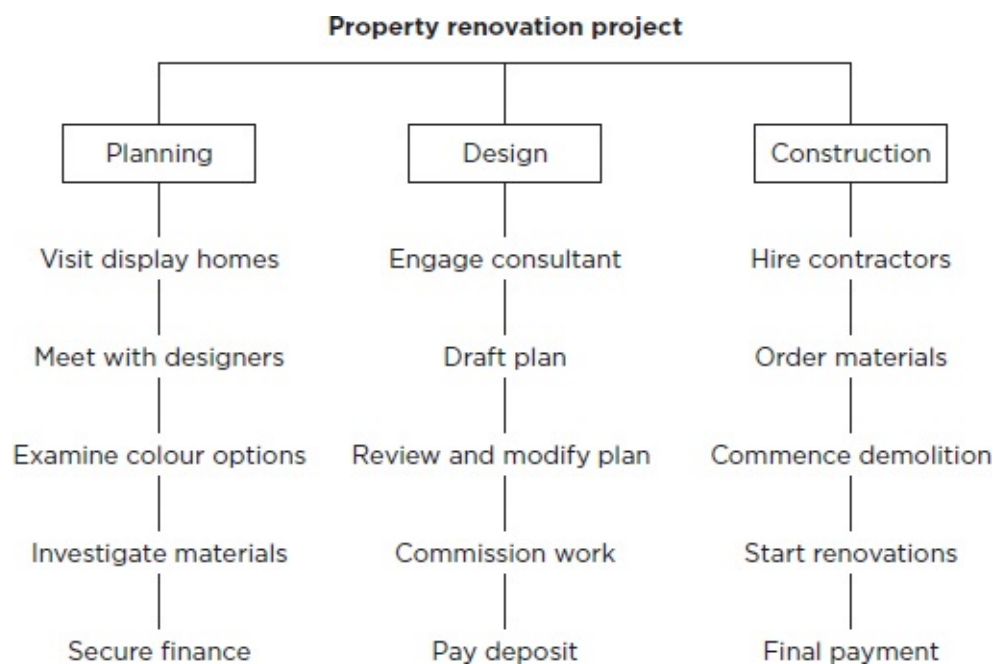
Figure 4.4 Graphical work breakdown structure

Table 4.4 Work breakdown structure—tabular representation

WBS #	Activity	Duration	Predecessor	Resources	Costs
1.0	**Computer purchase**				
1.1	Identify requirements				
1.2	Determine brand				
1.3	Source supplies				
1.4	Arrange finance				
1.5	Purchase hardware	*These columns have been intentionally left blank*			

1.6	Purchase complete	
2.0	**Computer installation**	
2.1	Backup files to cloud	
2.2	Install new computers	
2.3	Load software	
2.4	Download files	
2.5	Run test	

...hese columns have been intentionally left blank and will be explained in Chapter 5.

It is clear that a thorough WBS is formatted to depict:

- the project scope (visual portrayal)
- the internal and/or external dependencies (mandatory and discretionary sequencing)
- the grouped key stages (manageable)
- the hierarchical structure (sub-units of work)
- the different levels of detail (estimate accuracy)
- the asymmetrical pathways (relationships)
- a top–down approach (ties the project together).

So will everyone contribute equally to, agree with and abide by all this scope work? In one word, no. Given that this initial baseline is considering and capturing the merit of an idea or proposal (however well it has been thought through), the probability of conflicting interests, diverse experiences, positions and issues is high. Projects can be career-building or career-destroying activities that bring with them degrees of influence, power, authority and organisation-wide 'clout'. Consider some of the most likely issues to arise when trying to capture the scope baseline:

- political expediency
- perpetuation of silos
- poorly resourced projects
- conflict of interest
- constrained variables from the start
- prior workloads and existing commitments
- loose promises
- disparate expectations

- too many stakeholders involved
- poorly defined roles and responsibilities
- little if any common ground
- no time to scope project properly
- a lack of due process
- a lack of involvement
- protection of sacred cows and pet projects
- absence of any alternative solutions
- issues around prioritisation
- no obvious due process
- ambiguity
- poor meeting attendance
- repeated meetings
- little documentation
- a lack of transparency
- no single-point authority.

Given these potential issues, a number of specific actions will be required. The following suggestions are offered in the hope they might help us deal constructively with this negativity:

- Gain visible support from executive management.
- Identify the administrative processes and support needed.
- Conduct information-gathering meetings.
- Investigate alternative approaches and solutions.
- Sell the project benefits to stakeholders.
- Focus on the project objectives, not self-interest.
- Appoint a source of single-point authority.
- Capture a dictionary of terms (glossary or similar).
- Map out the process and documentation involved.
- Accept pre-existing constraints and interdependencies.
- Publish clearly defined roles and responsibilities.
- Update the scope baseline as authorised scope change occurs.

In other words, the scope baseline never leaves the project. Nothing happens in the project that hasn't been documented and managed at some stage (often through revisions or addendums) throughout the project. And remember, the project proposal (or again, the scope baseline) is a 'fluid' concept—a little like the 'moving goalposts' scenario. In these types of projects, the scope can be very

hard to tie down and control, which can lead to project failure. In fact, one of the givens in many projects is the high probability of scope change somewhere over the life of the project.

Critical reflection 4.2

Work breakdown structures (tabular or graphical WBS) not only provide a valuable opportunity to break down the project scope; they also enable the resources and know-how to be involved in further interrogating exactly what the client has asked for.
■ What are the benefits in being able to break down the client's expectations into discrete units of work (activities or tasks)?
■ Is there a danger in simply listing work sequentially when completing the WBS, and if so, how would you address this?
■ Given that you have included an activity in the WBS, should it produce a deliverable? Explain your answer.
■ Should activity estimates be finite and exact, or should they fall within acceptable limits?
■ If you are attracted to the acceptable limit option, how will you 'sell' this variability to your client and other stakeholders?
■ How will you be able to determine status and completion in the activities you have identified? Can they both be measured accurately?

Building in objective validation criteria

Now for the prickly issue of actually validating the requirements that were initially planned for, and then iteratively elicited, analysed and recorded. It is prickly because client acceptance is not automatic in that many projects; rather, it can be a prolonged process of formalising acceptance of the completed project deliverables (PMBOK, 2013). This formality could take the form of any of the following criteria:

■ issuing compliance certificates
■ measuring work performance
■ analysing change requests
■ conducting variance analysis
■ undertaking physical inspections
■ conducting quality testing
■ performing in line with quality standards
■ writing project reports
■ scheduling independent audits

- assessing technical feasibility
- maintaining a traceability matrix
- referencing external benchmarks
- verifying project documentation
- documenting non-conformities
- instigating product/service reviews
- commencing testing
- gaining stakeholder signoff
- finalising outstanding work.

Following either a single step or incremental approach, validation will determine whether the project meets the agreed requirements at some point in time before and during handover. It should not be seen as a separate action squeezed conveniently into a suitable gap in the schedule between project start and end. Rather, it should be an integral part of the overall planning and management functions of the project.

Equally important is that the project must satisfy the requirements (i.e. give the client 100 per cent of what they wanted) and not exceed their requirements (i.e. give the client 120 per cent of what they wanted). Project management has nothing to do with exceeding stakeholder expectations and requirements; it has everything to do with meeting them. Just as you would never choose to under-deliver the project, avoid the real temptation to over-deliver it as well. If you do go over, you invariably do so in your own time and at your own cost (not the client's), as Figure 4.5 illustrates.

Don't forget that each of these validation methods will potentially impact the project schedule, resources and costs. So the question becomes: In whose time and at whose cost do you perform all this validation? The client may well expect validation to be at the principal's cost and time. Objective validation criteria need to be discussed and agreed right at the start of the project to avoid any potential issues derailing acceptance and handover. So take the time to systematically build these processes and their implementation into the project documentation and schedule. Make scope validation part of the culture of the project management and the project management team alike, with zero tolerance for any shortcuts. Mistakes will be found, but unless they are terminal, make it right then move on. The goal is to gain acceptance, not to be endlessly assigning blame.
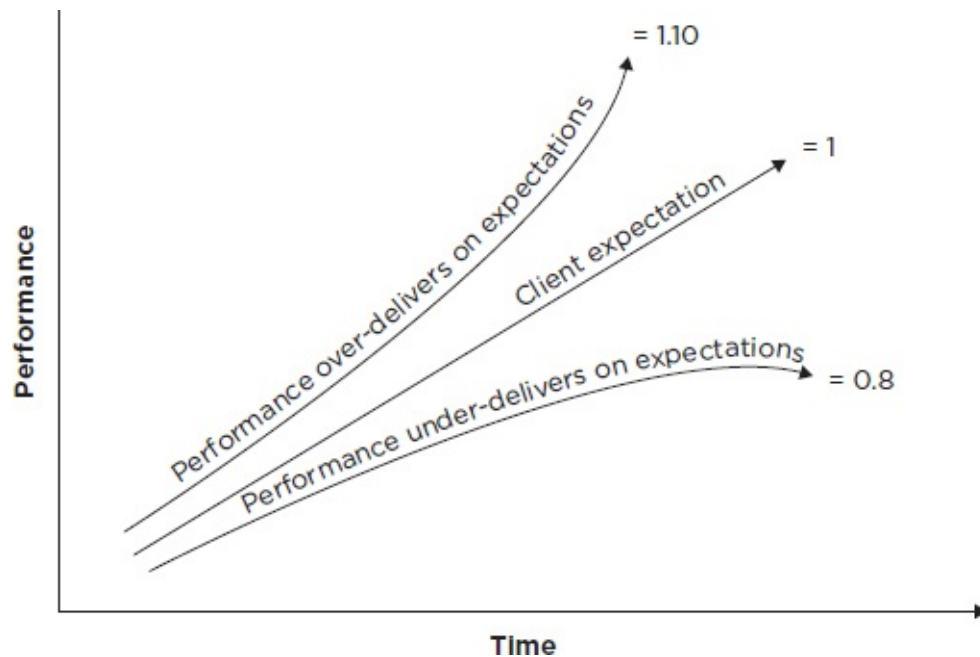
Figure 4.5 Satisfying client expectations

Critical reflection 4.3

Figure 4.5 often attracts criticism from those who think that project management is all about adding value wherever possible throughout the project, in other words by over-delivering on expectations.
- What is your take on meeting or exceeding your client's expectations (assuming you try to avoid under-delivering on them)?
- If you advocate exceeding the client's expectations, how do you ensure that the client funds this increase in scope and provides additional time where required?
- Are there genuine benefits in over-delivering a project? If so, how do you redeem them later?

Controlling the scope

Let's be clear about one thing: the scope will always creep, in some way or another, over the life of the project. While not necessarily a bad thing, creeping scope may be caused by any number of factors, ranging from misinterpreting the requirements, limited input from key stakeholders and lack of documentation through to not having any mandated formal change-control process.

Should scope creep be (actively) encouraged? If so, under what precise conditions? Terms like 'continuous improvement', 'creativity' and 'innovation' may well provide a clue to the right answer (which is 'yes', by the way). Of

course the scope baseline will change over the life of many projects: technology from Metal Storm (a defence company that was developing new age projectile launching systems) was aimed at replacing not only the modern machine gun but most other projectile launching systems dating back to the original Gatling gun (1860s). Using its unique, electronically fired, stacked projectile technology, Metal Storm's concept of multiple projectiles loaded nose to tail in a single gun barrel with propellant packed between them may be a game changer. Or do we stock up on Gatling guns?

Drum brakes on motor vehicles have, over time, been replaced by anti-lock braking systems (ABS). As another example, consider computer monitors, which have evolved through numerous configurations of screen size, resolution and refresh time. The latest, modern computer screens now make the monitors that were popular in the late 1970s look pathetic at best. I think you get the idea.

So technology may trigger some scope change (or creep). What else could? Clearly, any of the following would have an immediate impact:

- changes regarding stakeholders
- unexpected budget cutbacks
- accelerated delivery
- new regulatory standards
- changes in legislation
- resource unavailability
- incomplete specifications
- late design revisions
- prototype testing feedback
- additional functionality requirements
- risk events with adverse consequences.

However, becoming a vigilante for all of these may become a little tiresome and self-defeating. Perhaps your energies should be directed towards developing and maintaining a formal change-control process that assesses and then, in turn, actions only approved change requests. Such a process would include reference to the following 'inclusions':

- Insert a concise change request protocol into the project proposal, project plan and project report documentation.
- Pre-warn stakeholders that the scope baseline will probably change at some stage.
- Communicate the actions these stakeholders will be required to make.

- Develop the change request template that will be adhered to for all change requests.
- Compile a variation register to track all change requests and approvals.
- Produce timely technical, time and cost variation reports.
- Regularly update all plans with actual data against the plan.
- Communicate all proposed changes to the relevant stakeholders for assessment.
- Map proposed changes into the project schedule, budget, resource pool, risk register, quality plan and contract for a thorough impact analysis.
- Dictate that all scope change requests (and directives) are in writing.
- Ensure that all scope changes identify (and are signed by) the stakeholder initiating the change.
- Reflect all successful scope changes in a revised project schedule, budget, risk register and other associated documentation.

Let's now recap what should be the four obvious challenges in managing scope creep. They are:

1 sourcing the true cause of the scope creep, including justification
2 assessing the impacts that the proposed change will have on the project
3 gaining approval for the changes and impacts
4 managing the resultant changes with appropriate strategies.

Table 4.5 provides some examples of scope creep together with their impact and possible strategies.

Scope creep is both inevitable and treatable. Its inevitability is due to the constantly changing expectations stakeholder diversity brings to the project. Of course, stakeholders will change their minds, discover new options and want more features and enhancements as technology and other change drivers become evident. After all, it is this ongoing innovation that should inseminate projects from start to finish. And it is entirely treatable, too—both from an initial scope baseline perspective and ongoing change control. Scopes are created, agreed, modified, revised, agreed, modified, revised and so on. They are not static documents that get laminated once created. At best, they are strategic in intent, provisional in accuracy and refined in execution. And working closely with the scope baseline (proposal) is the foundation for scope change—a sanctioned and controlled process to assess and evaluate scope change requests throughout the project.

Critical reflection 4.4

Scope creep (unauthorised inclusions and/or subsequent changes—authorised or not) to differing degrees is common in most projects at one time or another.

- Recall the different types of scope creep you have encountered in past projects or even your current project.
- Given that project management involves a high degree of common sense, how could this 'creep' possibly occur?
- Apart from scope baselines, variation registers and the like, what other measures can you take to ensure that the scope is controlled throughout the project (and this doesn't mean it must never change, as change can bring creativity and innovation)?

Review questions

4.1 What is meant by the term 'scope management plan' and what does it involve?

4.2 What are some of the tools and techniques used to capture the scope baseline?

4.3 What roles do inclusions and exclusions play in the processes underpinning scope management?

4.4 How does scope management differ from scope control?

Table 4.5 Surviving the 'creeping' scope

The cause	The impact	The strategy
Imprecise language with a lack of detail in describing the work	■ Poor quality work, including incomplete work and rework ■ Delays in clarifying intent ■ Open to interpretation ■ Assumptions made ■ Any outcome will be good outcome ■ Subjective choices made	■ Glossary of terms ■ Drawings ■ Detailed specification ■ Contracts ■ Third-party review ■ Written in plain English ■ Draft versions of the scope ■ Technical experts to review the schedule
Widely inaccurate estimates (time and cost)	■ Invariably, schedule delays and cost overruns ■ Pressure from stakeholders to stick with original estimates	■ An understanding that early estimates are exactly that—estimates ■ Time to revise and fine-tune

	(deemed to be accurate)	the schedule and costing ■ Access to technical specialists with estimating experience
Failing to get third-party review	■ Insufficient detail ■ Key parts omitted ■ No insight from external parties	■ Distribute to qualified project personnel for review
No pattern, structure or chronological order	■ Chaotic schedule ■ High chance of rework ■ Conflicting resource assignments ■ Impossible delivery timetable	■ Sequence the work logically ■ Work backwards to check the logic ■ Prototype the schedule ■ Identify scheduling errors
Omitting special instructions and/or ignoring them	■ Non-compliance ■ Workplace health and safety issues ■ Possibility of rework ■ Fast-tracking completion times ■ Non-compliance ■ Cost variations	■ Detailed technical specifications ■ All supporting documentation is submitted ■ Statutory requirements ■ Third-party review
Lack of user involvement	■ Imprecise requirements ■ Delays with rework ■ Delays in issuing completion certificates	■ Get the users involved in the scoping stage ■ Ensure all users go to all project meetings ■ Get the users to test the deliverable frequently (and not just at the end)
Insufficient planning time	■ Development of an ad hoc schedule ■ At the mercy of unanticipated changes	■ Support the planning process and the time required ■ Consider the consequences of poor planning ■ Review earlier projects that were poorly planned
Unavailability of resources	■ Delays in work ■ Inferior resource	■ Secure written commitments from line managers

replacements	■ Identify replacement
■ Cost variations	resources
■ Impact on morale and	■ Build in sufficient float
motivation	

Case study

The conference had been in the planning phase for some months. However despite it being the sixth international conference the institute had held, the organising committee was falling further and further behind in getting the event planned. And the problem wasn't the lack of commitment, the lack of time or the lack of delegates wanting to attend (given that prior conferences had historically produced a staggering number of speakers and delegates).

The chair of the organising committee (Ian Keenan) sat in his office rewriting the agenda he wanted to get out before Friday's meeting. As he reread his notes, he realised that both he and the committee had missed some key information regarding how they were approaching the planning and management of the conference and that they would have to go back to square one if they were to make this conference a success. While the committee had access to the planning files from last year, Ian had always been reluctant to rely solely on this information as the past was not always a good predictor of the future. However, he now knew that the committee had done exactly that: it had copied the brief template from last year and simply updated the information where needed.

Clearly his committee needed to put together some type of document (and process) that captured not only what the conference was actually about, but more importantly what the board's and CEO's expectations were, and how these would be managed and controlled proactively once the project was underway. While he was confident that his event coordinator would ensure the conference timetable would go to plan (once finalised), Ian still had reservations about whether the members of his team fully understood what they were taking on.

Ian decided that he needed a scope management plan that captured not only what the project scope was and wasn't, but also how this information would be gathered, validated, managed and controlled throughout the project. Scope inclusions and exclusions were obviously important, as it was crucial to effectively limit what the conference project would actually deliver. Ian had discovered that past conferences had not matched the expectations of some stakeholders with regard to the expertise of the speakers engaged, the format of the breakout sessions and registration procedures. Even something as simple as free membership vouchers being placed in conference satchels when they should have been offered as prizes had caused some dismay and disappointment.

> 'Clearly his committee needed to put together some type of document (and process) that captured not only what the conference was actually about, but more importantly what the board's and CEO's expectations were, and how these would be managed and controlled proactively once the project was underway.'

And given the difficulties in getting hold of the CEO, membership manager and marketing coordinator, Ian knew that extended face-to-face meetings with these people would be hard to schedule. What he needed was an array of different techniques to gather the all-important detail on what they actually required and then lock it in. Sadly, getting clients and other stakeholders to accept handover on any project, let alone an international conference, was never going to be automatic.

With a prior working history with these conference stakeholders, Ian realised he would need to have in place a formal, documented change-control process before the project got underway. While this wasn't intended to restrict any opportunities for innovation or continuous improvement, the last thing Ian wanted was navigating heated arguments later in the project that may lead to budget blowouts, extension of time (EOT) and other variations being refused when the scope changed without any consultation, documentation or authorisation.

Questions

1 Why was documenting a scope management plan an important issue for Ian and the committee in shaping the project's over-arching objective and ultimate success?
2 Why is it important to cite the exclusions in all scoping documentation?
3 What requirement-gathering techniques could Ian access in the context of his stakeholder availability?
4 How could Ian and his committee work throughout the project side by side with their clients and stakeholders to ensure handover wasn't jeopardised?
5 What scope creep triggers should Ian watch out for throughout the conference project?
6 Given that the project (should) produce innovation and continuous improvement over time, why does the scope need to be controlled?
7 How can Ian both manage and control the scope changes when they first appear?

Time management

Developing and controlling the schedule

Key points

- Planning the schedule-management (time-management) approach
- Defining project activities
- Estimating techniques for calculating activity durations
- Estimating accuracy and confidence levels
- Building in the resource reality to the estimates
- Understanding activity dependencies
- Building in lead and lag time
- Creating network (activity-on-node) diagrams
- Developing the schedule timeline
- Working with the critical path
- Controlling the schedule reality

In practice

In the absence of templates and software, some project timelines (schedules) are intuitively planned and managed in someone's head. While perhaps making it easy to find, this 'technique' does little to embed thorough understanding, ownership, commitment and capability, not to mention planned performance.

An idea isn't a schedule any more than a proposal is. Nor is an extensive (and impressive) activity list in Word or Excel a schedule. Schedules are drawn up over time, and not just in columns and rows. Often just a simple bar chart, they are created to convey intent, drive delivery, measure performance and assess completion—over time, against budget, as scoped and within the agreed resource parameters. Further, an effective schedule provides a clear baseline (think of a master copy) of intent against which ultimate performance, deviation and/or achievement (reality) can subsequently be measured, assessed, reported and managed.

Remember that there can be a massive difference between the intent and the reality. That is why full disclosure is called for in drafting, publishing, updating and controlling the project schedule to demonstrate and maintain project performance, accountability, transparency, communication and client satisfaction.

Chapter overview

To manage time in your project, you need to demonstrate that, at any given time, the project is being managed for timely completion (PMBOK, 2013). That means delivering the project pretty much on time—give or take a +/– variation acceptable to the stakeholders.

But time management might actually mean a whole lot more. While completion is important, you simply cannot complete what you haven't planned —and in some cases, planned in significant detail. Time management is more than a mere schedule or bar chart; it is a process to identify all the component parts that make up the different schedules that the project will generate—

baseline, current and actual—throughout the life of the project.

As with every part of project management, policies, procedures and documentation are required to support how schedules are developed, executed, managed and controlled. This involves putting together some form of a schedule management plan, followed by a number of steps suggested by PMBOK (2013), including defining activities and their sequencing; estimating activity duration and resource units; and developing and controlling the baseline and actual schedule. The schedule will need to be monitored, reported on, updated and controlled if timely completion is to be achieved in a realistic fashion.

Remember how important these iterations will be, as each iteration of the schedule should address (as a minimum) the following contingencies:

- scope-based variations that would reflect the stakeholders' increasing or decreasing demands on the project
- time-based variations that might include 'balancing' realistic, pessimistic and most likely estimates of the time required
- cost-based variations that might involve predicting possible increases or reductions in project funding
- resource-based variations reflecting potential changes in resource skill sets, charge-out rates and availability.

Planning the schedule management approach

As with scope management, a concerted effort is required to put together a document that will guide and direct how the project schedule ultimately is managed throughout the project. Underpinned by internal policies, procedures and documentation, schedule (time) management is not a naturally occurring phenomenon if the number of 'printed once' Gantt charts often seen (and clearly out of date) is any indication.

As PMBOK (2013) points out, managing an evolving schedule requires specific actions that will clearly demonstrate that schedule planning, development, execution, management and control constitute a fully embedded process within the project—from start to finish.

Forming part of the project management plan (remember that this is more than just a simple timeline or sketch), this plan may include reference to any of the following:

- the rationale for managing the schedule
- any perceived obstacles or constraints impacting
- stakeholders responsible for the different processes and documentation
- appropriate control thresholds triggering an intervention
- timing and format of schedule reports (against the plan)
- processes required to update the schedule
- advising stakeholders of the different risk, cost, quality and scope decisions with implications for the schedule
- project management software for developing the schedule
- preferred tools to be used (e.g. work breakdown structure [WBS], milestones, Gantt chart)
- estimating techniques
- change-control procedures
- meeting formats and dates
- rules for calculating percentage complete
- definitions of actual performance measurement—for example, earned value (EV), treatment for variations, extension of time (EOT).

We already know that the scope will change, and with it the project schedule. As the schedule changes (e.g. behind schedule or ahead of schedule), both the project manager and team (along with other stakeholders) need to know in advance how to respond. Does every variation to the timeline warrant an immediate response? Is EV the only performance measure to use? How does culture influence project reporting? What level of accuracy do stakeholders want? This provides some idea of the value this formal or informal schedule management plan (protocol) can deliver.

Defining the project activities

As seen in Chapter 4, the activities required by the project's scope and reflected in the WBS are also needed to develop the schedule baseline.

Recall that the WBS is more like an activity list of what work has to be performed throughout the project. Classified under stages, phases or work packages (or other appropriate classifications), these activities will drive the schedule's compilation, sequencing and amendments throughout the project. When recorded in sufficient detail, all the relevant stakeholders will have a precise idea of exactly what work is required. Clearly, these and other attributes

will vary project by project, along with the level of detail required by the stakeholders. However, the following attributes or supporting information should be considered (PMBOK, 2013):

- meaningful description (consider the verb–noun format)
- unique identifier—for example, activity code, WBS number
- activity duration
- all logical relationships—for example, predecessor and successor
- provision for lead and/or lag time
- resource requirements
- underlying assumptions
- relevant constraints
- reference standards
- imposed dates
- required resources
- geographic location
- the project calendar.

Milestones will also play a part in this activity listing. Milestones are significant events, or a moment in time, within the schedule. They have no duration and, more often than not, they have few if any resources or costs directly attributable to them. Moreover, they are extremely useful for flagging key events (project authorised), signalling the conclusion of a series of related tasks (flooring finalised) or serving as either merge (multiple paths merging into one) or burst (single path breaking into multiple paths) points along the schedule.

Estimating activity durations

With the activities (and milestones) identified, the next step is to begin the process of estimating the activity duration or work period required to complete the activity. 'Estimate' is a key word here—it is different from an absolute or definitive duration.

Estimating activity duration can be difficult, particularly if you have little knowledge of the activity, prior experience and/or estimating techniques. To many, a process of progressive elaboration works best where you have access to more accurate and detailed designs, technical specifications or quality requirements. As these inputs change over time, the estimate can, in turn, be

revised progressively with increased accuracy.

It is worth noting that estimation outcomes may subsequently create legally binding contractual obligations between the principal, client or buyer and the contractor (supplier) once the project is underway. The same can be said for cost estimates, which are covered in Chapter 6.

A number of accepted estimation techniques are available, including:

- *pre-determined:* the estimate is announced by senior management (often in isolation from the other variables/constraints)
- *expert judgement:* relying on expertise from individuals or groups with specialised knowledge (or training)
- *analogous:* accessing historical data from a similar activity that serves as a frame of reference
- *group decision-making:* an interactive approach involving team members brainstorming emerging and iterative estimates with increased accuracy and commitment
- *unit rates:* commercial rates where the discrete unit of work can be accurately defined
- *published commercial data:* subscription services providing access to current unit costs, production rates and other rates for labour, materials and equipment
- *parametric estimates:* statistically combining historical information and other project variables (per square metre, per litre, per hour, etc.)
- *vendor bid analysis:* relying on the market through expression of interest (EOI), request for tender (RFT) and other market invitations
- *reserve analysis:* a contingency reserve to account for schedule uncertainty and risk ('known unknowns')
- *three-point estimate (wide band Delphi):* a weighted average requiring optimistic (best case), pessimistic (worst case) and most likely (probable case) estimates that define an approximate range for the expected duration. Two formulae are available for this calculation:
  □ $tE = (tO + tM + tP) / 3$ (triangular distribution)
  □ $tE = (tO + 4tM + tP) / 6$ (beta distribution).

Depending on the stage of the project life-cycle you are in, the accuracy behind the estimates might be very low (e.g. ±70 per cent), particularly if the team has limited experience of this type of project. In these cases, the accuracy level for the estimate might be very low. To elaborate on this point, consider the example in Table 5.1.

Table 5.1 Refining the estimate accuracy throughout the life-cycle

	Concept	Plan	Execute	Close
Estimate	1 day	1 day	1 day	1 day
Confidence	50%	25%	10%	5%
Best case	0.5 day	0.75 day	0.9 day	0.95 day
Worst case	1.5 days	1.25 days	1.1 days	1.05 days

Clearly, given the high variability in the duration range in the concept stage from 1.5 days down to 0.5 days, the project manager and team might spend more time revising this estimate or acknowledge that further revisions will be required in the planning stage to increase the accuracy and confidence of the required estimate. Too many greenfield projects start with duration estimates that are marginally confident at best, although for some reasons these get 'locked in' with little room to move as the project reality kicks in. Figure 5.1 illustrates this concept of progressive accuracy.

Regardless of the estimation technique used, it is important to remember that estimation is not an exact science (despite some senior management and clients assuming otherwise). Given the constant influence of uncertainty and risk throughout the project, consider the following 'guidelines' whenever you are asked to provide an estimate for the activity duration (and similarly with costs). When estimating accuracy, do the following:
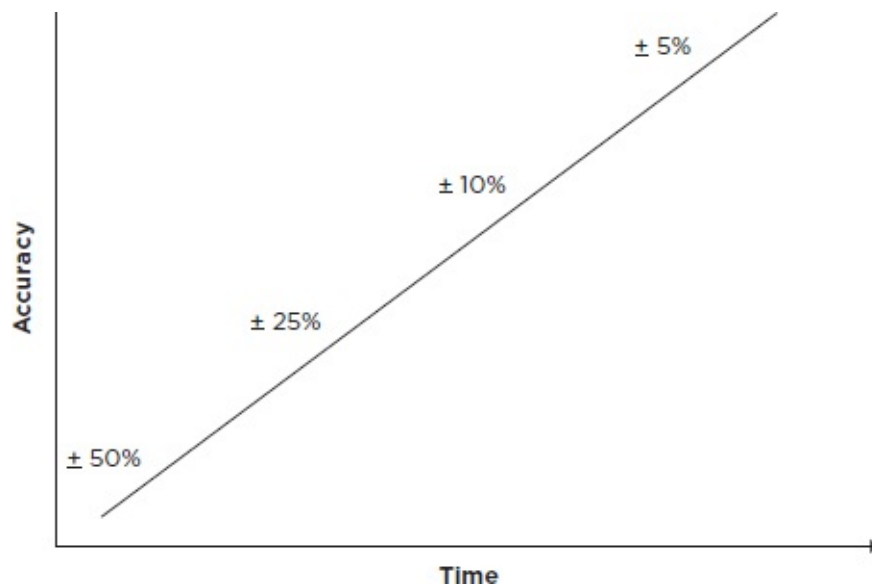
Figure 5.1 Estimating accuracy

- Record your confidence level (+/-where appropriate).
- Record how the calculation was determined.
- Record the broad, provisional or absolute nature.
- Record all underlying assumptions.
- Record all impacting constraints.
- Record any contingency amounts.
- Record an optimistic, pessimistic and likely range.
- Record all source data.
- Record details of all stakeholders involved.

In the early iterations of these estimates, try to resist the temptation (or demand) to get your estimates to perfectly match those from the proposal (where indicative, provisional or initial estimates were made). After all, you now have the activity detail, the subject-matter experts (SMEs) and the time (one would hope) to more accurately estimate the duration required. It is far better to have two different project windows in this stage, leaving you room to negotiate further rather than trying to fit all the work into someone else's unrealistic and out-of-date expectations. This is not to say that the estimates will not finally have to match those already determined for you by others—the point is that you should expect more confidence (and negotiating power), given that the duration estimates have been driven more by the technical nature of the work required and less by potentially extraneous, artificial constraints set by others (for reasons known only to them).

Try to resist allowing the resources who will likely end up doing the work cloud your initial estimates. Focus on the work required, not resource availability, proficiency, charge-out rates, required supervision or the training they require. Yes, these things will become important, but they are not the primary concerns right now. The activity has to be performed in whatever duration the estimates indicate it will be—in other words, the technical nature of the activity is the driver right now. This includes how long you will need to do this work, not who can do it or how that may impact the estimate. That decision (termed the resource reality) comes later.

Critical reflection 5.1

How long is a piece of string? Who knows? How long will it take to give the client what they want? Who knows?
- Given that a big part of estimation involves looking into the future, in the present moment and based on what happened in the past, how do you possibly convey any true measure of accuracy in your activity and/or schedule estimates?

- This book makes much of a sense of shared responsibility in project management. How is this relevant to time estimating?
- Over and above what the book provides, what other avenues do you have to improve the accuracy of your estimates?
- What are some of the benefits (apart from the obvious) that improved estimation will deliver to the project?

Identifying the resource capability

Having recorded the technical nature of the work and estimated the required duration for performing that activity to some associated measurable standard or quality criterion, the activity now needs to be resourced (and not just by people). Consider the examples of the range of potential project physical, system and human resources in Table 5.2 (Cole, 2010).

Table 5.2 Project physical, system and human resources

Resource	Description
People	Internal or external people with technical skills to perform the activity, associated support, engineers, consultants, designers, trades, administration, etc.
Material	Consumables, supplies, cabling, concrete, paper, etc.
Funding	Contingency funding that may be required.
Facilities	Buildings, infrastructure, offices, meeting rooms, transportation, etc.
Equipment	Computer, software, printers, etc.
Space	Workspace may need to be increased or remodelled.
Time	People's dual responsibilities (projects and operations) will need to be managed.
Training	Additional development may be required.
Technology	Smartphones, remote access, etc.
Knowledge	Familiarity with building codes, construction techniques, assembling steps, pricing models, etc.

Clearly, the type, quantity, characteristics and availability of the required human resources will end up impacting the accuracy of both the activity duration and activity costs, as the project's success or failure may well ultimately depend on the resources' technical capability, availability, commitment, motivation, responsibility and involvement, as well as how well they work together.

So what other information needs to be captured in making an assessment of the required resource capability? Consider the following wide-ranging suggestions that could easily be recorded in a resource matrix (Microsoft Project calls it a 'resource sheet'):

- *resource name:* individual name or generic label (e.g. plumbers)
- *resource type:* labour, material, etc.
- *resource group:* the group to whom the resource belongs
- *resource location:* the physical (geographical) location of the resource
- *resource capability:* skills, expertise, prior experience, etc.
- *resource quantity:* how many/how much will be required?
- *resource availability:* the actual 'free' time they have to allocate to the project activity (as distinct from their operational workload)
- *resource calendar:* what dates are excluded throughout the project (Easter, Christmas or other nominated dates)?
- *resource rate:* what are their normal hourly rate, overtime or other fixed/variable costs?
- *resource report:* to whom does the resource currently report in an operational capacity?
- *resource development:* will any additional training be required?
- *resource evaluation:* performance evaluations from past projects.

Bear in mind that some of this information will not be accurate, current or, for that matter, publicly available, given its sensitive nature. Irrespective of this, the resource reality plays a significant role in the final schedule (after activities and their durations have been estimated independently), as well as in any subsequent revisions later in the project.

With regard to the challenge of estimating the number of resources required to perform the activity, the estimation techniques cited earlier would apply, as would productivity metrics, the location of the resources, project management software and lessons learned. However, another useful technique when estimating, assigning and assessing resource impact on the schedule is to

produce a resource graph (or load chart) that is overlaid on or compared with the schedule. This allows the immediate effects to be seen, and indicates the required changes that need to be actioned should resources be over-allocated or unavailable. Much like scenario analysis, the project manager and team can assess the resource-by-resource implications following their assignment throughout the project. Figure 5.2 shows how the resource loading can appear when graphed against time.

Experimenting with the sequence

Any number of (scheduling) relationships will exist between project activities. Known more commonly as a sequence, the development of the project schedule is driven by these activity-to-activity relationships in determining when activities start and finish. These (logical) relationships or dependencies identify both the predecessor activity that is performed before the dependent activity in the schedule and the successor activity performed after the preceding activity.
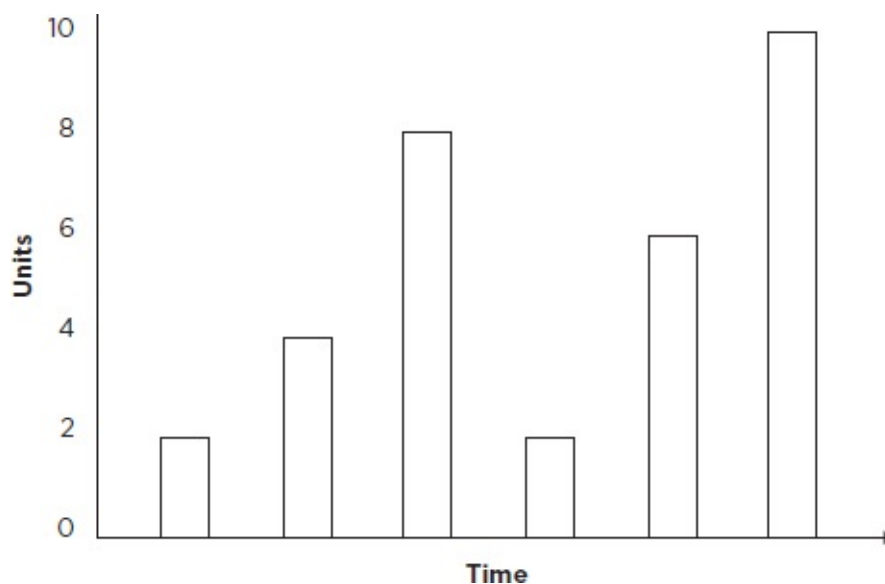
Figure 5.2 Resource loading chart

PMBOK (2013) identifies four different characteristics or attributes that dependencies reflect as they either enable or disable flexibility into the schedule. In other words, rather than having the schedule driven solely by actual dates (must start on, must finish on), the schedule can be constructed based on this

logic. The four dependencies are:

1 *mandatory:* fixed (hard) dependencies driven by physical limitations, regulatory compliance, contractual obligations or technical performance due to the nature of the work being performed (e.g. pouring the slab only after the foundations have been dug)
2 *discretionary:* preferred (soft) dependencies driven by best practice, local knowledge, past experience or a particular application where a change in the sequence is acceptable (e.g. preparing the draft presentation before all the information has been collated)
3 *internal:* dependencies between activities that fall within the project team's control (e.g. waiting for the code to be finalised before testing the software)
4 *external:* dependencies that fall outside the project team's control as they relate to relationships between the project and external parties (e.g. waiting for funding approval from a government agency).

Naturally there will be instances where dependencies will be relegated to the 'back room', as specific dates will drive some scheduled activities. Examples would include approvals, periodic inspections, testing, reporting or meetings, with each scheduled at an agreed timeline and irrespective (in some cases) of what was scheduled to have happened prior to these dates. Obviously, the more you allow the dependencies to determine the schedule sequence, the more flexibility you will have in accommodating changes later in the life-cycle.

Very few projects enjoy the luxury of having all activities starting or finishing at the same time. In practice, many activities are interdependent and relate to other activities. While many projects will contain a number of independent activities that have no relationship with any other activities in the project (that is, they can start and/or finish without any impact on any other activities), most projects contain activities that are largely constrained by other activities.

Four activity relationship types have been identified in project management, with each of them providing additional flexibility and control over the project schedule. With duration represented graphically as a horizontal bar overlaid against a timescale, the relationship types are:

1 *finish–start relationship:* activities will start when other activities have finished
2 *finish–finish relationship:* activities will finish when other activities have finished
3 *start–start relationship:* activities will start when other activities have started
4 *start–finish relationship:* activities will finish when other activities have

started.

Finish–start relationships

Relationships where an activity (Task B) cannot start until its predecessor activity (Task A) has finished are called finish–start (FS) relationships. These activities are scheduled 'in series'. Task A must totally finish prior to Task B starting. If Task A is delayed in either starting and/or finishing, it will effectively delay Task B, which is waiting for it to finish. See Figure 5.3 for an example, where Task A could be digging footings and Task B inserting fence posts. Clearly, the project manager and team members must monitor Task A to ensure there are no (unacceptable) delays to Task B, which could ultimately filter all the way through the schedule to impact on the projected finish.
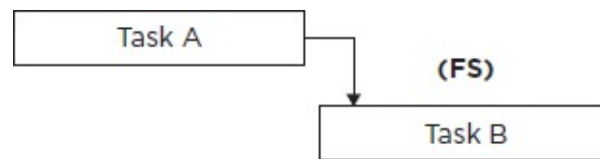
Figure 5.3 Finish–start relationship

Finish–finish relationships

Relationships where an activity (Task B) cannot finish until its predecessor activity (Task A) finishes are called finish–finish (FF) relationships. These activities are scheduled 'in parallel'. Task A must totally finish prior to Task B finishing. Here, the emphasis is on both activities finishing; their starting times are immaterial. If Task A is delayed in finishing, it will effectively delay the finish of B which is waiting for Task A to finish. See Figure 5.4 for an example, where the completion of the fire drill evacuation (Task A) allows the safety officers to finish monitoring the drill (Task B). Clearly, the project manager and team members must monitor Task A to ensure there are no (unacceptable) delays in finishing which would translate to delaying the finish of Task B. Again, these could delay the finish of the project.
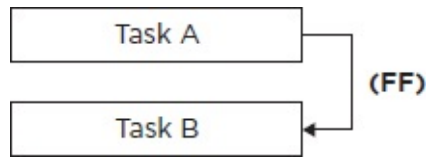
Figure 5.4 Finish–finish relationship

Start–start relationships

Relationships where an activity (Task B) cannot start until its predecessor activity (Task A) starts are called start–start (SS) relationships. These activities are scheduled in parallel. Task A must start in order for Task B to also start. Here, the emphasis is on Task A starting only (not finishing) as the trigger to starting Task B. Their finishing times are immaterial. If Task A is delayed in starting, it will effectively delay the start of Task B, which is waiting for Task A to start. See Figure 5.5 for an example, where the start of the meeting (Task A) allows the minute-taking (Task B) to start. Clearly, the project manager and team members must monitor Task A to ensure there are no (unacceptable) delays in starting, which would translate to delaying the start of Task B. Again, these could delay the finish of the project.
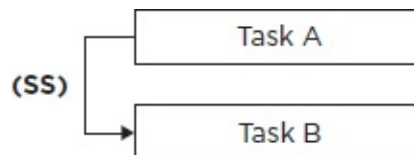
Figure 5.5 Start–start relationship

Start–finish relationships

Relationships where an activity (Task B) cannot finish until its predecessor activity (Task A) starts are called start–finish (SF) relationships. These activities are scheduled 'in series'. Task A must have started in order for Task B to finish. Here, the emphasis is on A starting only (not finishing) as the trigger to finish Task B. If Task A is delayed in starting, it will effectively delay the finish of Task B, which is waiting for Task A to start. See Figure 5.6 for an example, where the start of the morning security team (Task A) enables the members of the overnight security team to finish their shift (Task B). Clearly, the project

manager and team members must monitor Task A to ensure there are no (unacceptable) delays in starting, which would translate to delaying the finish of Task B. Again, these could delay the finish of the project.
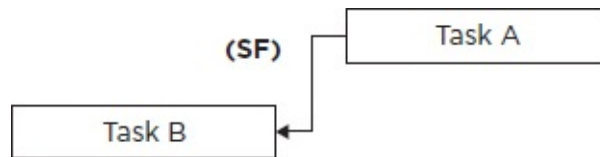
Figure 5.6 Start–finish relationship

Accelerated or delayed delivery

Another area of flexibility that the schedule permits is the option of using either lead time and/or lag time. Be aware, though, that any of the four relationship types identified above can be scheduled with either lead or lag time—however odd or illogical the relationship becomes (e.g. start–start with lead). Anything is possible: it is just the tradeoff (to the schedule) that you must manage. (*Note:* software programs will allow you to schedule illogical task relationships, so be careful. The programs are nothing more than graphical databases, not intelligent life-forms critically assessing the efficacy of your logic.)

Lead time

This is sometimes known as acceleration or compression—both can potentially take time out of the project. With reference to the traditional finish–start relationship identified earlier, Task B could start earlier than the finish of Task A by taking advantage of lead time. Essentially, Task B would start after Task A had partially finished (that is, finished up to a point). The 'in-series' activities move to an 'in-parallel' format with the overlap representing the lead time or the time effectively taken out of the schedule. An illustration is given in Figure 5.7. Be aware that any of the activities in the relationship types cited above can be scheduled with either lead or lag time.
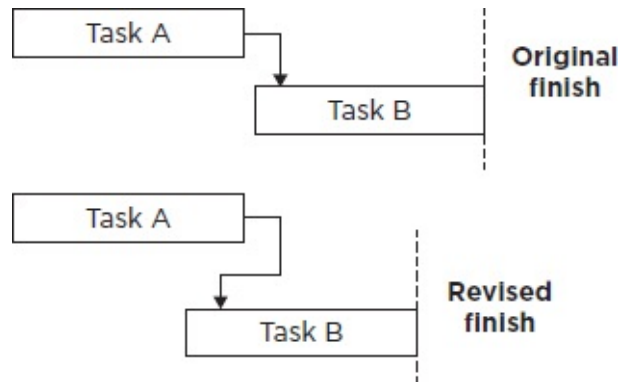
Figure 5.7 Lead time (intentional acceleration)

Lag time

This is sometimes known as delay or prolongation—both can potentially add time to the project. With reference to the finish–start relationship identified earlier, Task B could start later than the finish of Task A by taking advantage of lag time. Essentially, Task B would start after Task A had finished and then some. That is, the start of Task B is delayed even though it could have started right after Task A finished. In this case, the 'in-series' activities remain 'as is', with the space between the bars representing the lag time, or the time effectively added to the schedule. An illustration is provided in Figure 5.8.

   Perhaps now is the time to discuss some advantages and disadvantages of the WBS—our first foray into a specific scheduling tool—see Table 5.3. Remember that the WBS is an expansion of the proposal document—in greater clarity (or granularity or decomposition). If the activities are not identified in the WBS, they will not be completed in the project.
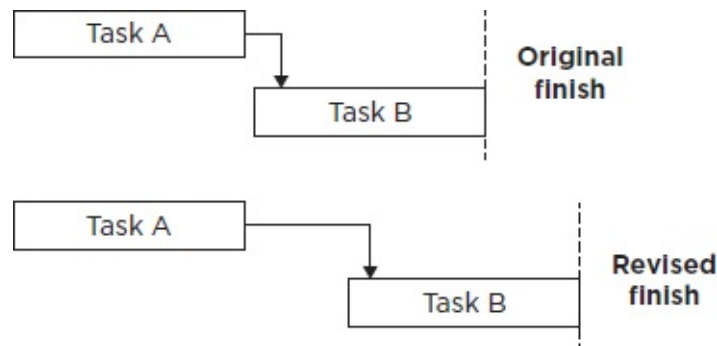
Figure 5.8 Lag time (intentional delay)

Critical reflection 5.2

It seems that project management has been reduced to long and short horizontal task bars, diamond-shaped milestones and connecting lines suggesting that multiple relationships are possible throughout the schedule.

- Think about the information gathered, the stakeholders engaged, the meetings held, the questions asked, the decisions taken, the time involved and the documentation produced to get you to this stage in scheduling the project.
- Think about how impoverished and incomplete your schedule may well be if some of the above actions were not undertaken.

Table 5.3 Advantages and disadvantages of the WBS

Advantages	Disadvantages
It captures all activities required to complete the project.	It can be time consuming to complete, especially by people with limited experience.
It identifies the relationships between activities.	A 'table' of information does not necessarily portray a schedule.
It is easily read in the table format ('list of things to do').	Errors in logic can occur because information is often listed sequentially, numerically or linearly.
It confirms a common understanding of project scope because work not in the WBS is outside the scope of the project.	The resources may not be identified at the time it is prepared.
It provides tabular examination of the key aspects of the project schedule.	It might not record in sufficient detail the description of activities.
It can be filled in by the relevant resources working on the project.	Some activities might be constrained by factors other than predecessors.
The levels shown are sufficient to achieve estimating accuracy as each descending level shows an increasingly detailed description of the activities.	Bottlenecks, scheduling, resource conflicts and float cannot be identified easily.
It shows the deliverable-oriented grouping of project elements.	The top-down approach might not be suitable for all types of projects.
It is drawn top down.	It is hard to promote ownership, commitment and energy to the project

	by examining a detailed list of work required to be performed.
It ties a project together.	It encourages using past templates for similar projects.
It makes a complex (large) project manageable.	It may limit the attributes captured (subject to format).
It can often be reused in other similar projects.	It is difficult to get a holistic overview of the project.

Don't get hung up on time just yet

Up to this point in the scheduling stage, the WBS has served us well. It has captured the activities required by the project, duration forecasts, predecessor relationships (which also generate the start/finish dates) and the preferred resource allocations (although we will revisit resource allocations in more detail in a later chapter).

However, the usefulness of the WBS at this point has now become limited. The WBS could be thought of more in terms of a list of work, or what Microsoft Project calls an 'entry table'. What is now needed is a picture of our project and, more importantly, a picture of our project's logic, which the WBS accurately (we hope) recorded. The tool that delivers this information is known as the network diagram (formerly known as the Program Evaluation Review Technique— PERT) and illustrates:

- the project's logic
- the relationships that exist between all the required activities
- the flow of work throughout the project
- where the critical path lies through the project (this will be covered shortly)
- exactly where potential bottlenecks are
- how the project is 'tied' together
- how each activity is required for the project to be finished.

Figures 5.9 and 5.10 reveal that the network diagram is a lot like a flowchart that depicts the sequence of activities needed to complete a project. When drawn, the network consists of a series of activities (sometimes referred to as nodes) and

connecting lines and arrows, indicating the relationship between the activities and the direction of the project. The diagram may be referred to as a 'logic network', a 'PERT chart', or a 'precedence diagram', and will contain a mix of either an 'in-series' path or 'parallel' paths.

| Task A | → | Task B | → | Task C | → | Task D |

Figure 5.9 Network diagram (linear path)

| Task B | → | Task D |
| Task A |
| Task C | → | Task E |
| Task F |
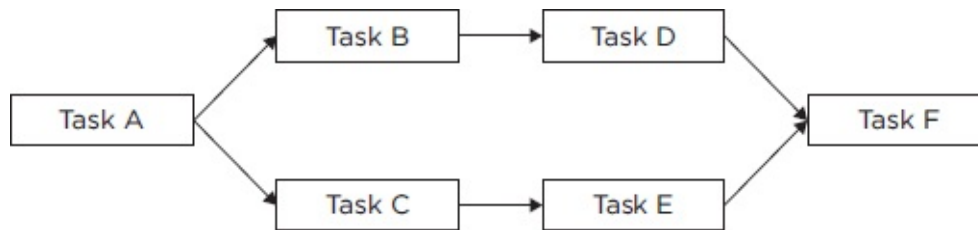
Figure 5.10 Network diagram (parallel paths)

Some simple rules for drawing network diagrams

When drawing the network, a few simple rules will be beneficial—not only to ensure it is technically correct, but more importantly to ensure that you can maximise the network to improve your scheduling (and ultimately your project success). Consider the following:

- There is no timeline drawn (this is one of the later advantages the Gantt chart has over the network diagram).
- Time (figuratively speaking) flows from left to right through the diagram.
- Each activity is located in order of dependency as dictated by the WBS.
- Lines should be pencilled in to record links, ensuring that all activities are connected to the network (i.e. they are on a path).
- The network can be drawn either 'in series', which is a straight line or linear network with one activity following directly on after its linked predecessor, or 'parallel', where there are two or more paths of linked activities through the network from start to finish.
- The schedule direction is indicated by the connecting lines and arrows.
- Each activity has at least one connecting line going in and out of it (the exceptions being the project commencement activity and the project-completion activity).

- Try to avoid crossing lines where possible (they make the network harder to read and interpret).
- Don't forget to work backwards to check for errors of logic. Two common errors are dangling activities—activities that are not a predecessor to any other activities in the project (such an activity effectively dangles in the network without being connected to the project path or to the finish of the project), and looping or cyclic errors that make an endless loop in the network.

While not technically a rule, one final suggestion when drawing the network diagram is to consider using a whiteboard on which to draw the activities. This way you can easily erase and redraw the activities and/or the relationships. A variation on this theme is to use Post-it® note pads and write the activities details down on each piece of Post-it paper (including milestones). Then place the Post-it paper on the board and create your project's schedule. In this way, any errors in the logic can easily and quickly be accommodated by removing the Post-it paper. This can also be extremely beneficial if the project team members are involved, as they participate in 'creating' the schedule and jointly make the relevant decisions as the project logic unfolds.

Let's now see how the WBS and the network diagram mesh together. Recall that the WBS captures all the activities required to be completed by the project—activities referring to all stages, activities and/or milestones. The network diagram shows the logical and sequential scheduling of those activities. Figure 5.11 brings these tools together to show how the WBS is transformed into a network diagram.

ID	Task	Duration	Predecessor	Resource	Cost
1	A		-		
2	B		1		
3	C		1		
4	D		2		
5	E		3,4		

a. WBS table
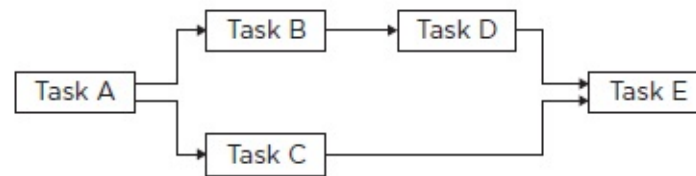
b. Network diagram

Figure 5.11 Migrating from the WBS to the network diagram

When first drawing the network diagram, concentrate on checking your schedule logic—that is, the relationships you have established between the activities, as reflected in the predecessor column. What might look logical and manageable on the WBS can often be complicated and illogical when drawn as the network diagram. At this stage, before we introduce the concept of critical path analysis, think of the network diagram as a great way of checking whether the schedule is workable, whether all the activities to complete the scope have been captured, and whether all the activities are free from scheduling errors (dangling and looping errors).

Now, with a firm understanding of the network diagram in place, it is timely to reflect on the possible advantages and disadvantages of this tool. These are summarised in Table 5.4.

Let's recap on what our project journey has covered so far:

■ The project was initiated by someone for a reason—a problem, an opportunity, market pressure, government requirements.
■ A scope baseline or proposal document was developed and agreed, with all (key) stakeholders signing off on the document.
■ A WBS was developed to begin the process of capturing all the activities required to deliver the scope, along with relevant attributes.
■ A network diagram was drawn to test the logic and completeness of the WBS.

Developing the schedule

One of the earliest and most popular scheduling tools is the Gantt chart. Developed by Henry Gantt in 1917, the chart is prepared by listing the work activities as discrete activities on a horizontal axis and by plotting each one against a timeline on the vertical axis (network diagrams do not have timelines, although software can add them). The activity's duration is shown as a rectangle (or any other shape of choice) on the timescale. In this way, the chart (dependent or independent) activity bars can quickly convey the overall plan, the completed work and the status of the project. Figure 5.12 depicts a (bar) Gantt chart.

Ground rules for drawing a Gantt chart

For many, the Gantt chart is intuitive and user-friendly; for others, it represents a collection of bars that look too much like hard work. In reality, the Gantt chart is easier to put together than the network diagram, and it can be constructed by reference to the following guidelines:

Table 5.4 Advantages and disadvantages of the network diagram

Advantages	Disadvantages
Excellent visual to demonstrate the schedule.	Not everyone understands it.
When drawing the network diagram, it is an interactive tool (if the team is involved).	Can become difficult to read if the project is large.
Offers more of a conceptual (if not holistic) view of the schedule.	The connecting lines can become confusing, especially if they start to overlap.
Increases opportunities for participative decision-making by involving the team.	Adds additional time to developing the schedule (another step) Some people bypass the network diagram and go straight to the Gantt chart.
Uses the 'wetware' (brains) of the team.	The absence of a timeline can limit the analysis the network diagram delivers.

Tests the logic and accuracy of the WBS.	The amount of information you can display (either on a Post-it or on the node in software programs) can be limited.
Evaluates effects of changes made to the schedule's logic.	Simplistic and graphically trivial.
Identifies activities that create bottlenecks.	Does not convey conditional and/or alternate paths.
Identifies activities that dangle (no other activity is dependent on them finishing).	Difficult to monitor and report performance.

- Record the WBS (software programs normally list this down the left-hand side of the proposed schedule), making sure you can identify and record the activities required, their duration and their predecessors.
- Determine the appropriate timescale for the project. This is drawn across the top of the proposed chart (timeline).
- Each activity is now drawn on the Gantt chart under the timeline as a Gantt bar drawn the length of the activity's duration, and is reflected in line with the timescale shown.
- Each subsequent bar is drawn on its own horizontal line, with its position on the timeline determined by its activity predecessors.
- Leave sufficient space between each bar to allow for relationship lines to fit in between and around the relevant activities.
- Pencil in lines to record links, ensuring that all activities are connected to the network (they are on a path).
- Each activity should be connected to the schedule (from start to finish).
- The schedule can be drawn either 'in series', which is a straight line or linear network with one activity following directly on after its linked predecessor, or in 'parallel', where there are two or more paths of linked activities through the network from start to finish.
- The schedule direction flows from left to right and is indicated by the connecting lines and arrows.
- Each activity has at least one connecting line going in and out of it.
- Try to avoid crossing lines wherever possible (they make the Gantt chart harder to read and interpret).
- The starting activity (perhaps a milestone would be more suitable) has at least

one line coming out of it.
- The finishing activity (perhaps a milestone would be more suitable) has at least one line going into it.
- Work backwards to check for errors in logic. As with the network diagram, two common errors are dangling activities (an activity that impacts on another activity or the finish of the project) and looping activities (a group of activities that are dependent on each other on a recurring basis).
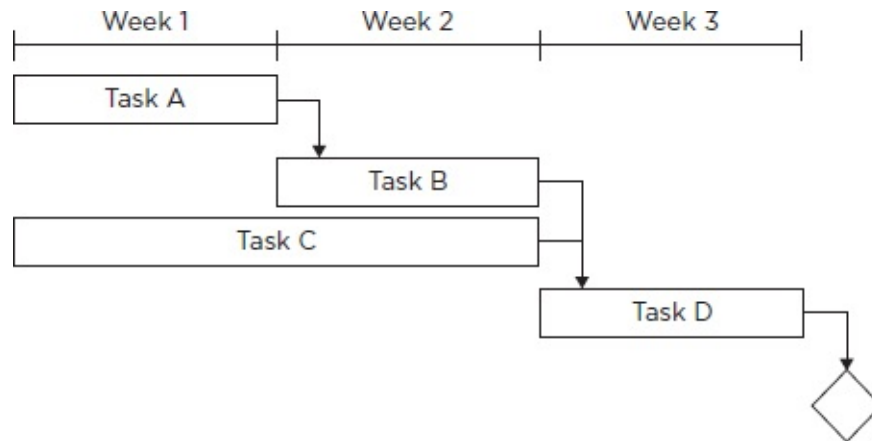
Figure 5.12 The Gantt chart (linear and parallel paths)

One important point to stress here (and equally relevant for the network diagram) is the practice of scheduling activities to start 'as soon as possible' (front-loading) as distinct from finishing 'as late as possible' (back-loading). With a front-loaded schedule, activities that fail to start on time may have the option of slipping back through the schedule to be rescheduled in a later time period (subject to the dependencies in place and the critical path). A back-loaded schedule may leave little if any room to accommodate delays and/or EOT in completing activities without extending the delivery date.

Related to this is the notion of scheduling activities by identifying the 'earliest they can start' as opposed to asking 'What comes next?' The difference may appear subtle, although the reality is that the former will always attempt to fast-track (front-load) the start of activities and may create multiple paths to achieve this (subject to resource and other constraints) as distinct from potentially adding time (and delay) in a linear fashion.

Here, many people ask why, if the Gantt chart shows all the required detail, you would ever use the network diagram or the WBS tools. If you are one of these people, go back and review the advantages and disadvantages of each tool for a better understanding. Each tool serves a purpose—you just need to know

what it is and when to use each. Let's now look at the advantages and disadvantages of the Gantt chart, as listed in Table 5.5.

Critical reflection 5.3

Logic diagrams, PERT charts, network diagrams, Gantt charts, timelines and other graphical displays of time-based activity may well create unrealistic, though visually appealing, representations of the project schedule.
■ Do you agree or disagree with the above statement, and why?
■ If you were asked to produce a project plan, would you simply prepare a Gantt chart or similar? (The wrong answer here would be to agree with the question.)
■ If a project plan does in fact involve far more than just a schedule, what other information should it capture? (This topic will be canvassed in great detail as you work through the book.)

Table 5.5 Advantages and disadvantages of the Gantt chart

Advantages	Disadvantages
Clearly illustrates the duration of each activity.	Can be difficult to read due to the amount of information displayed (baseline, current and actual data).
Clarifies the four different types of activity relationships.	Requires the use of software to avoid excessive time spent drawing and reviewing the schedule.
Illustrates the application of lead and lag time.	Often bears little resemblance to reality.
Ideal for monitoring actual progress to date.	Time consuming to continually update and report.
Easy to read from top down and from left to right.	Easily outdated, given the frequency of scope changes and revisions.
Identifies which activities can float and by how much.	One-dimensional focus on time only.
Identifies the critical path(s).	Directs time and effort away from 'doing' the project.
Easy to allocate resources.	May be meaningless in light of information quality and timeliness.
Easy to resolve resource over-	Possible issues with version control.

allocations.

Easy to view different iterations of the project.	Requires a formatting protocol across the project team.
Easy to compare the current version of the schedule with an earlier version (baseline).	Difficulties with project-by-project comparisons if different formats are used.
Easy to view the impact network analysis can have on the project.	May infer that 'as scheduled' is in fact the only way the project can be scheduled.

Working with the critical path

The next challenge is to analyse the schedule and focus on the critical path method (CPM). Something in the schedule will be critical, in the scheduling sense of the word. Perhaps an example will help to explain this crucial difference. To most people, having lunch would seem to be a critical activity during the day. It would be an important activity to complete from a nutritional sense and from a balanced lifestyle sense, and would be a fantastic way to get out of the office. However, if the start time of the lunch activity can be postponed (that is, delayed) without delaying the original agreed finish time of your workday, then lunch is not a critical activity. Important—yes; crucial to your personal wellbeing—yes; but not critical to the completion of your workday as originally scheduled. In effect, if lunch could be rescheduled to any time during the day without delaying your finish time at work, it is not critical.

It is important to note that the term 'critical activity' can be applied to any of the following:

- a single activity—known as a critical activity
- multiple (independent) activities—known as critical activities
- multiple (dependent) activity/activities—known as the critical path(s)
- a milestone—known as a critical milestone.

To determine the critical activities, paths or milestones within the schedule, you will need to identify the components of the schedule that comply with the following elements of critical (path) analysis:

- *the longest path(s) throughout the schedule:* where a path is indicated by activities joined together by predecessor relationships; collectively, the activities on this path represent the longest duration scheduled for the project's completion
- *the path(s) or activities(s) with zero float:* a path or activities cannot be started later than the scheduled start date of each activity on the path without delaying the project's scheduled completion time
- *the activities(s) or milestone driving the end date of the project:* where the end date is the scheduled finish date of the project
- *the shortest completion time of the project:* where the project cannot be completed in any less time within the current schedule.

Note that all four actually say the same thing.

The critical path is found first by identifying the different activities(s), path(s) and/or milestones in the network, then by determining two pieces of information: the activity sequencing and the duration of each activity. The technical nature or identity of the activities themselves is irrelevant, as the focus is time-based analysis only. You will also need to consider that, in some projects, if activities can be completed before a specified end date, there will be no critical path, activities or milestone. Next, identify all the different ways (paths, routes, directions, etc.) of getting from the start of the project to the final activity. Add up the duration of each path (the sum of the individual activities). The longest path will be the critical path—that is, the path where scheduled activities must start and finish as scheduled (on time) for the project to finish as scheduled (on time).

The path is critical because it represents the longest path through the network, and thus identifies essential activities that must be completed on time to avoid delays in finishing the project. A delay in any one of these critical activities means a delay in the project itself. In effect, the critical path demonstrates greater 'constraints' and 'control' because those activities simply must start and finish as scheduled. Any unforeseen delay in the critical path will immediately delay other critical activities and the project. It is worth noting, however, that the critical path does not always need to flow from the start of the project to the end —it could be the last activities in the schedule or it could be the final milestone, or it could begin at any point in the schedule, depending on how much float-time there is for activities to be delayed or extended without impacting the completion date, and where this float occurs.

In a linear schedule, the activities will always be critical, as each consecutive activity effectively adds time to the schedule so that this collective time drives

the schedule. Each activity takes time and adds time, which in effect becomes critical. Note that when conducting this critical path analysis, you need to analyse the schedule as 'given'—that is, do not revise the durations, do not rework the schedule, do not downgrade the scope by deleting activities. Work with what you have. After your analysis, all the above suggestions might be required; however, they are determined after your analysis. Figure 5.13 represents the critical path in a network diagram, while Figure 5.14 shows the critical path through a Gantt chart.

However, your project may well have multiple critical paths, in which case each of the paths would add up to the same duration. In these cases, a delay in either of the critical paths would extend the project. In the case where you needed to shorten the project's completion time, both critical paths would have to be shortened by the same amount. As Nicholas and Steyn (2008) warn, having multiple critical paths can dilute management focus because there are actually others things going on in the project that are critically important too—though the definition of 'critical' would change in these cases.
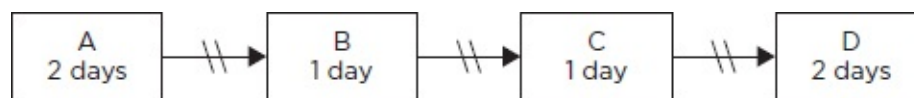
a. In-series critical path—sample PERT
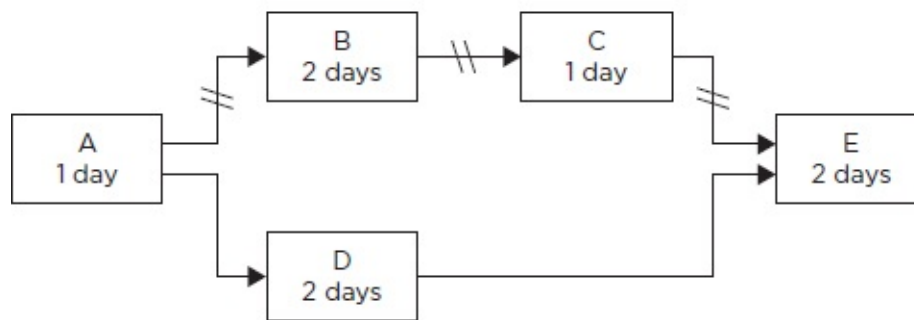
b. In-parallel critical path—sample PERT

Figure 5.13 Critical path (network diagram)
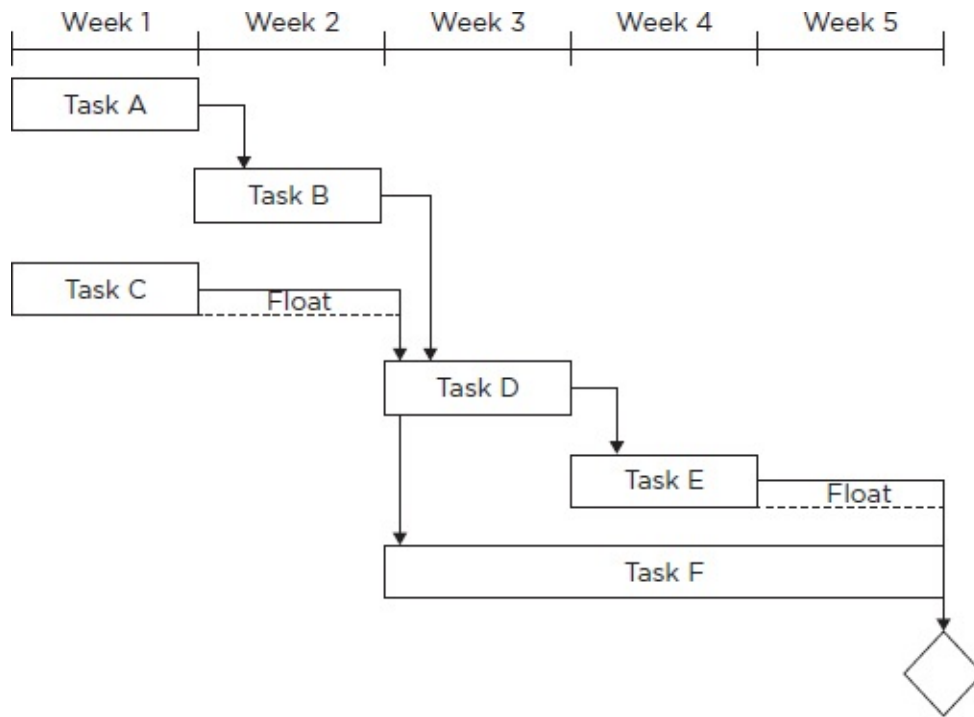
Figure 5.14 Critical path (Gantt chart)

Critical reflection 5.4

Something will always be critical in your project, even if it is the very last thing you do.
- Has the above information on the critical path changed your understanding of what you thought was critical in your project? If so, why?
- How will you balance the technical nature of the required work (technicians will believe their work is critical) and the agreed time for the project? In other words, can you ignore one and favour the other?
- In cases where the timeline keeps getting extended, why bother with critical path analysis? (Think carefully about this response.)

The critical path or the critical chain?

During planning and execution, critical path analysis will indicate whether the schedule is achievable, whether the objectives are realistic and whether any changes are needed in balancing activities and resource decisions. Later, during the 'rollout', the critical path will indicate areas of concern in the schedule— where things are going wrong and where action can be taken so that overall project objectives can be realised. In fact, any of the following advantages in Table 5.6 would be full justification for ensuring that the critical path is closely

monitored, while the disadvantages should suggest some measured caution.

But what about instances of simply having no more resources to assign in any given period? Will this impact the critical path? As PMBOK (2013) suggests, the resource-constrained critical path is known as the critical chain, and takes into account the effects of resource allocation, resource optimisation, resource levelling and activity duration uncertainty on the critical path. Derived from the theory of constraints (TOC), the critical chain has a resource focus, whereas the critical path has a time focus. Through the use of buffers and buffer management, the critical chain targets resource availability and seeks to improve productivity where possible. By factoring in individual performance (not to mention Parkinson's law where the work expands to fill the time available), the critical chain takes the contingency out of the activities and creates buffers in the schedule to accommodate likely overruns—which effectively gives the project team tighter deadlines to comply with (Velopi: adapted from online resources). Two buffer types are commonly used:

Table 5.6 Advantages and disadvantages of critical path analysis

Advantages	Disadvantages
It contains those activities that must be closely managed.	Can be time consuming to calculate manually.
It is the path with no delays possible.	Suggests other non-critical paths can be ignored.
The path requires accurate estimation.	Not an easy concept to convey.
The critical path requires regular performance reporting.	Confusion occurs between critical in the dictionary sense and critical in the scheduling sense.
It is crucial that timely corrective action is taken.	Does not automatically guarantee agreement between estimates and/or management.
It may trigger and direct the necessary contingency actions.	Can place emphasis on particular activities only, not on all project activities.
The path requires tight variation analysis and controls.	Difficult to locate in complex network diagrams.
Calculates the project completion time.	Reduces scheduling analysis to just

	timeline-based decisions.
Focuses attention on the activities that will delay the project if those activities themselves are delayed.	Becomes largely irrelevant if all project paths are equally critical.
Confirms critical activities path.	The project's completion can be governed unduly by the critical path.
Helps prioritise resource allocation should resources be over-allocated across multiple activities.	
Confirms where the float exists.	

1 *project buffer:* this is placed at the end of the project plan and protects the project finish date from slippage along the critical chain
2 *feeding buffer:* added to all the non-critical chains to increase the length of these paths to equal the critical paths.

When using the critical path method, mistakes, omissions and rework problems will often delay the schedule, as the focus remains on the project completion date. Consequently, early completions are seldom published and rarely benefit the project (unless end dates are brought forward). By making the planned contingency explicit, the project team is encouraged to get straightforward activities completed quickly and to flag any delays in order to access the nominated buffers. Thus, the critical chain is a more aggressive, if not accurate, schedule than the critical path. The clear advantage for the project manager is that the use of contingency is visible and tracked, and its use justified (Velopi: adapted from online resources).

However, do not be fooled into thinking that the critical path or critical chain are the only things that matter to the schedule's completion 'on time'. Clearly, every activity must be completed for the project to be completed—be they critical or resource constrained. So, while it is the critical activities that will delay the project, no activity can be ignored if the project is to be properly managed (time and resource decisions) through to successful completion. Figure 5.15 reflects the sequential steps involved in applying the theory of constraints to your project.
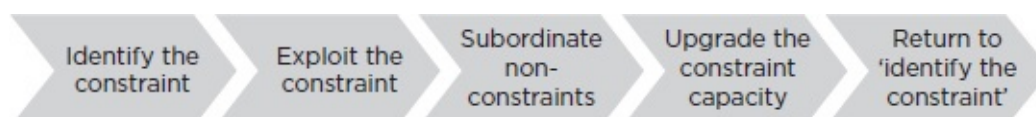
Figure 5.15 Critical chain method

Controlling the schedule

At best, the project schedule is a graphical display of pure intent. Perhaps it is a little harsh to call a project schedule 'a work of fiction'; however, what made sense in the office on the computer with project planning software may not be evident in the execution environment of the project. A plan is just that: a plan—nothing more and nothing less.

However, given that a plan exists, actual performance, progress and completion against that plan can be measured and reported. In other words, time, cost and scope variations can be tracked, reported, managed, updated and/or controlled as required. Remember that any number of things will change the schedule baseline, and these deviations will need to be recognised as either minor or major, with associated preventive or corrective actions being put in place to minimise the risk of these changes (PMBOK, 2013).

To effectively control the project schedule, the following actions should be considered:

- publishing the agreed schedule
- updating changes to the schedule as they occur
- determining the current reporting date of the project
- assessing the current status of the project against the published plan to identify progress (completed, actual duration), status (current, physical percentage complete) and forecast (outstanding, remaining duration) performance
- rescheduling remaining activities
- recirculating the agreed schedule revision
- conducting retrospective reviews and walkthroughs to record lessons learned.

Figure 5.16 displays three versions of the same project—the baseline, the current schedule and the actual performance to date—to demonstrate the practice of schedule control.

With regard to the various tools you could use for controlling the schedule, trend analysis will map performance to look for improvement or deterioration in the project performance; and earned value analysis (EVA) will look at both cost and schedule variances to reflect the planned, earned and actual value delivered by the project, either cumulatively or at a single point in time. Experimenting

with lead and lag time may also identify options, as would modelling techniques for crashing the project for the least incremental cost (PMBOK, 2013).
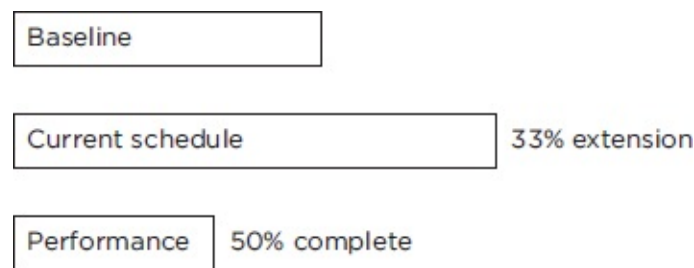
Figure 5.16 Tracking actual performance against the baseline and current schedule

Perhaps the real key to schedule control is the timeliness of the information reported, along with the detail and justification contained. As an example, simply reporting that the project is 40 per cent complete on any given date is meaningless if there is no project schedule for this to be reported against (and the status date). Depending on exactly what you are measuring and what part of the timeline you include, 40 per cent could indicate: just work complete to date; that the project is behind schedule; that the project is ahead of schedule; or that the project is on schedule. You really have no way of knowing, nor should you always rely on the honesty and integrity of those doing the reporting. They have their own agenda, reporting requirements and protocols that either enhance or mitigate their performance, which may well be at odds with what the project needs and despite what is expressly required in the contract.

Critical reflection 5.5

Baseline schedules, current schedules and actual performance all sound like a lot of scheduling chatter. However as with other topics, distinctions are important—particularly when measuring 'performance' against 'promise'.

- Given that the project scope will likely change at some stage throughout the project, what is the point of capturing schedule baselines?
- Would scheduling as you go (planning it as you deliver) be a better approach, and why? (The short answer would be no, it wouldn't.)
- Given that schedules will often be comprised of long and short bars (and some tabular data in columns), how can you visually represent your current schedule and actual performance in your timelines or on Gantt charts (in addition to your baseline schedule)?
- How up to date do you think all three schedules (baseline, current and actual) should be throughout your project, and why? (It sounds like a lot of work on someone's part but perhaps there are key benefits.)

Review questions

5.1 What is the value behind having a schedule management plan?

5.2 What information does WBS capture and how does this help scheduling?

5.3 Activity duration and resource estimates are often not precise calculations. What techniques are available and how would you defend your choice of technique?

5.4 What is the difference between the critical path and critical chain methods?

5.5 Explain why project schedules have to be developed, tracked, reported and controlled throughout the project?

Case study

Three months in, the superintendent (Mike Miller) for Blackwood Coal had an inkling the company's $100 million coal plant project was behind schedule. It was an inkling that would soon bear fruit as the project laboured under poor scheduling, poor work performance and poor management.

With the tender awarded in November 2016 and a scheduled start onsite of February 2017, all parties had agreed to the practical completion (PC) date of February 2018. Even when Blackwood Coal brought forward the start date to December 2016, the contractor (DWI Mineral & Mining) accepted the accelerated start date, not to mention the $18 million advance they requested to cover pre-start and mobilisation expenses. The PC date was also revised to December 2017. While DWI appeared only too happy to start earlier and get some much needed cash flow, Mike could see little evidence, if any, of his investment in terms of the contracted performance three months later (25 per cent into the schedule with 18 per cent of the budget spent). And Mike's concerns were not allayed as he stared at the high level, baseline Gantt chart the contractor had issued back at contract award (which was effectively now three months out of date).

The problem was compounded by DWI only issuing schedule updates for the next two-week look-ahead (without the critical path), which left Mike wondering what he wasn't being told, why and what was happening to the PC. He realised he had reservations about how the 'work', as per the design and construct (D&C) contract was being delivered technically and managed professionally. Having engaged a reputable contractor, he had assumed, at least on some level that, as the company's representative, he would be involved in the ongoing monitoring, reporting, adjusting and controlling of the schedule (in addition to administering the variation protocol). While acknowledging the rights and obligations of DWI under the bespoke D&C contract, Mike continued scouring through the contract and his file notes from the pre-award negotiations, trying to find any meaningful, practical reference to defining his role and involvement in proactively 'managing' the schedule. A qualified engineer, Mike had always known that the clauses pertaining to the 'work' were very brief and open-ended—particularly those relating to performance reporting.

> ❝ With DWI struggling to meet key dates and finding no solace in his desk audit of all the documents, Mike called his team into his office to try to put together a

> blueprint that would ensure PC was met without being
> seen to be helping the contractor. '

    With DWI struggling to meet key dates and finding no solace in his desk audit of all the documents, Mike called his team into his office to try and put together a blueprint that would ensure PC was met without being seen to be helping the contractor. After three hours, the team came up with the following suggestions:

- A common project management software platform for improved schedule diagnostics.
- Specifying the level of detail used for WBS.
- All logical relationships visible in Gantt charts.
- Critical path and PC in all Gantt charts and reports.
- Identification of who owns the schedule float (client or contractor).
- Identification of time-based control thresholds that would trigger reporting and intervention.
- Comparison of actual performance against baseline performance.
- Assessing project progress, status and forecast information.
- Inclusion of PC on all Gantt charts and reports.
- Updated schedules reviewed prior to meetings.

    As Mike reviewed these great ideas, he remained committed to building the relationship with the DWI project manager in seeking to influence the 'usefulness' of the information Blackwood received.

Questions

1 How would a schedule management plan have helped Mike's project from day one?
2 Does Mike have the right to dictate to DWI the level of decomposition in presenting reports to Blackwood?
3 Should Mike adopt the suggestion that critical path and PC be in all Gantt charts and reports, and why?
4 What is the value of updating the Gantt chart and re-circulating this to all stakeholders?
5 Would assessing progress, status and forecast data have helped Mike 'co-manage' the schedule more proactively?

Cost management

Ending the reliance on the budget variance

Risk management

Procurement management

Communications management

Integration management

Human resource management

Stakeholder management

Quality management

Scope management

Cost management

Time management

Key points

- Understanding the cost management plan
- Estimating project costs
- Types of cost classifications
- Estimating techniques for project costs
- Estimating accuracy and confidence levels
- Pulling the project budget together
- Approaches to budgeting
- Publishing the project cash flow
- Comparing budget and actual results
- Demonstrating budget control with EVA
- Costs of crashing the project schedule

In practice

Cost managing is often thought of as cost controlling, although some also use the term 'cost reporting'. Although used interchangeably, these words are very different in execution. Cost reporting is the act of summarising and communicating costs—after they have been incurred. That is, no control is allowed if you simply report costs—the money has already been spent and, more often than not, in a past time period. Your Visa card statement is a perfect example. At the end of each month, your statement arrives reporting your expenses for that month. The money has gone, the fun has been had, the purchases have been unwrapped and used. There is nothing to control here, is there? Just depressing (perhaps) news on your lifestyle and spending patterns. You can see what you spent and where you spent it.

On the other hand, cost control invites proactive attention to costs to ensure that the money is spent in line with budget projections, and that deviations from this are caught and corrected before too many cost revisions are required. A daily pre-approval check on your intended purchases and the resulting residual bank balance could be thought of as cost control. Radically different concepts, aren't they? One seeks to report historical data; the other seeks to control present and future data.

It is often surprising—even disappointing—that so many project financial reports focus on the almost sacrosanct importance of the budget variance (budget costs less actual costs). Okay, so they throw in a percentage spent to-date figure, as if this will increase the rigour and decision-making capability of the report.

Knowing what you spent against what you have planned to spend is certainly worth knowing when managing the project budget and particularly important for ensuring you have enough in the budget to finish the project. You can't really fault that logic. However, if the organisation does not know the value of the work the project has returned (earned), then they are missing the second part of the equation. Earned value analysis will be discussed further later in this chapter.

Chapter overview

Cost management is the process of planning, estimating, budgeting, financing, funding, managing and controlling costs to enable the project to be completed within budget (PMBOK, 2013).

Cost is a four-letter word that should never be under-estimated. Given that some project budgets are often set before the true cost of the project is known, and that money will be spent along the schedule timeline, policing this expenditure requires more than just paying contractor claims and invoices. Stakeholders don't just want to incur costs; they want a real return on that investment.

Starting with a cost management plan that governs (or at least establishes the protocol for) the funding, distribution, management and control of the money, the challenges for the project manager and team lie in estimating the true costs of the project, finalising a budget that covers the planned expenses and being able to measure, report and control costs throughout the project. With a raft of varied resource types comprising the prime ingredient of costs as they are allocated to project activities, stakeholders need to ensure that the project is not over-funded (potentially encouraging waste, scope creep, inflated accounts or unrealistic expectations). Nor should it be under-funded (potentially encouraging poor quality work, schedule delays, scope omissions, technical non-conformance or contract breaches). So somewhere between these two outliers is where the project budget needs to fall in meeting the costs of delivering the project.

Just as there will be scope variations and schedule variations, the project will also experience cost variations. Estimating costs, determining the budget and controlling the spending pattern will never be absolutely determined and driven by precise calculations, accounting codes, contract conditions and performance management (despite all best intentions). It will ultimately be determined by the expectations the project stakeholders have, which we know are subject to change. When they change, cost control provides the necessary guidance and direction for assessing the implications of the change and any subsequent decisions (not just financial decisions) taken.

Planning for cost management

By now you should be getting used to the notion that PMBOK is very big on having some sort of plan or document that outlines the approach taken to manage the different knowledge areas of project management (scope, time, cost and so on). While all are vital in outlining (formally or informally) the required management approach, the cost management plan occupies a special place, as it considers the stakeholder requirements for managing costs.

In other words, it is the planning process that establishes the policies,

procedures and documentation for planning, managing, expending and controlling project costs (PMBOK, 2013). Not only will different stakeholders contribute different amounts of funding to the project; they will also measure costs in different ways, report costs in different ways and control costs at different times.

In guiding and directing how costs are dealt with, the cost management plan should reference the following information:

- the source of funds (and associated access)
- details of the reporting formats, frequency and distribution
- internal organisational finance protocols and the accounting system
- identification of percentage variation thresholds triggering action
- provision for contingency funding (and associated access)
- approval procedures
- an accepted level of accuracy in determining realistic cost estimates
- known units of measurement defined for each resource
- the degree of precision required
- a specified performance measurement technique.

As with any plan, the cost management plan establishes the framework to ensure that all of the cost estimation, budgeting and cost-controlling processes are designed into the project and performed as required.

Clearly, the cost management plan provides an agreed pathway for spending. It removes any potential ambiguity (as it should) regarding what the rules of financial engagement are throughout the project. Given such glowing credentials, will it always be created by the project manager and team? Possibly not. The reasons why would include the time taken to prepare it, the constraints set by the project organisation's internal finance and accounting departments, and the primacy and dominance of some key stakeholders. In some projects, money is simply found and disbursed without too much fanfare, transparency and accountability; in others, the true costs at any point in time throughout the schedule are not known accurately. In yet others, contractor invoices are authorised and paid without referencing the necessary facts, contract clauses or substantiation.

Critical reflection 6.1

PMBOK is full of planning activities in each of the ten knowledge areas as a precursor to the subsequent activities it endorses.

- Do you engage in discrete cost management (planning) activities for your projects or simply adopt or adapt standard operating procedures?
- What are the particular differences that planning and managing project costs have over operational methods?
- Can you see how a sense of shared responsibility might be important in project costing, just as it was in both scope management and time management?

Estimating project costs

Once the resources have been identified, these costs (they could be dollars or hours) will need to be charged against the project. Cost estimates will include people, materials, equipment, facilities, services, space and/or technology.

In order to begin the process of understanding project costs, a wide range of obvious information is available to the project manager and the team (or estimator), with each offering a further piece of the puzzle necessary to ultimately aggregate the project budget. Let's first examine the large amount of financial (and related) information required by the project manager and other relevant stakeholders when making important and timely cost decisions. Consider the following examples to begin with (adapted from PMBOK, 2013):

- *project proposal*, citing not just the scope inclusions but, equally importantly, the underlying assumptions, acceptance criteria, inspection regime, perceived risks and other constraints impacting the project (limited budget, fixed completion dates, internal policies and procedures, etc.)
- *work breakdown structure (WBS)*, deconstructing the project activities level by level
- *contractual conditions*, prescribing specific work, health and safety, security, policy, performance, intellectual property rights, licences and permits
- *project schedule*, reflecting the planned activity sequencing
- *chart of accounts*, to track all cash outflows and inflows
- *required quality standards* and special conditions
- *asset registers*, reflecting whole-of-life costing
- *costs associated with mitigating risk exposure*
- *historical documents*, identifying where cost overruns and/or savings occurred
- *market conditions*, flagging terms and conditions for accessing certain resources
- *quantities and rates of allocated resources* (people, equipment and materials)

- *organisational policies,* and their compatibility with controlling financial data
- *lessons learned* from previous project cash flows and budget measures
- *performance reports,* which link performance with progress payments
- *revised cost estimates* and *budget updates.*

Sadly, no one piece of information will contain all the relevant cost information across the project. In fact, in many cases the 'true' costs of the project may never be known, tracked or reported—for example, when an operational salary gets transferred to the project overhead. Always remember that the information that is acted upon is only as good as the integrity of the financial system, process and documentation used to capture, report and control that information—another excellent reason for keeping complete, timely and accurate project cost records.

To further assist the cost debate regarding what is and isn't included, it might be worthwhile to revisit some of the more common cost terms used across organisations and projects. Needless to say, there is no one right term, although I would strongly advocate that more common understanding and application of any of the following terms be adopted early in the life of the project so no subsequent classifying errors could occur. Building on from Kloppenborg (2015), costs could be classified in the following manner:

- *fixed:* remain constant as volume varies
- *variable:* varying directly with volume
- *direct:* associated with a specific project
- *indirect:* not associated with a specific project, but required to keep the project functioning
- *recurring:* repeat as the project progresses
- *non-recurring:* paid once
- *regular:* incurred during normal working hours
- *expedited:* incurred outside of normal working hours
- *internal:* incurred within the project
- *external:* incurred outside the project
- *lease:* incurred to have access to an asset
- *purchase:* incurred in acquiring ownership
- *labour:* human resources required for the project
- *material:* physical resources required by the project
- *estimate:* quantified assessment of the cost
- *reserve:* costs allocated to deal with accepted risks.

Estimating techniques

And as with estimating activity durations, estimating costs brings similar challenges if you have little knowledge of the resource expertise and rate, the activity itself, prior experience and/or knowledge of various different estimating techniques. For some, a process of progressive elaboration works best where you have access to more accurate and detailed designs, technical specifications or quality requirements. As these inputs change themselves, the cost estimate can in turn be revised progressively with increased accuracy.

It is worth noting that estimation outcomes may subsequently create legally binding contractual obligations between the principal (owner) and contractor (supplier) once the project is underway.

As with time estimation, a number of accepted cost estimation techniques are available, including the following:

- *pre-determined:* the estimate is announced by senior management (often in isolation from the other variables/constraints)
- *expert judgement:* relying on expertise from individuals or groups with specialised knowledge (or training)
- *analogous:* accessing historical data from a similar activity that serves as a frame of reference
- *group decision-making:* an interactive approach involving team members brainstorming emerging and iterative estimates with increased accuracy and commitment
- *unit rates:* commercial rates where the discrete unit of work can be defined accurately
- *published commercial data:* subscription services providing access to current unit costs, production rates and other rates for labour, materials and equipment
- *parametric estimating:* statistically combining historical information and other project variables (per square metre, per litre, per hour, etc.)
- *value engineering:* efforts to reduce project (life-cycle) costs, save time, increase profits and/or improve quality
- *life-cycle costing:* inclusion of both the creation costs of the project and its result over its useful life
- *vendor bid analysis:* relying on the market through expression of interest (EOI), request for tender (RFT) and other market invitations
- *reserve analysis:* a contingency reserve to account for schedule uncertainty and risk ('known unknowns')

■ *three-point estimation (wide band Delphi):* a weighted average requiring optimistic (best case), pessimistic (worst case) and most likely (probable case) estimates that define a range for the expected duration. Two formulae are available for this calculation:
☐ tE = (tO + tM + tP)/3 (triangular distribution)
☐ tE = (tO + 4tM + tP)/6 (beta distribution).
Figures 6.1 and 6.2 illustrate this concept.

As we saw in Chapter 5, depending on what stage of the project life-cycle you are in, the accuracy behind the estimates might be very low (e.g. ±70 per cent), particularly if the team has limited experience of the specific type of project. In these cases, the accuracy level you have in the estimate might be very low. To further make this point, consider the example in Table 6.1.

Clearly, given the high variability in the cost range in the concept stage, from $1.50 down to $0.50, the project manager and their team might spend more time revising this estimate, or acknowledge that further revisions are required in the planning stage to increase the accuracy of the required estimate. Many greenfield projects start with cost estimates that are marginally confident at best, and for some reason many of these get 'locked in', with little room to move as the project reality kicks in. As we saw in Chapter 5, accuracy is very much a progressive concept, as Figure 6.3 illustrates.

$$E = \frac{O + 4M + P}{6}$$
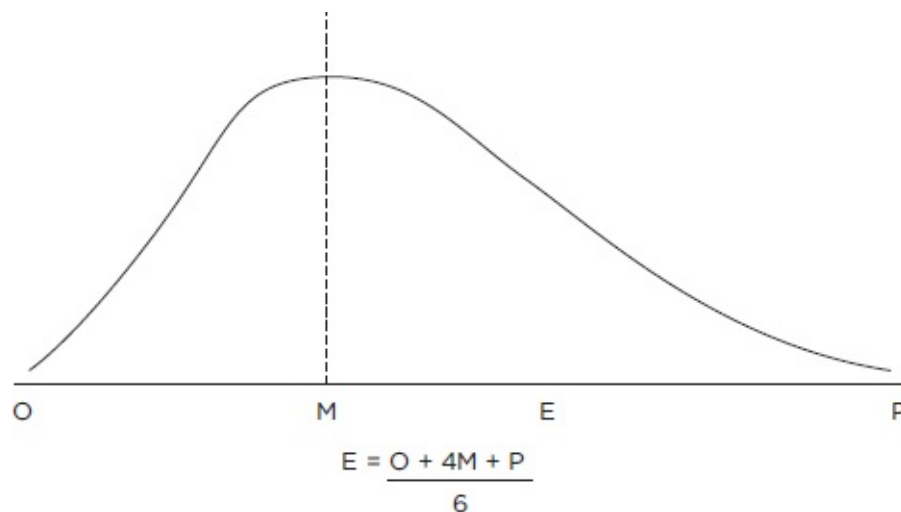
Figure 6.1 The three-point estimation method
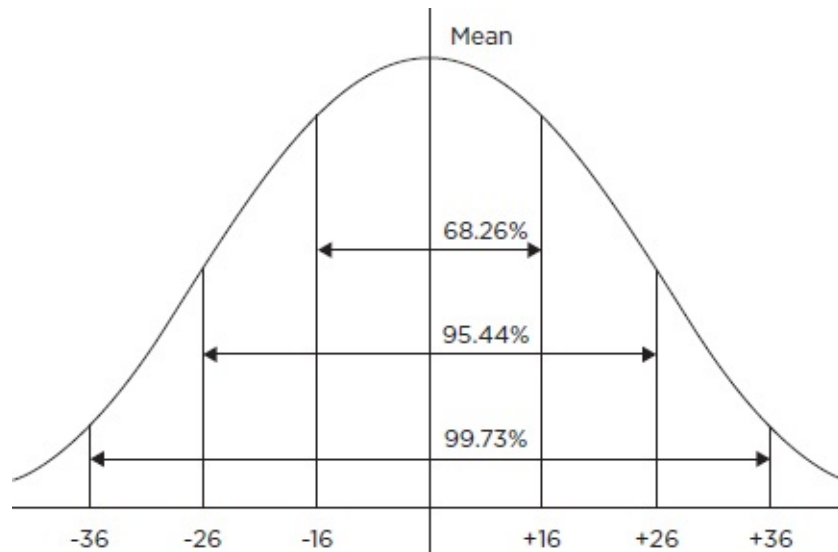
Figure 6.2 The bell curve and standard deviation

   Regardless of the estimation technique used, it is important to remember that estimation is not an exact science (despite what some senior management and clients might expect). Given the constant influence that uncertainty and risk have throughout the project, consider the following 'guidelines' whenever you are asked to provide an estimate for the activity cost (and similarly with duration):

Table 6.1 Refining the cost estimate accuracy throughout the life-cycle

	Concept	Plan	Execute	Close
Estimate	$1	$1	$1	$1
Confidence +/−	50%	25%	10%	5%
Best case	$0.50	$0.75	$0.90	$0.95
Worst case	$1.50	$1.25	$1.10	$1.05
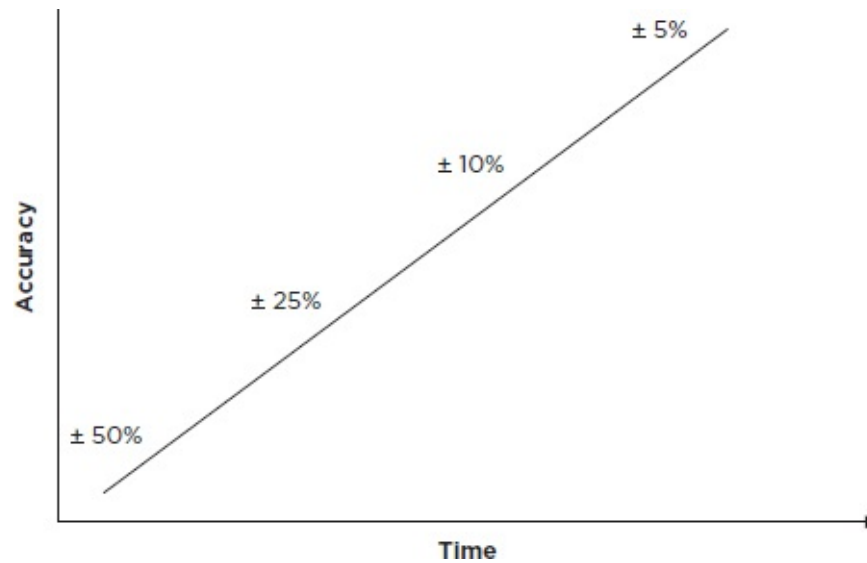
Figure 6.3 Estimating accuracy

- Record your confidence level (+/– where appropriate).
- Record how the calculation was determined.
- Record the broad, provisional or absolute nature.
- Record all underlying assumptions.
- Record all impacting constraints.
- Record any contingency amounts.
- Record an optimistic, pessimistic and likely range.
- Record all source data.
- Record details of all stakeholders involved.

In the early iterations of these estimates, try to resist the temptation (or demand) to get your estimates to perfectly match those from the proposal (where indicative, provisional or initial estimates were made). After all, you now have the activity detail, the subject-matter experts (SMEs) and the time (one would hope) to more accurately estimate what costs are required. It is far better to have two different project windows in this stage, leaving you room to further negotiate, as opposed to trying to fit all the costs into someone else's unrealistic and out-of-date expectations.

This is not to say that the estimates will not finally have to match those already determined for you by others. The point is that you should have more confidence (and negotiating power), given that the cost estimates have been driven by the technical nature of the work required and the resource capability, and less by potentially extraneous, artificial constraints set by others (for reasons known only to them).

Pulling the budget together

With each project resource assignment, there will be project costs, including both fixed (leasing, management fees) and variable (materials and other consumables) costs. The aim of project cost management is to complete the project within the approved budget. After all, in many cases the budget allocation is a finite resource—although you might be lucky enough to have factored in a contingency or reserve fund, which can help to offset unexpected and unplanned variances.

The role of budgets in cost management

The planning of future activities for your project in financial terms is what budgeting is all about. From a project perspective, budgeting involves setting a target which, in financial terms, reflects how much money you need in order to fund the project and how to control *what* is spent, *when* it is spent and *why* it was spent. It also provides a benchmark to work towards by helping to coordinate and control all the resources and their activities. Finally, budgeting is a financial planning and control process that enhances management credibility with the various stakeholders and outside interests (banks, investors, shareholders and other stakeholders).

Despite these glowing endorsements, not every project has a finite (or, for that matter, a known) budget. In some cases (as with time constraints), budgets will be locked in prior to fully understanding the final scope. Grants and residual funding in some government departments—as the end of the financial year approaches, for example—are examples of this practice, where the belief is that the budget pool will fund exactly what the organisation needs to achieve through the delivery of the project (perhaps they have a crystal ball).

Yes, budgets (known as the authorised cost baseline too) can establish a financial target (or constraint). However, as depicted in Table 6.2, they also come with a range of advantages and disadvantages that should influence the decision-making behind the budgeting process.

Table 6.2 Budgets: Compelling reasons for and against

Advantages	Disadvantages
Improves decision-making	Reduces decision-making to costs only

Provides initial cost baseline	Limits innovation, flexibility and change
Enables cost control	Lacks provision for contingencies
Incorporates operational procedures	Relies on internal financial procedures
Accesses expert judgement	Uses historical out-of-date information
Improves management credibility	Involves a high degree of uncertainty
Targets long-term objectives	Ignores cyclical fluctuations
Identifies and diagnoses problems	Communicates unrealistic targets
Requires constructive input	Based on 'guestimates' and unreliable estimates
Enables tracking of cost variances	Fails to set cost thresholds

Approaches to budgets

There is no perfect way to prepare project budgets. It seems that the stakeholders of each project often stick to what they know and feel comfortable with, despite there being a broad range of budgeting formats they could use, including the following:

- *Traditional:* the previous year's level of performance is the foundation for next year's figures.
- *Zero based:* ignores previous results as each activity and outlay is justified; each activity is recorded with zero spending to begin with.
- *Program:* activities are grouped together for projecting costs generated by each program or major activity.
- *Top down:* based on pooling the knowledge of senior managers and past results. Project costs are estimated and then passed to lower-level managers, who continue the breakdown into further estimates.
- *Bottom up:* individual task budgets are estimated in detail by the people directly responsible for doing or managing the work. Estimates are aggregated to give the total project cost.

Critical reflection 6.2

Many would argue that budgeting apparently improves management credibility while at the same time restricting decision-making mostly to cost-only factors. What other cost contradictions exist in your projects?

- Do your operational budgeting processes map across to your project budgeting processes (seamlessly or otherwise)?
- How do budgeting activities help or hinder your ability to plan and manage your projects?
- Can your budgeting activities be improved in any way to mitigate any potential limitations?

Publishing your budget in the cash flow

Budgets can look pretty good in spreadsheets: nice format, great formula, advanced calculations and bolded totals with underlining for emphasis. So what?

Unfortunately budgets are not spent in columns (though they may well be tracked in columns). In a project, costs are incurred over time, so it is important to see exactly how much money is required at any given point in time throughout the project schedule.

In a strict accounting sense, a cash-flow forecast predicts what money will flow in and out of an organisation over different time periods (day by day, week by week or month by month). Why would a project be any different? Often called time-phased budgeting, the project needs to convert the budget into meaningful time periods when the funds will be required throughout the project, period by period (payroll, material, invoices, travel expenses, etc.).

With Gido and Clements (2015) reminding us that funding coming from the client should be controlled by the terms of payment specified in the contract (or agreement), you will need to ensure that you have money coming in faster than it is going out. The reason for this is simple: if you don't have sufficient money, you will need to borrow the required amount to cover your expenses and then claim it back from the client (who will hopefully pay). So the earlier you receive the money from the client, the earlier you can deliver that portion of the project with the client's money. You will also need to read *very* carefully the terms of trade the client has with you regarding when they pay invoices—and it won't be within seven days; most probably 30 days or longer.

While project management software is capable of overlaying schedules and cash flow figures automatically, let's wind the technology back and look at a simple example. Table 6.3 maps out the budgeted cost of a number of activities over five time periods along with the total budgeted cost (TBC) in doing the work.

Table 6.3 Time-phased budgeting

Phase	Week 1	Week 2	Week 3	Week 4	TBC
Design	3	5	2		10
Construct		12	20	35	67
Total	3	17	22	35	77
Cumulative	3	20	42	77	

So what does the table reveal? Consider the following questions:

■ What information do you now have about the amount of money the project requires each week?
■ How does this information assist you to deliver the project?
■ How do you account for the sudden spike in costs in weeks 2, 3 and 4?
■ At the end of week 2, if you had only spent $15, what inferences could you make about the cause and potential impact of this under-budget expenditure?

Would the reality of week 2 have any ramification for completing the project by the end of week 4?

Critical reflection 6.3

For some project organisations and financial standard operating procedures, being able to visualise cash flow for the project over time (merging schedules and budgets) hasn't been seen as a priority.
■ Imagine being able to overlay this table format with a Gantt chart (or similar) and being able to see exactly how much money is required to fund the scheduled activities throughout the project. What benefit would this formatting bring to your ability to both plan and manage the project?
■ Can you see any difficulty in getting this format standardised? If so, how would you overcome any challenges?

Comparison of budgets with actual results

A budget offers little meaning if the cost of the planned activities is not compared with the actual results achieved and reported. When the actual result corresponds with the budgeted figure (and can be verified as accurate), financial performance can be considered to be in line with projections or the baseline costs. If there is a significant difference between the two results, the difference

or variance may need to be investigated and action taken to correct the cause where possible and/or if required, subject to what upper (over-budget) and lower (under-budget) threshold levels have been set.

Any number of 'valid' reasons could explain the variances, including:

- original estimates not being revised
- changes in market and/or vendor prices
- mathematical errors in calculating costs
- tasks requiring rework
- cost differentials between replacement resources
- higher than expected inspection and testing costs
- revisions to the specification (up or down)
- rescheduling work outside normal work hours (overtime, penalty rates, etc.).

Perhaps it might be timely to review some of the 'rules of thumb' cited earlier for estimating time or costs. Always state the assumptions underlying your estimates, show the level of tolerance stakeholders will accept, state the key factors that affect the validity of your estimates and, finally, indicate how the estimates were derived. This way, your figures can be defended. Regardless of the actual budget format used, the following information could be included to really frame your budgeting development, reporting, analysis and control activities. Yes, everything could be achieved in the one document or spreadsheet, taking the project through the concept, planning, execution and close-out (and/or evaluation) stages (Table 6.4).

While the table may look quite extensive and valuable, like most budgets relied on in project management, it has a fatal flaw. Yes, it tracks what the project is budgeted to spend (the planned value) and what is actually spent (actual cost) in completing the activities up to the status report date, then it in turn calculates a variance. Great—so what is missing? Is project cost management just about tracking and reporting the money? The answer lies with the concept of earned value management (EVM).

Table 6.4 Sample project budget

Suggested inclusions	Description
Budget cost	The original approved cost
Estimation technique	How was the budget determined?
Confidence level	The degree of confidence and/or accuracy in the

	estimate
Assumptions	The things believed to be true that have not been confirmed (adequate funding available, suppliers will have the capability, etc.)
Constraints	The limitations that may impact the estimates (foreign exchange rate, valid for 30 days only, etc.)
Contingency reserve	The amount of additional reserve funding, source and approvals required
% work complete	The amount of work actually completed to date
Actual cost	The reported cost in performing the activities to date
% actual cost	The percentage of money spent against the budget
Variance percentage	The difference between the budget and the actual costs
Acceptable tolerance	The acceptable difference between budget and actual that will not trigger corrective action
Corrective action	The required actions to get the budget back into the 'black'
Budget remaining	The amount of the budget remaining to complete the project

Controlling project costs

When the Bureau of Meteorology tells us what the daily temperatures will be, it is making a prediction based on historical weather patterns and current conditions. So it is only reporting temperature information; it is not attempting to control the temperature. As we saw both in scope and time management, reporting what the current scope expectations of the stakeholders are (scope baseline), along with the schedule baseline, does little—if anything—to control what subsequent changes will occur (apart from an initial baseline for comparative purposes). In allegedly controlling project costs, the traditional

allegiance to reporting budget to actual costs fails to effectively control costs, let alone project performance.

Okay, so it tells us what we have budgeted for, what we have spent and what is left in the budget. But does it tell us what value (in dollar terms of schedule performance) we got for the outlay? No—and this is the missing link in controlling project costs. Table 6.5 shows sample values for the traditional approach taken to control project costs through the budget.

Table 6.5 Traditional project budget analysis

Budgeted cost	$500
Actual cost	$600
Analysis	$100 over budget

In this example, if the project was finished, then the budget went over by $100. More importantly, it could be argued that if the project was only 20 per cent complete, for example, the project would appear to be in financial trouble with actual costs exceeding the budgeted amount. Clearly, if this trend were to continue, some questions would need to be asked prior to rushing off and getting contingency funds, including:

- How accurate were the budget baseline figures?
- How accurate is the reporting of actual costs?
- Have there been any approved scope revisions?
- Has there been any unauthorised scope creep?
- Were early payments required for mobilisation, deposits, bulk buying or other conditions?
- Is this nothing more than a temporary blip?
- What is the acceptable variation threshold, and does this difference trigger corrective action?
- Does the budget have funds to cover this excess?

Knowing what you planned to spend and what you have spent is, of course, important. But in the example above, we do not know the earned value of the work completed. Figure 6.4 highlights the situation many projects operating under traditional budgeting practices will find themselves in more often than not. Obviously the figure reveals what we planned to spend and what was actually spent (in percentage terms) up to a given time period in which a budget report

was required—pretty standard stuff.

If you now add in the vitally important piece of project-relevant cost information—what the money bought in terms of project performance (completed work)—you can infer that the project is behind schedule, but costing more. Try to get that analysis from a variance report. While there may be any number of valid reasons for these apparent discrepancies, detailed cost and time analysis is certainly warranted to mitigate a worsening of the situation. Yes, past trends don't necessarily predict future trends; however, history does have a habit of repeating itself, so stay alert whenever money is being spent on a project. Always ask yourself: What did it buy in terms of schedule performance to plan?
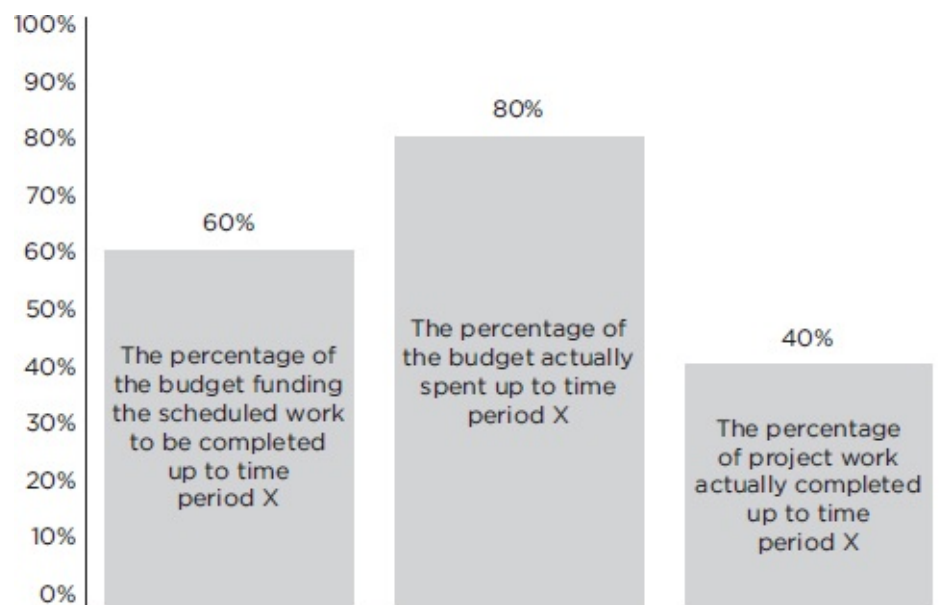
Figure 6.4 Revealing the missing cost in project budgets

Critical reflection 6.4

The argument that budget, actual and variance reporting fails to provide a meaningful analysis of the project's performance continues to be disputed (if not rejected) by some financial people working on projects.

- Obviously budget, actual and variance reporting communicates meaningful information, since it is an iron clad cornerstone of financial management. So what is the information it communicates?
- How relevant is this same information to you in measuring and reporting your project's performance?
- Perhaps the question should be: What are you actually trying to measure in terms of your project's performance? And what would your answer be?
- Think more about the four project constraints—scope, time, cost and resources—and ask yourself how traditional budgeting measures and reports each of these.
- Can you appreciate that just concentrating on how much you have and how much you spent (without knowing what it actually bought you in terms of schedule progression and performance) is a seriously

narrow and incomplete report on performance.
■ Now read the section on earned value and see whether you agree with my comments about traditional budgeting.

Earned value management

Over and above the important aspect of traditionally reporting just budget to actual, a true measure of cost control is the practice of EVM. The PMBOK Guide (2013 states that EVM is a methodology that combines scope, schedule and resource measurements to assess both project progress and performance. In other words, earned value is a measure of performance (progress) in terms of scope, schedule and budget metrics (and their implications). With reference to the scope baseline, schedule baseline and cost baseline, progress and performance are constantly measured (in cost, not in units of time), assessed and controlled against these three independent variables.

One of the compelling reasons for using EVA is the misplaced reliance on simply comparing actual costs against budgeted costs. In this scenario, there is no measurement of the work actually completed for the money spent in the time elapsed. In other words, what did the money spent actually buy, performance-wise? Imagine if someone reported the project as 90 per cent spent. This might imply that the budget was still in the black, with 10 per cent of the funds remaining. What if you then found out that only 25 per cent of the work had actually been completed, and that this had cost you 90 per cent of your budget? How would you feel? Might there still be a budget surplus at the end of this project? Or might you require additional funding (and also a new career)?

The calculations underlying EVM begin with the following three metrics:

1 *Planned value (PV)* is the estimated cost of the scheduled work:
 □ Each activity will have its own planned value.
 □ It defines the physical activities that should have been completed at any point in time throughout the project and at any status date.
 □ The summation of all the planned values throughout the project gives the budget at completion (BAC).
2 *Earned value (EV)* is the value of the work performed to date, indicating what amount of the budget has been 'earned':
 □ It requires a progress measurement to be determined reflecting the reported component of work completed as at the status date.
 □ It assesses the progress measurement in terms of the budget authorised for

that amount of work.
3 *Actual costs (AC)* are the invoiced costs incurred in performing the completed work to date. They measure costs incurred in delivering the amount of completed work.

Table 6.6 updates the earlier 'traditional' example with some meaningful earned value terminology and sample analysis.

Clearly, both the traditional budget versus actual example (Table 6.5) and the EV example in Table 6.6 demonstrate attempts by management to report and control their scope, schedule and costs. However, with the addition of the EV, management can now see the value of the work performed at the status date. Figure 6.5 presents these three measures plotted over time (with the AC exceeding both the PV and the EV), reflecting both schedule and cost data.

Table 6.6 Earned value scenarios

Planned value	$500 (budget cost)
Earned value	$300 (at a status date, $300 worth of earned value gets reported)
Actual cost	$600
Analysis	Not only is the project clearly over budget by $100; the project has only delivered scope to the tune of $300 measured against the planned value of $500—the project is behind schedule to the tune of $200 worth of scope.
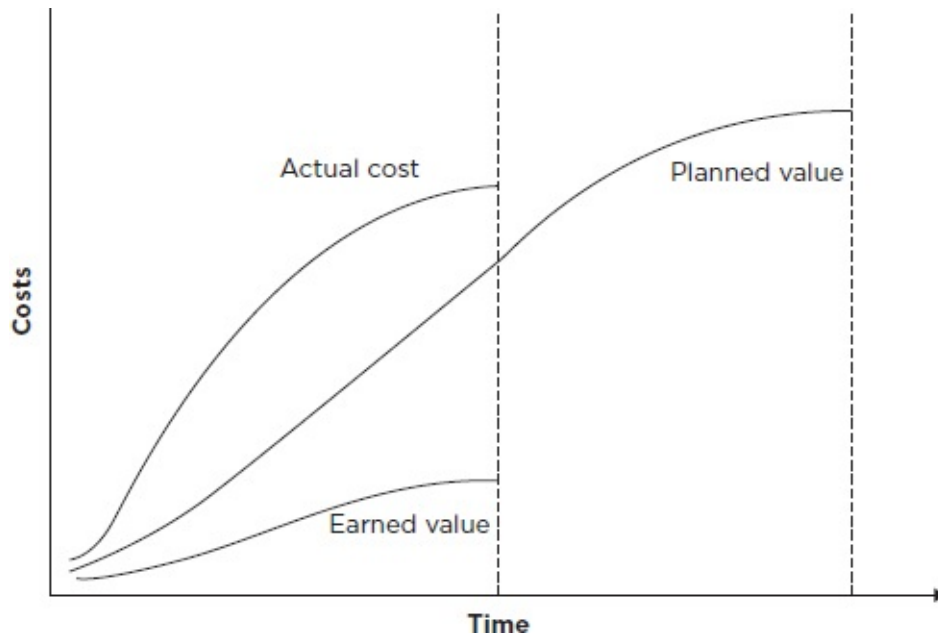
Figure 6.5 Planned value, earned value and actual costs

This analysis replicates the earlier over-budget reality, and highlights the fact that the project is behind schedule. Someone has serious questions to answer:

- Why hasn't all the PV (budgeted scope) been delivered?
- How accurate is the reporting of work completed (percentage complete)?
- Have there been any unauthorised scope changes?
- Has all the work completed to date met the technical and quality standards required?
- Has the schedule been extended so that the scope baseline and schedule baseline are no longer accurate?
- Have there been supplier issues (out-of-stock, freight delays, etc.)?

Consideration also needs to be given to what the earning rules will be for each activity reported (at each status date). One way to address this is to have a nominated percentage of EV assigned to parts of the activity, enabling the reporting of the EV once the portion is complete. Therefore, an earning rule could be based on a 35/65, 25/75 or 20/80 calculation, effectively signalling work in progress. Alternatively, the 0/100 rule reflects no earnings until the scheduled activity finishes, or the 50/50 rule which allocates a 50 per cent earning value when the activity commences, with the remaining 50 per cent allocated once the activity had been completed. Equally, hours of work performed could also be the appropriate measure instead of the percentile model.

Additionally, percentage complete or spent calculations could include:

- percentage complete of plan = EV × 100/BAC
- percentage spent of plan = AC × 100/BAC
- percentage spent of estimate at completion = AC × 100/EAC.

Let's now return to the earlier calculations. From these three initial values (PV, EV and AC), two variances can be calculated. The schedule variance (SV) measures the *schedule performance* (at a point in time or cumulatively) as the difference between the EV and the PV, to assess whether the project is ahead or behind the agreed schedule. The cost variance (CV) measures the *cost performance* as the difference between the EV and the AC incurred, and reveals either a budget surplus or deficit. Table 6.7 records these calculations, while Figure 6.6 shows an example of how these variances could be graphed and the analysis each could generate over time.
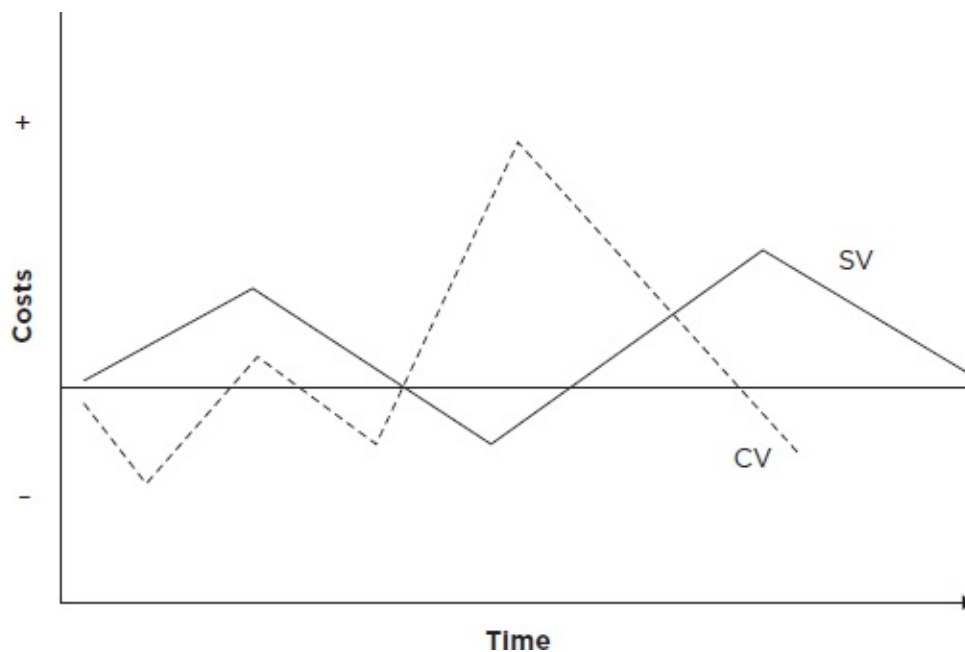
Figure 6.6 Schedule and cost variances

Table 6.7 Schedule and cost variance calculations

Schedule variance	SV = EV – PV
Cost variance	CV = EV – AC

Table 6.8 Increasing the earned value analysis

Planned value	$500 worth of planned value (PV)
Earned value	$300 worth of earned value (EV)
Actual cost	$600 worth of actual cost (AC)
Schedule variance (SV)	–$200 worth of progress behind schedule (– indicates behind schedule, + indicates ahead of schedule)
Cost variance (CV)	–$300 worth of cost over budget (– indicates over budget, + indicates under budget)

Referring back to our earlier budget example data, we now have the EVM information, as presented in Table 6.8.

We can now also extend our analysis to look at both schedule-efficiency and cost-efficiency ratios. These ratios (known as performance indices) provide valuable insight into how well the project manager and team are using their time, and how well the money is being spent to complete the work. Perhaps think in terms of the following: for every one day of scheduled performance, how many days are being completed? And for every dollar spent, how much value is being returned? (Both should be expressed as ratios.) Table 6.9 shows how these are calculated.

Table 6.9 Schedule and cost performance index

Schedule performance index (SPI)	SPI = EV/PV
Cost performance index (CPI)	CPI = EV/AC

Clearly, these indices provide information used not only to determine the project status but, more importantly, to provide a basis for forecasting any project's final schedule and cost outcome (as shown below for the earlier budget example data). Figure 6.7 shows an example of how these indices could be graphed and of the analysis each could generate over time.

- Schedule performance index (SPI) = EV/PV(300/500) = 0.6:
  - ☐ Values less than 1 indicate that less work was completed than planned.
  - ☐ Values greater than 1 indicate that more work was completed than planned.
- Cost performance index (CPI) = EV/AC(300/600) = 0.5:

☐ Values less than 1 indicate that cost overruns for the work completed.
☐ Values greater than 1 indicate that cost under-runs for completed work.

Again, the analysis now confirms that neither time nor money is being used efficiently in this sample project. This result could now be used comparatively with other projects in which the organisation has invested, in order to assess the efficiency of these projects within their project register or portfolio, enabling critical decisions to be made on the management of their scope, scheduling and cost baselines.

A few more calculations and we are done. Recall the acronym BAC. By adding up all the PV amounts through the project, you get the budget at completion (BAC) value—the total budget for the project. From our earlier budget example data, we will use the same $500 value:
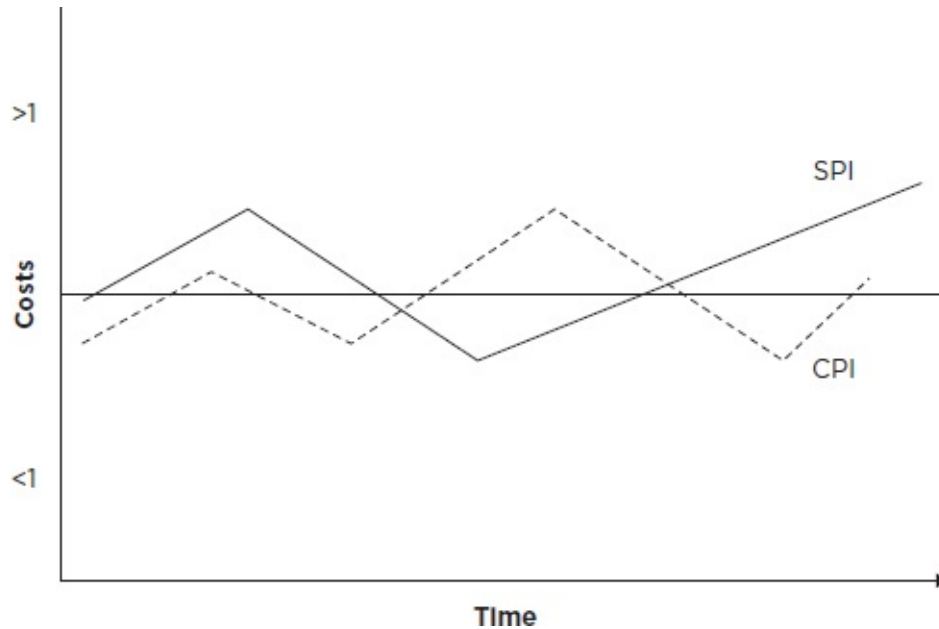
Figure 6.7 Schedule and cost performance index

- Budget at completion (BAC) = $500.
- Estimate at completion (EAC) = AC + (BAC – EV) = 600 + (500 – 300) = $800.
- Variance at completion (VAC) = BAC – EAC = 500 – 800 = –$300 (over budget).
- Estimate to complete (ETC simple) = EAC – AC = 800 – 600 = $200 (to finish the project).

So what is the result from this analysis? Based on what we have spent to date, the revised budget estimate is likely to be at least $800 should the rate of spending continue, instead of the original $500. We will also need an additional $200 on top of what we have actually spent to complete the project (which, as we know, was based on a single time period in the earlier example, which realistically may now necessitate an extension of time (EOT) to allow for the outstanding work to be completed). Additionally, EV calculations allow for determining the work and funds remaining, along with two additional performance indexes further revealing the issues faced by this project (again, notably because it was based on a single time period):

- Work remaining = BAC – EV.
- Funds remaining = BAC – AC.
- To-complete performance index (TCPI) = BAC – EV / BAC – AC (using a target budget) = 500– 300/500 – 600 = 200/–100 = –2.00.
- TCPI = BAC – EV/EAC – AC (using a target estimate) = 500 – 300/800 – 600 = 200/200 = 1.00.

This means that the project would have to proceed at a budget efficiency of $2 of scope for every $1 invested to restore the original budget—clearly impossible. The new estimate to complete (of $800) results in a finding that, so long as the CPI is kept at 1.0, the project could be completed within the new estimate. This assumes no further variations will occur to the scope or AC.

As a uniform and aggregate measure of project schedule and cost performance, EV actually adds value itself by radically improving the opportunity to analyse schedule and cost performance data discretely or cumulatively throughout the project. It is important to measure and report on money spent. So is the performance that the money actually bought along the way in terms of achievement, productivity and resource usage – in line with what was planned.

Effective project management requires the ability (and the processes) to measure project performance and then make the appropriate management decisions and interventions. Its integration as the cost-control mechanism will ultimately enable:

- limiting or preventing scope creep
- modelling objective communication among stakeholders
- promoting proactive risk management
- supporting performance reviews for future cost and schedule outcomes

- encouraging ongoing transparency and accountability
- tracking of periodic performance against the scope and schedule baselines
- applying a single management control system that integrates work, schedule and cost using a WBS
- allowing non-cost data to measure performance (e.g. hours worked).

EVA is not only an important tool for helping with status reports; it also enables calculations for future work along with predictions in terms of scope, schedule and cost performance.

EV does have its detractors, however—particularly given its reliance on historical information that is then used to forecast revised completion estimates and budget outlays. It places a solid administrative burden on a project, which is dependent on how accurate the work package tracking and reporting needs to be.

As with any statistical measurement, threshold levels really need to be set to flag any major deviations triggering corrective action. So can EVA be promoted as the panacea (magic pill) replacing the need for proactive management and leadership throughout all processes within the project (notably scope, schedule and cost)—not excluding quality, human resources, risk, communication, stakeholders and procurement functions? Finally, EV has no provision to identify and measure project quality or other qualitative performance issues, so there are no guarantees that clients will ultimately accept projects where either schedules or budgets have moved.

Critical reflection 6.5

Much has been made of EVA here, but does it suit every project, big or small, simple or complex?
- Think about whether EV is appropriate for your current project and justify its inclusion or omission.
- Given that past performance is embedded in the calculations that end up predicting completion information, how accurate is EV, and is it over-rated?

Crashing the schedule

All too often, the client will decrease or compress the duration of the project (or task). In these cases, they will want exactly the same amount of work performed —albeit in less time and, more often than not, with no increase in costs. So what comes to mind—cancelling some of the work, downgrading the quality, taking

some shortcuts?

Another (more positive) way to try to accommodate this schedule revision is through assigning additional resources. These may be more expensive than the normal resources—for example, overtime or weekend working, hiring of subcontractors and the use of more powerful plant are all likely to be more expensive per unit of work done. By way of example, let us assume that an activity's duration can be reduced by assigning more resources (recall that this was referred to earlier as 'resource-driven' scheduling). As a result of this reduction in duration, the costs driving the project will increase. In this scenario, there are four time and cost variables that must be assessed:

1 *normal duration:* the expected schedule duration that was originally agreed
2 *crash duration:* the revised (read compressed) time nominated
3 *normal cost:* the agreed cost for the original schedule duration
4 *crash cost:* the revised cost to resource the schedule compression.

In Figure 6.8, the cost slope is calculated by the following formula, which calculates a figure (in dollars) for each specified unit of time compressed or crashed:

$$\text{Cost slope} = \frac{[\text{Crash cost} - \text{Normal cost}]}{[\text{Normal duration} - \text{Crash duration}]}$$

By applying the cost-slope formula and examining the project schedule, it is possible to calculate the cost of reducing the project by one day, two days and so on, in line with the revised expectation. This is known as 'crashing'—or perhaps accelerating—the delivery date. There is, of course, a limit below which the project duration cannot be reduced without impacting other aspects—such as quality, specifications and resource availability. If the administrative and opportunity costs are known with reasonable accuracy, and the costs per day of reducing the project time are known, then a minimum total cost will occur when the marginal cost of reducing the project by one day is equal to the duration cost. This will also give the optimum project duration if costs are to be minimised.
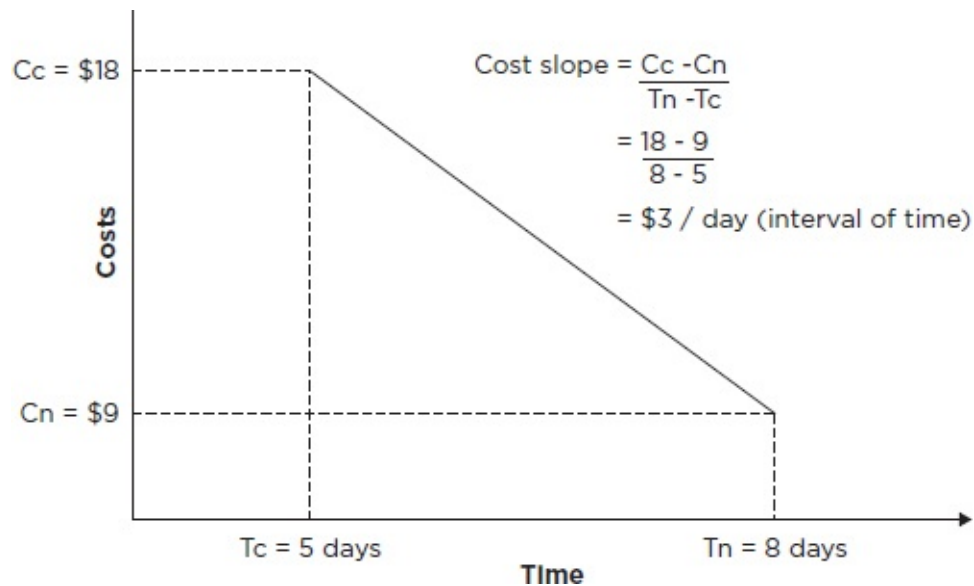
Figure 6.8 Time and cost under normal and crash conditions

However, while this crash cost appears attractive, also consider the 'dangers':

- Not every project can be crashed (let alone without dramatic consequences).
- It is often extremely difficult to obtain accurate figures for the changes in cost resulting from changes in duration time.
- The relationship between time and cost tends to be a stepped function rather than a linear or curvilinear one.
- The crash costs are not always paid for by the sponsor/client and will need to be absorbed. Clearly, margins will be impacted.
- Accelerated delivery brings with it additional complexity, not to mention anguish, frustration and (perhaps) unrealistic expectations.

Clearly, in attempting to control costs, any number of techniques are available. The earlier you make those discoveries and practise cost control, the less costs will be outlaid in later stages of the project, as demonstrated in Figure 6.9.

So, while crashing the schedule will possibly lead to increased cost and increased risk, what would be the impact of fast-tracking the schedule if this pressure were applied? Not only will you need to consider changing the dependencies between some tasks to shorten the project duration by changing the path to parallel (where technically able); you may also incur more rework, increased costs and greater risk (among other impacts).
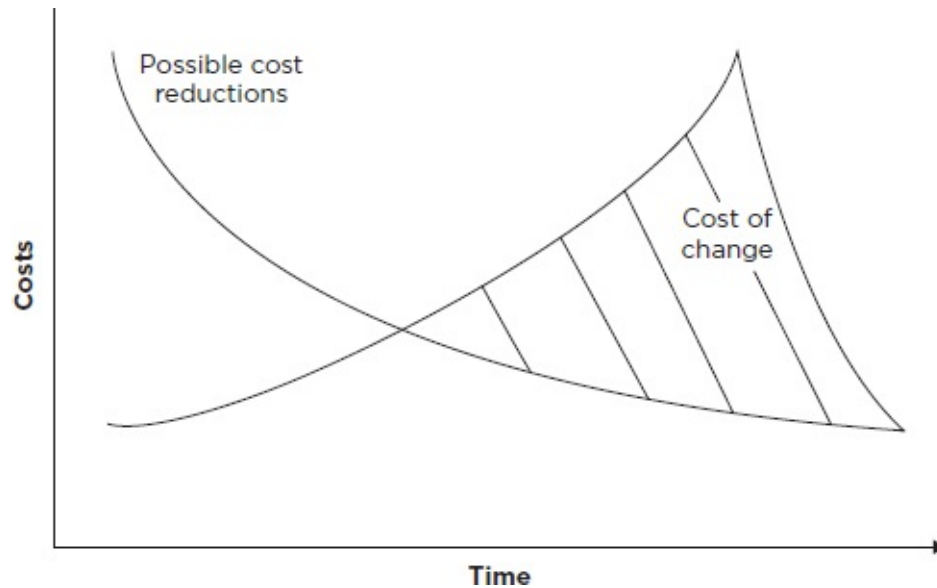
Figure 6.9 The cost of change exceeding original costs

Review questions

6.1 How would a cost management plan address the challenges of managing project costs within the internal financial procedures and accounting codes of the organisation?

6.2 What are some of the challenges involved in estimating project (resource) costs, and how can these be overcome?

6.3 What benefits do budgeting processes bring to projects, and what weaknesses do they possess?

6.4 What does traditional budgeting fail to report and control in project management?

6.5 How does EVM provide for schedule and cost performance reporting, analysis and forecasting?

Case study

Helen loved the spreadsheet she had inherited. Her predecessor had developed it over many months as the finance officer for the company. Not only did it track all the operational costs; it also showed the original estimates, monthly actual-to-date (and percentages) and consolidated year-to-date.

She thought the best parts were the graphs that brought to life rows and columns of fairly boring numbers that filled each page. Colour-coded legends and labels all combined to display either an-over budget, under-budget or on-budget result. As she pored over the file, Helen was confident that

she wouldn't be asked to make any changes in her role as project finance officer—after all, projects spent money, just like the operational side of the business.

At the first project kick-in meeting, her project manager, Ron, asked Helen how she would track all the project costs. Helen was ready for this question and quickly put up her PowerPoint display of the spreadsheet. Thinking Ron would share her enthusiasm, she was shell-shocked to discover that he wasn't happy at all and she clearly wasn't comfortable with the barrage of questions she was now getting about measuring the project's performance over time (whatever that meant), not just the money budgeted and spent.

> 'Ron knew he needed to adjust Helen's spreadsheet to build in the missing project-specific financial information and that he would need to educate the team on the calculations, analysis and application of the information.'

Ron had worked on previous projects where he had encountered considerable delays and cost overruns. While it was important to know what money was available and how much was spent at any given point in time, Ron had come to appreciate the importance of also knowing what the money spent 'actually' bought in terms of project delivery. And while this type of information was historical (as it was based on previous performance up to the reporting date), Ron also realised the value of a window of performance forecasting to help him get the project from the reporting date up to the scheduled finish date.

As the meeting progressed, Ron knew he needed to adjust Helen's spreadsheet to build in the missing project-specific financial information and that he would need to educate the team on the calculations, analysis and application of the information.

The longer the meeting went on, Ron came to realise that his team also had a history of relying heavily on historical data when estimating with little effort made to contextualise and update the estimates for each project's cost baseline. And with the accepted practice of always using top-down budgeting to get the project up and running, Ron quickly understood the endemic fixation his team had with its reliance on traditional budget tracking and analysis in their projects.

With a team comprising staff from both the public and private sectors, Ron became increasingly bemused as he listened to the feedback and arguments he received during his presentation. Some of his team had only ever been measured on what they spent—as any part of their budget not fully accounted for was likely to be reduced in the following year. Others had little, if any, experience of bringing a project in on time or on budget, as both extra time and additional money were always found in the end. Others were worried about the increased transparency of having to track, report and control both costs and the schedule from start to finish.

It was clear to Ron that the concepts of scope, schedule and cost, and the intricate interdependencies between all three, had largely escaped his project team. As he took over the meeting again, Ron flagged the following key points:
- Cost management is more than merely reporting money spent.
- Reporting formats needed to be agreed.
- EV would become the cost-control standard for the project.

Ron also knew he would have another battle outside of this meeting, as he would need to convince the finance department that this project and future projects would need a different cost-management procedure and tools over and above what already existed operationally.

Questions

1 Why is Ron convinced that cost management is different from managing operational costs?

2 What additional estimating techniques would Ron like explored and why?

3 What are the major weaknesses in simply comparing budget to AC at each reporting date?

4 What is behind Ron wanting to know the SV and CV?

5 Is EV the panacea for replacing proactive schedule and cost management? If not, why not?

Chapter 7

Quality management

Achieving technical excellence and customer satisfaction

In practice

For such an objective topic, quality has an incredibly subjective pedigree.

So what does quality mean and imply? Is it an agreed standard of work, a specification, a requirement, a business rule, what the finished work looks like or how well some function is performed? And does it relate to only quality management systems, to management systems in general or is it the sole domain of project management?

Realistically, it could be all of these. Each of these interpretations (or measures) of quality sound as if they are output based. In other words, they each describe the finished product, service or, in our terms, how well the output or outcome (remember that these are two entirely different concepts) of the project complies with some measure—ideally some performance measure (acceptance criteria) or other project objective.

But taking a broader perspective, our understanding of quality could, in fact, be extended to include what could be termed 'process-based' criteria for examining quality—in other words, the supporting (business or project) processes through which the agreed quality standards are regularly (and perhaps randomly) monitored, inspected and reported on to ensure compliance is maintained from start to finish.

So is it a measure? Is it a process? And does it (whatever it is) enable project organisations to succeed through targeting management responsibility, performance enhancement, employee motivation, customer satisfaction and continual improvement?

Chapter overview

PMBOK (2013) defines project quality management as the 'processes and activities…that determine quality policies, objectives and responsibilities', contributing to satisfying the project's objectives. Through a process predicated on continuous improvement, quality management ensures that both the project's physical requirements (scope, schedule and cost) and process requirements (documentation) are addressed.

Project management quality processes include documenting the quality

management plan (in line with all the other project management processes); ensuring that appropriate quality standards, technical criteria, business rules, operational procedures and definitions are defined; and monitoring and assessing performance with the recorded results (conformance or non-conformance) triggering the required changes and control.

In many instances, project quality is a personal dimension, framed by individual experiences, expectations, values and attitudes. For some, quality implies reliability; for others, it means value for money, fit for purpose, an improvement or enhancement over an earlier product or service; and for others still, it is a reflection of the image and position the product holds in the marketplace. However, being such a personal and versatile dimension only makes its ultimate measurement all the more difficult. And quality essentially implies (perhaps dictates) measurement. If you cannot measure something, it makes it rather difficult to ensure conformance and improvement.

Clearly, different types of projects (and their parent organisations) will adhere to different quality processes, measures and techniques. Some will seek direction from the International Organization for Standardization (ISO) 9000 series; some will adhere to the technical requirements of the work itself and agreed acceptance criteria; while others may follow benchmarking or other proprietary aspects of best practice. Regardless of the philosophy followed, quality-management processes seek to produce a prevention dividend by minimising variations (regardless of their source) while delivering verified results that meet (not exceed) the client's requirements. (Remember, while exceeding your client's expectations might appear noble, the question remains of who pays for it and in whose time is it performed—clearly not the client's.)

Critical reflection 7.1

Quality means different things to different people as they each assign some subjective attribute or measure to something of value.
- Before reading any further, identify what the quality requirements are for your current project.
- Is this your personal perception only, or is quality unambiguously defined somewhere?
- Who do you think will ultimately determine whether or not the quality has been delivered throughout the project?

Planning for quality management

The concept of quality and total quality management (TQM) has been with us for decades, possibly dating back to the military projects of World War II and the collective works of Shewhart, Deming, Crosby, Juran, Ishikawa and Feigenbaum —the acknowledged fathers of the quality revolution. In the traditional sense, TQM is a process that embraces management and employee involvement that is directed towards continuous improvement in productivity, quality and workplace harmony.

Quality management also has a more strategic and central presence within and across the project organisation, as it is:

- defined externally from the client's perspective (recall that the client is always right):
  - □ performance (essential operating attribute)
  - □ features (secondary operating attribute)
  - □ reliability (frequency of failure)
  - □ conformance (matching required specification)
  - □ durability (ensuing product or service life)
  - □ serviceability (speed, courtesy and competence of repair)
  - □ aesthetics (outward appearance, finish and fit)
  - □ perception (acuity, feelings or reputation)
- linked with the triple bottom line:
  - □ social
  - □ environmental
  - □ economic
- associated with a demonstrated, organisation-wide commitment.

The true meaning of the word 'quality' and how it impacts on the project, both from a management perspective and a product, service or result (deliverable) perspective, is still open to wide debate, interpretation and application. *The Macquarie Dictionary* defines quality as a characteristic, property or attribute that belongs to or distinguishes something with respect to excellence, fitness or attainment. If we now apply this definition to a project, every project is created and managed to be successful as measured against some defining benchmark, most notably time achievement (the schedule), scope compliance (technical specification) and cost control (the budget). However, project success (and, by inference, its quality) is also measured against the client's identified and agreed needs, and their unconditional acceptance at the end of the project.

Quality considerations belong chiefly at the front end of the project when the investment or concept is being discussed, alternatives are being proposed, the

tentative schedule is being put together, budget baselines are determined and the commitments that will ultimately drive the project's success are signed off on. This is not to say that quality is ignored in the later stages; what it means is that once it is built in from the beginning, quality—both from a process management and technical compliance perspective—can be monitored, managed, reviewed and controlled. In other words, the earlier mistakes, omissions, rework and other examples of required corrective action can be identified, the cheaper they may be to correct, as the true costs of identification and rectification will invariably increase exponentially over the project's life-cycle.

Clearly, quality planning is not an overnight activity, nor is it something that is done once in isolation. As with most project management processes, quality planning is progressive, iterative and constantly reviewed. Nor should it be overlooked or fast-tracked due to the time involved. Often the difficulty is getting buy-in from everyone. As with most plans, it will only be as good as the information it contains. Ultimately, the quality plan (or its component parts) will be instrumental in describing how the project management team will implement, monitor and review the project-quality policies and results throughout the project. Finally, the quality plan will need to be endorsed, communicated and maintained across all project stakeholders.

Ideally, the quality management plan will formally collate the 'right' approach to be followed by the project organisation in meeting the project's objectives. Capturing the relevant quality requirements, standards and other measurable expectations, the plan will document how compliance will be demonstrated and validated throughout the project's life-cycle. Key elements found in the plan should reference the following:

■ the quality methodology (or approach) to be followed in managing the project
■ relevant standards, rules or guidelines to be adopted in performing the work
■ review of the product descriptions
■ monitoring and inspection regimes
■ identification of acceptance criteria
■ agreed processes for dealing with authorised changes, incidents and issues (change control)
■ risk-mitigation procedures
■ confirmation of roles and responsibilities
■ existing operational governance procedures
■ scope, schedule and cost baselines
■ external agency regulations
■ relevant working and/or operating conditions that may impact the project

- opportunity for feedback (meetings and other forums)
- tools and techniques used in assuring and controlling quality—for example, data flow diagrams, process flowcharts, cause–effect diagrams, storyboards, check sheets, Gantt charts, scatter diagrams, control charts and other quality tools.

Underpinning these planning activities is the central tenet of quality project management—quality is always planned into the project from the start, and not simply randomly inspected in as required. While a convenience dividend (in formally ignoring the importance of quality) is often the decision of choice for some project organisations, the quality management plan enables a 'sharper focus on the project's value proposition and reductions in costs and in the frequency of schedule overruns caused by rework' (PMBOK, 2013). Clearly, the challenge for the project organisation is to truly understand and manage the different quality lenses through which both measurable and qualitative expectations are created and satisfied.

Turner (1997) suggests there are six prerequisites to ensure the project adheres to a quality regime—these are summarised in Table 7.1 along with additional 'process' suggestions.

Performing quality assurance

Remember that quality is often exactly what the client claims it to be, and it will change as the stakeholder changes. Despite being characterised by this fluid and subjective form, quality also involves the culture, mindsets and methods at the organisation's disposal to drive the quality imperative (Cole 2010). Assuring such a commanding, if not elusive, edict is no mean feat either.

Table 7.1 Building in quality

Assuring quality	Exactly how…
Budget cost	This means that the project is decomposed (through the WBS) to the lowest level required to identify the client's requirements accurately. Clearly, a balance needs to be found between too much and not enough detail. One way to overcome this is to define the specification in not only its technical domain but also

	its performance and/or functional domains.
Clear specification	Many project deliverables already have established and acknowledged standards, which are openly communicated, not open to interpretation and cannot be avoided without possible penalty. Where possible, these should be sourced and agreed.
Defined standards	History breeds both experience and information, both of which can be put to good use in determining the appropriate standards (where there might be no 'official' standard).
Historical experience	The only thing worse than not having a clear specification is having resources unqualified and/or untrained to perform the work to the required standard (perhaps your worst project nightmare). In these days of downsizing and all the popular 'resource-eating' business philosophies and practices, the specification must be in writing (with penalty clauses for breaches).
Qualified resources	Certification at either the second- or third-party level are two ways to ensure that quality is being built into the deliverable. While relatively expensive to obtain (and sustain), think of it as another prevention cost.
Impartial reviews	The only constant in any project is change, so why wouldn't you plan for it by designing appropriate controls to account for the changes when they arise? A change of scope request is such a control; an updated risk assessment is another change control, as is the revised project schedule.
Effective change control	Quality is everyone's responsibility, not just that of one person or department.
Organisational-wide commitment	Like other project management processes, quality needs to be assessed and aligned with all the other processes —time, cost, human resources and so on looking for overlap, interaction and dependencies.
Integrated processes	While planning may well be a mental process to begin with, it must end up on 'live' paper as the plan will always change and need updating.

Documented planning	Projects do not produce quality as an accidental outcome or by-product. Accordingly, ongoing planning that is documented, reviewed and amended over time is required to ensure all associated costs and realities of quality management have been captured and communicated.

PMBOK (2013) defines quality assurance performance as the 'process of auditing the quality requirements and the results from quality control measures to ensure that appropriate quality standards and operational definitions are used'. This approach is compatible with the International Organization for Standardization (ISO), as detailed in the ISO 9000 standards and the supporting 10,000 series of standards and guidelines and other relevant proprietary and non-proprietary approaches to quality management (the ISO has developed over 17,000 standards, mostly relating to product and process).

Much like a declaration or guarantee that the overall project performance and result are evaluated on a regular basis to give all stakeholders the confidence that the relevant quality standards will be satisfied, assurance may involve:

■ adoption of an internationally certifiable process
■ eight quality management principles cited by the 9000 series, reflecting management best practice:
    1 customer focus
    2 leadership
    3 people involvement
    4 process approach
    5 system approach to management
    6 factual approach to decision-making
    7 continual improvement
    8 mutually beneficial supplier relationships
■ an innate and public culture that says 'quality is what we do'
■ a spirit of experimentation and a creative climate
■ internal systems, procedures and practices to build quality into the start of the project
■ processes to eliminate waste, variation and excess:
    □ a surplus/deficiency in resources to complete the work
    □ inappropriate methods when performing the work (e.g. the use of labour-intensive methods when automation would save time)

□ excessive float in the schedule, encouraging the work to expand to fill the time available
□ the location and/or standard of the facilities creating access, storage or logistic problems
□ poor administration and management infrastructure causing communication bottlenecks, decision delays or a bureaucratic (and unnecessary) administrative framework
□ delays in accessing and verifying information such as progress, status and forecast completion reports
■ avenues for open, honest and constructive feedback
■ opportunities for continuous improvement
■ transparent relationships between internal and external clients and suppliers.

Getting the quality documentation right

Quality can be assured with reference to three different types of documents: a detailed quality manual that sets out the organisational quality objectives and policies; an operating procedure required by a particular business unit; or specific work instructions nominating how a given activity needs to be performed. As with any form of documentation, problems can be common, time consuming and detrimental to the project's quality footprint. These problems may include:

■ a lack of standardised processes
■ omitting some of the required procedures
■ a lack of familiarity with the procedure
■ poorly sequenced procedures
■ out-of-date procedures
■ an inability to map end-to-end processes
■ ambiguous language
■ inconsistent levels of detail
■ over-reliance on verbal explanations
■ failing to account for variations
■ inaccurate documentation
■ different formatting styles
■ an inability to measure and communicate results
■ failing to involve all key stakeholders.

While all these points impact the ability to assure project quality through improved quality processes (in both physical and process-based terms), direct involvement, total support and demonstrated commitment are crucial in removing activities that do not add value. Quality is not a part-time activity performed only by the quality circle members, the quality inspectors, the audit team or the statisticians. It is owned and demonstrated by everyone as they work to communicate openly, reduce errors, deliver quality, work together, promote involvement, improve problem-solving and enhance motivation.

As Cole (2010) reflects, quality assurance comes from paying attention to the little things—the things that some people will miss as they try to do 100 things 1 per cent better as opposed to trying to do one thing 100 per cent better (as practised under the 'Kaizen' principle of continuous incremental improvement).

> For want of a nail the shoe was lost
> For want of a shoe the horse was lost
> For want of a horse the rider was lost
> For want of a rider the battle was lost
> For want of a battle the kingdom was lost
> And all for the want of a horseshoe nail
> — *proverb from Poor Richard's Almanac*

In seeking to assure that work in progress will be completed in line with agreed expectations and other stated requirements, quality assurance 'will prevent defects through the planning processes or by inspecting out defects during the work-in-progress stage on implementation' (PMBOK, 2013). Clearly, the initial scope baseline, schedule baseline and budget baseline will be integral to making some of these judgements during the planning stages and, subsequently, in the iterative revisions to each during the implementation and close-out stages.

Critical reflection 7.2

Re-read the proverb above (slowly this time), then ask yourself:
- What have been the 'nails' in your past projects that came back to 'bite' the project and possibly you?
- What remedial action was required at the time to avoid 'losing the kingdom'?
- What current or future assurance activities can you undertake to ensure that the technical excellence required by the client is delivered?

Systematic quality assurance tools

Over the years, a number of numeric, text and graphical modelling tools have been developed to assist quality assurance (and ultimately control). Collectively, the tools are not only designed to gather the raw data required as efficiently and accurately as possible; they also endeavour to reflect discernible data patterns, variability, redundancies and exceptions. More often than not, all the tools are simple and easy to use, although this does not dilute their value in reporting process information and the opportunity for further analysis and control. While no one tool is exhaustive in identifying, measuring and analysing improvement opportunities, they could all be considered practical. Cole (2010) suggests a variety of useful and objective analytical tools and techniques applicable to identifying and resolving problems, streamlining systems and processes, and building in quality. They are included in Table 7.2, along with additional suggestions from PMBOK (2013) and other well-known diagnostic and analytical tools. Figure 7.1 illustrates ten of these tools.

Quality control processes

Here we look at controlling quality, controlling the costs of quality and continuous quality improvement.

Table 7.2 Systematic quality assurance (and control) tools

Brainstorming	**Group participation in generating ideas**
Control charts	Setting upper and lower limits to determine a stable or predictable pattern of performance
Flowcharts	Sequential display of steps and their branching possibilities
As-Is diagram	Mapping the 'current state' of a process
Pareto chart	Graphical representation of the vital few sources responsible for causing most of the effects
Cause and effect diagram	Narrowing down possible causes to the main cause (primary, secondary and tertiary causes)

Force field analysis	Identifying reasons for and against a change
Five 'whys'	Asking 'why' five times to uncover the main cause
Histograms	Simple bar charts showing dispersion rate, central tendency and the shape of a statistical distribution
Scatter diagrams	Correlation charts explaining a change in the dependent variable as observed by a change in the corresponding independent variable
PDCA cycle	An iterative four-step management method (plan–do–check–act) for the control and continuous improvement of processes and products
Affinity diagrams	A mind-mapping process creating structure around an issue
Tree diagrams	Visualising parent–child relationships in any decomposed hierarchy
Prioritisation matrix	Prioritised and weighted criteria to obtain mathematical scores and option ranking
Network diagrams	Precedent (logic) diagrams showing activity sequencing
Data flow diagram	A graphic overview of the flow of data or a process through a system
Tick sheet	A structured method of capturing data by making marks (checks)
Circling	Sharpening problem definition by circling key words
Interrelationship digraph	Maps moderately complex scenarios possessing intertwined logical relationships
Pie charts	Circular graphs depicting percentage slices of the whole 100 per cent
Checklists	A component specific set of required steps
Statistical sampling	Choosing a random part of a population for inspection
Benchmarking	Comparisons with comparable projects to identify best practice; a basis for measuring performance and generating ideas for improvement
Design of experiments	Statistical method for identifying factors influencing

	specific product or process variables
Meetings	Opportunity to discuss, review and amend information
Audits	Structured and independent process to assess compliance
Change requests	Provision for full consideration of proposed changes, for taking corrective action, preventative action or to perform defect repairs
Inspection	Onsite, physical compliance check
Lessons learned logs	Historical database of variance causes, corrective action and other lessons

Controlling quality

The extensive list of tools and techniques cited above under quality assurance also helps address the processes driving quality control. PMBOK (2013) identifies controlling quality as the 'process of monitoring and recording the results of executing the quality activities to assess performance and recommend necessary changes'. Not only would this identify and confirm the contributing factors leading to the poor processes undermining quality; it would also validate the requirements for final acceptance. While confidence can be established initially through the quality plan and the assurance processes and tools, quality control is used through the implementation and finalisation stages of the project to 'formally demonstrate, with reliable data…that acceptance criteria have been met'.

  In other words, quality control monitors specific task and project results to identify, measure and eliminate the causes of unsatisfactory performance, while also ensuring that quality compliance is always demonstrated and achieved.
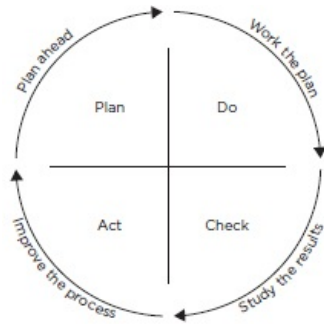
a. The PDCA cycle

Plan ahead / Work the plan / Study the results / Improve the process

Plan | Do
Act | Check

b. Pareto chart

Holidays taken — Cumulative percentage

Alaska | New Zealand | Sweden

c. Cause and effect diagram

Cause

Training | Procedures

Effect

Staff turnover

Conditions | Processes

d. Scatter diagram

Preparation time (hrs)

Test score results

25% | 50% | 75% | 100%

e. Flowchart

No | Yes | Yes | No
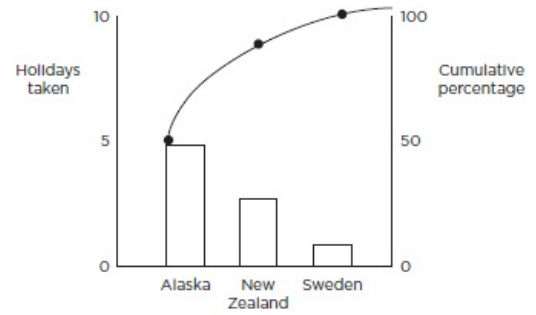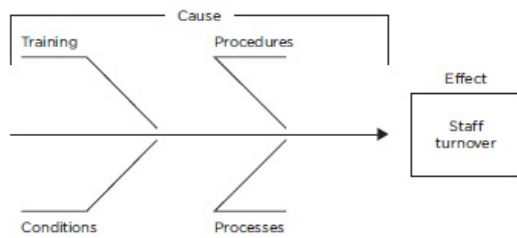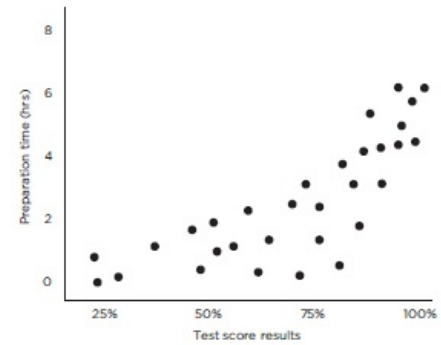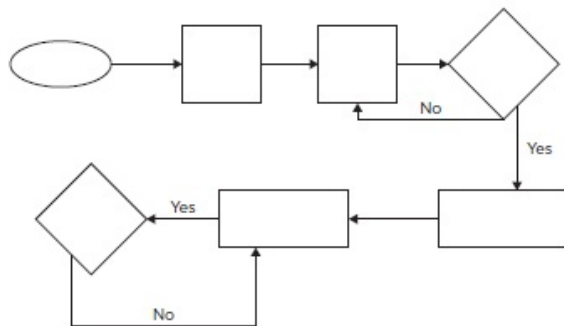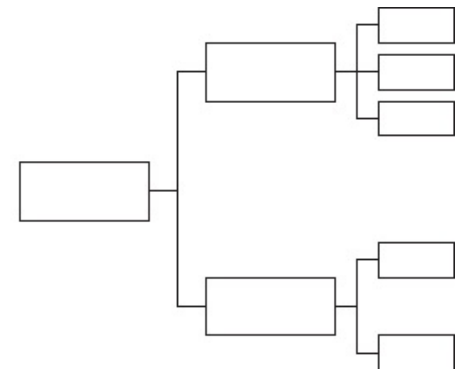
f. Tree diagram

g. Control chart

Units produced

1 | 2 | 3 | 4 | 5

Time
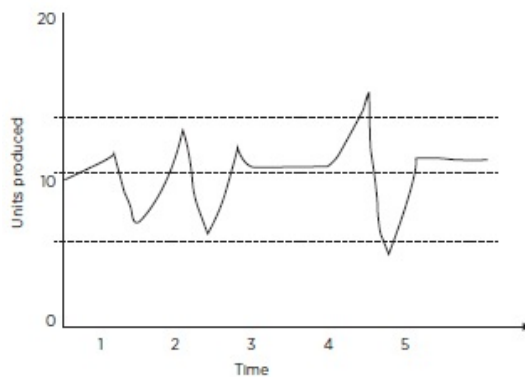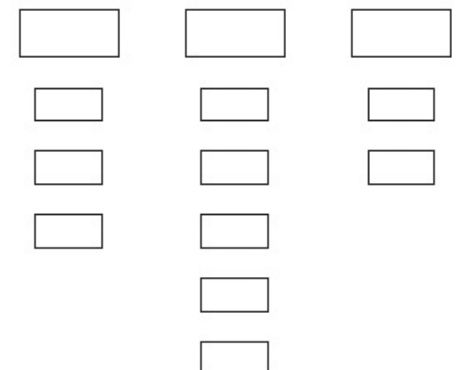
h. Affinity diagram
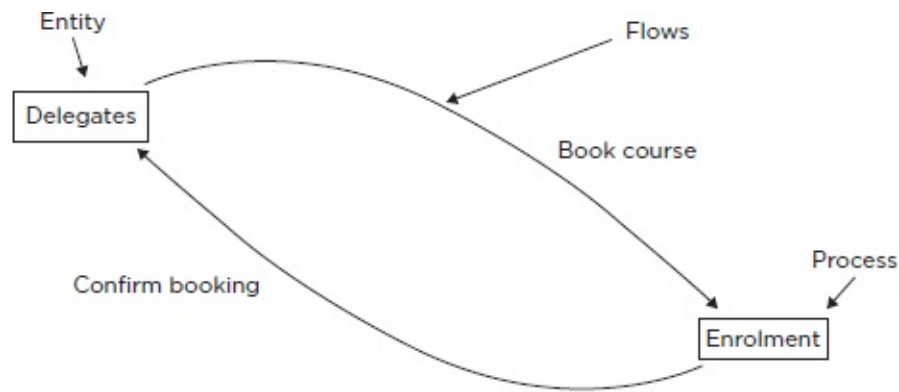
i. Data flow diagram

j. Tick sheet

Figure 7.1 Quality assurance and control tools

Remember that control implies measurement. As a direct result of this mix of scheduled (and random) attempts at quality control come:

- elimination of rework
- completion of work in progress
- confirmation of acceptance
- documented quality improvement
- completed checklists
- process adjustments.

Controlling the costs of quality

In many cases, control activities can be relatively expensive whenever the required work is performed more than once—for example, in the case of

defective work. If you get it right the first time, every time, there may be no onerous direct cost for delivering a quality outcome. It is only when the work needs to be repaired time and time again that quality incurs a direct cost—one that increases exponentially with the number of times the work is repeated. For many, the continued perception is that 'in-built' quality is an expensive endeavour, and that it is difficult to evaluate projects in terms of a commercial value proposition—for example, cost improvement and profit enhancement. However, with general acceptance that quality costs can be assessed under four broad groups (prevention, appraisal, internal and external), project organisations, stakeholders, project managers and teams can now evaluate these costs more confidently, accurately and independently.

Prevention costs are charged when it is necessary to prevent defective work, products or services being handed over to clients. While it is realistic to assume that the most effective (and immediate) way to manage this type of cost is to avoid having defects in the first place, inferior work can still be performed, resulting in clients being dissatisfied with the work they are expected to approve and accept. Examples of some direct and indirect preventative costs include:

- quality planning processes
- quality auditing
- investment in knowledge management and information systems
- provision and maintenance of safety equipment
- design approvals, verification and change control
- product liability insurance
- ongoing technical support provided to suppliers
- independent external assessments
- team meetings (quality circles)
- time developing detailed schedules
- planning to recall faulty products
- supervision of prevention activities
- a regime of preventative maintenance
- time reviewing and updating baselines
- quality inductions, education and training initiatives
- designing and developing quality measurement tests and equipment.

Appraisal costs are charged when costs are incurred to identify defective work, products or services before client acceptance and handover. Any defect should be identified as early as possible in both the planning and implementation stages. The reality, however, is that performing appraisal activities alone doesn't always

prevent defects from happening again, and most managers realise that reliance on just an inspection regime can be both a costly and an ineffective approach to quality control. Examples of direct and indirect appraisal costs include:

- repair, rework or replacement
- re-inspection and testing
- discarded scrap and waste materials
- recall costs
- defect diagnostics
- returned products
- downtime with lost production
- contingent legal liability
- warranty claims
- feedback, evaluations and reporting
- penalties and punitive late fees
- calibration and performance testing
- inspection of work in progress
- independent external assessments
- record storage and archival
- report analysis and interpretation
- completion certificates
- utilities in the inspection area
- final product testing and inspection
- maintenance of test equipment
- supervision of inspection activities
- depreciation of test equipment.

Internal failure costs are charged when a product fails to conform to its specified design requirements, and result from the identification of defects before the products are shipped to clients. The more effective a company's appraisal activities are, the greater the chance of catching defects internally and reducing the level of internal failure costs—which can be incredibly expensive and prolonged. Examples of direct and indirect internal failure costs include:

- the residual cost of scrap
- the net cost of spoilage
- reworking labour and overheads
- re-inspection of reworked products
- productivity erosion

- the disposal of defective products
- debugging the process or system
- the time required to re-enter data.

External failure costs are charged when a defective product is delivered to a client. In the past, some managers have taken the attitude that 'we give it all to the client and deal with any issues under the warranty'. This attitude generally results in high external failure costs, poor client relationships, a bad reputation in the market, and a loss of profits. Examples of direct and indirect external failure costs include:

- legal liability from legal action
- loss of reputation and goodwill
- in-field servicing
- warranty repairs and replacements
- repairs/replacements outside warranty
- liability arising from defective products
- returns and allowances
- product recalls
- out-of-warranty complaints
- processing complaints
- product liability.

Gardiner (2005) suggests that the total cost of quality can be captured in the following formula:

Total quality cost = failure costs + appraisal costs + prevention costs

However, he cautions that a balance is required between the total cost of prevention and appraisal on the one hand, and the total cost of failure on the other. Without quality management processes in place, he presents a compelling case that failure costs will probably far exceed appraisal and preventative costs (if the true costs of quality are, in fact, known and accurately reported to begin with). Perhaps if projects could devote more time to the *prevention* of costs, both money and time could be saved, as the subsequent appraisal and failure costs often incurred as projects progress could be minimised or avoided.

Despite the potential for these extensive and impressive costs, not every deviation warrants an immediate corrective action pathway. Both tolerances (specified range of acceptable results) and control limits (boundaries of common

variation) will need to be agreed and complied with in controlling work performance data (PMBOK, 2013). These variations will be evident in comparisons between:

- planned and actual technical performance
- planned and actual schedule performance
- planned and actual cost performance.

In these instances, a formal and documented change-control request process will be mandatory in approving those accepted and rejected changes—be they changes in stated requirements, defect repairs, revised work methods, schedule modification or risk treatments to ensure quality assurance and compliance are being met.

Critical reflection 7.3

Quality costs each and every time. In most cases, the person specifying the quality pays for it. In other cases, though, the true cost of quality may be accidently overlooked or intentionally ignored.
- Building on from the examples in the text, identify genuine costs that your project has incurred in delivering quality.
- For each cost, work out who rightly 'owned' the cost.
- now determine how that cost was actually paid for. Was it charged directly to the client, paid for out of contingency funds, borne by the operational overhead of the project organisation, funded by savings made from downgrading other work, deleting scheduled activities altogether, or simply ignored?
- Depending on your answer to the above question, what changes would you recommend to deal with the costs of quality?

Continuous improvement

While it may appear last in the list of quality processes, continuous improvement is not delayed to the last thing we do, nor is it the big result that automatically drops out of quality planning, assurance and control. Certainly, each of these lays down the framework and supporting infrastructure to enable, encourage and reward continuous improvement initiatives throughout the project. However, continuous improvement is more of a culture, a commitment and an ownership of what the project is delivering, and ultimately of how well it is being delivered. Where innovation and feedback are encouraged, continuous improvement will flourish.

Where efficiencies, economies of scale and capacity can be enhanced,

continuous improvement will equally flourish. Where risk-taking is supported, where different approaches and ideas are canvassed, continuous improvement will again flourish. Realistically, continuous improvement can never be mandated by a standard business rule or a stakeholder expectation.

The typical tools of continuous improvement are not all that exotic. They commonly include:

- regular performance reporting
- meetings and debriefs
- decision gates and approval processes
- walkthroughs and peer reviews
- scenario analysis
- evaluation reports
- suggestion boxes
- user feedback.

Critical reflection 7.4

The term 'continuous improvement' conveys so much: change, innovation, feedback, creativity, strengths, opportunities and the like. Is it just a documented practice or an assumption buried within the organisational (invisible) culture?
- In your own words, define what continuous improvement is in your projects.
- If you were not particularly happy with the answer you just gave, try again by defining what it should be like in your projects.
- What actions are required to make the necessary changes, whereby continuous improvement becomes an ongoing, consistently applied and publicly demonstrated practice where accountability and transparency reign supreme?

Review questions

7.1 Define the term 'quality' and explain its relevance to project management.
7.2 What intrinsic value does quality planning have for your project?
7.3 What role does quality assurance play in dealing with the associated quality costs?
7.4 What systematic tools and techniques are applicable in reporting direct and indirect quality costs?
7.5 How is quality control different from quality assurance?

Case study

Marsha and noel thought they had a winning idea in wanting to self-publish their first e-book. Not only would it leverage off the plethora of books on gardening, nutrition and organics, but all their friends had given it a glowing endorsement.

Their book, *Going Green: Reinventing Our Community Street by Street*, did come with a catch, though—neither Marsha nor Noel knew anything about publishing. So they decided to go online and invite specialists in the field to submit an expression of interest (EOI) for the technical side of things —editing, designing and publishing the e-book while at the same time ensuring Marsha and Noel would be delighted with the result (the basic tenet of quality management).

Their friends had suggested that they put together some form of document that helped clarify what it was they actually wanted—especially given their emotional attachment to the book and their collective expectations and assumptions. However, they were both so immersed in 'greening their community' that they didn't quite get around to doing it. Over the next couple of weeks, they received over 60 global responses and then spent another two weeks trying to sort through all the information they had received, most of which was unintelligible to them both.

As they sat in their lounge room wading through the EOIs, Marsha remarked that she couldn't understand any of the points, as most were just vague statements, while others seemed like techno-babble, particularly the following:

- KDP intake systems
- custom media solution
- comprehensive guidance
- flexible and attractive cover options
- NCX navigation
- powerful book building website
- expert editorial team
- apple-approved aggregator
- exciting new technologies
- innovative software platform.

Feeling bewildered, Marsha and Noel decided to set their personal self-interest aside and adopt a more strategic approach to ensure that their publishing objectives would be met. Having defined their objective, they set about drafting a project brief detailing what they wanted.

> **"**…they wanted to know what 'real-time' processes the successful contractor would have in place to deliver on this guarantee.**"**

At this stage, as they had no idea of *how* it would all come together, they limited their notes to *what* they wanted and the features they thought the e-book should have. No doubt they would get some further ideas from the reissued EOI; however, they felt they needed to put down some form of initial and tangible benchmark against which subsequent offers, engagement and e-book delivery could be assessed. They knew that if they got this early documentation right, the later stages of this project might be less stressful and produce the very result they wanted.

They also realised that they would need some mechanism to guarantee that whoever they engaged actually lived up to their objectives, not to mention the technical aspects of putting the e-book

together and getting it up on the web. While they could rely on the contract they would put together, they wanted to know what 'real-time' processes the successful contractor would have in place to deliver on this guarantee. After all, they didn't want to spend all their time chasing up broken promises. Nor did they want to end up with an e-book they wouldn't accept, which meant they had to devise some means of monitoring and controlling the contractor's quality from start to finish, while at the same time being open to new ideas, fresh approaches and some degree of innovation— particularly if technology and/or the market changed.

Marsha and Noel now realised that without an equally great focus on the quality processes, activities and documentation behind the book, their 'potentially' great book could actually result in very little result.

Questions

1 In support of Marsha and Noel's refocus on their strategic publishing objectives, what would their quality management plan look like?
2 What steps should Marsha and Noel follow in assuring the contractor's performance and result?
3 How do you suggest Marsha and Noel should control the project quality to ensure compliance and acceptance?
4 What would be some indicators that Marsha and Noel were open to new ideas, proposed changes and other forms of continuous improvement.

Chapter 8

Human resource management

Developing and maintaining individual and team performance

In practice

The only way you will ever convert a project plan into a reality is with and through resources. And those resources are mostly people—the individuals, groups and teams working on the project.

Another reality concerns the (fluctuating) motivation, energy and commitment these assigned resources will display. And as we know from earlier chapters, different stakeholders each have different expectations that change throughout the project—as they should. Given this, and the enormity and potential complexity of other project variables, building and sustaining skills and commitment throughout a project constitute another (often ignored) integral component of project management.

Think about the people with whom you currently work on your projects. Are you simply a bunch of individuals who just happen to work together at times, in the same physical (or virtual) location? Or are you an active team member, part of a loyal and cohesive team working collaboratively together to achieve common goals? Perhaps you might work alone (either by decree or by choice), with little or no interaction with others.

What a dynamic mix each of the above scenarios presents if you have to manage, or even simply interact with, these people. How can we possibly balance the needs of the individual with the needs of the team, let alone with the over-arching needs of the project? How do you manage competing interests, two or more direct reporting relationships, diversity and disputes, not to mention motivation or power? Perhaps the better question to ask is: What could really be achieved if we built and sustained the team?

Chapter overview

Little gets done without people. Regardless of the language used—activity, task, stuff, work, actions, priorities or projects—human resource intervention will be needed on one level or another. And it will need to begin well before task performance is monitored or project results are achieved.

PMBOK (2013) suggests that human resource management (HRM) includes

the processes that 'organise, manage and lead the project team'. So does it pretty much come down to these three simple words, or is there more to it? Such a succinct sentence gives little, if any, clue to the myriad challenges and opportunities the project organisation, stakeholders, project managers and teams will face throughout the life of the project.

As with the other PMBOK processes, the management of human resources doesn't happen without a plan that captures fundamental information about the people involved in the project, and their roles, responsibilities, skill set, reporting relationships and development needs. Once this information is documented, the project team can be confirmed, along with its members' location, availability, experience, attitude, knowledge, skills and costs—all factors that drove their acquisition by the project.

So the team has been pulled together. Does it stop here, or will the individual and team (developmental) needs warrant some investigation along the lines of competency levels, interaction and the overall team environment? Remember that teams are often illusory: a bunch of people occupying the same floor space doesn't make them a team (perhaps just a crowd). As part of this development, ongoing performance management will be crucial for enabling the team to perform at the level required by the project.

Planning for human resource management

Much of the emphasis in this book so far has been on the scope, schedule and cost baselines, and their interaction with other project management processes. While this emphasis is justified, no project can enjoy any measure of success without the application and commitment of the project's human resources (on either a full-time, part-time or contract basis).

The best-laid project plans will quickly and comprehensively be derailed, if not destroyed, by resources that lack the energy, drive, focus and commitment to achieve the project's output and outcomes. With the 'wrong' resources doing the 'right' work, the project will invariably be challenged—or worse, fail. And that failure will not occur overnight: it may be gradual or even invisible. There may be early warning signs (often missed, misread or mismanaged), followed by alarming danger signs, followed not too long afterwards by impending disaster that will seriously challenge even the best project managers.

While theory will suggest that these team members are actively involved in the project's planning and decision-making activities, a strategy is required to

prevent the project becoming 'damaged' by the escalation of these resource issues—be they about performance, personality or relationships. To keep the project team on track, the project manager needs to build courage, commitment and performance throughout the project's life-cycle—from idea to completion.

The HRM plan establishes the baseline for identifying the prerequisite resource needs (and necessary skills) for the project's success. In an operational climate characterised by different shades of competing priorities, functional manager reporting lines, downsizing, restructuring, job-sharing, outsourcing and contracting, the resource landscape has become increasingly competitive as resources are performing multiple roles in their operational positions (and only getting paid for one), well before they get acquired by the project. A well thought-out resource management plan could contain the following information:

- internal or external acquisition strategy
- roles and responsibilities
- reporting relationships
- acquisition and release timetables
- identification of professional development needs
- team-building strategies
- plans for recognition and rewards
- geographical location
- resource calendars
- performance management procedures
- work, health and safety issues
- dual reporting relationships (project and operations)
- communication protocols
- organisational structure and culture
- standard operating administrative procedures
- escalation procedures for resolving issues.

There is a wide-ranging array of generic tools and techniques useful for putting together the resource plan (many of which you will already be familiar with, although some perhaps not), including the following examples of text-based information and graphical formats:

- organisational chart
- stakeholder responsibility matrix
- position (role) description
- responsibility assignment matrix

- training register
- personnel files
- contractor agreement
- performance reviews
- application forms
- social media
- résumés
- aptitude tests
- psychological tests
- behavioural interviews
- reference checks
- employment contracts
- organisational standard processes
- lessons learned log.

Resource scarcity is becoming increasingly common as a finite number of resources are tasked to perform multiple, competing priorities—operational and project work. Add to this the increasing expectations that clients have towards the project's objectives being met—in scope, on schedule and within budget—and it is evident that resource planning can never be an ad hoc activity. It remains fundamental to the project's planning, implementation and finalisation stages as it endeavours to constantly match the right skill set with the right activity in the changing landscape of the project life-cycle.

Critical reflection 8.1

Getting resources on board your project involves much more than finding out who has what skill, who is available and what it will cost.

- Review what process your project has used to resource the project: direct appointment or some merit-based system.
- Does this always result in getting the best people for the required work?
- Do you think the PMBOK resource management planning process is something you could create and implement in your projects for baselining their prerequisite resource needs?

Acquiring the multi-generational project team

In acquiring the right resources at the right time to be a successful team in

delivering the project's objectives, the project organisation and management need to assess their level of control and influence over the resources they require in the team. With operational priorities and reporting relationships driving the daily availability of nominated resources, collective bargaining agreements, subcontractor arrangements and other nuances of the modern workplace, a number of factors will need to be considered and planned for in the early stages of the project (and controlled in the later stages). These could include the following (adapted from PMBOK, 2013):

■ negotiating with operational managers to release or share resources for the project (this may also involve allocating a percentage of their time and cost)
■ investigating prevailing market conditions for availability and commercial rates for contractors
■ reviewing preferred supplier arrangements should these resources be used again
■ communicating potential consequences to stakeholders for failing to acquire the necessary resources (this may include scope, schedule, cost, risk and quality variations impacting client acceptance, project success and/or outright cancellation)
■ evaluating potential resources against the ambit of legal, regulatory, mandatory and/or other specific criteria covering their assignment
■ considering the professional development plans for the nominated resources and how this time and cost will be addressed by the project budget
■ factoring in the challenges of managing resources collocated in multiple locations, each with different time zones and communication protocols
■ determining how performance throughout the project will be measured and evaluated
■ reflecting on the manager's ability to manage a group of diverse resources brought together for a finite time span.

The issue of diverse resources is paramount. With the project resource pool spanning the Traditionalists ('silent generation'), Baby Boomers ('Wrinklies'), Generation X, Generation Y and Generation Z (or 'Next' or 'Millennial'), managing diverse project teams involves working with resources that are both diverse and ageing. With the majority of workers now 45 years and older, organisations need to hire, train and retrain people, while also retaining older workers (Cole 2010). With more than mere muscle tone and wrinkles fuelling the generational gap, the marked attitudinal differences between these generations often create potential problems in understanding each other

(different attitudes, expectations, beliefs, motivation and skill sets), in dealing with issues and conflicts constructively, and in appropriate responses to behavioural performance problems as they arise. As Cole (2010) suggests, 'The better you understand the combination of factors that motivates and drives each generation, the better you can lead them.'

Let's review three of these generations, looking for ways in which the project organisation and project manager can bring together (and manage) a resource pool that develops courage, commitment and performance. Table 8.1 summaries some of the key characteristics for each generation, drawn from Cole (2010) and Kane (adapted from online resources).

With such a diverse multi-generational pool of resources, along with the flexibility of working conditions of the modern era (full-time, part-time and contract positions), project managers will need to ensure that everyone is task-ready to carry out their allocated activities. The following suggestions might help to get the best out of everyone involved:

- Demonstrate empathy (where you genuinely can—this should never be faked).
- Encourage continuous, open and honest feedback.
- Give everyone an opportunity to 'shine' in what they are good at.
- Identify what the common ground is.
- Praise the effort, not just the result.
- Avoid rushing in to rescue.
- Don't over-stimulate, as boredom often leads to imagination.

Table 8.1 The multi-generational project team

Baby Boomers (1946–64)	Generation X (1965–80)	Generation Y (1981–95)
Live to work	Work to live	Work–life balance
Focused on position and prestige	Dislike routine	Respond to a sense of purpose and achievement
Defined by professional accomplishments	Well educated	Enjoy working with supportive management
Critical of gen X and gen Y work ethic	Independent, resourceful and self-sufficient	High positive self-belief

Confident, self-reliant	Value freedom and responsibility	Expectations of continuous and positive feedback
Strive to make a difference	Casual disdain for authority	Avoid following the traditional chain of command
Competitive in the workplace	Detest structured work hours	Excellent grasp of technology platforms
Believe in hierarchical structure, rank and power	Prefer hands-off management style	High education completion rate
Practise 'face time' in the office	Comfortable with technology	Comfortable with change
Well established in their careers	Willing to change jobs for career advancement	Drivers of innovation
Loyal and cynical	Ambitious and eager to learn	Peer acceptance and recognition is important
Independent	Enjoy fun in the workplace	Socially conscious and environmentally aware
Not afraid of confrontation	Not intimidated by authority	Value corporate social responsibility
Resourceful and clever	Free agents	Sense of entitlement

- Develop capacity, not dependency.
- Provide an environment where continual learning is encouraged.
- Provide choices and pathways.
- If mistakes are not terminal, focus on the lessons learned.
- Focus on the project's objectives (output and outcomes).
- Call for volunteers (where you can, as opposed to always allocating jobs).
- Be aware of personal differences.
- Focus on skills, not age.
- Develop appropriate recognition and reward programs.
- Facilitate meet and greet sessions (off site).
- Initiate a mentoring program.

Given that a number of key decisions will end up being made around resource capability, availability, experience, cost, attitude and other unique human factors, is this all that is required to bring resources together? Or is resource acquisition only a stepping stone to a bigger challenge—that of developing the project team? With predefined roles, known abilities and scheduled activities, many would think the hard work is over. Think again!

Developing the project team

Henry Ford once said, 'Coming together is a beginning; keeping together is progress; working together is success.' His words provide an enlightened insight into the machinations of teams (and those who pretend to be part of teams). Perhaps the key word in his quotation is 'together', and the reason should be clear. When a group of people first come together under the project umbrella, are they:

■ really a team or a group of individuals occupying the same floor space
■ committed to the team (and the project objectives)
■ able to nominate/elect/support/follow a leader
■ clear about their specific roles
■ ready to share their ideas
■ ready to work together
■ open to constructive feedback
■ prepared to help each other?

The answer is 'possibly not' to many (if not all) of these questions. So what exactly is a team: what does it look like and how does it function? Perhaps the following characteristics (often used to describe a high-performing and conforming team, which is held up as the ideal) can be used as a guide. A team has:

■ clear, communicated and recognised long-term goals
■ clear, communicated and accepted objectives
■ unqualified opportunities for success
■ a tolerance for calculated risk
■ mutual appreciation of members' individual and broad skills
■ defined, communicated and accepted roles

- explicit, discussed and endorsed procedures
- open, honest and continuous communication
- supported leadership
- a commitment to delegation and accountability
- ongoing access to constructive feedback and support
- appropriate, tailored and timely rewards
- opportunities for regular performance reviews.

You may be familiar with terms like 'dead wood', 'oxygen thieves', 'chair warmers' or 'whingers'. Sadly, terms like this can categorise the type (and standard) of human resources engaged in the project—just as easily as 'champions', 'advocates', 'supporters' and 'volunteers' can. In fact, one of the most frequent complaints issued by project managers from in-house projects is that they often cannot hand-pick the team they need, as they invariably inherit the established team or at least the key team members. Best practice would dictate that team members are recruited (either formally or informally) in line with the project's initial objectives, agreed deliverables and ultimate success criteria. The following may serve as a useful guideline. Team members should have:

- the technical competence required to perform the assigned work (or the ability to acquire this competence)
- commitment to the project's goal
- the ability to work with, respect and trust other team members
- demonstrated communication skills, particularly in issuing instructions, conducting meetings, resolving conflicts and writing reports
- the ability to identify key issues, solve problems and implement the solution (while still being a team player)
- the ability to work without constant or ongoing supervision
- experience and knowledge of project methodology
- the availability (time) to give to the project
- the consent of their operational managers (if in-house).

So let's get a positive out of inadvertently categorising resources with potentially unfair or discriminatory labels. Drawing on the DiSC® personality assessment, Cole (2010) suggests that another form of classification may be more appropriate when looking to maximise the different personalities and unique attributes that resources bring to a team environment:

- *conscientious thinkers:* the detailed, checking, accurate, time management type
- *dominant directors:* the focused on the end-game results type
- *interacting socialiser:* the fun, enthusiastic, spirited and energetic type
- *steady relaters:* the patient, willing, reliable and cooperative type.

Regardless of the classification used, the project manager will need to bring out and showcase the differences everyone has, and use those differences to build the team.

Valuing project team diversity

Project teams will consist of unique individuals drawn from a very diverse demographic pool. With these differences will come the need to acknowledge, understand and value these differences in the composition of your project teams, through respecting and harnessing those differences to deliver the project.

However, Gido and Clements (2015) point out that diversity can also generate different outcomes around mistrust, misunderstanding and miscommunication (to cite a few examples), leading to low morale, increased tension, suspicion and distrust, reduced productivity and a growing impediment to team performance. By refusing to embrace diversity through creating a shared sense of belonging and feeling valued, project teams can miss out on the unique ideas, perspectives, experiences and values that people from different ethnic backgrounds can bring to the project.

Valuing diversity creates an inclusive environment, which promotes equality, values diversity and maintains a working (and social) environment in which the rights and dignity of all team members are respected. So what might diversity look like in your project environment? Consider the following suggestions (and feel free to add to this list):

- *Ethnicity:* different cultures may require their members to be tolerant and patient in the customs and behaviours shown by and to immigrants and/or their descendants. Language proficiency may also be a factor.
- *Age:* different age groups bring different experiences, expectations, values and perspectives.
- *Appearance:* facial features, tattoos, weight, jewellery and clothing (as examples) should not cloud assumptions about performance or competence.
- *Gender:* non-discriminatory recruitment practices need to be followed.

- *Sexual orientation:* an inclusive and diverse working environment should be created that encourages a culture of respect and equality for everyone, regardless of their sexual orientation or gender identity.
- *Health:* physical mental and/or behavioural abilities will need to be accommodated and not used to discount real or potential capabilities.
- *Status:* marital and/or parental status should not fuel assumptions about availability or competency.
- *Religion:* religious practices need to be respected and accommodated.

Critical reflection 8.2

It is important that project teams do not exclude or lower their expectations of certain diverse groups, as differences do not imply inferiority or superiority.
- Identify ways in which diversity can be encouraged and actively supported in your project.
- What benefits would this inclusive practice deliver to your project?

Teams and their evolution

It is now time to examine, in some detail, a few of the more common and prevalent 'team issues' (and problems) that can impact on the team's ability to deliver its assigned performance throughout the project. In a project, a number of individuals may come together under a common purpose (ideally) to form a team. Teams do not develop by themselves, though; nor do they remain energised, motivated, committed or 'pumped' by themselves. What does happen is that newly formed teams develop and evolve through a largely predictable cycle or stages of development on the road to maturity.

Tuckman (1965) proposed a model that is still endorsed today. It tracks the development of a team over five predictable stages, with the attainment of each level of development triggering each subsequent level. At each level, there are different characteristics, issues and pressures on the team members that must be managed skilfully by the project manager if the team is ultimately to perform its tasks. Table 8.2 outlines the five stages of team development, the more salient characteristics of each stage and the key tasks the project manager will need to action to ensure the team develops and reaches the required level of maturity (adapted from Cole, 2010; Tuckman, 1965 and others).

These different stages do not just happen—they have to be managed not only by the team leader and/or project manager, but also by all the team members

themselves. Few teams, if any, perform effectively from day one—or overnight —and continue performing. Their evolution must be guided, instructed, coached or even redirected at times. Nor is their (implied) sequential development a given, as the team can fracture at any of the five stages. Should this happen, development will often revert to an earlier stage to enable the issues to be satisfactorily readdressed before development and performance continue, as reflected in Figure 8.1.

In essence, each team member must be a known capability and be made to feel valuable—they must see that they have an important role to play and that they will actively contribute and be involved in the project. Everyone involved will have a significant impact on the whole project—from concept to finalisation —and they may need to be guided, instructed, coached or redirected. While much has been said of the need for the team to evolve into a highly performing and conforming entity, there are disadvantages as well as advantages when using teams on a project (see Table 8.3).

Given the ongoing prevalence of teams and their known disadvantages, here are a number of timely suggestions for improving project team effectiveness:

- Control the loud, the dominant and the opinionated, who often quash the passive, less confident and perhaps inexperienced team members.
- Encourage the quiet and silent members to voice their opinions in a nonthreatening environment.
- Protect the weaker members from ridicule, recrimination and destructive criticism.
- Wherever possible, close on a positive note that recognises achievement, performance or contribution.
- If required, address the most senior people last to limit their input, direction and influence on other (easily led) members.
- Encourage the constant cross-fertilisation of ideas, alternatives and discussions.
- Practise honesty, respect and integrity in all the team pursuits.

Table 8.2 The five stages of team development

Stage	Characteristics	Required actions
Forming	■ A room full of strangers ■ Obligatory introductions (attempts to 'break the ice') ■ Little common understanding	■ Facilitate the 'meet and greet' ■ Build a common goal ■ Understand and moderate

	(ambiguity in both goal and role) ■ Personal feelings are a priority ■ Low or absent group identity ■ Impersonal, polite and careful conversations (caution, anxiety) ■ Tentative relationships (little trust, hidden agendas, initial pecking order) ■ High need for approval ■ Dependent on leadership for structure and guidance	personal expectations ■ Clarify roles and responsibilities ■ Assess and acknowledge individual capability ■ Practise directive leadership for both objective and process
Storming	■ Inevitable and natural conflict (personality, role or leadership clashes) ■ Cliques may form and silos be established ■ Power struggles and 'turf' wars develop ■ Exploration of values, working styles and aims ■ Disillusionment and frustration may surface	■ Practise open communication, where everyone has a valid opinion ■ Enable issues, differences and conflict to be discussed and resolved ■ Re-clarify goals and roles ■ Discuss the project work and project management approach ■ Encourage collaboration
Norming	■ Codes of acceptable behaviour, rules, customs and policies established ■ Work rhythms established ■ Close relationships develop ■ Renewed sense of hope ■ Individual difference accepted and appreciated ■ Trust and openness develops ■ Emerging team identity	■ Encourage forums, workshops and other avenues to share information ■ Create appropriate feedback loops ■ Practise principled negotiation where required ■ Collate and circulate team rules ■ Revisit individual, team and task expectations ■ Discuss the technical decisions involved in

		completing the work
Performing	■ Synergy, creativity and harmony develop ■ Close working relationships (independent, together or other combinations) ■ Balanced productivity (task) and cohesion (process) ■ Continuous improvement and innovation ■ Resolution of internal disputes ■ Strong team spirit (trust, open communication, resourcefulness) ■ High team autonomy and maturity	■ Appraise performance and results against the project plan ■ Recognise and reward success ■ Sustain the close relationships within the team ■ Encourage initiative and innovation ■ Practise delegation where appropriate ■ Ascertain whether the team's efficiency and effectiveness can be improved
Adjourning	■ Project objectives realised ■ Performance is evaluated ■ Achievement is celebrated ■ Impending sense of loss of (team) identity ■ Team disbands and resources are redeployed	■ Ensure all project objectives have been met ■ Celebrate performance and results ■ Reassign resources ■ Document the lessons learned ■ Close out all processes ■ Allow time to mourn
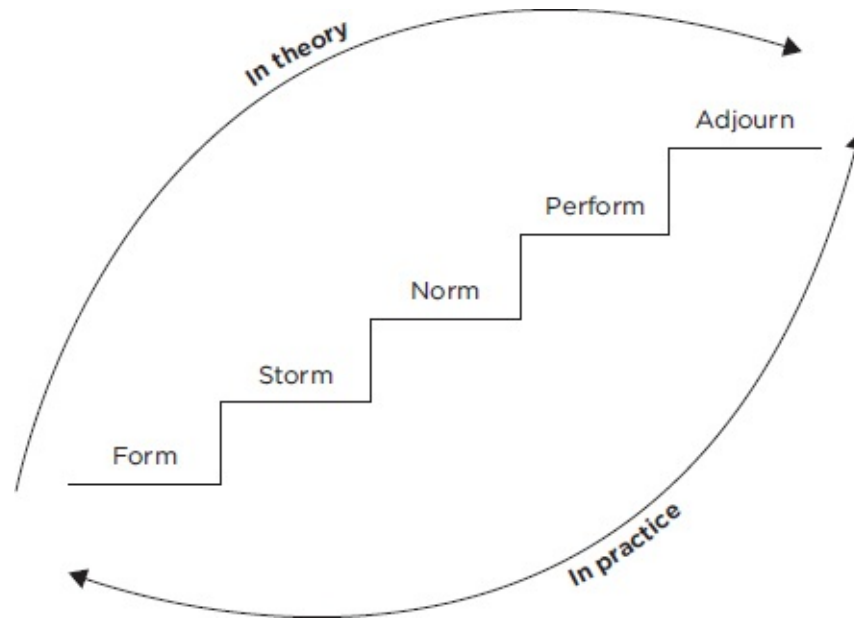
Figure 8.1 Stages of team development

Table 8.3 What teams do and don't deliver

Advantages	Disadvantages
■ Greater knowledge and information sharing	■ Premature decisions
■ Different approaches to the problem	■ Individual domination
■ Increased acceptance of the solutions	■ Conflicting alternative solutions
■ Better comprehension of the decision	■ Prior commitments
■ Opportunities to match people's abilities with those of others	■ Time taken to make decisions
■ The synergy displayed by the individual contributions	■ Time taken to implement the decisions
■ Shared achievement	■ Too many places to hide
■ Cross-fertilisation of ideas	■ Delays in organising and attending meetings
■ Equal sharing of the workload	■ Domination by strong personalities

- ■ Listen attentively (and completely) until you experience another person's point of view.
- ■ Communicate your views assertively, free from guilt and aggression.
- ■ Closely examine your own motives (and those of others) within the team.
- ■ Be committed to resolving conflicts as soon as they have been identified.
- ■ Actively participate in meetings that are well managed and ultimately effective

—that is, an outcome is reached.

Remember that the team members will need to feel a sense of personal achievement, accept responsibility for the work, make their own decisions in their delegated area and feel that their efforts are genuinely appreciated.

While the project manager may well carry much of the responsibility for making this happen on an ongoing basis, Kloppenborg (2015) proposes a dozen ground rules to further facilitate their development, six of which are relationship based and the remaining six process based, as depicted in Table 8.4.

Critical reflection 8.3

It is often stated that teams do not develop naturally; they have to be skilfully designed and executed if they are to perform as required.
- What words (good or bad) would you use to describe your current project team?
- What has led to the team being described in this way, and what impacts does this have on your project?
- What is needed to reinforce or address the behaviour you have noted and what impacts would this have on your project?

Teams and their personalities

A team that works well together will never be a chance event. With the explosion of multi-generational teams, globalisation, the information era, virtual teams and workplace and organisational diversity, the increased interdependence of different work teams, and the uncertainty of team members' respective roles, project managers and team members must work together more effectively to align information and people if team goals are to be achieved. One of the most popular instruments to help team members align themselves is the Myers-Briggs Type Indicator (MBTI®) personality inventory, which describes the valuable differences between normal, healthy people. After more than 40 years of development, it is one of the most widely used psychological tools in the world today. It offers insight into how each person's individual preference can be used to help the team to work more productively to accomplish common goals, and will often explain much of the misunderstanding and miscommunication between people.

Table 8.4 Ground rules

Relationship ground rules

Encourage participation	Being prepared to be both a leader and a follower (at times) and ensuring everyone has, and can use, their voice and their ears.
Discuss openly	Avoid the cone of silence, secret squirrel societies and other rumour- and gossip-promoting devices.
Protect confidentiality	Be aware of sensitive issues and the rights of others, both under legislation and within the team expectations.
Avoid misunderstandings	Active listening and questioning techniques will reduce the likelihood of information being distorted or deleted, and provide the opportunity for everyone to be on the same page.
Develop trust	Trust doesn't develop naturally, so team members must be open, honest and transparent with each other if respect and trust are to be developed and maintained.
Handle conflict	Is it conflict or is it creative discussion, a personal attack or something more destructive? Remain neutral and encourage an exchange of ideas without fear or favour.

Process ground rules

Manage meetings	Have a reason for meeting, and know what the process will be, what has to be covered and what decisions are required.
Establish roles	Everyone needs a role and the necessary delegation of responsibility that goes with the role. A role is much more than just a title, so get the team members talking broadly about their role.
Maintain focus	Projects have a lot going on all the time, so focus, motivation and performance can begin to wane over time. Reaffirm the project objectives, deliverables, methodology and performance against the plan.
Consider alternatives	While no one wants unbridled dissent, putting forward options, alternatives and ideas is a great way to explore different ways of doing things. People contribute and

	feel valued, and authorised changes might be allowed. The sense of ownership this creates is priceless.
Use data	Information exists to be used, not just archived in boxes. Focus on the facts, not the fiction, and communicate how the information was used to make different decisions.
Make decisions	In the absence of decisions, not too much happens. So in order to maintain momentum in both the team and the project itself, timely decisions will need to be made, communicated and perhaps even 'sold' to the team.

Source: adapted from Kloppenborg (2015)

The profile may help to uncover the team members' strengths and unique gifts, their influence on other team members, how each member can contribute to team functioning and their individual ability to maximise team effectiveness. It is also useful as a self-affirming tool, while also enhancing cooperation and productivity (not to mention the way some team members can often annoy and irritate each other). The MBTI reports your preferences on four scales, each consisting of two opposite poles, as depicted in Table 8.5, along with the common characteristics of each type (adapted from Briggs Myers, 1997; Hirsh, 1992).

So how does all this information help with accepting people's unique differences in project teams? See whether you know people who:

- are constantly late, absent, or present but not participating
- are unprepared and don't follow up on tasks
- are direct in dealing with everyone
- are distracted by the lack of immediate results
- complain, whine and negate everything
- interrupt and talk too much
- are overly emotional
- get off the track easily
- lack common sense
- play the devil's advocate
- waste time and talk abstractly.

Table 8.5 MBTI preferences

Focusing your attention

Extroversion (external)	Introversion (internal)
■ Breadth of interests	■ Has depth of interest
■ Speaks first, reflects later	■ Reflects before speaking or acting
■ Social and expressive	■ Private and contained
■ Communicates by talking	■ Prefers written communication
■ Takes the initiative	■ Readily focuses
■ Learns by doing	■ Learns by reflection (mental practice)
■ Enjoys working in groups	■ Enjoys working alone
■ Extends into their environment	■ Defends against external demands
■ Shares thoughts freely	■ Guards thoughts until (almost) perfect

Taking in information

Sensate (practical)	Intuitive (creative)
■ Focus on what is real and actual	■ Focuses on possibilities (what might be)
■ Values practical applications	■ Values imagination and insight
■ Has an interest in facts, concrete information	■ Has an interest in abstract, theoretical concepts
■ Remembers sequentially	■ Sees patterns
■ Lives in the moment	■ Lives in the future
■ Likes step-by-step instructions	■ Prefers to jump around
■ Trusts experience	■ Trusts inspiration
■ Seeks predictability	■ Desires change
■ Sees difficulties as problems to overcome	■ Sees difficulties as an opportunity to explore
■ Follows the agenda	■ Departs from the agenda

Making decisions

Thinking (objective)	Feeling (subjective)
■ Analytical	■ Sympathetic
■ Logical problem-solver	■ Assesses impacts on others
■ Cause–effect reasoning	■ Driven by personal values
■ Tough-minded	■ Soft-hearted
■ Prefers impersonal, objective truth	■ Promotes harmony and compassion
■ Reasonable and fair	■ Accepting
■ Controls expression of feelings	■ Openly expresses feelings

■ Wants things to be logical	■ Wants things to be pleasant
■ Questions first	■ Accepts first

Orientation to your environment	
Judging (logical)	**Perceiving (flexibility)**
■ Scheduled	■ Spontaneous
■ Organised	■ Fluid
■ Systematic	■ Casual
■ Methodical	■ Flexible
■ Likes to plan	■ Adaptable
■ Priority is closure	■ Open to change
■ Avoids last-minute change and stress	■ Energised by last-minute pressure
■ Finishes tasks before deadline	■ Finishes tasks right on deadline
■ Prefers to be conclusive	■ Prefers to be tentative
■ Focuses on results, achievements	■ Focuses on options, openings

What about the great contribution the very same people can make through offering systematic, practical perspectives; creating morale, unity, harmony, energy and excitement; asking questions others don't want to ask; providing ideas and insights; seeking unique possibilities; and being empowering and inspiring? While numerous different 'versions' of the MBTI profile (and other profiling instruments, inventories and tests) are now commercially available, it will still enable all team members to understand:

■ their natural preferences for focusing their energy, gathering information, making decisions and living a certain way
■ their preferred way to respond to team challenges
■ their style of interacting and communicating with others on the team
■ the unique way in which each member makes a distinctive contribution to the team
■ ways of reducing unproductive work
■ areas of strength and possible areas of weakness for the team
■ how to clarify team behaviour
■ how to match specific task assignments with team members according to their preferences
■ how to identify which team members handle conflict better
■ how different perspectives and methods can lead to effective problem-solving.

Finally, Robbins and Finley (1999) propose a version of the ten commandments for working in teams. These have been amended and updated (three have been added) to reflect the changing dynamic behind project teams:

1 Never create a team unless the task requires a team.
2 A team shall have only one primary goal.
3 When the goal is accomplished, the team should disband.
4 Disband the team when policies and procedures for which they were
    responsible have served their purpose.
5 People who do not wish to participate in the team should resign or be removed.
6 All members are leaders who must lead if the leader is not leading.
7 Keep the enemy outside the team.
8 Differences of opinions are to be encouraged.
9 When you break your word, trust will be ten times harder to rebuild.
10 Open up the channels of communication and information.

Critical reflection 8.4

Everyone has a personality. Sadly this doesn't mean we all get on well and appreciate the unique differences each personality offers when we work together.
■ Do some additional research into profiling tools: MBTI, DiSC, Belbin® team Roles and others.
■ What have you learnt about your personality—the bits you like and perhaps the bits you don't?
■ In understanding more about personality, how has your impression of others changed (if at all)?
■ What will an understanding of your own and others' personalities bring to the project team and the
   ultimate success of the project?

Learning and development for teams

The explosion of the internet, the flexibility now required in the workplace and the generational changes in learning have all driven changes to the training and learning environments and to the array of available professional development pathways and delivery modes.

   Now, more than ever, there is a need for resources to be able to learn, unlearn and relearn—and not just the technical knowledge that so often prescribes their position description. The pool of knowledge, skills, insights, experience and information held by the team will need to be tapped into and developed throughout the project. And learning shouldn't be limited to just plugging the gaps, as it should also be about 'strengthening existing skills, identifying

development opportunities and developing people for the future' (Cole 2010).

With learning no longer limited to traditional delivery modes, personal, business, interpersonal or technical skills can now be addressed through any of the following:

- taking on projects
- online learning
- coaching
- webinars
- formal study
- job rotation
- distance learning
- internal courses
- mentoring
- seminars
- private research
- observation
- professional reading
- acting in higher positions
- committee work
- shadowing
- delegated duties
- discussions
- work experience
- special assignments
- on-the-job experience
- peer-assist programs
- professional memberships
- role models
- conferences
- evening classes
- simulations.

Clearly, projects themselves are a form of professional development for many of those involved in them. In some cases, learning opportunities are limited, as it is believed that all the pre-existing operational expertise people possess will automatically be applicable and transferable to the project. To ensure that this learning opportunity is not lost, consider the following questions that could be asked by the project manager:

- How well have I understood the team's skills, knowledge and abilities?
- How have I assisted the team to sustain and develop these?
- How do I allow the team members to practise what they have learned?
- How do I encourage the team member to share what they have learned with others?
- How do I create an environment that enables the team to create and innovate?
- How do I encourage the team members to contribute to their maximum potential?
- How do I model the appropriate behaviour and actions that I want the team to develop?
- How do I demonstrate that I value the team's opinions?
- How do I encourage the team members to learn from their mistakes and to help others learn from theirs?
- How do I regularly assess the team's competence?

Be wary, as training and learning regimes should not always be the default solution (ideal or otherwise) on everyone's 'to do' list. Obviously, a lack of motivation, outdated and inadequate equipment, resource scarcity, personal crisis or resources ill-suited to the role to begin with would not be addressed by enrolling them in a training course.

Managing the project team

The complex nature of the project resource pool requires project managers to effectively manage (and lead) traditional and non-traditional teams—merged, matrix, mixed and virtual teams—along with volunteers, casuals, contractors and part-timers. Effective management requires performance management to align the organisational project goals with the goals of the team members, and conflict management to deliver greater productivity and positive working relationships.

The innate driving force

All human behaviour and performance start with some form of internal detonation called motivation. People act the way they do because they are motivated to do so. However, it is impossible to motivate someone unless they want to be motivated. That is, all motivation is self-motivation and comes from

within. It is an innate driver within each team member that is much like the ignition key on the car—it triggers action, the car starts and performance (safe motoring) follows.

Motivation is the force acting on or within an individual that will cause that person to behave in a specific, goal-directed manner. The motivation that drives a project team will affect their performance and productivity within the project, their ability to achieve the project's deliverables and other related goals. Project managers are held responsible for completing a project; however, a manager alone cannot complete the task—it will require the sustained and committed efforts of the team members. What the manager must do is provide the environment that will allow (and stimulate) the team members to contribute their best efforts to the project. This is the challenge of motivation. Within the team, their collective motivation will:

- energise the team members to complete their scheduled work (on time, on budget, as specified)
- direct the team towards meeting deadlines, milestones and other constraints
- draw the team together cohesively
- enable the team to function in self-directed mode
- allow the team members to self-correct much of their own work.

Everyone has a favourite theory of motivation. Two of the frequently cited examples are Maslow's hierarchy of needs model and Herzberg's motivators and hygiene factors. Both are expanded upon in Table 8.6. Irrespective of which model you embrace, the key learning should be that the project team must work within an environment that allows for motivation. Be it a hierarchy of needs, internal work factors or external factors impacting on the team's satisfaction, the project manager must ensure that all avenues are actively pursued in order to motivate the team.

As organisations continue to restructure, downsize and increase the loading of their resources across both operational priorities and project work, motivation cannot be ignored—regardless of which theory is espoused. Figure 8.2 overlays both theories. Yes, you can buy their time on an hourly basis, but you cannot buy 'their enthusiasm or loyalty, the devotion of their hearts, their minds and souls' (Cole 2010). It is only through motivation that resources will be engaged (and not just satisfied) and productive in the workplace.

Critical reflection 8.5

Everyone these days has a theory about motivation, although I admit my preference for the earlier work of both maslow and Herzberg, both of whom offer practical insights into what our motivations are.
- A simple question to start with: What motivates you in your current project role?
- How do the people to whom you report know this is what actually motivates you?
- Now look at the people you (might) manage and ask yourself the same questions you just answered.
- What is the key to discovering someone's true motivation.
- How difficult is it to match rewards to motivation in every case?

Measuring team performance

Underpinning this management is a formal or informal process of deliberate and systematic measurement, assessment and feedback aimed at building performance, motivation and work satisfaction—in other words, a conversation discussing performance, and potential and professional development opportunities. By encouraging frank, open and honest discussion, realistic expectations can be negotiated, questions answered, doubts resolved and a pathway for continued learning and development agreed to.

With the focus on developing and sustaining peak performance, team performance assessments 'are expected to increase the team's performance, which increases the likelihood of meeting project objectives' (PMBOK, 2013). While project performance could be assessed against any number of traditional organisational performance criteria (key performance indicators), within the project context these should be extended to include a number of results-oriented and agreed upon criteria, including:

- performance against the objectives
- performance against the schedule
- performance against the budget
- performance against the scope.

Table 8.6 Theories of motivation

Maslow	This model suggests that motivation exists on five different levels, with each level being a prerequisite for the next—that is, a bottom-up hierarchy of needs in which the lower level needs must be satisfied before the higher level needs. There are five different categories of needs that all individuals seek to satisfy. These are (starting at the bottom and with a few examples): 1 physiological (e.g. air, water, sex)

2 safety (e.g. shelter, clothing)
3 social (e.g. interactions, memberships)
4 self-esteem (e.g. ego, self-worth)
5 self-actualisation (e.g. autonomy, independence).

Herzberg	This model examines the relationship between job satisfaction and productivity. It claims that some job factors lead to satisfaction (and increased productivity), while others can only prevent dissatisfaction (and lower productivity). It also argues that job satisfaction and dissatisfaction do not exist on a single continuum—that is, it is possible to be satisfied and dissatisfied at the same time. The model pivots around two central categories.

Hygiene relates to factors external to the job or work, which parallel maslow's lower level needs (physiological, safety, social):
- company policies
- administration processes and procedures
- remuneration and other benefits
- working conditions
- interpersonal work relationships.

Motivators relate to internal factors directly associated with the job itself, which parallel maslow's higher level needs (esteem and self-actualisation):
- the nature of the work itself
- acting in another capacity
- challenging work
- recognition
- feedback
- advancement
- acknowledgement
- work variety
- responsibility.
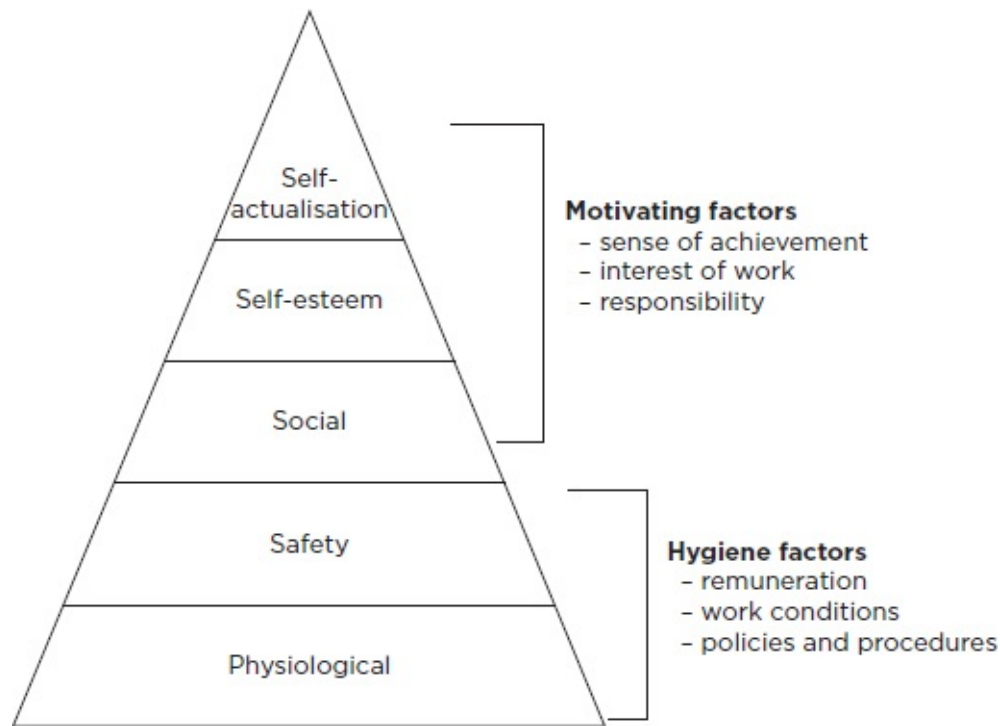
Figure 8.2 Overlaying maslow's and Herzberg's theories of motivation

With some projects having a short life-cycle, the opportunity for the project manager to conduct a performance review is often not viable. In these cases, the operational manager must be made aware of the performance and development of staff throughout the project. Equally, on longer projects, project managers may not think that such a review is necessary, or even part of their own position description—so again the opportunity is lost, with everyone relying on the operational manager's prescribed responsibility to conduct the performance assessment and review.

Research has confirmed two significant trends regarding project-based work and performance. First, there is a clear move from functional-based work to project-based work in organisational contexts (Baker 2013). In practical terms, this means that managers are more inclined to organise work around cross-functional projects rather than functions. This shift has resulted in matrix organisational structures. Project capabilities are therefore becoming more valued in the workplace.

The second conclusion is that performance management is being perceived as an ongoing process rather than being considered a once- or twice-a-year event. In other words, the performance appraisal is under critical review and is not valued to the same extent as it was in the twentieth century. This means that performance management ought to be a seamless process based on a series of

short, focused conversations. Managing performance has moved from an evaluative process to one of employee development.

Consequently, with more project-based work and a shift to a developmental approach to performance management, project leaders need to put structured performance systems and processes in place. In practical terms, this means people's project performance is an ongoing concern and not an episode conducted at the conclusion of the project. This implies that project leaders should be skilled in initiating timely and constructive dialogue with project members and stakeholders about performance. These performance conversations are often neglected in order to meet ambitious project management milestones.

There are numerous definitions out there for what performance management is and is not. In the context of project-based work, performance management is a process for establishing a shared understanding about what is to be achieved in the project. It is about aligning the project objectives with the project members' agreed measures, skills, competency requirements and development plans, and with the delivery of results. The emphasis is on improvement, learning and development in order to achieve the overall project strategy and to create a high level of performance.

Baker (2013) proposes a new approach to performance management, referred to as the five conversations framework. The framework is based on five conversations over the course of five months between the project manager and their staff. This framework is outlined in Table 8.7.

Each conversation, lasting no more than 15 minutes, has relevance for project work. The *climate review* conversation can provide a temperature gauge for where project members are at and any remedial action that can be taken to improve satisfaction, morale and/or communication. Project managers can utilise the *strengths and talents* conversation to determine the extent to which peoples' skills are best being utilised in the context of the current project. Conversations on *opportunities for growth* can consider areas that need developing. The *learning and development* conversation considers ways and means of assisting project members to capitalise on their talents and overcome their limitations. *Innovation and continuous improvement* conversations are designed to bring to the surface ideas for enhancing the project and all its components. Together, the five conversations are an effective performance-development methodology for project managers.

Table 8.7 The five conversations framework

Date	Topic	Content	Key questions

Month 1	Climate review	Job satisfaction, morale and communication	■ How would you rate your current job satisfaction? ■ How would you rate morale? ■ How would you rate communication?
Month 2	Strengths and talents	Effectively deploying strengths and talents	■ What are your strengths and talents? ■ How can these strengths and talents be used in your current and future roles in the organisation?
Month 3	Opportunities for growth	Improving performance and standards	■ Where are there opportunities for improved performance? ■ How can I assist you to improve your performance?
Month 4	Learning and development	Support and growth	■ What skills would you like to learn? ■ What learning opportunities would you like to undertake?
Month 5	Innovation and continuous improvement	Ways and means to improve the efficiency and effectiveness of the business	■ What is one way you could improve your own working efficiency?

Source: Baker (2013).

How hard can it be to have a conversation with a team member—to show an interest in their past performance, to provide constructive feedback that enables and empowers improvement and to discuss their aspirations? Is it the appraisal system (paper based or electronic) that lets everyone down? Is it the lack of management training in conducting appraisals that leads to cynicism and mutual indifference, or is it the cumbersome and time-consuming process that ticks over every six or twelve months that creates visible resentment, distrust and criticism? Perhaps it is the perceived judgemental nature of the process?

There are numerous performance management techniques available, some of which are previewed in Table 8.8. Review the list and feel free to experiment with the ones you are least aware of, or are least confident in, and take them for a 'test drive'. And remember, each technique can play a part in improving understanding, trust, commitment and communications among management and team members, and can facilitate more productive teams throughout the project (PMBOK, 2013).

Remember that performance appraisal is carried out to provide feedback (constructive information) that will identify specific training, coaching, mentoring, assistance or changes required to improve the team's performance— be that through personal skill development or increased team cohesion, leading to improved overall project performance (PMBOK, 2013).

Reinforcing the performance

Another related topic is rewards. Someone once said, 'What gets measured and rewarded gets done'. Think about your project teams and the reinforcement and/or rewards they receive for performance. The following questions may help you to evaluate the suitability of your rewards:

■ Do people value the rewards (are they worth the effort)?
■ Is there equity in the rewards across the team?
■ How competitive are they?

- Do the team members want them?
- Have you asked the team members how they would like to be rewarded?
- Are the right people being rewarded for the right reasons?
- Have you considered that some good team members may be made to feel worse as a result of others receiving rewards?
- Is the reward a 'one off', or is it a regular occurrence?
- Are the rewards demonstrating 'lazy management'?
- Are the rewards conditional on performance, or are they a regular management practice?
- Are the rewards handed out in a timely manner driven by task achievement, or do they exist for management's convenience?
- Are you rewarding success based on ability, effort, strategy, luck or task difficulty?

Table 8.8 Popular performance-management techniques

Technique	Purpose
Structured interviews	Formal interviews with team members responding to the questions asked
Critical incidents	A record of both positive and negative important (critical) incidents during the review period
Written essays	Writing a couple of paragraphs detailing each team member's behaviours and skills
Rating scales	Defined scales for each job-related skill, enabling quick comparisons between team members
Peer review	Team members review each other's performance against key criteria
360-degree feedback	Multi-rater anonymous feedback from people working with the team member
Balanced scorecard	A rating against a list of values, attributes and qualities deemed critical to success

In some cases, reinforcement is not an automatic consideration, as the emphasis lies solely on taking corrective action through exception reporting. While performance deviations must be addressed, they cannot be focused on in isolation from other compliant performance. Nor does every deviation need

corrective action. For the project manager to build and sustain team performance, they must learn (and learn quickly) how to balance both corrective action and reinforcement.

Critical reflection 8.6

Performance in a project is a given, isn't it? So why measure and manage it? Don't operational managers do that sort of thing?
- Do projects require some form of performance management process? If so, why?
- What could explain the different level of performance someone displays throughout a project as distinct from their everyday role?
- How could you ensure that project performance is incorporated into any operational performance-review process?

Conflict management

In business, there will always be issues, complaints, delays, broken promises, false expectations, misinformation and misunderstandings. These will generate problems and complaints—some valid, some not. Some might get resolved, and some might not. Projects are no different. In every project, given stakeholder diversity and changing expectations, there is so much potential for conflict that many would suggest it is a growth industry. Conflict can arise from a multitude of issues, including:

- working under extreme pressure to meet deadlines
- mismatched task and skill sets
- personality clashes within the team and/or with stakeholders
- conflicting operational work priorities
- performance issues within the team
- feelings of role insecurity
- degree of involvement in decision-making
- changes to the project's scope
- reporting to two or more managers/supervisors
- disagreements over alternative solutions proposed and/or actioned
- degrees of delegation and autonomy
- different expectations, needs and/or objectives not communicated and clarified
- hidden agendas, self-interest and dishonesty (don't forget these!).

Given the apparent popularity of conflict, should it be ignored? Should it be avoided at all costs? Should it be viewed as a destructive force paralysing the project's outcomes or recognised as a way to constructively encourage and manage diversity? The answer is all of the above, because conflict can have both a negative and positive (yes, it is possible) outcome, depending on how it is handled.

For example, consider the following examples of positive outcomes:

- exploration of new ideas
- consideration of other people's perspectives
- adjustments, fine-tuning or modifications made
- clarification of different positions and interests
- postponed decisions (yes, this can be *very* positive)
- time to reconsider, clarify and communicate a proposal to those yet to support it.

Of course, there are negative (and traditional) outcomes arising from conflict, including:

- the breakdown in communication between project stakeholders
- increased hostility among all parties
- the cessation of work on the project
- legal action taken for contract breaches
- project personnel being replaced.

With so many opportunities for conflict during a project, a number of different and popular approaches have been developed over the years to enable conflict to be managed—if not resolved. These are illustrated in Figure 8.3 using a two-dimensional chart displaying a scale of 'assertiveness' orientation (an interest in your own outcome) on one axis and a scale of 'cooperation' orientation (an interest in the other person's outcome) on the other.

Each of these five approaches, strategies or styles offers something different for resolving conflicts and disputes, as well as for negotiations. Using quadrant analysis, the model reflects individual behaviour in conflict situations measured across two dimensions: assertiveness (the degree to which individuals try to pursue and satisfy their own interests); and cooperation (the degree to which individuals try to pursue and satisfy the other person's interests). At one end of the scale, you assert yourself as you compete (some would suggest force) and hold out for what you know is right (or what it is you want) with little, if any,

regard for the other party involved. In other cases, your position might be more collaborative, taking both your and the other person's positions into account with a plan to work together.

At different times, the best style may be to not engage and effectively avoid the whole issue—being neither assertive nor cooperative. And herein lies the key to addressing conflict, issues, disputes and disagreements: there is no one 'right' style that will work in every instance, and nor should there be, as there will always be a number of variables (e.g. time, priority, opinions, criticality of the agreement, evidence, positional power or ego) at play whenever two or more people disagree over something.
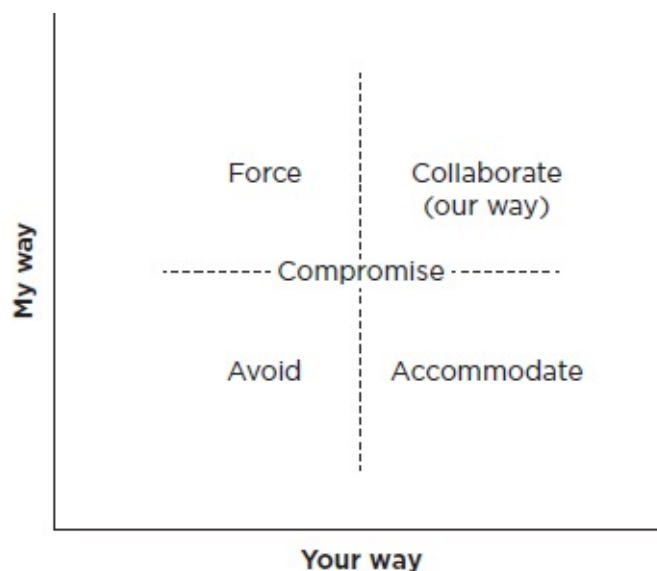
Figure 8.3 Choosing the 'right' conflict-management style

Now, in greater detail and with examples of when each strategy might be effective, the five strategies are: avoid/withdraw; accommodate/smooth; force/compete; problem-solve/collaborate; and compromise/reconcile.

Avoid/withdraw strategies (low assertion, low cooperation)

This strategy is neither assertive nor cooperative. No attempt is made to address the conflict at all, be it your own goals or the other person's (also known as a lose–lose situation). An avoidance strategy may be effective when:

■ you cannot possibly win

- the issue is relatively minor or trivial
- it will be resolved by others
- confronting the other party may result in more damage than resolution
- a time-out is needed to allow everyone to disengage
- there is an inequitable balance of power
- more time is needed to prepare.

Accommodate/smooth style (low assertion, high cooperation)

This strategy is unassertive and cooperative. Here, the other person's point of view is considered more important than your own (also known as a lose–win situation). An accommodating strategy may be effective when:

- the other person's evidence is more compelling
- peace, goodwill and harmony are more important to the valued relationship
- you want to create a tactical advantage by offering a concession
- you acknowledge the weakness in your own position
- you wish to avoid damaging the relationship further
- emphasising common ground is more important than differences.

Force/compete style (high assertion, low cooperation)

This strategy is assertive and uncooperative. In this case, power and dominance will be often used to gain compliance to your own perspective from the 'losing' side (also known as a win–lose situation). A competing strategy may be effective when:

- you know you are right
- the stakes are too high if you lose (failure is not an option)
- quick and decisive action is required
- unpopular decisions have to be made
- a show of force is required.

Problem-solve/collaborate style (high assertion, high cooperation)

This strategy is assertive and cooperative. Mutual and optimal outcomes are

sought by both parties (also known as a win–win situation). A collaboration strategy may be effective when:

■ you want to build an alliance and relationship
■ you need the enduring commitment from the other party
■ you want to encourage, investigate and consolidate different perspectives
■ your solution is largely governed by the other party getting their solution too
■ you need an optimal outcome without sacrificing your own
■ multiple viewpoints must be considered
■ time is needed for open dialogue.

Compromise/reconcile style (mid assertion, mid cooperation)

This strategy combines both assertiveness and cooperation, although to a moderate or intermediate degree. Here, a mutually acceptable outcome is reached that partially satisfies both parties through each sacrificing some personal goals and issues. A compromising strategy may be effective when:

■ the outcomes are only moderately important to each party
■ no other option is working
■ the balance of power is evenly balanced
■ a gesture of 'moving forward' is required
■ a decision (however temporary and/or expedited) is required
■ temporary or partial resolution is acceptable.

As project manager, you will need to develop all these approaches, strategies and styles (and be able to recognise them in the hands of others) if you are going to resolve diversity, conflict and disagreements with all project team members and stakeholders. To achieve this, you will need to take into account possible anger (and the opportunity to vent that anger), burning emotional calories, frustration, irritation, upset, complaints, irrational discussions, and perhaps little or no satisfaction. Let's not forget that these same people also want someone to understand how they feel and to try to fix their disputes and problems immediately. Perhaps the following suggestion might help to lower the temperature—particularly when the emotions are running hot. Try substituting the term 'conflict' with less emotive or prejudicial (and somewhat more positive) terms like 'misunderstanding', 'encounter', 'variance', 'confusion', 'divergence' or 'discussion'. (Yes, they are just different words, but they also don't carry the

same emotion, positional power, vested interests or a winner–loser tag.)

So what is the best way to deal with people in conflict? Here are some guidelines (but remember, every person, situation, vested interest and desired outcome will be different):

- Take responsibility and ownership yourself—now (do not pass the problem on to someone else).
- Totally focus on the person and 'actually' listen (non-defensively, with your mind, not just your ears) to their issue.
- Demonstrate your understanding of their issue by paraphrasing it back to them (repeating it in your own words). Make sure they have identified the real problem, and not just the symptoms.
- Examine both the stated position (what you do hear) and the unstated position (what you don't hear).
- Be up front, honest and caring by apologising to the person for what has happened.
- Use empathy to acknowledge their feelings and emotions with respect and diplomacy.
- Outline the course of action you think will solve the problem (and be prepared to involve the person in this discussion).
- Seek their agreement in the proposed solution (if you fail to do this, you really do not have any solution that will be effective).
- Sincerely thank them for bringing the information to your attention (even if this one really hurts).

Critical reflection 8.7

Conflict is such a big topic. Not only can the word itself be modified to help manage conflict; this book offers some popular strategies on how to deal with all forms of conflict—both positive and negative.
- Think about why conflict needs different strategies to respond with, and why one size doesn't fit every conflict situation.
- Identify what your default conflict management style is (and why you favour this) and your least preferred style (and again, why).
- What can positive conflict bring to your projects and how can it be encouraged?
- What can negative conflict bring to your projects and how can it be discouraged (over and above the strategies the text suggest)?

Review questions

8.1 Why is HRM planning fundamental to the success of the project?

8.2 What information and decisions must be factored in to acquiring the project team?

8.3 How does the project manager help their team develop throughout the project?

8.4 Should conflict be viewed as a positive force in a project and how should it be dealt with?

8.5 What is the role of the performance review in contributing to peak project performance?

Case study

Trevor was all they had. Old school and trading on past glories with a couple of preferred suppliers (mates really), Trevor was not the ideal choice to manage this renovation project. Project management had changed from being all about technical mastery to now knowing how to manage the delivery of the project—on time, on budget and in scope. Times had changed, but sadly Trevor hadn't.

A qualified carpenter and registered builder, Trevor had always been a 'hands-on' kind of guy, never afraid of getting in and getting the job done, even if it meant doing the work himself. So technically, his work couldn't be faulted—although it was known that he sometimes took unnecessary shortcuts (which had so far not come back to bite him).

However, outside of his limited technical range, Trevor always struggled to engage, influence, direct and manage both his stakeholders and team members, as expected of a competent and practising project manager.

> ❛Trevor always struggled to engage, influence, direct and manage both his stakeholders and team members, as expected of a competent and practising project manager.❜

So leanne, the CEO of aged Care Renovations (his employer), faced a dilemma. Having just won the $800,000 contract to refurbish a residential wing at the local retirement village, she knew this project was politically sensitive, commercially crucial and community conscious, so there could be absolutely no slip-ups. Not only did Trevor need to manage the project, he needed to be the public 'face' of the project. As she sat in her office, leanne was hesitant to act.

Following his appointment and juggling his operational property management role, Trevor was tasked with pulling together his team for this project. With everyone literally drowning under their own operational priorities and direct reports, it proved to be an ongoing nightmare as no one really had the time, nor in some cases the skills, to take on yet another 'conveyor belt' project. However, with a bit of begging and pleading, Trevor pulled together something resembling a team, although it was more likely a bunch of uncommitted conscripts than a productive team.

With no recognised learning and development background (apart from his trade qualifications), Trevor failed to realise the challenge he faced in not only bringing his team together, but also identifying the assistance they would need to get ready to take on this project. While he had enrolled in different training courses over the years, Trevor's stock-standard response to any training was that he knew everything and the trainer was an idiot who couldn't teach him anything. Yes, Trevor certainly wasn't the perfect role model for his team.

With marginal social skills, Trevor knew he would struggle with getting to know his team on both a personal and professional level (though he would never admit this). He didn't really understand any of this new age 'psycho-babble' around personality profiles, team roles and other profiling psychometric tools, and couldn't have cared less about getting his team to play off each other's strengths and weaknesses.

Trevor also realised that, given the real operational and project conflicts under which his team would be working, he would have to work hard to motivate, if not reward, his team (where appropriate) through some form of performance-review process. Privately, Trevor had no idea what any of this meant or involved, as in his day you were lucky to have a job, and performance was expected if you wanted to keep your job, no matter what level it was.

As Leanne reflected on Trevor's appointment, she realised that her own reputation and that of the company was at stake.

Questions

1 What behaviours do you think Trevor has to change and model to be an effective project manager?
2 Could an HRM plan have helped Trevor to manage, if not mitigate, the human resource issues he knew the project faced? If so, how?
3 What steps could Trevor have taken to develop his human resources (over time) into a highly conforming and performing team?
4 How could Trevor accommodate the different personalities on his team to enable them to maximise the team's effectiveness?
5 How could Trevor identify the learning and development needs of his team to ensure they each had the prerequisite skills and knowledge to perform their project work?
6 What performance-management techniques would you recommend that Trevor adopt in measuring his team's performance?

Communications management

Matching intent with outcome

Key points

- What to include in a communications management plan
- The reality and challenges in communication
- Barriers to project management communication
- Common project communication tools
- The project meeting: effective or not?
- The importance of kick-off and kick-out meetings
- True measures of project performance (progress, status and forecast)
- Controlling project communications

In practice

Communication, as a 'soft' skill, is often taken for granted by most people who specialise in it—in other words, all of us. We talk, we write, we wave our arms around, and therefore we communicate both efficiently and effectively. Simplistic, yes; totally plausible, perhaps not.

Consider for one moment how you are communicating right at this moment as you read this page. How are you dressed? Are you seated, lying down or walking back and forth? Are you highlighting sections when you find a 'bit of gold', or are you interrogating this book with questions and disagreements (hopefully not the latter)? No matter what you do at any point in time, we are always communicating by using verbal, vocal or visual cues, full of both intent from the sender and outcome for the receiver.

Sometimes when we communicate, understanding and action go hand in hand. At other times, confusion, disputes and inaction might be the output. Nor should it surprise you to read that projects are not exempt from these communication realities. In fact, projects offer fertile ground for frank, honest, complete and concise communication if all stakeholder expectations are to be identified, assessed, agreed and communicated throughout the project.

After all, projects are littered with all sorts of planning, meetings, approval and reporting documentation that, at least in theory, targets particular stakeholder needs. Charters, plans, gantt charts, change requests, progress reports and handover checklists are all capable of capturing, analysing and communicating the true performance information on the project's progress, status and future. But the real question is: How well do they accurately and consistently capture, analyse and communicate?

Chapter overview

Communication is often taken for granted by us all. Yet, like any other process in project management, communication between all stakeholders, regardless of importance, position or input, must be managed if it is to be both efficient (doing things right) and effective (doing the right things). Are we fully equipped to manage these changing stakeholder expectations throughout the project? Do we have the 'stage-specific' tools to communicate effectively with each stakeholder throughout the project life-cycle? How do you communicate a sense of direction, excitement, urgency, commitment and enthusiasm? How can you communicate

the tradeoffs required to the relevant stakeholders when pressure is applied to the project?

PMBOK (2013) defines project communications management as the processes required 'to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and the ultimate disposition of project information'. Communication processes create a bridge across which each stakeholder packs their car with different backgrounds, expectations, expertise, perspectives and interests, then travels back and forth, interacting with the project's objectives, delivery and ultimate success.

Despite the long definition, PMBOK has thankfully narrowed the processes down to just three: plan communications management, manage communications and control communications—with the emphasis clearly on the project manager communicating with team members and other project stakeholders.

Planning communications management

With anywhere from 75–90 per cent of a project manager's time spent communicating in any one or more of the four given communications modes (writing, reading, talking and listening), it is little wonder that communication is the organising force of any organisation in setting the scene for both productive work and relationships alike (Cole 2010). Despite this glowing endorsement, poor communication continues to frustrate and undermine the workplace in its different guises as problems, issues and misunderstandings.

Everyone communicates, every day and every minute. Some do it publicly and explicitly, others more privately and implicitly. Some achieve it with aggression, others through passive means. For some, it is verbal through the use of their words, speech and perhaps presentations; others rely on written reports and the like; while still others choose non-verbal means to communicate (e.g. how they dress, the gestures they use). Even silence is a powerful non-verbal means of communicating. Irrespective of which methods are adopted by the communication stakeholders (let's call them the sender and the receiver), each method will always result in communication (effective or not) taking place, as Figure 9.1 reveals.

The questions to ask are: What is communication? Is it effective communication? Will it lead to the desired actions being taken? Herein lies the true meaning of effective communication: the process by which the desired actions of the sender are performed by the receiver. In other words,

communication is all about intent and outcome. Given that up to 93 per cent of our verbal communication is mostly impromptu, any time for advanced forethought and planning for what has to be communicated is essentially forfeited by the project manager.

There is a need for a communications management plan for the project. And developing an appropriate approach and plan to communicate effectively and efficiently with project stakeholders is what should drive these planning processes and activities. To be honest, the approach requires a high degree of selfishness and editorial control in order to provide only the information that is needed by any particular stakeholder at any particular time. Yes, project stakeholders need to constantly share information; however, there are a number of examples of less than constructive communication overload in which many projects find themselves immersed, including:
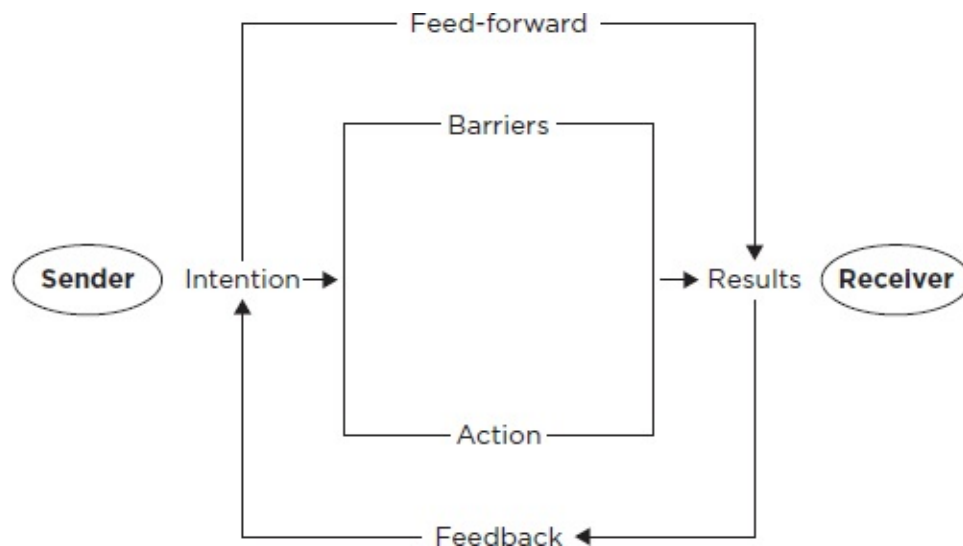
Figure 9.1 The communication process

- an inbox full of meaningless and irrelevant emails
- reports no one will pick-up, read or act upon
- redundant conversations with people who don't matter
- out-of-date schedules failing to account for the latest revisions
- updates not getting circulated
- mind-numbing presentations
- delays in delivering the message
- the wrong people receiving the information
- insufficient information being issued
- ambiguity in the message itself

- missing information on change requests and approvals
- poorly attended meetings that produce little (except hot air).

The project manager must ensure that information is provided 'in the right format, at the right time, to the right audience and with the right impact' (PMBOK, 2013). This can present quite a challenge, as information needs and dissemination methods will vary from project to project, and from stakeholder to stakeholder. Despite this, any of the following should be taken into account when developing the communications plan:

- What information is needed?
- Why is it needed and what decisions might it trigger?
- What level of detail is required?
- Who is authorised to access this information?
- How will internal and external information needs be treated?
- When will the information be needed?
- What urgency is placed on the information?
- In what format will the information be stored?
- What medium will be used to convey the information?
- Who will receive the information?
- How will sensitive and confidential information be communicated?
- How will the information be shared?
- How frequently will the information be needed?
- What other considerations need to be taken into account (language, culture, time zones, etc.)?

Finally, having sought answers to these (and other) questions, a proper communications plan can be developed outlining exactly how the project communications will be planned, structured, monitored and controlled (PMBOK, 2013). So what can you expect to find in one? Work through the following suggestions and, as usual, add your own (project-specific) ideas:

- an extensive glossary of terms
- protocols for creating, securing, distributing and storing information
- stakeholders involved in receiving the information
- methods used to keep stakeholders informed and up to date
- any communication constraints governed by legislation regulations or organisational policies
- escalation steps to deal with issues

- team members authorised to release information
- nomination of specific document requirements.

Managing project communications

So a plan is in place. No doubt all communications will now function perfectly.

Back to reality. By now, you should be getting a feeling that communication can be difficult between two or more people. In fact, the more people involved, the more difficult communication can become. Any number of factors can contribute to this: individual perspectives, language and vocabulary, status (seniority always has the best memory of what was said), self-image, message complexity and cultural factors, along with personal perceptions and prejudice.

Recall from earlier in the chapter that PMBOK (2013) defines project communications management as the processes required 'to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring and the ultimate disposition of project information'. The intent behind this definition is that relevant, timely and accurate information is appropriately generated, is confirmed upon receipt and, most importantly, is fully understood. Cole (2010) advocates a clever continuum of the four Fs in analysing and thinking information through (along with some valuable tips for separating the four):

- *Fact:* indisputable and objective truth accepted by everyone—present only factual information that can be independently verified.
- *Fantasy:* someone's opinion or interpretation—acknowledge that it is only an opinion that is being stated.
- *Folklore:* rumour, gossip or hearsay—don't get caught up or feed the rumour mill (some people will make up what they don't know).
- *Feelings:* intuition, ego or emotion—allow time for feelings to be expressed without judgement.

Clearly, there will be opportunities to seek further information—be that clarification or justification through any formal or informal channels, including:

- scheduled meetings
- written reports
- discussion forums

- journals and articles
- presentations
- voice-mail
- email
- impromptu meetings
- hard-copy documents
- web publishing

More specifically, in a project management environment, poor communication will often be a very real barrier, preventing stakeholders from identifying, clarifying and resolving issues throughout the life-cycle. Table 9.1 captures some of these barriers.

Whichever project life-cycle you endorse (be it my four-stage model or any other one), the opportunities, challenges and most certainly the pressures present at each stage should dictate the communication strategy or tools used. So the need to communicate is obvious, as is the notion that communication works best when you work at communication. However, what tools are available to the project stakeholders? Table 9.2 illustrates some of the more common communication methods historically used throughout the project, stage by stage. Take a moment to review these, reflecting on whether or not your project team has access to all of these and whether or not the team is using them in the 'right' stage'. Also consider whether they are efficient (timely, cost-effective, etc.) and/or effective (produce outcomes, decisions taken, etc.).

Table 9.1 Project life-cycle communication barriers

Communication barrier	Concept	Planning	Execution	Finalisation
Lack of client involvement	✓		✓	✓
Lack of meetings	✓	✓	✓	✓
Lack of agreed scope changes		✓	✓	
Poor reporting requirements			✓	
Lack of auditing			✓	✓
Changing project personnel		✓	✓	
Poor documentation	✓	✓	✓	✓
Ambiguous terminology	✓	✓	✓	✓
Frequent scope changes		✓	✓	

Lack of qualified personnel		✓	✓	
Too many meetings	✓	✓	✓	✓
Poorly informed stakeholders		✓	✓	✓
Co-located resources	✓	✓	✓	✓

Much of what presents as project communication will be formatted around tender documentation, submissions, proposals, plans, reports, memos and formal letters. While the goal is not to cover each of these separately or show you how to prepare them here, the following are some simple and valuable guidelines for whenever you prepare written communication:

- Use simple, plain English that is familiar, unambiguous and straight to the point (your actions will always speak louder than your words).
- Write naturally, as though you are speaking the words (with the reader in mind).
- Delete the extraneous words diluting the message ('the system will be able to…' becomes 'the system will…'—no points for being verbose).
- Avoid technical jargon (and use a glossary of terms if it cannot be avoided).
- Use inclusive language (eliminate unnecessary gender).
- Write logically with simple (single idea), compound (two ideas) and complex (two or more ideas) sentences.
- Be positive and precise.
- Forget about wrapping the text and keep sentences short.
- Limit your ideas to one per paragraph.
- Use a courteous, confident and assertive tone.
- Keynote the same terms consistently ('information' doesn't become 'data').
- Determine what 'angle' or focus the information will present.
- Include current and credible sources, references and examples.
- Steer clear of useless adjectives or adverbs.
- Use objective language only (don't let your own opinions or experience get in the way of the ideas or theory).
- Break-up the information with relevant headings and sub-headings.
- Do not make unsubstantiated or wild claims (rather, support any statements with relevant evidence).
- Include quotations and citations intelligently to support the information.
- Use reference tables, graphs or figures to quickly and visually organise the information.

■ Edit (several times over) for grammar, punctuation and spelling.

Table 9.2 Common project communication tools

Communication tools	Concept	Planning	Execution	Finalisation
Project charter	✓	✓	✓	✓
Project plan		✓	✓	✓
Approval documents	✓	✓	✓	✓
Meetings	✓	✓	✓	✓
Minutes of meetings	✓	✓	✓	✓
Risk assessment		✓	✓	✓
Network diagram		✓	✓	✓
Work breakdown structure		✓	✓	✓
Gantt chart		✓	✓	✓
Performance reports			✓	✓
Site inspections			✓	✓
Project correspondence	✓	✓	✓	✓
Change of scope request			✓	✓
Variations			✓	✓
Completion report				✓
Work instructions			✓	
Statement of work		✓	✓	
Asset register		✓	✓	✓
Inventory			✓	
Purchase orders			✓	
Invoice/statements			✓	✓
Complaint correspondence			✓	✓
Contractual agreements	✓	✓	✓	✓
Updated work orders			✓	
				✓

Handover documentation				
Material safety data sheets			✓	
Safety plans		✓	✓	✓
Completion certificates			✓	✓
Compliance documentation	✓	✓	✓	✓
Stakeholder analysis	✓	✓	✓	✓
Earned value reports			✓	✓
Budgets	✓	✓	✓	✓
Cash flows			✓	✓
Organisational charts	✓	✓	✓	✓
Transition plans			✓	✓

Critical reflection 9.1

Keeping people in the loop is often harder than it might first appear to be. Information is one of the essential aspects underpinning the success of your project, but it is often poorly understood and performed.
- Why is it difficult to guarantee that what you intended might not be quite the same as the outcome you get when you communicate?
- So what is it about communicating that can make it so difficult to do well?
- Review some of the ideas suggested in the text and evaluate how effective they are in matching intent and outcome.

The project meeting

Some people have suggested that managers (and often their subordinates) can spend upwards of 85 per cent of their time in meetings. This figure probably sounds alarming to those who have never stopped to consider this valuable statistic. If true, a disproportionate amount of time can be spent having meetings within closed doors, along the corridor, in the car park or onsite. The obvious questions to ask are:

- How much of this time is spent wisely, efficiently and effectively?
- How many of the meetings result in actionable outcomes?

- What percentage of the meetings include the stakeholders who can actually make the required decisions?
- How much constructive information is presented at the meetings?
- How participative are the meetings—that is, do they allow for differing opinions, proposals and responsibilities?
- How many meetings are poorly managed?
- How many meetings are held merely to ratify what has already been decided by others?
- How often do meetings go back over ground that has already been discussed at previous meetings?

Don't get the wrong impression: meetings are an excellent communication tool —if planned, executed and managed well. However, our focus will be on the other types of meetings, where the planning, execution (including the management) and follow-up processes fall far short of the preferred level. And why should these types of meetings be targeted? Because meetings can take a lot of time out of a day; they can involve numerous stakeholders, each with personal time agendas; and they often achieve very little, as reflected in Figure 9.2. Then walk through Table 9.3, which contrasts crucial differences between best practice and common practice at each stage of a meeting.
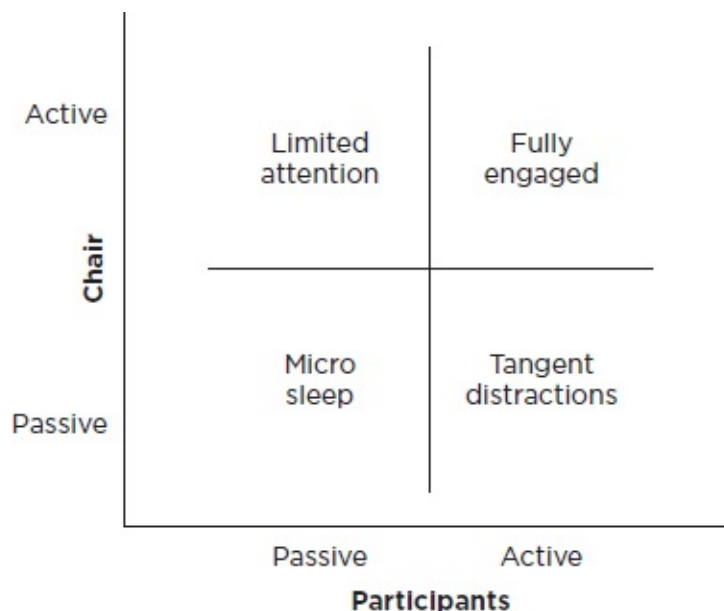
Figure 9.2 Profiling the meeting

Table 9.3 Linking meetings with the life-cycle

Organisational structure	Advantages	Disadvantages
Concept	■ Energy, commitment and motivation ■ A structured and agreed process ■ Clarification of all stakeholders ■ Clear identification of project direction ■ Attended by all appropriate stakeholders ■ Accurate and concise records kept	■ Little emphasis on formality ■ Each stakeholder is trying to maximise their input by putting a positive slant on things ■ Little direction or guidance ■ A lot of spontaneity ■ Poor identification of stakeholders, their roles and responsibilities ■ Revisiting decisions already made ■ Reluctance to consider alternative solutions ■ Insufficient time given to clarify stakeholder expectations
Planning	■ Targeted stakeholders and functional experts sharing information ■ Ongoing reviews and checks with the client ■ Involvement of team who will perform the work ■ Revising project documentation in line with improved estimates ■ Updating risk assessment	■ Pressure to forego this stage altogether and move straight to the progress stage ■ Little time to confirm detail and/or changes with stakeholders ■ Pressure to support the first schedule developed and to implement it immediately ■ Team members and functional experts not invited to attend or contribute to the schedule ■ Failing to revisit with the stakeholders to agree the schedule (in line with the agreed scope)
Execution	■ Accurate recording of all changes and justifications	■ Believing that progress meetings alone will deliver

	and impacts of those changes ■ Written confirmation of all changes ■ Opportunities to reinforce performance ■ All project constraints reported—time, cost, quality and resources	quality to the project ■ Discussion focusing on progress reporting only ■ Reactive responses to scope changes ■ Failure to confirm scope changes with stakeholders ■ Failure to confirm changes in the risk assessment with stakeholders ■ Exception-reporting mentality, focusing only on what went wrong
Finalisation	■ Meeting to fully debrief all stakeholders ■ Documenting and sharing the 'lessons learned' throughout the project ■ Reassigning all project resources ■ Celebrating project successes and understanding the failures	■ Failing to complete a thorough review of the project ■ Team members not present for final reviews and debriefs ■ Focus on completing the project and moving on to the next one ■ Little attempt to acknowledge and celebrate success ■ Little identification and/or sharing of lessons learned

When managed correctly, project meetings can clearly deliver effective and efficient outcomes. Two very specific project meetings that every project needs are expanded on below.

Kick-off meeting

Hopefully the name of this meeting paints a clear picture of what the meeting is about. It can be held at any time after the project team has been assembled—be that during the initiation phase, in the planning stage or just prior to the execution phase: the choice is yours. Its intention is to formally introduce

everyone to the project, to each other and to the key stakeholders. Where you hold the meeting will determine what is actually covered, although the following examples would apply in any phase:

■ detailing the project objectives, expectation, deliverables, outcomes and benefits
■ meeting the client or their representative
■ reviewing all the scope inclusions and exclusions
■ clarifying the roles and responsibilities of executive, project, operational, technical, team and/or other support members
■ explaining the project management methodology (or framework) to be followed
■ walking through the project management plan (and any subsidiary plans)
■ discussing different views between the stakeholders and/or team members
■ explaining the indicative budget and preferred timeframe
■ resolving any outstanding issues
■ outlining the approval process
■ sharing the communication protocols
■ confirming the reporting requirements
■ identifying the required documentation
■ asking for questions, suggestions or feedback
■ establishing the culture of the project team that accommodates both team process and team relationships.

Critical reflection 9.2

The kick-off meeting really established the initial groundwork for bringing everyone together with a preliminary understanding of the project.
■ Have any of your past project meetings been framed around this kick-off format?
■ What benefits have you identified that a kick-off meeting would deliver to your project management practices?
■ Provide additional examples of what other issues could be covered in the meeting (apart from those cited above).
■ Develop both a kick-off meeting agenda and a PowerPoint template to use for your future kick-off meetings.

Kick-out meeting

No prizes for guessing what the kick-out meeting is all about.

This is the meeting that formally brings the project to a close—be that a successful or unsuccessful close. Remember, projects can close at any time, completed or not. During this final meeting, the intent is to ensure that all aspects of the project are formally closed out prior to the team being disbanded.

Critical reflection 9.3

The reality is that this meeting could in fact occur during any phase of the project's life-cycle and, as cited earlier, where you hold the meeting will determine what is actually covered.

- Have any of your past project meetings been framed around this kick-out format?
- What benefits have you identified that a kick-out meeting would deliver to your project management practices?
- Provide examples of what issues could be covered in the meeting.
- Develop both a kick-out meeting agenda and a PowerPoint template to use for your future kick-out meetings.

The obvious question to ask is: Why should a meeting be planned? There are several reasons, and the reality is that meetings can easily be made efficient and effective with little more than process and discipline:

- Identify the discussion topics to expressly restrict the introduction of 'new' topics once the meeting gets underway.
- Research the discussion topics thoroughly so the focus remains on the objective facts and supporting information, not just subjective opinions.
- Nominate and advise the relevant stakeholders who need to attend, and limit the bystanders who don't need to be there.
- Draft an agenda that confirms the collective input of the required stakeholders (and not personal agendas).
- Prioritise the agenda items in line with the urgency, sensitivity and/or availability of the attending stakeholders. Often too much time is spent discussing unimportant and non-urgent points, leaving little real time for the other topics.
- Set nominal time limits (start and finish) on discussion topics (the result should be less 'waffle', carefully considered viewpoints, more constructive debate and agreed outcomes).
- Determine the appropriate venue, as there can be a lot of power behind the selection of the venue (the automatic 'home team advantage', or a neutral venue demonstrating a genuine appeal for ideas, free discussion and consensus in decision-making).
- Confirm attendance to encourage people to fully prepare 'contributions' (it

also eliminates those irritating excuses: 'I didn't know', 'No one told me', 'I am unprepared', 'I will have to get back to you on that' and so on).

■ Encourage preparation time by stakeholders (this may include copying information, canvassing ideas, building coalitions, counting the numbers, working out tactics—meetings are not places for winging it).

■ Receipt all information required by the meeting (all the supporting information and documentation—change requests, certificates, approvals, performance reports, complaints, etc.).

■ Create a sense of expectation, fruitful discussion and actionable outcomes, as the meeting is an opportunity to rectify problems, make decisions, develop strategies, and build ownership and commitment.

■ Identify who will chair the meeting to ensure it is conducted professionally (it takes particular skills and knowledge, patience, an understanding of protocols, an ability to work with difficult people, time-management skills, questioning skills, and an ability to draw out the silent while controlling the loud).

■ Develop a uniform protocol for working through the agenda—items could be processed as either 'noted' (no action required), 'decision' (what was decided) and 'action' (required steps).

■ Nominate the person (or the technology) to take the accurate minutes (record what you want people to remember and action, not every word of dialogue).

■ Ensure that all required actions are captured, people allocated and dates agreed.

■ Circulate the minutes within two days of the meeting to confirm the accuracy and to enable actions to be taken.

Critical reflection 9.4

Meetings with little preparation, wavering participation and questionable outcomes are not the type of meetings you want to have.
■ Critique the type of project meetings in which you are involved.
■ Are you satisfied with how effective they are or would you like to make some changes?
■ Identify the required changes, the benefits and how you will go about implementing them.
■ What resistance do you envisage and how will you manage this?

The project performance reports

Another vital communication tool to project stakeholders is the favoured,

although often maligned, project report. Commonly (and mistakenly) called the 'progress report' or 'status report', this document carries with it considerable responsibility in conveying the true nature of the project's performance— whatever that performance might be. Consider the following scenarios:

- If the project is behind in any area, this is the document that will enlist stakeholder assistance to bring it back on schedule.
- If the project is progressing to plan, this is the document that will reinforce that progress.
- If the project is encountering a number of contractor performance management concerns, this is the document that will communicate the redress.
- If the project is ahead of schedule, this is the document that will ensure that completion will not be jeopardised.
- If the project is generating a raft of issues and conflicts, this is the document that will communicate the required escalation.
- If the project is experiencing an increase in the risks impacting the project, this is the document that will communicate those impacts.
- If the project quality is not being delivered as required, this is the document that will identify the areas that need improvement.

The requirement to write reports can often lead either to an impressive work of fiction (at worse) or a concise and honest summary of the project's progression, status and likely conclusion (at best). While the latter is our target in this section, the reality is that reports often fall considerably short of stakeholders' true requirements. To some, reporting is a chore; to others, it is a piece of bureaucratic compliance that is issued with monotonous frequency. To still others, it is a document that is written, often filed, but seldom acted upon. Figure 9.3 emphasises the traditional cost (over spent) and scheduling (behind schedule) reporting that generates the abstraction and distraction found in traditional, narrowly focused project reports.

Surely, project reports are written with specific objectives in mind. Two come to mind straight away: to initiate corrective action, and to reinforce performance. However, within these two objectives, the true intent of the report can be broken down into more specific detail to act as a guide in evaluating how well your project reports are put together. Consider the following generic objectives. Does your report:

- convey accurate, complete and timely information to the different stakeholders
- provide a possible escape route to the project personnel for a mismanaged

project
- reflect the true facts on the project's progression
- encourage early detection of problems
- enable problem-solving
- facilitate decision-making
- track all the scope changes and revisions
- confirm that the project is on track in all respects
- sustain the project's momentum, energy and commitment
- request extensions to the project's original schedule?

One of the most difficult aspects of project management is achievement or performance measurement—that is, measuring and ultimately reporting the achievement the project has realised over time. It is difficult because achievement can be measured differently by different stakeholders. Consider a project replacing a manual production line with a fully automatic operation. One stakeholder in this project might be measuring orders placed for materials (production manager). Another could be measuring invoices paid (finance manager). Yet another tracks materials delivered to the site (construction manager), while another stakeholder measures whether or not the new production line works (client). It can be a challenge finding common ground between all the vested interests. In many cases, the common ground is not found and the project's achievement is measured in imprecise, ambiguous and potentially misleading language.
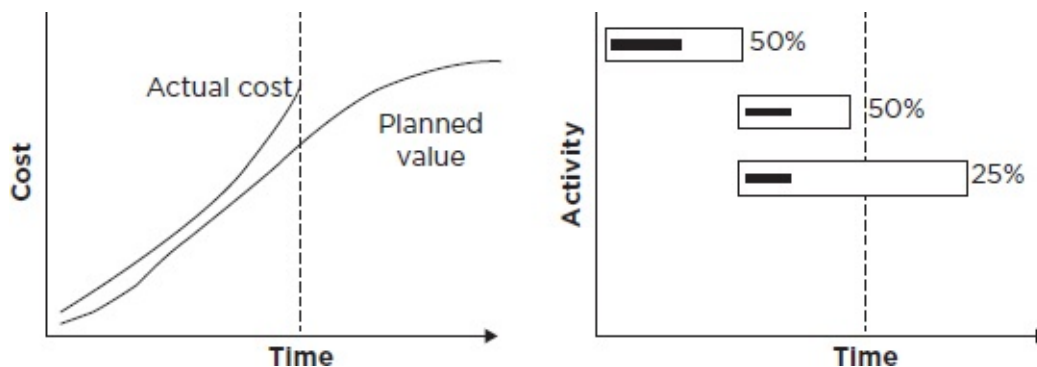
Figure 9.3 Traditional cost and schedule reporting

One of the more important roles of stakeholders (notably the project manager or team personnel) is how they manage and report on the project's periodic achievement against the scope, time and cost baselines. The information reported may take the form of graphical (and colourful) dashboards, formal reports or

simple emails covering any or all of the following (adapted from PMBOK, 2013):

■ past schedule/budget performance (e.g. completed work)
■ current schedule/budget status (e.g. work in progress)
■ future schedule/budget predictions (e.g. outstanding work)
■ risks and issue management
■ quality compliance
■ financial considerations
■ summary of approved changes.

The key point is that, as any project progresses, information quickly becomes out of date as there is often a considerable lag between the production of the message (information capture) and the consumption of the message (information reporting). Measuring and reporting performance are not ad hoc activities undertaken whenever the relevant stakeholder expresses a sudden interest in the project's performance. They are agreed criteria or a range of criteria discussed and agreed (way back at the start of the project) between all the stakeholders performing and measuring the project's achievement.

   The inference here is that this measure is set in stone well and truly before the progress stage. So why isn't performance measurement done? A few of the factors that increase the difficulty in measuring performance include:

■ the fear of transparency and accountability
■ the project life-cycle, with different stages producing different outputs over different time periods
■ the length of the project itself, together with the length of individual tasks, which make it difficult to measure across all tasks with any degree of confidence and accuracy
■ the failure of reported information triggering decision-making
■ the conflicting priorities between projects and operational work
■ the lack of interest displayed by some stakeholders
■ the difficulty in identifying true measures of achievement
■ the type of estimating method used, the underlying assumptions supporting this estimate, and the ultimate accuracy of the estimates.

Given that these factors can work against accurate measurement, a number of broad guidelines have been proposed over the years to try to overcome the challenges of measuring performance. You should evaluate the following

suggestions:

- 0/110—no measurement is recorded until the task (or project) is fully completed
- milestone—achievement is earned and recorded when the control point or milestone is reached
- standard dollar expenses—a percentage of the costs are assigned to an equal percentage of time interval passed
- 50/50 rule—half the achievement is recorded for each task at the time the work is scheduled to begin, and the other half at the time the work is scheduled to be completed
- level of effort—measures the resources consumed over a given period of time
- equivalent units—achievement is measured by the number of completed units, rather than labour or budget considerations
- the number of compliance inspections, testing and/or reporting
- the remaining duration of the project
- the number of deliverables completed and/or handed over.

All the guidelines can be equally defended and defamed with relative ease. Perhaps the key point to take from this is that each measures something different, yet all are good. Again, it comes back to what the stakeholders determine achievement to be, and what can actually be measured. Remember, if it cannot be measured in the first place, it cannot be reported, let alone corrected, reinforced or improved.

Should the one project report try to cover all the objectives cited above (and the ones that weren't)? Or should there be separate reports for different stages of the project's evolution and performance? These are interesting questions. Common sense would dictate that there can be no perfect template for a project performance report (or, for that matter, any other project documentation). Each project follows a different path, has different expectations and constraints, different performance measurements and different stakeholders. Realistically, though, these three reports are all contained within the one performance report— think of the progress, status and completion reports more as useful headings. The three report types that are discussed in this section (and reflected in Figure 9.4) are:

- the progress report
- the status report
- the forecast completion report.
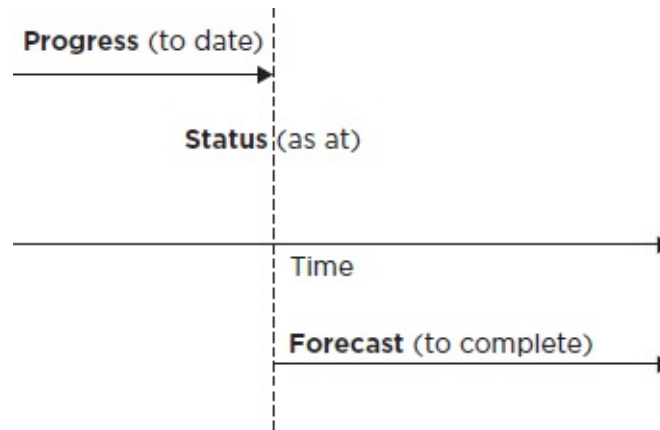
Figure 9.4 The reporting continuum

The progress report

We will begin by closely examining the word 'progress' itself. The *Concise Oxford Dictionary* confirms its meaning as 'carrying on or developing a stated journey'. Taking the literal meaning of these words, the focus of the progress report will be to report the journey the project has enjoyed (or perhaps endured) since commencement. That is, its focus is largely on reporting historical and stale information from project commencement up to the reporting or status date.

It may seem like we are being pedantic here with the English language; however, I make no apology. Perhaps an analogy will help. Remember growing up as a small child and measuring yourself in the door frame of the bedroom? As you grew, your new height (or progress) was recorded at each new status date. At each new measurement, you could look back and see your progress (the key word) since you started measuring your height (the project commencement). At each measurement, your current height is recorded (the status) and below that are the progressive heights you have reached (the progress). And interestingly, nowhere on that door frame was there any indication as to the ultimate height you would reach (the forecast completion) over your growing years (which was the project).

So let's leave the door frame and return to our projects. If our focus is on history, from project commencement up to project reporting date (status date), what type of information should the report include? Review the following obvious suggestions:

■ project, task and milestone commencement (behind schedule, on schedule,

ahead of schedule)
- project, task and milestone progression (behind schedule, on schedule, ahead of schedule)
- project, task and milestone completion (behind schedule, on schedule, ahead of schedule)
- budget and cash flow consumed by the progress (under budget, on budget, over budget)
- conformance with the specification (conforming or non-conforming)
- changes to scope proposed, assessed and justified
- approvals received
- resource assignments, reflecting work in progress.

It would be tempting to leave the report at this level of detail, as the report has concisely captured and reported on the minimum amount of information—the four project variables (time, cost, specification and resources). However, if you can see beyond the blinkers for a moment, think about the additional 'information-rich' progress that the project has made. You might also report on:

- the issues that have arisen throughout the project and how these have been resolved and/or escalated
- the accuracy of the project's estimates (time and cost predominantly)
- the risk profile of the project's progress so far (is this in line with the original risk assessment completed in the earlier scope and the planning stages?)
- all variations to the baseline scope (agreed at the end of the planning stage)
- quality issues addressed and delivered
- contractual performance and compliance
- stakeholder commitment and motivation
- the support given by the project steering committee and sponsor.

Clearly, there is a need to report the obvious. But don't ignore the other less tangible or measurable aspects of the project's progress, cited above. And don't forget to take the credit and to celebrate your successes while also flagging (perhaps in small print initially, although the other reports will help raise the flag) any failures that might require some additional stakeholder assistance. Remember, the earlier you flag the problems, the more time you will have to find and work with the solution.

The status report

Let's now move on to the status report and examine the true meaning of the word 'status'. Again, the dictionary confirms its meaning as 'the position of affairs, in relation to others, at a point in time'. Taking the literal meaning of the word 'status', the focus of the status report will be on the current position the project holds in relation to its overall plan. That is, is the project running to schedule, on budget and as specified, and is it fully resourced? This report is often shorter than a progress report, and the following key information is mandatory:

■ where the project, tasks and milestones are in relation to the status date
■ where the budget and cash-flow expenditure are as at the status date
■ what the specification conformance is as at the status date
■ what the resource loading and assignments are as at the status date.

Again, justification (a nice word for excuses), changing project circumstances and key issues affecting the project's status (at this point in time) should also be reported—but not the history. The status report is more concerned with your ability to manage the project to plan, and not the highs and lows of the journey so far. It wants to know where you are at in relation to where you said you would be at (in other words, where you should be at and, if not, why not). This point is crucial to understand. It is absolutely worthless to be told that the project is 60 per cent complete, or that six tasks have been completed, if in fact you do not have any reference point, plan or baseline to compare this information against. Too bad if you *should* have been 100 per cent complete, or if 25 tasks were scheduled to be completed in the same period that you are reporting only six complete. If there is no underlying reference point, then 'status' just becomes a meaningless word.

While it is true that progress and status data often overlap (in some cases considerably), take the point that progress focuses on history while status focuses on the present performance against the plan—here and now. While many progress reports contain status information (e.g. 60 per cent completion to budget), and many status reports contain progress information (e.g. six tasks commenced as scheduled), the point is that stakeholders need *both* types of information, ideally in the one report, under two separate headings.

The forecast completion report

Finally, the third type of report cited here is the forecast completion report. The

Concise Oxford Dictionary defines the word 'forecast' as 'a conjectural estimate of something future, a prediction'. Taking this literal meaning, as before, the forecast completion report will focus on one thing: the completion of the project to plan. Remember, the clue lies in the report name—forecast completion. In this report, there is no request for historical information, nor is there a request for information on where the project is right now. What the stakeholders want to know in this report is your ability to bring the project in on schedule, on budget and as specified, and what your strategies are for doing this.

The forecast completion report should include the following information:

■ forecast completion date/time and/or revisions
■ pending and foreseeable risks
■ approvals outstanding and/or required impacting completion
■ forecast completion budget and/or projected cost overruns
■ anticipated scope revisions
■ issues requiring resolution and/or escalation
■ forecast completion specification (there was a hospital once that suddenly 'lost' a couple of floors as the specification was revised in line with time delays and cost overruns as the project drew to a close)
■ forecast resource requirements in line with the above points.

Finally, remember that not everyone needs the same information at the same time, nor in the same format. What might be 'generically convenient' for the project organisation might not be convenient for every stakeholder. Ensure that any information provides:

■ strategic and operational direction
■ motivation for everyone
■ degrees of control
■ the 'fuel' for current decision-making.

Critical reflection 9.5

Project performance reports endeavour to report more than just progress over time as the sun rises and sets every day. They want to know what was promised, what was measured, what was achieved and why.
■ Read through one of your recent project reports from a project with which you are familiar and identify what wasn't reported throughout the project.
■ Think about how the reporting template determined the accuracy of the information reported and the level of supporting detail.
■ Why is it critical to know what was completed to the reporting date, what should have been completed and what remains to be completed at any point in the project?

■ Record your suggestions for how your project performance reporting can be improved, along with the benefits it would deliver to the project.

Controlling communications management

Communication control is not an isolated activity—it is fully integrated across the project life-cycle and across all other project processes. The collective wisdom from a professional library that has in excess of 500 project management texts and research articles presents a wide range of measurement, reporting and control processes designed to put stakeholders back into the correct driving position when measuring and controlling changes to scope in general, and project achievement in particular.

Realistically, all project information and communications will need to be monitored, acted on and released to stakeholders throughout the project. This could take the format of any of the following documents:

■ issue register
■ lessons learned log
■ performance reports
■ earned value reports
■ correspondence register
■ milestone reports
■ stakeholder feedback
■ risk registers
■ variation registers
■ presentations
■ project plan
■ meeting minutes
■ update schedules
■ revised budgets
■ change requests.

Regardless of which one you use (hopefully most of them at some stage), attention will remain on the following:

■ Always focus only on what is important and who it is important for.
■ Stay true to the project objectives.

- Factor in issues of confidentiality and formality.
- Accept that not every deviation needs correction.
- Use processes that support information being collected on a timely basis.
- Understand the difference between schedule/cost reporting and schedule/cost controlling.
- Use documentation that produces a verifiable audit trail.
- Keep channels of communication open at all times.
- Regularly identify and discuss the issues and risks impacting on the project.
- Balance corrective actions and reinforcement where required.
- Moderate your approach to exception reporting.
- Meet regularly with project stakeholders.
- Conduct ongoing project reviews and revisions.

Remember the origins of all this documentation and these communication processes—the optimal flow of information among all communication stakeholders at any moment in time. After all, you are trying to avoid that uncontested variation, that minor revision that was never recirculated or that misinformation that was acted upon all being woven into the communication control protocols of the project. Controlling communication isn't about managing the spin, the 24-hour news cycle or the egos of primary stakeholders; it is all about organised and summarised information reaching the right people, in line with both objectives and performance (see Figure 9.5).
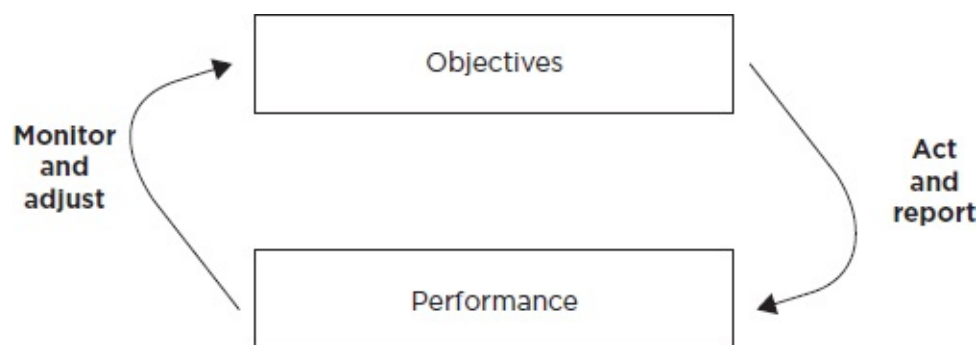
Figure 9.5 Project control

Review questions

9.1 What are some of the common challenges encountered when communicating

with project stakeholders?

9.2 How does a communications plan seek to address these?

9.3 How can project meetings be improved?

9.4 What are the three crucial components of a thorough performance report?

9.5 How will controlling project communications work towards delivering a successful project?

Case study

When margot was handed the correspondence registers for both the client and training company, she knew immediately that her skills as a quality management auditor would be sorely tested in walking through this project.

It wasn't the lack of documentation that had her concerned; rather, it was the copious pages and pages of letters and emails reflecting 'he said, she said, they said'; minutes of meetings that failed to articulate, let alone summarise, the key points, decisions and actions required; monthly reports that offered little in the 'way forward' and a number of variation claims that she would have rejected outright as simply non-compliant, according to the contract she had seen.

The (training) project involved the development, delivery and evaluation of national project management training for a regional local government council. The accredited Diploma of Project management qualification had been signed off by all the key stakeholders: the CEO of australian land Corporation (Carol), training manager (anthony) along with Suzanne from Vet Pro (the training provider). Margot had been called in six months into the 24-month project after a number of recurring and potentially caustic issues had become apparent between anthony and Suzanne over their respective interpretations of the project's requirements.

In reviewing the registers, margot realised that most correspondence was more 'tit for tat' with far too much grandstanding as opposed to any meaningful attempt to honestly resolve the root cause of the unresolved issues (and, by association, their implications for the project's delivery).

Collectively, the communication issues related to:

- meetings held with no prior warning or agenda circulated
- a preoccupation with face-to-face meetings that resolved little, if anything, during the talk-fest format
- frequent absences of key stakeholders from meetings (or any other 'update' activity)
- the requirement that all meetings adopt PowerPoint as the presentation medium
- outside of meetings, excessive reporting requirements that had little to do with what was actually learned and, more importantly, what applied in the workplace as a result of the training
- the continuing illusion that a constant stream of (ambiguous) paperwork implied productive performance
- an undue focus on negative feedback while ignoring the positive comments provided
- pressure to change the learning materials following feedback from each cohort completing the modules
- questionable protocols for the collection, dissemination and security (notably privacy legislation) of the information to relevant stakeholders.

Strictly speaking, as an auditor margot was not onsite to tell both parties how to communicate with each other in an open and transparent way. However, she felt compelled to take off her audit hat and subsequently encouraged both parties to engage an independent communications expert who would sit them down, talk through their issues and formulate a viable approach to enable both to co-develop a common and equitable communication protocol for the project. After all, much of the confusion, ambiguity and heated debate had more to do with differences in expectations, language and terminology than evidence-based, actual reporting. If these crucial differences could be resolved,

margot believed that both anthony and Suzanne could find a constructive way to balance preventative and corrective communication where demanded and reinforcement where warranted.

> '…much of the confusion, ambiguity and heated debate had more to do with differences in expectations, language and terminology than evidence-based, actual reporting.'

Questions

1 Why is it crucial to keep open all channels of project reporting between anthony and Suzanne at all times?
2 What components of a communications management plan would be useful in this situation and what obstacles would it resolve between the two parties?
3 How would creating a meeting agenda template, an effective meeting protocol and a meeting minute template address the concerns identified by margot?
4 For this training project, what communication documents (and/or tools) would you recommend and why?
5 What would an appropriate performance reporting template look like for this project and how would it focus attention on the critical learning outcomes from the qualification?
6 How would you advise anthony and Suzanne to work together to control how they communicate with each other?

Risk management

Proactively managing uncertainty, complexity and change

Key points

■ A planned approach to risk management
■ Profiling the organisational risk context
■ Identifying project risks
■ Categorising risk for critical assessment
■ Risk tools and techniques
■ Performing qualitative and quantitative probability assessment
■ Performing qualitative and quantitative impact assessment
■ Prioritising scaled risk intervention
■ Planning risk-response strategies
■ Assigning risk accountability
■ Controlling project risk

In practice

No matter what we do, risk is always present. From getting out of bed, to commuting to and from work, through to executing the project plan, there is always a need to identify, assess and manage your risk exposure. There is risk in getting the local authority to approve a new sporting facility, in redesigning a restaurant, in renovating your home, in investing in retirement options, in recruiting new applicants—each of which may well be somebody's project.

For some, risk is obvious and in your face. Examples include death, illness, changing jobs or working within a team. In other cases, risk may be more remote, if not invisible—for example, in the case of being hit by space junk or being attacked by a rogue animal. And herein lie the many challenges in working with risk—the identification of risk factors that could potentially impact the project. The key point here is the project itself. The risk lies in executing the project performance and deliverables—not post-implementation, when nobody turns up to dine in the remodelled restaurant (if the project was to remodel, not to promote and fill the seats), and not when the new emergency admission procedures fail to be followed (if the project was to investigate and report alternative emergency admission procedures).

But enough doom and gloom. Risk can also bring with it innovation, enhancements, efficiencies and continuous improvement, as new ways are found to do the work or alternate measures are put in place in response to perceived or real risk. Risk can force us to think outside the square and to move beyond the standard operating procedure (SOP) treatment responses, which might work for operational risks but may fall short in dealing with project ones.

There will always be risk throughout the project, starting with the concept stage and traversing the entire life-cycle through to finalisation. In places, it will be vague and poorly defined. At other times, it will gain clarity as more is understood about the project and communicated to everyone involved. And as with each of the other PMBOK processes, risk management never leaves the project.

Chapter overview

Clearly, one of the 'givens' in most types of projects (given that they produce

change) is the notion of risk in some shape or form. The other 'given' is that risk is not a static or fixed concept. In fact, risk is one of the most fluid forces the project organisation will need to manage throughout the life of the project.

PMBOK (2013) defines risk management as 'the processes of conducting risk management planning, identification, analysis, response planning and controlling risk on a project'. It should be apparent that the goal of risk management is to ensure that a suitable risk-response mechanism is put into place to reduce the probability of trauma (or increase the probability of the opportunity) in the project, and to reduce the resulting negative consequences (or increase the positive consequences)—that is, to proactively manage the risk.

Following a six-step model, risk management involves agreeing how the risk-management activities will be planned and conducted, identifying the risks, qualifying and quantifying these risks, and developing targeted responses, along with monitoring and evaluating the effectiveness of the risk processes. Regardless of the number of steps, the challenge facing most project organisations in this regard is to ensure that these processes become an integral and seamless part of the organisation's culture and a constant priority for the project stakeholders, project manager and team (and an agenda item at every project meeting).

Planning for risk management

A 'reasonable' person may define risk as a potential problem, a situation or perhaps an opportunity that will have a measured impact on a nominated outcome. The AS/NZS (31000: 2009) standard defines risk as an 'effect of uncertainty on (project) objectives'—in other words, the exposure of an activity to an uncertain outcome.

This definition is intuitively appealing, relatively simplistic and easily understood, with no reference to difficult mathematical processes, complex formulae, impossible-to-understand algorithms or scientific processes. This is important because the objective for all stakeholders is to agree with the true meaning of project risk—its volatility, its positive and negative contribution to the project—and to appreciate the need for its proactive management throughout the project.

Many project organisations (regrettably) place heavy and singular reliance on their standard operating procedures (SOPs) when it comes to managing their project risk. To be fair, many low-level risks are well suited to being managed

under this operational framework, including authorised access, work, health and safety (WHS) inductions, incident reporting, financial delegations, regulatory compliance and issue escalation pathways. But (and it is a *big* but) will faith in this operational practice enable and empower the proactive management of all levels of project uncertainty over the project life-cycle?

Mapping inherent strategic risk

Obviously, explicit, thorough and documented risk-management planning activities will work towards not only evaluating and controlling project risks, but (and equally importantly) also delivering a successful project. However, many organisations undertaking a major project will face strategic (high-level) risk exposure. In launching a new product, not only could the launch fail, but the reputation and profitability of the organisation could be seriously damaged. Equally, the new mining project may not produce the expected tonnage, or the construction of the new tunnel (to alleviate inner-city congestion) may fail to get the predicted traffic flow. In all these cases, the risk is strategic, as it belies the over-arching success (however measured—for example, profitability, competitiveness, survival) of the business itself and not just the project's internal risk of not being completed on time, on budget and as scoped (to narrowly focus on just three aspects for now).

Not only is this overall strategic project context important; the project stakeholders' risk appetite and tolerance is equally important (PMBOK, 2013). It follows that different people (and organisations, for that matter) will have different levels of acceptance of (or tolerance for dealing with) risk. These risk 'attitudes' will play an incredibly constructive (or destructive) role in how well risk-management planning activities are supported, and can be classified under three broad perspectives:

1 *risk averse* (low tolerance), where the intent is avoidance with the focus on refraining from perceived risk activities
2 *risk neutral* (neutral tolerance), where the intent is caution, with the focus on remaining impartial to perceived risk activities
3 *risk seeking* (high tolerance), where the intent is acceptance with the focus on engaging in risk activities.

The process of planning the risk-management activities begins with clearly understanding and agreeing exactly how the risk-management activities for the

project will be carried out. This will also require an equal acceptance that project risk never comes gift-wrapped in a universal and convenient one-size-fits-all format. These activities will need to continually balance the degree, type and visibility of what risk management involves with the scale of the risk itself, the project planning and delivery, and, of course, the importance of the project to the organisation itself.

Nor should these activities be the sole domain of the project manager. All stakeholders need to be actively present in these (and other) activities from the concept stage onwards, in demonstrating their agreement and active support, and in ensuring that the risk-management processes are actioned effectively throughout the project. This support should never be marginalised in subsequent project life-cycle stages, when 'new' risk suddenly appears that had not previously been documented. No project has a crystal ball, so common sense would dictate that risk will continue to change and challenge the project, from start to finish—and the last thing you want is some stakeholder feigning surprise (or worse, ignorance) and then putting the blame on the project manager and the project team. Risk management will always be a shared and transparent responsibility—perhaps a novel idea for some.

As with any other project planning processes (scope, time, cost, quality, etc.), the risk-management plan needs to convey how the risk-management activities will be structured and performed, and may include the following information and activities (adapted from PMBOK, 2013):

- the methodology (approach, tools and data sources) to be used
- roles and responsibilities for stakeholders, project manager and team members
- estimates of, and access to, additional funding to cover contingency and management reserves
- scheduling the frequency of risk-management activities throughout the life-cycle
- a format for analysing examples of risk activities
- reference to mandatory (and associated) documentation relying on updated risk information (e.g. the project plan)
- categorising potential causes of risk through a project-specific risk breakdown structure (RBS), or adapting a categorisation framework or SOP
- scaling both qualitative (descriptive) and quantified (numeric) definitions of risk probability and risk impact
- specifying that risks will be prioritised using a probability and impact matrix
- revised stakeholder tolerances
- reporting formats nominating how risk-management activities will be

documented, analysed and communicated
- an audit trail of tracking documents showing how risk activities were recorded and responded to.

Critical reflection 10.1

With projects conceived with different degrees of uncertainty, complexity and change, it is little wonder that risk poses a constant threat and opportunity to the project's successful completion.
- What is your organisation's operational attitude towards risk?
- How well do you think risk is managed operationally?
- What is your organisation's attitude towards project risk?
- How well do you think project risk is managed operationally?

Identifying the risks

With a planned approach bedded down, risk identification (as the second of six steps) will involve project stakeholders, the project manager, team members, clients, subject-matter experts (SMEs) and others anticipating and identifying those risks (and their characteristics) that may affect the project in some measured way. In fact, regardless of any specific role, all project personnel should be actively encouraged to identify potential risks (mapped back to the WBS) with a shared sense of ownership, responsibility and additional objectivity. Remember, this is not an ad hoc, reactionary plan or a last-resort process. It has structure, due process and a logical flow (like everything else in project management).

It is important to remember that when you begin to identify risk, very few risks—if any—will be absolute in their detail, as they will continue to evolve throughout the project's life-cycle (not to mention the new ones that will make themselves known). Risk identification is an iterative process governed by any situational context in which the project is located—risk identification in the planning stage will not be as accurate (or timely) as the risk identification carried out in the execution stage. However, the more comprehensive the identification aims to be, the less chance there is of any risk not identified at this early stage being automatically excluded from any further analysis (and possible response strategy) once the project has commenced.

Risk events are often described in terms of the 'known unknowns'—knowing something could or will happen, but not when it will occur or to what degree.

Examples include knowing it might rain, the supplier might go broke or the electronic part might fail. And there are also the 'unknown unknowns'—not knowing anything about what might possibly happen. In these cases, the project stakeholders have no history, general knowledge and/or experience in the type of project they are working on (or what risk may be relevant). Anything and everything that happens from a risk perspective would take them by surprise. In this type of project, it is pretty much impossible to predict the risks that could impact.

Categories of risk

As covered in the risk-management plan, part of dealing with uncertainty in anticipating and identifying risks is the process of categorising risk under meaningful headings to enable further, and more concrete, analysis. Two initial categories could be as simple as:

1 *internal risk*, which is controlled and/or influenced by the project organisation, stakeholders, project manager and team
2 *external risk*, which sits outside the direct control and/or influence of the project organisation, stakeholders, project manager and team.

Once you can separate internal from external risk categories, it is easier to begin populating potential and more tangible sources of risk, as identified in Table 10.1.

Irrespective of where the risk comes from (whether inside or outside of the project parent organisation), the project manager and team must remain vigilant throughout every stage of the project as different risks are identified.

Table 10.1 Internal and external categories of risk

Internal risk (controllable)	External risk (uncontrollable)
Ambiguous project charter	Market deregulation and changes
Inaccurate estimates	Technology innovation
Fast-tracked decision-making	Political unrest, upheavals, changes
Access to management reserves	Fluctuating economic cycles
Poor performance reporting	Increasing global competition

Undefined quality requirements	Increased compliance
Communication bottlenecks	Variable contractor performance
Unauthorised changes to scope	Social changes
Fluctuating commitment	Legislative constraints
Limited resource availability	International standards or regulations
Low-level skill sets	Conflicting contractor priorities
Lack of accountability	Partnering relationships
Variable stakeholder expectations	Contractual obligations

For those of you who find more generic risk categories easier to work with, project risk could originate from any of the following categories:

- *competition activity*, evidenced through merger activity, market acquisitions, plant closures, price fluctuations, the introduction of new product or service offerings, or a reduction in operating costs
- *political agendas*, evidenced through legislation, documentation and record-keeping, inspection, and audit or compliance
- *economic performance*, evidenced by the economic cycle, changes in exchange rates, government fiscal and monetary policy, unemployment rates or interest rates
- *technology impacts*, evidenced by production efficiencies, mass production, increasing redundancy or e-commerce opportunities
- *marketing appeals*, evidenced by the release of competing products or services, changes in market share, consumer response rates to advertising or accuracy of market research
- *legal matters*, evidenced by contract administration, non-conformance, conflicts or dispute resolution
- *financial markets*, evidenced by access to reputable sources of funds, funding contingencies, penalties/costs associated with funding or unanticipated changes to scope
- *organisational practices*, evidenced by initiatives to outsource, re-engineer, restructure or downsize existing SOPs, policies and processes, or cultural norms and values
- *resource capability*, evidenced by skill shortages in key areas, limited availability, conflicting operational priorities, fluctuating commitment, low morale and motivation, failure to identify training and support requirements,

or a lack of direct control and supervision.

If you are still looking for another category (system) to follow, why not adopt all the PMBOK processes that make up the acknowledged project management methodology? These are shown in Table 10.2.

Critical reflection 10.2

Given the prevalence of risk, categorising the different sources of risk can be a challenging task for some.
■ What categories do you use to group different sources of risk?
■ How does this categorisation assist in both identifying and ultimately managing the risk?

The tools and techniques

To further assist you in coming up with categories to help locate sources of risk, a number of useful approaches, tools or techniques can be applied in this stage, and throughout the entire risk-management process, including:

Table 10.2 PMBOK process risk categories

Project management processes	Examples of potential risk
Integration	■ Inadequate methodology ■ Poorly defined life-cycle ■ Lack of approvals and signoffs ■ No authorised change-control process
Scope	■ Poor definition of expectations ■ Lack of stakeholder involvement ■ No supporting documentation ■ Lack of precise requirement details
Time	■ Scheduling conflicts ■ Deadlines agreed independently ■ Scheduling detail omitted ■ Critical tasks dominating the schedule
Cost	■ Budgets agreed independently ■ Difficulty in tracking money spent

	■ Lack of control over spending ■ Limited access to contingencies
Quality	■ Failure to define quality standards ■ Monitoring and inspection costs ■ Schedule and cost implications from rework ■ Incomplete or ambiguous specification details
Human resources	■ Poor project management expertise ■ Poor skills and training ■ Problems with monitoring and reporting performance ■ Operational priorities causing over-allocation issues
Communications	■ Absence of accurate information ■ Lack of ongoing consultation with stakeholders ■ Uncontrolled documentation ■ Failing to update documentation
Procurement	■ Non-compliance with specification ■ Viability of contractors ■ Supply, logistic, reporting and management problems ■ Contractual performance compliance
Stakeholders	■ Inability to identify key stakeholders ■ Failing to control changing expectations ■ Disclosing confidential information ■ Lack of timely approval and signoff

■ risk registers
■ assumption analysis
■ lessons learned
■ checklists
■ SWOT analysis
■ simulations
■ risk specialists
■ material safety data sheets
■ trend analysis
■ industry databases
■ specification descriptions
■ project scope baseline
■ project budget baseline
■ quality requirements

- sensitivity analysis
- decision trees
- project completion reports
- process flowcharts
- historical research
- cause–effect diagrams
- brainstorming
- critical incident reports
- strategic plans
- interviews
- feasibility studies
- SMEs
- commercial databases
- project schedule baseline
- issue logs
- benchmarking
- probability distributions
- expert judgement.

Remember that at the completion of this stage of risk identification, every stakeholder must have reviewed, documented and agreed on a comprehensive list of risk sources.

Performing qualitative and quantitative risk analysis

Following the risk-identification stage, the next two stages require a more detailed analysis to reduce the level of uncertainty and/or impact facing the project, and to enable everyone to focus on the high-priority risks. To achieve this, attention will now turn to:

- the probability of the risk occurring
- the impact of the risk on the project
- the priority (or ranking) of the risk.

As with any analysis, the pre-existing risk attitude, any assumptions made, the subjective nature of the analysis, the potential influence for bias and the time criticality of risk-related action may each magnify or diminish the importance

(or not) of any risk source identified (PMBOK, 2013).

The probability of project risk

Whenever you mention the word 'probability', most people start to panic and think of all the reasons why they do not like statistics. Rest assured that, for our purposes, we will keep probability simple, without undermining its application to risk. After you have identified what types of risk might impact on your project, it is necessary to predict or determine the probability or likelihood of the risk happening—in other words, to try to find out whether the risk is about to happen, might happen or has little chance of happening.

Risk assessment requires that the project manager and team be able to determine the probability of a risk event occurring. Numerical values ranging from 0 to 100 may be used just as easily as descriptive generic terms like 'high', 'medium' or 'low'. Clearly, the numbers enable more measured analysis, although the qualitative terms might also provide insight into the probability. While there is no ideal way to present probability data, Table 10.3 demonstrates how probability data could be recorded.

In Table 10.4, the probability of the (sample) risk events identified has been added. So far, we can identify what potential risk has been captured, and the likelihood of each risk occurring. Is this enough information upon which to base project decisions?

Remember that there are no right or wrong words or numbers to use, as long as the scale used (a number scale of 1 to 5 or a word scale from 'very high' to 'remote') is rigorously and consistently applied in scoring the probability (or likelihood) of the risk.

Table 10.3 Qualifying and quantifying project risk probability

Risk probability		Explanation
Value	**Descriptor**	
1	Rare	A one in one hundred chance of occurring
2	Unlikely	A slight possibility of occurring
3	Moderate	Reasonable to consider it could occur
4	Likely	Most probable that it will occur

5	Certain	100 per cent chance of happening

Table 10.4 Assigning probability to risk

Risk event	Probability
Inclement weather	4
Operational priorities	3
Uncontrolled scope changes	5
Fluctuating exchange rate	1

The impact of project risk

This represents the fallout, the consequences (positive or negative) or the damage (again, let's not forget the potential gain) arising from the risk. Impact will need to be described in as much detail as possible by the project team, because it is this impact that has the greatest influence on the team's ability to deliver a successful project. It you cannot visualise, describe or quantify the impact, this will make it next to impossible to treat. Close attention will also need to be paid to the four stages of the project's life-cycle, as the impacts will have different levels of severity at each stage.

Now the challenge is to isolate and record the impact resulting from each risk event. Again, as with probability, numerical values (1–5) would work just as easily as values measuring delays, costs and other value data. Of course, descriptive generic terms like 'major', 'moderate' or 'insignificant' would work too. Try to be as descriptive as you can to make ultimate response strategies more effective. Table 10.5 demonstrates how impact could be recorded, while Table 10.6 adds the impact score to the risk assessment.

Table 10.5 Qualifying and quantifying project risk impact

Risk impact		Explanation
Value	**Descriptor**	
1	Insignificant	Impact would be inconsequential
2	Minor	Some noticeable impact

3	Moderate	Manageable scale of impact
4	Major	Large scale of impact
5	Catastrophic	Extreme, widespread impact

Table 10.6 Assigning impact to project risk

Risk event	Probability	Impact
Inclement weather	4	5
Operational priorities	3	4
Uncontrolled scope changes	5	5
Fluctuating exchange rate	1	4

Having formally investigated the likelihood that each identified risk will occur, then assessed the potential effect the impact may have on the project's objectives in terms of the scope, time and cost baselines (along with quality, human resources, communication and the like), a clearer picture has emerged of both the negative effects for threats and the positive effects for opportunities for each identified risk.

PMBOK (2013) has recorded a range of meaningful impact scales for negative risk mapped against four of the key project objectives (as indicated in Table 10.7). This could easily be extended to capture all the remaining objectives, with scales relevant to different types of projects and organisational risk profiles.

The probability and impact matrix

Given that each risk event will generate a different probability and/or impact score or value, there needs to be a way to separate, rank or prioritise all the different levels of risk exposure. A practical way to do this is to simply multiply the probability score by the impact score (assuming you have quantified these) to get an overall priority score. This can then be used to separate the different levels or degrees of risk exposure, and to assist in developing appropriate response strategies.

Table 10.7 Definition of impact scales for four project objectives

Project objective	Very low 0.05	Low 0.10	Moderate 0.20	High 0.40	Very high 0.80
Cost	Minor cost increase	<10% cost increase	10–20% cost increase	20-40% cost increase	>40% cost increase
Time	Minor time increase	<5% time increase	5–10% time increase	10-20% time increase	>20% time increase
Scope	Minor reduction in scope	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item effectively useless
Quality	Minor drop in quality	Only very demanding applications affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item effectively useless

Therefore, the information collected so far (the risk events, their likelihood and their impacts) can be merged into a risk matrix, which will enable the project stakeholders to analyse and begin the process of prioritising the risk. The priority is calculated by multiplying the probability value by the impact value. The higher the resulting value, the greater should be the priority, as shown in Table 10.8.

There should never be any automatic nor direct correlation between probability and impact; they are mutually exclusive and objective assessments. Something with a low probability (a tidal wave hitting a densely populated city) could result in either singular or any number of multiple impacts (loss of life, infrastructure and environment).

By completing this matrix, all stakeholders in the project can clearly see:

- what the risk is
- the probability of it occurring
- the impact it will have on the project
- what the priority status is.

Table 10.8 Calculating the priority scale

Risk event	Probability	Impact	Priority

Inclement weather	4	Catastrophic (5) Schedule postponement	20		
Operational priorities	3	Major (4) missed deadlines	12		
Uncontrolled scope changes	5	Major (5) Revisions in schedule and budget	25		
Fluctuating exchange rate	1	Major (4) accessing contingency funds	4		

A useful graphical approach to plotting risk probability and impact is the '5 by 5' grid (there are also '3 by 3' or '10 by 10' grids), which uses numeric values for both probability and impact, and generates values ranging from 1 through to 25. The higher the number, the greater the priority that should be given to the treatment of this risk. In many cases, this grid is also used in conjunction with SOPs to determine a suitable low-level intervention. Table 10.9 displays the '5 by 5' grid with the following scaled intervention options:

- *Low:* values from 1 to 6 will be treated by existing SOPs.
- *Medium:* values from 8 to 12 will require direct intervention by the project manager.
- *High:* values from 16 to 25 will require immediate escalation and intervention by senior management (project steering group and/or sponsor).

Table 10.9 '5 by 5' priority grid

		Impact				
		1	**2**	**3**	**4**	**5**
Probability	**1**	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Critical reflection 10.3

Being able to define probability and impact in either qualitative or quantitative terms (or ideally both) is fundamental to treating risk effectively.
- Review how you define probability and impact in your risk register (or other documentation)

- Does it provide enough 'range' to enable all stakeholders to fully capture the risk?
- What improvements can you make to ensure that probability and impact descriptions and scales are effective?

Planning risk responses

With the analysis completed, it is necessary to plan the risk responses. These strategies will need to be well planned and tailored for each risk, and will need to identify who will be accountable for actioning the responses deployed throughout the project when required. In other words, a risk-management strategy or response will be assigned to, or 'owned' by, someone for each risk event throughout the project. All risk must be managed—and managed well. And for those who are still not convinced, perhaps an example will help. Consider that you have an investment portfolio—perhaps $10,000 worth of managed funds with a broker. Take your mind back to 11 September 2001 and the days following the terrorist attacks on the United States. As the fallout from the attacks spread around the world and through the stock market, shares began plummeting as investors feared the worst. Now consider the most common response options to this stock market collapse:

- *accept the risk:* ignore the falling share prices and do nothing, believing that over time your portfolio will regain any lost value
- *mitigate the risk:* increase your portfolio by buying blue chip stocks at rock bottom prices, and decrease your existing portfolio to offset the losses caused by falling prices
- *avoid the risk:* sell down your portfolio and get out of the share market to limit your losses.

Don't ask me to choose; it is your portfolio. However, your response may well be the best response for your given risk profile. Whichever response you choose, you are demonstrating your response—that is, your management of the risk threat (or opportunity). Figure 10.1 displays these options.
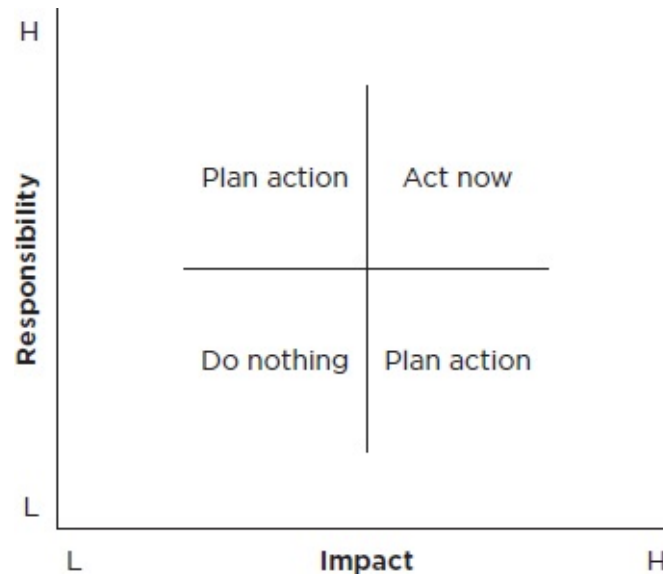
Figure 10.1 Risk-response matrix

Risk-response strategies for negative risks or threats

Recall that projects are all about scope, time, cost and resources. Each of these (and the other PMBOK processes) now need to be considered in light of possible risk-response strategies (regardless of where you are in the life-cycle). A number of possible choices are available, but it normally comes down to choosing one of the following four (or variations of these) strategies:

1 *Acceptance:* the acceptance (passive or active) of the risk and the impact it may have on the project's outcome, if it occurs. By choosing this response, the stakeholder's only recourse is constant monitoring and/or establishing a contingency reserve to handle the risks. Examples may include accepting that your flight might be delayed or your wedding reception rained out.

2 *Mitigation:* taking specific action to reduce either the probability and/or impact of the risk event. This strategy is designed to work with the risks, as they cannot effectively be avoided, and nor are the stakeholders willing to accept them outright. Examples could include informing your client in advance that the meeting might need to be changed due to an expected flight delay, or relocating the wedding indoors.

3 *Avoid:* this is a targeted response aimed at eliminating the threat to protect the project from the impact altogether. This may mean rescheduling, scope adjustments or isolating part of the project being affected. Examples could

include organising a Skype call with your client, or postponing the wedding until the dry season.

4 *Transfer:* the aim is to transfer the impact of the threat, together with the ownership of the response, to a third party. Rather than eliminating the risk, its management is simply transferred to someone more capable of dealing with the threat presented (this may also include the payment of a risk premium for transferring the liability). Examples could include hiring specialist travel consultants or engaging a specialist wedding planner.

Critical reflection 10.4

With four stock-standard response strategies available, treating risk is more manageable than some project stakeholders think.
- Review your last project's risk register and map each of the treatments against the four generic risk responses.
- What does this tell you about your attitude to risk: is it averse, neutral or risk-taking?

Risk-response strategies for positive risks or opportunities

In these cases, another three specific responses can be followed (in conjunction with the acceptance one cited above). They are:

1 *Exploit:* the focus here is on ensuring that the identified opportunity is realised by eliminating the uncertainty around it altogether so that the opportunity definitely happens. An example would be using new technology or talent resources to reduce the cost and duration required to complete the project.
2 *Enhance:* this strategy seeks to actively increase the probability and/or positive impacts of an opportunity. An example would be assigning additional resources to close out the project earlier.
3 *Share:* in many cases, project risk is shared between partnerships, consortiums and/or mergers, where each party is contracted for their particular expertise and each has a particular ownership, given that they are best able to manage the risk. An example would be a joint venture, where each party is known for a particular expertise that the other does not have.
4 *Accept:* this focuses in on being willing to take advantage of the opportunity should it arise, while not doing anything to actively pursue it. An example would be being open to a funding partner if the situation arose later in the project.

It must be remembered that, regardless of the negative risks or threats and the positive risks and opportunities, both probability and impact may be the drivers for response strategies. In some cases, it may be possible to develop a response to address the probability of the risk without having to develop an impact strategy. The probability of a major rain event in the wet season in the tropics would be quite high, so why not postpone the project to a drier season? In this example, there is no response strategy to limit the potential impact. In other cases (like death), probability cannot really be influenced so some people take steps to delay the inevitable (exercise, diet, medication, etc.). The key learning here is to not rush headlong into only seeking to manage just the impact every time. Always investigate both the probability and the impact.

Also avoid the temptation to include risk events that fall outside of the project. Think back to the tunnel example earlier—the project was to 'build' the tunnel. In this case, is there any risk to the builder if motorists do not use the tunnel? The short answer is 'no'. Surely the more relevant risks would relate to materials, rain, access and so on. The reality is that someone (the client) wants a tunnel to ease congestion and to turn a profit—both of which fall outside the contractor's obligations (although contractual conditions may certainly present a different picture). The lesson here is not to make yourself liable for risk that is outside the project's boundaries.

Assigning accountability

Clearly, risk-response strategies have to be assigned to the most appropriate stakeholder available to carry out the required response. Their technical skills may be the sole selection criterion in this instance, or it may come down to their seniority or financial delegation. Obviously (one would hope), the project manager will *not* be held responsible, in the first instance, for each and every response strategy, as these should be 'outsourced' to the people who have the prerequisite authority and financial delegation, or who can actually work towards resolving them. The project manager will, however, retain overall control of the process.

Assigned ownership is a foreign concept to a lot of project stakeholders, which is both surprising and alarming. If no one is assigned responsibility, there is a very high chance that no one will take any interest in the risk or its treatment. If the responsibility is shared, everyone on the project takes an active role in not only identifying and analysing risk but also in ensuring that capable resources are actually assigned to action and monitor the response strategy. As a

result, they could be responsible for any of the following key supporting activities:

- identifying the triggering events that set the response strategy in effect
- carrying out the response strategy
- presenting an update at the project risk meetings
- updating the project scope, schedule and cost baselines and management plans
- monitoring the risk register for additional, related risks
- conducting further quantitative risk analysis
- evaluating the effectiveness of the response strategy.

Let's now return to our risk assessment (Table 10.10) and update the information with what the response strategy is and who is accountable.

There is one final action (perhaps series of actions) to be taken before rushing off to try to control the project risks (as per the PMBOK model). Recall that one of the key assigned responsibilities above was to update the project scope, schedule and cost baselines, as these have probably changed given the risk analysis conducted and the development of the appropriate strategies. In fact, there are other documents to update as well, including:

- the quality management plan, reflecting changes to processes, standards, practice or tolerance and supporting requirements documentation
- the human resource management (HRM) plan, reflecting changes in technical skills, resource assignment and loading or professional development required
- the communications management plan, reflecting changes in additional information needs, reporting protocols and formats
- the procurement management plan, reflecting changes in tendering and/or contracting conditions relating to any additional work required
- the stakeholder management plan, reflecting changes in stakeholder expectations, revised requirements and 'handling' strategies
- the change request registers, reflecting changes to resources, activities, cost estimates and other items impacting the project planning and delivery
- the technical documentation, reflecting changes in design, physical deliverables or other technical behaviour of the modified product or service
- assumptions logs, reflecting changes in outdated assumptions and/or new ones.

Table 10.10 Project risk register

Risk event	Probability	Impact	Priority	Strategy	Accountability

Inclement weather	4	Catastrophic (5) Schedule postponement	20	Seek approval for time extensions	Logistics officer
Operational priorities	3	Major (4) missed deadlines	12	Identify replacement resources	Production manager
Uncontrolled scope changes	5	Major (5) Revisions in schedule and budget	25	All proposed changes in writing and authorised	Project manager
Fluctuating exchange rate	1	Major (4) accessing contingency funds	4	Closely monitor cash-flow reserves	Project steering group

The principal document that needs updating is, of course, the project risk register. These updates will be dependent, once again, on the risk attitudes of the organisation and key stakeholders, the priority ranking and the risk responses. While some low-level risks may be assigned to an almost casual watch list, those with a medium to high priority may well require that the following information is regularly reviewed and updated (PMBOK, 2013):

■ risk owners and assigned resources
■ agreed response strategies
■ trigger conditions, or warning signs of a risk occurrence
■ contingency plans and reserves
■ residual risks remaining post response
■ secondary risks arising directly from implementing a risk response.

Controlling project risk

Risk assessment is an invaluable tool for the project organisation, stakeholders, project manager and team members in terms of ensuring that the project

objectives are realised. However, identifying, assessing, analysing and responding to tentative risks at the start of the project does not mean you are free from constantly reviewing and controlling your risk assessment processes *throughout* the project. It simply means that you are following due process every time a project is initiated.

As you know, risk is not a static concept, nor does everyone get it right the first time, every time. The challenges of identifying the risk events to begin with, let alone the attempts to try to quantify the probability and/or impact, require a dynamic mix of science and art, to say the least. In some situations, the chosen strategies might be very effective at minimising the risk exposure, although in others they might turn out to be questionable, if not totally ineffective. Ongoing control is what is needed to ensure that the opportunities involved in managing risk are not squandered and that the many lessons presented throughout the project are, in fact, learned. Figure 10.2 highlights the dilemma faced by the project organisation regarding balancing risk.

PMBOK (2013) stresses the importance of risk control, with its acknowledgement of the process as 'implementing risk response plans, tracking identified risks, monitoring residual risks and evaluating risk response effectiveness throughout the project' as it continually optimises risk responses. New, changing and outdated risks need to be monitored continuously for their impact on the project. With such a direct focus, risk control involves accessing performance information to determine whether:

- project assumptions are still valid
- performance data are still accurate and current
- planned results compare favourably with actual results
- new risks have been identified, current risks reassessed and risks closed out that have been extinguished
- adherence to the risk-management plan has been confirmed
- contingency reserves for both schedule and cost performance are available
- alternative strategies have been canvassed and analysed
- corrective action has been implemented
- the project management plan and associated documents have been revised
- the lessons learned databases have been updated.
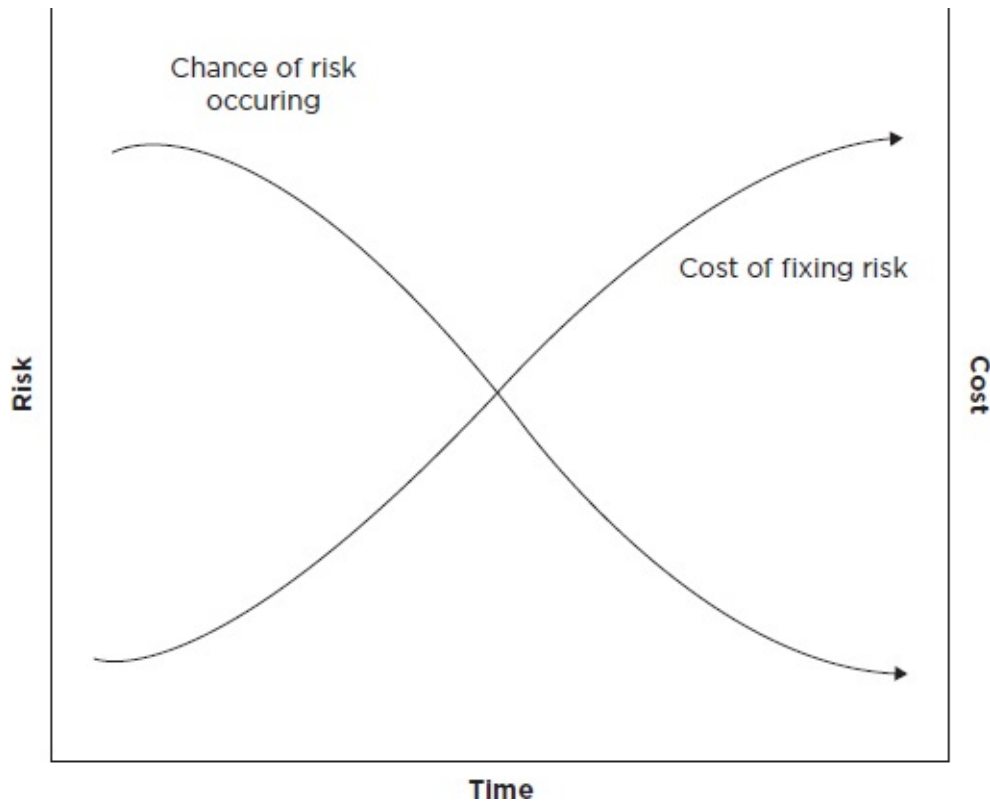
Figure 10.2 The risk-management dilemma

In the completed example in Table 10.11, the expectation that risk must be reviewed and controlled constantly throughout the project has been incorporated in the risk register. Failure to do so would leave the door open for retribution against the project manager and the team for mismanaging the project and for failing to anticipate all the changes the project incurred—many of which may be clearly outside the control of the project itself. After all, no one is allowed to blame others. Every party is walking the same road, with an acute sense of shared ownership and responsibility.

Table 10.11 The risk register

Risk event	Probability	Impact	Priority	Strategy	Accountability	C
Inclement weather	4	Catastrophic (5) Schedule postponement	20	Seek approval for time extensions	Logistics officer	R: pr (1
Operational priorities	3	Major (4) missed	12	Identify replacement	Production manager	R: pr

	deadlines		resources		(4
Uncontrolled scope changes	5	Major (5) Revisions in schedule and budget	25	All proposed changes in writing and authorised	Project manager	R p (1
Fluctuating exchange rate	1	Major (4) accessing contingency funds	4	Closely monitor cash-flow reserves	Project steering group	R p (4

Critical reflection 10.5

Simply because you identify and treat risk doesn't (sadly) mean that the risk has disappeared, nor does it block any future risks from appearing in your project.
■ Review your last project's risk register and find examples of where the nominated treatment did not achieve the desired result.
■ Review your last project's risk register and find examples where the residual risk (left after treatment) was monitored and reviewed and/or the register was updated to reflect this.
■ Review your last project's risk register and find examples of where new risks were added throughout the project.

Review questions

10.1 Why is risk management crucial to project planning and delivery?

10.2 Summarise the steps involved in managing project risk and identify the role each step plays in proactive risk management.

10.3 Explain the application of the probability and impact matrix and the benefits it delivers.

10.4 What are the common risk-response strategies for both threats and opportunities throughout the project?

10.5 What are the individual actions that need to be performed under risk control?

Research activities

As with each of the PMBOK processes, the project manager or team members may be tempted to believe that they have to become qualified risk managers or experts to deal with project risk.

Let's be clear: this isn't necessary. However, the critical understanding and application of how project risk impacts the planning and execution of the project are required. To further develop your understanding of your organisation's risk-management policies, procedures and practices, consider researching any of the following specialist areas and topics:

- risk-management models
- health, safety and workplace legislation
- incident reports
- material data safety sheets (MSDS)
- probability distribution
- sensitivity analysis
- risk standards
- contingency plans
- expected monetary value analysis
- interviewing techniques
- risk registers
- quantitative analysis
- qualitative analysis
- SWOT analysis
- cause and effect diagrams
- process mapping.

Case study

Migrating to the new software platform was always going to present some challenges for the business. Not only were there localised, operational issues across the state; there was also the staggering amount of 'illegal' software loaded on most PCs throughout the offices. Not to mention that this decision had been announced from 'above', with little, if any, meaningful consultation.

George, the newly 'anointed' third project manager in as many months, continued reading through the project mandate (written by the executive) and the project delivery plan (written by the original project manager), although he was yet to locate the project management plan itself and its component parts—notably the risk-management plan.

Categorised as a level 4 project, the mandate had provided some indication of the 'high-level' risks this crucial project would face, although without going into the necessary detail as to how they would be managed. With the budget approaching $1.5 million, disparate stakeholders more than

likely wanting to protect their fiefdoms, political sensitivities, dated infrastructure and the obsolete XP platform, george knew he was well and truly in trouble after his first week in the role.

It wasn't that the risks were all that hard to identify in the first place; it was the culture of the organisation that seemed to be his biggest impediment. As a recipient of recurrent government funding, the bureaucratic business had always survived by not rocking the boat and clearly by not taking too many risks. The notion of proactively managing risk through an embedded process, let alone having a resident risk champion on board, was totally foreign to everyone who worked there. George also realised that not all the potential risks to this project would in fact be negative, as the opportunities presented by this major upgrade should be identified, promoted and capitalised on.

> ❛…regular meetings would need to be held, with risk added to the agenda. Scalable templates needed to be developed to help identify, analyse, respond, control, monitor and review risk; all project performance reporting would now incorporate risk and schedule impact updates; and…the practice of shared risk ownership would be clearly defined, allocated and communicated from now on.❜

George now knew what he needed to do, and it wasn't going to be popular with everyone. Within the hour, he had drafted out a risk-management planning document ready to send to the project's key head office and state-wide stakeholders, contractor supervisor and their SMEs, while also informing everyone that they were now foundation members of the project's risk-management team—and attendance would not be optional.

An integral part of the planning document was the 'on the ground' process george wanted followed as this migration project evolved through the different phases of development, testing and rollout, and the decision gates and required approvals that would need to be in place. This involved more than singularly filling in a risk register template, or worse still finding an example (probably with the help of google) and simply copying and pasting in the information. Ideally, george wanted a fully endorsed ICT governance standard to be adopted, but he realised that this was outside his remit on the current project.

George was proposing that regular meetings would need to be held, with risk added to the agenda. Scalable templates needed to be developed to help identify, analyse, respond, control, monitor and review risk; all project performance reporting would now incorporate risk and schedule impact updates; and, perhaps most importantly, the practice of shared risk ownership would be clearly defined, allocated and communicated from now on.

Conscious of only lip service being paid to his ideas, george further proposed a series of state-wide risk-management workshops to walk everyone through not only the process and documents, but the level of discussion, detail and analysis warranted. The last thing he wanted was risk-management discussions and registers littered with 'lame' risk events like legacy systems, coding errors, a lack of user input, incomplete requirements, testing failure, contractor disputes, time delays and budget blowouts. What george and his team needed to know was how the project uncertainty and the resultant impact (good or bad) would be managed proactively.

Questions

1 How will a risk-management plan change the endemic culture in both the business and the project?
2 What are 'real' examples of both negative and positive risks in george's project?
3 How would you scale and prioritise these risks to enable a targeted response?
4 What existing controls and 'new' treatment strategies could george expect to see in the risk register?
5 Why is the notion of shared responsibility for risk so important to george?
6 Should george feel completely at ease once risk treatment has been assigned?

Procurement management

Embedding value into the project

Key points

- Understanding the procurement planning process
- Making the procurement decision
- Selecting potential suppliers
- Evaluating supplier responses
- Contractual considerations
- Controlling procurement activities
- Processing compliant claims
- Reporting contractual performance
- Discharging the contract

In practice

Individuals, community groups, professional associations and organisations, from small businesses through to major corporations, all face the same crucial decision at one time or another: to either complete an activity themselves (in-house) or to outsource it to another party.

Many projects will be self-resourced using internal subject matter experts (SMEs), team members and other employees as required. Proprietary knowledge, existing capability and demonstrated expertise and experience will prove to be sufficient to sustain the project. Other projects—perhaps those bigger in scale, complexity and risk—may well warrant access to external expertise not resident in the project organisation itself. In these cases, third-party vendors, suppliers and other resources may need to be sourced, hired, procured or contracted to perform the required work.

Think about your projects. How are they resourced? What value does outsourcing promise and actually deliver? What drives that decision and what risks are associated with it? Yes, there are a number of very clearly defined risks (as well as considerable value) with outsourcing resources. Think about the management issues that may arise, the vagaries of quality, the multi-layered channels of communication, the reporting lines and the contractual conditions that (should) apply. Will these potential risks outweigh the derived value? After all, what you gain is pretty positive too: access to an external pool of dedicated (and readily available) resources, highly sought after and 'prized' industry knowledge and expertise, and independent employment terms, conditions and benefits—not to mention no ongoing employment and/or legal relationship or obligations.

Chapter overview

The modern-day project organisation uses procurement to secure additional value (not just the lowest price); to form partnerships and alliances with key suppliers (not multiple suppliers); to seek out enduring benefits (not just immediate benefits); and, finally, to pursue growth and development in the markets and businesses in which it operates (rather than just market survival).

Collectively, this new 'power' behind the procurement planning, decisions and practices of the organisation has seen the emphasis shift from a purely administrative role, which simply managed the operational and transactional

needs of the organisation, to becoming an integral part of the strategic supply chain for the project.

Beginning with planning for procurement activities, PMBOK (2013) again adopts a sequential approach to include all 'processes necessary to purchase or acquire products, services or results needed from outside the project team'. This includes conducting procurement planning activities that result in the contract being awarded, controlling procurement activities to manage the relationships, performance and contracts and closing out all procurement activities.

Planning procurement management

Let's begin with a comprehensive yet straightforward definition of exactly what procurement is: procuring the right materials, with the right quality, in the right quantities, at the right time, for the right price, from the right external source and, ultimately, for the right reasons. This is not to say that the project could not 'actually' procure from itself, in exactly the same way as outsourcing occurs, and adopt internal service level agreements (SLAs).

Historically, project procurement has performed a process-based function, driven by a particular department or local division seeking to gain possession of something that solves an operational issue—a mechanical part, stationery, a training provider, waste disposal and so on. On the other hand, strategic procurement has a widespread 'value-adding' function that focuses on the efficient attainment of goods, services or results that deliver a number of very specific and measured benefits to the project organisation, including:

■ supplying the project with a range of goods and services as specified
■ improved relationships with key suppliers
■ balancing output with both value and quality
■ advancing the interests of the buying organisation
■ increasing accountability in the supply chain
■ demonstrating value for money
■ insulating the project parent's cost structure and financial exposure
■ enabling the project parent to focus on its core competencies
■ allowing greater access to state-of-the-art technology, premium materials and workplace expertise (to name just a few).

As cautioned in previous chapters, procurement activities are not completely

independent of other project management processes. Although discrete in definition, each will potentially overlap and impact with scope, cost, quality, risk, human resources, communications, time and stakeholders. Perceived by many to be document-based and an unnecessary process-driven business function, project procurement needs to demonstrate that it is at the forefront of embedding value into the project (as opposed to delaying decision-making with compliance regimes).

Project procurement involves deciding whether or not the project needs to procure something or someone. Known by some as the 'make or buy' decision, this decision will trigger a number of actions and outcomes, each with far-reaching consequences for both the project and the stakeholders involved. Clearly, an assessment needs to be made as to what the needs of the project are (and will be), and whether these needs are best satisfied by going to the open market. Table 11.1 highlights what some of those assessments might be when making that all-important decision.

Table 11.1 The initial procurement decision

Make decision (in-house)	Buy decision (out-house)
Currency of skills	Insufficient capability
Known availability	Conflicting operational priorities
Cost-effective resource allocation	Enhance project scope
Excess capacity	Access to existing solutions
Unknown supplier base	Statutory compliance requirement
Existing management protocols	Partnering opportunities

In acknowledging that the project needs could be met by either outside or internal support, PMBOK (2013) adds that planning for procurement management is the process of 'documenting project procurement decisions, specifying the approach and identifying potential sellers'. Remember that the focus of procurement planning is to establish up front whether procurement is required, and then to begin the process of ensuring that potential suppliers, qualified personnel and appropriate procedures and guidelines are in place. The decision to procure will thus be made for the right reasons, knowing full well that the project stakeholders will support both the process and the additional time taken throughout the project.

Undoubtedly, internal and existing procurement policies, procedures and practices will govern and direct much, if not all, of the project's procurement activities. However, market conditions, project-specific (unique) requirements, risk attitudes and market research should not always be sacrificed or overridden by prescriptive internal processes. Clearly, a blended approach is required that could be reflected in the project procurement management plan, detailing exactly how the project will acquire what it needs, the documents created, the processes managed and how the contracts will be administered and closed out. Inclusions could include any of the following:

- specifying contract deliverables
- information on the prevailing market capability
- preference for a single- or multiple-source supply
- what the tender process is: invitation for bid (IFB), request for information (RFI), request for quotation (RFQ), expression of interest (EOI), invitation to tender (ITT)
- preference for contract types:
  □ standard form (AS 2124, AS 4000) construction contracts, minor works contracts, supply contracts, period contracts, consultancy contracts
  □ bespoke form (principal generated)
- agreement of the pricing model:
  □ fixed-price
  □ cost-reimbursable
  □ time and material (hybrid)
- potential risks associated with contractual arrangements:
  □ legal (e.g. conditions of contract, amendments)
  □ commercial (e.g. administration, profitability)
  □ technical (e.g. statement of work, specification)
- escalation hierarchy for alternate dispute resolution (ADR): notice of dispute, discussion, meeting, negotiate, mediate, arbitrate, litigate
- suite of procurement documents (form and format)
- all assumptions and/or constraints
- flagging issues of long lead times
- how contract compliance will be managed
- performance reporting metrics and other data
- identifying performance bonds, guarantees and/or insurances
- supplier management activities
- roles and responsibilities.

Critical reflection 11.1

The decision to make or buy in procurement can have significant impacts on how you plan and manage your project.

■ How well are your project management procurement processes documented and understood by the project stakeholders?

■ What level of training (or support) is provided whenever the project needs to engage in procurement?

Separating the statement of work and the specification

Having formulated a basic approach to how procurement activities will be planned, managed and closed out, a number of technical procurement documents should also be created for each procured item that not only support the procurement strategy, but also enable unambiguous information to be communicated between all the parties involved. Consider the following two important documents (noting the crucial difference between them, as they are sometimes used interchangeably and/or combined):

■ *Statement of work (SOW):* defines the component of work that will be included in the project—in other words, *what* the project organisation wants. This document is written in clear, concise and complete language, and describes the procurement items in sufficient detail to enable sellers to assess their capability to supply. This detail could include a specification (or not), and will be driven by the nature of the item, the needs of the project (e.g. required quantities, work location, quality standards, performance requirements) or the expected form of the contract. Put simply, a statement of work identifies *what* is required (without specifying *how*).

■ *Specification:* defines the technical detail of the work to be performed. As with the SOW, it is written in explicit, clear and unambiguous language, as it describes the technical capability (or technical approach) required. This detail could include the required standards, quality, service, regulatory compliance, performance or other relevant dimensions (inspection, measurement and testing). Put simply, the specification identifies *how* it must behave or function.

A considerable amount of time will also be spent on confirming technical specifications, requirements and other deliverables and documenting all contractual obligations, conditions and provisions. These are tasks requiring not

only technical knowledge but also a good command of the English language, as the documents can easily become cumbersome, confusing and too demanding for potential suppliers to respond to. James (1995) offers the following suggestions for writing effective specifications (with a few additions):

- Base them on a precise understanding of the project's scope and its agreed specifications.
- Develop the final specification through a series of drafts and revisions.
- Express the contract clauses and conditions clearly and unambiguously.
- Identify the true performance required by the specification.
- Include a comprehensive glossary of terms.
- Construct the specification logically.
- State the evaluation criteria for assessing responses.
- Include response templates where possible (even with sample templates completed).
- Use a third party to review the documents.
- Include a copy of the proposed contract that will be used to administer the agreement.
- Encourage alternative and/or innovative responses (sometimes referred to as 'non-conforming' tenders).
- Check it thoroughly for errors, format flaws and incomplete information.

Selecting potential suppliers

The formal or informal procurement management plan has flagged the relevant process and documents involved in deciding to deal with the market (solicitation). Procurement solicitation refers to the process of engaging potential and/or targeted suppliers with the intent of obtaining responses from them regarding how they each believe the needs of the project can best be met. Popular solicitation vehicles include e-alerts from government and other tendering agencies, the internet, commercial directories and databases, preferred supplier lists, newspaper advertising, industry publications and/or trade journals and conference sponsors.

   An important part of this process is giving the market enough time to prepare its detailed responses and proposals. Again, the solicitation medium will largely determine the response time; however, as most respondents will be investing their own time and money into preparing their responses, it would be wise not to rush this stage. During this stage, it will often be necessary to respond to a

number of queries arising from the solicitation that will need to be seen to be addressed equitably, and favouring no one potential respondent. In the case of tenders, addendums will be issued, addressing any questions that potential suppliers have raised in their reading and interpretation of the documentation. In other cases, supplier workshops (bidder conferences) will be conducted to publicly work through all the materials, addressing any concerns as they are raised.

Irrespective of the forum or media used, clear, complete, accurate, applicable and user-friendly solicitation documents (and nominated response templates) will ensure that suppliers can address all the criteria required in their proposals. The key is to ensure that as much of the documentation ambiguity and subjectivity is removed prior to solicitation. The last thing you want is to end up with 25 different respondents, each with a different interpretation of the requirement, and daily addendums being issued (yes, this happens more often than it should). Clearly, this preparation will be time consuming and probably costly, and will require personnel trained in preparing these documents. The extent of work undertaken here might well depend on the underlying value of the procurement, the degree of risk involved and the expertise required.

So what other factors might influence whether a supplier responds by submitting a response? Gido and Clements (2015) (along with my additions) suggest that the following could be key factors in making that all-important decision:

- the number of competitors that might be interested in submitting a proposal and whether they have a prior relationship with the project client
- the degree of risk (technical, financial, reputational, etc.) in delivering on the client's requirements
- whether the mission, value and/or culture (to cite a few factors) are consistent with those of the suppliers
- whether there is some form of synergy with the client's standard operating procedures (SOPs) and those of the suppliers to ease information exchanges
- whether their existing supplier capability is sufficient, and/or whether the supplier will be enabled to extend and enhance their capability
- whether the project will improve or harm the supplier's credibility, goodwill and reputation in the industry
- whether the client has funded the project adequately, or is on a 'fishing trip' looking for free estimates from the market
- whether the supplier has enough resources to not only put the response together (quite an effort in some cases), but also has the necessary project

resources once the bid is won

- the inherent value of the project to the supplier
- whether the supplier has confidence in the reliability of the estimates provided by the client
- whether there is a sufficient profit margin in the project
- whether the supplier is competent in the nominated methodology the client has specified to manage the project.

The project procurement personnel will have very specific duties to perform and very clear selection criteria to evaluate all the potential suppliers. While many have already been flagged in the procurement planning section, a few additional requirements are fleshed out below (PMBOK, 2013):

- *Understanding of the requirement:* does the proposal address the project need?
- *Technical capability:* does the proposal address the technical knowledge and skill required, or can this be acquired easily?
- *Management capability:* does the proposal address the necessary management procedures and processes to ensure a successful project?
- *Financial capability:* does the proposal provide evidence of the required financial resources (e.g. profitability, cash flow, funding)?
- *Resource capability:* does the proposal nominate the required resource requirements (e.g. skills, location, training)?
- *Price:* does the proposal detail all actual cost and ancillary costs (e.g. delivery, installation, testing)?
- *Life-cycle cost:* does the proposal include whole-of-life costing modelling?
- *Past performance:* does the proposal include how the supplier has performed on similar projects?
- *Warranty:* does the proposal guarantee how the seller will warrant their work, and for what time period?
- *Intellectual property:* does the proposal assert any rights to pre-existing work or work to be performed during the project?
- *Legislation compliance:* does the proposal confirm that all legislative, legal and statutory obligations will be complied with?
- *References:* does the proposal include referees verifying expertise, experience and/or compliance with contractual requirements?

Another useful technique to help consolidate (if not visualise) exactly what the supplier selection criteria are for your subsequent evaluation of the supplier's responses is the source selection criteria grid suggested by Kloppenborg (2015).

Once all the criteria categories have been agreed, it is a simple matter to populate the table with the relevant criteria, as Table 11.2 demonstrates. Not only does this ensure you have broad coverage across a number of key criteria; it will also help with the relevant weighting you assign each criteria.

Table 11.2 Mapping supplier selection criteria

Technical	Management	Financial	Operational
Requirement understanding	Appropriate methodology	Financial capacity	Organisational profile
Technical approach	Contract management	Progress claims	Prior experience
Risk mitigation	Performance reporting	Life-cycle costing	Capacity
Commitment to quality	References	Warranties	Resource capability

Critical reflection 11.2

Dealing with multiple current and prospective suppliers can quickly become quite a burden for procurement people. Review your procurement supplier evaluation processes in line with the information above and identify where additional criteria could be incorporated into the evaluation process on your projects.

Contractual considerations

Irrespective of whether your project adopts a process approach or a value-adding procurement approach, specifications, an understanding, purchase orders, invoices, agreements and/or contracts will mandate the underlying legal framework (and documentation) within the project. Whether dealing with clients, buyers or sellers, contractors, subcontractors, vendors, service providers or suppliers, legally binding agreements (ranging from the simple to the complex) may be created between a buyer and seller. With one party having the obligation to provide something of value and the other party the obligation to provide valuable compensation (perhaps money) in return, the project organisation, key stakeholders, project manager and team members will need to

fully appreciate, comply with and enforce every mutually binding agreement used throughout the project (and don't forget about the potential risks here either). These agreements and contracts (standard form or bespoke) should never be taken lightly, and may require the input of legal expertise where appropriate (although try to limit the legalese).

Given the (increasing) proliferation of different types of proposals, agreements and contracts floating around projects, and the reality that one size does not fit all, it is imperative that anyone engaged in procurement has at least a working knowledge of contracts (or access to someone who has). Expressed simply, a contract is a legally binding agreement between two or more parties to act, or refrain from acting, in a particular way. More often than not in writing (not all contracts must be written), the contract creates an obligation, enforceable in law, between the parties. With the intent of protecting the interests of both parties, contracts should include the following elements:

- offer (capable of being accepted)
- acceptance (capable of being communicated)
- consideration (provision of something valuable in return for what was provided)
- intention (both parties agree to be bound legally)
- mutuality (neither party is disadvantaged)
- capacity (both parties are not under any duress)
- legality (it is not an illegal activity).

Established by common law, it is possible to group all contracts under three broad categories, although each offers a totally different configuration on profit maximisation and risk minimisation (the two principal reasons why people and business enter into contractual arrangements). The privity of the contract specifies that the contract exists only between the buyer (principal) and the seller (contractor), as distinct from all other parties (see Figure 11.1). Table 11.3 summarises fixed-price contracts, cost-reimbursable contracts, and time and material contracts that will formalise this privity.

Table 11.4 adds another perspective to the debate about which contract to use with reference to a wider range of variables over and above just profit and risk. As you read through the additional considerations, weigh up what you consider to be the advantages and disadvantages of each type, from both the project (buyer) and the vendor (supplier) perspectives, and reflect on which one would best serve your project and why. The information has intentionally been presented in a very siloed fashion, which is fraught with difficulty, depending on

whether you are the buyer or seller, the scale of the project and any number of other variables.
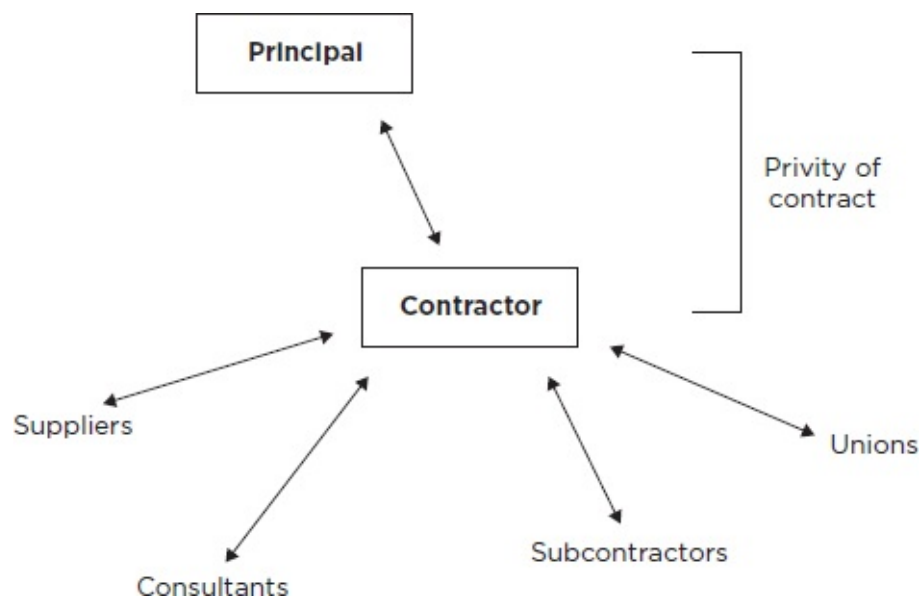
Figure 11.1 Privity of contract

Table 11.3 Popular contract pricing models

Pricing model	Description
Fixed-price	This is one of the most common contracts used. By name, the contract seeks to fix the final price of the project in line with the contracted services covering both contractor costs and profit for the defined product, service or result, with all work then performed at the negotiated contract value.
	With these contracts, a detailed scope or requirement is mandatory, as the price of the work is fixed for the contract term. Variations can be accommodated, although generally with a higher contract price. Incentives may apply for achieving project objectives (delivery dates, cost and technical performance) or anything else that can be quantified and measured.
Cost-reimbursable	In these contracts (of which there are numerous variations based on fees, incentives and savings), the contractor is paid an agreed fee to reimburse the

	legitimate performance costs incurred in completing the work, as well as an additional fixed fee that may cover profit or any other incentives negotiated.
	The attraction to this type of contract is that it will often reduce initial negotiations as a finite scope is not required to get the project underway.
Times and material	This hybrid contract pricing model contains aspects of both the fixed-price and cost-reimbursable contracts. In cases where a precise statement of work cannot quickly be prescribed, work performed is paid for with an agreed amount for an agreed period of time. As more work is performed, more costs are incurred and more payments are made.

However, regardless of the analysis, the essential point to remember is that, irrespective of which type of contract you use, each will favour or disadvantage both the buyer and/or seller in some way at some time. Be aware of what these might be, as ignorance of the law is *not* a legal defence.

Table 11.4 Contract type comparisons

Considerations	Fixed-price	Cost-reimbursable	Time and material
Final price	Known, excluding equitable and subsequent adjustments	Not known	Not known
Profit	Expected, potentially variable, but not guaranteed	Agreed and fixed	Assumed
Risk	High (supplier)	High (buyer)	Low (supplier)
Cost	Fixed	Estimated only	Not known
Terms	Rigid	Flexible	Flexible
Responsibility	Borne by the supplier to	Borne by the buyer to ensure costs are	Borne by both buyer and seller

	accurately estimate true costs	legitimate	
Preparation time	Detailed and lengthy	Quick to get up and running	Little required
Protection afforded	Buyer	Supplier	Both
Contingency	Potentially high	Low	Not applicable
Variations	Costly	Allowed	Allowed
Auditability requirement	Low	High	High
Degree of control	Low	Very high	Low
Completion incentive	High	High	Low
Performance incentive	High, if savings and efficiencies made by the seller	Low, often agreed and fixed	None
Scope requirements	Final, detailed and specific	Indicative, subject to revision	Fluid
Ease of administration	Relatively easy	Considerable time and effort	Low level required

Another perspective on contracts is the contrast between traditional forms of 'adversarial' contracting and the modern 'relational' approach favoured by major capital improvement projects. Think of traditional forms of contracting as having the following stereotypical characteristics:

■ legal relationship
■ master/servant relationship
■ adversarial nature
■ win–lose approach
■ creation of legal obligation
■ regulation of commercial transactions
■ risk management by party best able to do so
■ formal dispute-resolution mechanism
■ unsuitability for high-cost, high-risk, complex projects
■ used to enforce compliance.

In contrast, consider the following behavioural characteristics common to relationship contracts:

- working relationship
- open communication
- mutual trust from both sides
- dispute escalation built in
- innovation encouraged and supported
- contract 'as matter of last resort'
- the aim of mutual goals achievement
- transparent reporting from both parties
- collaboration underpinning the entire project
- facilitated partnering meetings
- prioritisation of objectives.

Perhaps there is a place for both types; some very much follow the 'working relationship' model, while others adhere to a more 'legal' relationship. However, regardless of the nature of the contract, both formats could reference the following inclusions:

- general conditions of contract
- supplementary conditions of contract (or special conditions)
- definitions and interpretations
- statement of work (and/or specification or scope baseline)
- schedule baseline
- performance period
- performance reporting requirement
- roles and responsibilities
- pricing information
- payment terms
- contractor warranty
- testing and inspection regime
- acceptance criteria
- limitation of liability
- fees and retainers
- incentives and penalties
- insurance and performance bonds
- change request methods
- ADR mechanism

- termination clauses
- agreement instrument.

Conducting procurement activities

PMBOK (2013) defines these activities as the processes 'of obtaining seller responses, selecting a seller and awarding a contract'. While price may well be important in selecting the preferred supplier, it should form just one of many other communicated evaluative criteria in determining both the technical merit of the submission and the overall value for money it represents. Evaluating responses is a lot like the recruitment and selection process, where candidates are scored against a number of key selection criteria weighted according to their importance to the position being applied for. These criteria (cited earlier) would have been listed clearly in the procurement invitation (although some organisations do not include the weights for each one, nor do all organisations publish all their evaluation criteria), inviting potential suppliers to demonstrate exactly how they met those criteria. One useful, relatively straightforward and transparent way to conduct this evaluation is to use the evaluation matrix. The matrix allows for respondent submissions to be scored against each weighted criterion and numerically evaluated to establish a competitive range of results. The evaluation panel is then in a position to approach any suppliers within a certain range to engage in additional negotiations prior to submitting their revised and final proposals to the panel. Strict confidentiality is maintained during all these negotiations.

This may involve initially shortlisting any responses (tenders) that conform, then refining the proposals by performing a more comprehensive evaluation against the selection criteria. A weighting system could also be used to rank all responses against the criteria to generate weighted evaluation scores assigned to each proposal.

Additional discussions and negotiations may also be required to elicit substantiation or additional information. This may help rectify:

- significant differences in cost estimates
- non-conforming responses (if this provision has been specified)
- deficiencies in the SOW or specification
- different technical approaches covering methodologies, techniques, solutions and services

- proposed amendment to the contract submitted by the seller
- clarification on contractual conditions
- performance reporting requirements.

Having objectively, ethically and without discrimination evaluated all the received submissions (of those that conformed with the stated specification and/or other instructions provided), it is now time to nominate the preferred supplier(s), which will invariably lead to a formal agreement being reached and in many cases a contract being awarded to the successful party. Recall that a contract is a mutually binding agreement between two or more parties prescribing what is expected from one party (perhaps performance) in return for something from the other party (perhaps payment). In this instance, all other respondents would be notified that their submission was not successful and be offered an opportunity for a debrief and feedback on the reasons why.

Controlling procurement activities

With the contract now awarded (flagging the commencement of the contract administration stage), processes have to be in place to manage procurement relationships, monitor contract performance, and make changes and corrections to contracts where required (PMBOK, 2013). This will not only enable both parties to be satisfied that each party has fully met their legal obligations as stipulated under the agreement or contract, but will also allow each party to feel confident that their legal rights are protected. Clearly, anyone administering a contract or controlling any aspect of procurement must be aware of the legal implications of their actions.

Regardless of where the procurement function sits—operationally or within the project—they (contract manager, administrator, superintendent, project manager or team member) will be responsible not only for the contractual relationship, but also for the integration of other project management processes throughout the project life-cycle, including:

- directing and managing authorised work
- inspecting and verifying completed work prior to payment
- ensuring all variations are properly assessed and approved
- confirming rectification of all corrective work
- maintaining accurate historical records.

Compliant progress claims

One of the above areas that warrants closer scrutiny is the process of authorising contractor progress claims and payments. Too often, payments are made without any prior checks and balances regarding whether the work claimed has been completed, let alone completed as required. It is not uncommon for claims to be made with only a brief description of the work performed and an amount to be claimed. Sadly, payments are often made immediately, in the belief that the claim is justified and with full trust in the contractor's ability to invoice correctly.

While not making disparaging allegations about (some) contractor claims, the issue can be resolved comprehensively and permanently in a transaction that is transparent. Consider the following suggestions for what every claim should contain (adapted from Contract Control International, workshop resources):

- *Facts:* what are the particulars of the claim (work performed, location, etc.)?
- *Clause:* what contract clause authorises this work to be performed and the claim to be made?
- *Proof:* what proof is offered in support of the claim (invoices, sign-in sheets, consultant reports, technical documentation, testing results, work performance data, etc.)?
- *Amount:* is the amount claimed and presented as per the contract requirement (itemised breakdown, ex-GST, etc.)?

This format would fit on one page, and enable the procurement person to easily and quickly authorise payment. It also does two other things: it obligates the contractor to demonstrate that their claim is legitimate by submitting their claim exactly as specified by the contract if they wish to be paid promptly and, perhaps more importantly for the project personnel involved, it saves them wasting time trying to determine whether the claim is legitimate. In other words, the claim is either compliant or not, as assessed against four 'agreed' criteria. If compliant, it is paid; if not, a two-line letter is forwarded to the contractor stating that their claim will not be assessed until they submit a compliant claim.

Critical reflection 11.3

Managing progress claims (the assorted order forms, invoices and queries) can easily consume a lot of valuable time, most of which would be unnecessary if those claims were always compliant.
- Identify in your project documentation (contract, project plan, service-level agreements, terms of trade or

other relevant documents) where the 'correct' process for getting paid promptly has been stated clearly.
- Review a number of past claims and assess exactly how compliant they were.
- For the non-compliant ones, investigate why they were processed and query the amount of time taken to process the payment.
- How could the above situation regarding non-compliant processing be improved?

Performance reporting

Over and above progress claims, the other area of concern in controlling project procurement is getting accurate and timely performance reporting information. Again, one would expect to find this specified in the contract; however, often it is poorly communicated and enforced. Now is not the time for conflict, disputes and other work-in-progress issues that can cause the schedule, budget or contractor relationships to haemorrhage in one way or another. What should be occurring is plain and simple: the contracted performance of the contracted supplier. This might entail any of the following activities:

- efficient handling of any requests for additional information
- regular comparisons of performance against the plan
- accurate and timely reporting of performance problems
- prompt processing of variations
- information on objectives or deliverables achieved
- timely implementation of any corrective action required
- updates on milestones and/or deadlines met
- documented and authorised requests for changes to scope (variations)
- resolution of disputes, escalation and other conflicts.

Bear in mind, too, that reporting performance (contractual or otherwise) is fraught with danger, as the truth can sometimes get lost in the story being told. With Figure 11.2 showing the discrepancy between what was planned and what actually occurred over time, there would be severe contractual issues arising from this reported position.
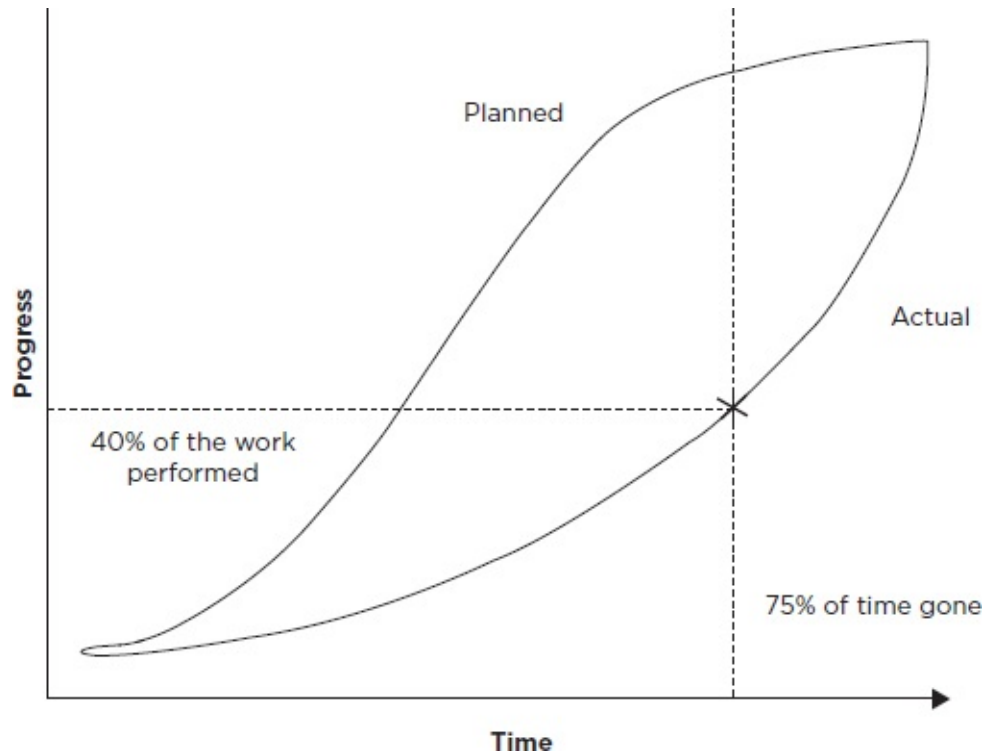
Figure 11.2 Performance below the line

Structured performance review

Contractual control can also be demonstrated by conducting a structured review of the contractor's performance and progress in delivering the project scope and required quality, within cost and on schedule (PMBOK, 2013). The objective of this review process would be to identify performance success or failure, acceptable progress against agreed work (both in terms of schedule and budget) and any instances of contractual non-compliance. In some cases, appalling principal and contractor performance falls far outside the contract terms, and no enforcement (compliance) action is taken. Why have a contract if you are not prepared to enforce it? Precedents then get set, which are hard to remove later— and no court in the land would view this behaviour favourably if it ultimately ended up in court, as both parties could be held jointly complicit and liable.

Contractual issues

It would be remiss to conclude this section without citing some of the common

problems that occur at this stage of the procurement process. Reflect on the following list and determine ways to avoid problems occurring in the first place. The contractual issues may include abuse of power; hidden agendas; poor contracting skills; latent conditions (unknown physical conditions requiring additional work not in the contract); undue reliance on verbal statements (not every contract must be in writing); disputes over delays, disruption and extension of time (EOT) claims; the perceived lack of independence of the contracting team; and failure by the stakeholders to maintain open channels of communication.

While these and other problems will always be present with contractual agreements, it is never too late to implement the following:

■ Try cooperation before contractual muscle.
■ Watch for early warning signs that something is amiss.
■ Maintain close and constant contact with your contractor.
■ Consider all viewpoints before locking in your own.
■ Park the unnecessary emotion.
■ Maintain accurate correspondence registers.
■ Put all communication in writing.
■ Adhere to the ADR hierarchy: notice of dispute, discussion, meeting, negotiate, mediate, arbitrate, litigate.

Closing out procurement activities

The final procurement stage requires two things to occur. The first involves ensuring that the contracted performance has been delivered and verified as complete and satisfactory performance. The second requires that all the (largely) close-out administrative functions are performed. Some of the activities that should be performed at this stage include:

■ reviewing all the procurement documentation
■ updating and archiving all appropriate records
■ financial reconciliations
■ finalising open claims
■ analysing all requested and approved contract changes
■ completion of the agreed inspection and testing procedures
■ issuing completion certificates (if required)

- reporting and rectification of any defects and/or damages
- auditing the entire procurement process to ensure that the promised benefits of outsourcing have been delivered
- written confirmation that the project (or at least the supplier's involvement) has been completed.

It is a good idea to develop a checklist for closing out this stage to ensure that both the project parent organisation and the contractor complete all their legal obligations to the satisfaction of the other party.

Critical reflection 11.4

Don't have a contract or agreement if you are not prepared to enforce its agreed clauses and conditions.
- Review your current or past projects and identify instances of where the contractors or resources were in breach of the contract (or agreement).
- How was this handled? What was the outcome?
- Is there a downside to enforcing performance as per the contract? If so, what might it be?
- Who is responsible for knowing what is written in the project contracts?

Discharging the contract

Of course, this all assumes the project has been completed according to the contract. However, what about a situation where the project has not been completed to the satisfaction of the other party? This is known as discharging the contract (for cause or convenience). Consider the following options:

- *actual performance:* where exact performance (as agreed under the contract) is performed
- *agreement between the parties*: where the contract may contain reference to a clause providing for its own termination upon the occurrence or failure of some specified event
- *frustration:* where performance becomes impossible without fault to either party; in this case, automatic and mutual discharge should occur
- *breach (actual or anticipatory):* where one party fails to carry out the obligations as per the contract, or signals that those obligations will not be performed
- *operation of law:* where contracts are discharged through bankruptcy, company liquidations or the statute of limitations.

Review questions

11.1 What role and benefit does procurement management planning bring to any project?
11.2 What are examples of objective selection criteria for evaluating potential seller proposals?
11.3 What are some of the challenges in managing project contracts?
11.4 What general and/or supplementary conditions of contract would you seek to include in most contracts?
11.5 How can a contract be terminated?

Case study

Acting in the role of contracts manager for the first time (during the usual manager's maternity leave), Sharon was mulling over what the most challenging part of the tender documentation was: the legal, commercial or technical sections. While it was often the legalese that made it such a chore, she also realised that she hadn't always understood the commercial investment required by the project, although the technical section was, after all, a breeze as she had been team leader for the in-house contract administrators for over seven years.

With this tender in its final preparation stage before release, Sharon knew she was responsible for ensuring everything was correct prior to publication. Historically, some previous tenders had gone out with the wrong attachments, addendums hadn't been issued, clauses had been copied and pasted from other (unrelated) contracts to cut down on the preparation time and certain privacy conventions were not always followed with existing preferred suppliers.

> ❛Sharon wanted this procurement activity to focus more on building relationships, collaboration and value-adding, and less of the short-term, narrow focus her predecessor had adopted in seeking to resolve operational job requests through a simple lowest cost quotation system.❜

With her organisation electing to go to the market for external expertise to construct the pathways, associated infrastructure, signage and landscaping throughout the parklands, Sharon wanted this procurement activity to focus more on building relationships, collaboration and value-adding, and less of the short-term, narrow focus her predecessor had adopted in seeking to resolve operational job requests through a simple lowest cost quotation system.

Traditionally, the company had always provided suppliers with a detailed specification that spelt out exactly what they wanted, how they wanted it and what the allocated budget was. The cold

reality was that this hadn't always worked out, as their internal designs didn't always comply with the local council's permit, zoning and approval processes. So this time the opportunity existed to provide a scope of work only (along with a draft contract and response templates), and not the specification, while also amending the tender to allow for non-conforming responses.

Sharon now needed to ensure that her evaluation panel tweaked the selection criteria (and changed the weighting) to take this significant change into account as they now needed more than construction workers. They needed suppliers with ideas, innovators with vision who would challenge the traditional notion of what parkland could look like, and designers and builders who could make the impossible a living reality for the community.

While the company had always nominated the type of pricing contract for its projects, Sharon decided to leave it open for this tender. Feeling satisfied with her changes, Sharon called her team together and canvassed the options in releasing the tender, who would be dealing with the inquiries and putting together the evaluation matrix. They also discussed the merit of holding a supplier information session after releasing the tender to answer all the questions people would have. However, they still had one big-ticket item to address: once awarded, how would they effectively manage and control the contractor's performance throughout the project and did the standard-form contract attached to this tender sufficiently provide the company with that level of protection? Sharon clearly wanted more, as she issued highlight markers to her team along with a copy of the proposed contract. She then asked them to read through every clause on every page and mark up any reference to the following:
- contractor's performance (including progress claims)
- performance reporting
- contractor breach.

To everyone's surprise, all that was found were clauses related to 'the contractor warranting', 'monthly reports' and 'progress claims within five working days'—all of which could be collectively described as being ambiguous, vague and open to interpretation. As everyone left, Sharon decided to pull the tender until these clauses actually said something that could be contractually enforced.

Questions

1 How would developing a procurement management plan address some of the historical issues faced by Sharon?
2 What are the risks involved in getting potential suppliers to provide the specification?
3 What would be appropriate selection criteria (and weighting) for this tender evaluation?
4 What recommendation would you give Sharon as the 'correct' contract pricing model to accept?
5 Is Sharon being unrealistic (or even paranoid) in wanting to tighten up the contractual performance clauses with a bespoke contract?

Integration management

Unifying a coordinated approach

Key points

- Developing the project proposal
- Developing the project management plan
- Directing and managing the work
- Monitoring and controlling the performance
- Performing integrated change control
- Closing down the project
- Life-cycle mapping of the project management processes

In practice

How often do you see your projects as an integrated series of procedures, processes, behaviours and decisions? Are the best intentions of everyone involved coordinated from start to finish? And what of the audit trail—that post-project walkthrough to reflect and learn the many lessons the project dropped in your lap?

We now know that some projects are, in fact, targeted responses to strategic directives with clear objectives, procedures and documentation that not only baseline the project's direction, but also serve as navigation beacons along the way. Yet, despite personal endeavours, and access to best practice and global standards, many projects struggle and meander from start to finish.

Rather than taking the holistic perspective that the project is, in fact, a series of interdependent, overlapping and iterative processes and behaviours, the projects that struggle seem to fight themselves on so many fronts. Poorly defined objectives, conflicting operational priorities, stakeholder power and interest, competing operational procedures, limited resource capacity and a lack of meaningful documentation can all collide to create an untenable project environment.

Conversely, with all project stakeholders, processes and operational aspects working in sync with each other (and this isn't hard to realistically achieve at all), projects present as a united, integrated and focused force driving through change. Projects are conceived to be successful—not to fail, not to miss targets and deadlines, and not to take hostages (or leave carnage) along the way.

A common direction needs a common, integrated approach.

Chapter overview

Often the first chapter in many project management texts, integration management signals the final chapter in this one—and for a very sensible (if not practical) reason. You can't really integrate all of the processes and documentation prescribed by any proprietary or off-the-shelf methodology without first gaining an understanding of what these actually are. Singular mastery of a process or document is not an option in project management (although many people have specialised in exactly this). If you stay true to PMBOK, mastery should extend across all ten processes (knowledge areas) in order for you to realistically be in a position to control project conception, planning, executing and completion activities.

PMBOK (2013) suggests that integration processes (and the outputs—documentation) include those activities that identify, define, combine, unify and coordinate within and across all other processes.

This means that, while PMBOK presents its processes as discrete processes (as does this text), they do in fact overlap and interact in any number of ways throughout all projects. After all, there is no single way to plan, let alone manage, any project. The project organisation, competing objectives, stakeholder diversity and operational realities (to cite just a few factors) will direct the degree of deliberation, determination, consistency and rigour applied (read integrated) throughout the project.

So how does one practise integration management (remembering that it is both process and documentation based)? If you follow the advice of PMBOK (2013), the steps involved include: getting the proposal written, developing the project management plan (containing all the separate plans for each of the ten processes), and directing and managing the work—ensuring that you monitor and control the performance, deal with all the change requests and, ultimately, close down the project on completion (ideally, a successful completion).

The intent behind this final chapter is not to reproduce all the content from the previous chapters. Rather, it is to encourage and enable you to develop some best-practice, integrated processes (or systems, techniques or tools) to use when you apply some rigour to your projects. Someone has to join all those loose threads together and be the glue for the project…and that will probably be you: the project managers, the team members and the other committed (and competing) stakeholders working to deliver a successful project.

Developing the project proposal

Remember the proposal (some might call it a charter, scope baseline or something else). Not only did this document confirm the existence of the project itself (as distinct from an operational priority); it also enabled the project manager (if appointed) to begin the process of obtaining a foundational understanding of the project and also to begin the process of putting together all the initial information relevant to the project (scope, time, cost, resources, etc.). In what could be called the formal record of the project, senior management have the opportunity to accept and commit to the project while also conferring the necessary authority on the project manager to plan and execute the project (PMBOK, 2013).

Recall also that this initiation process and document should validate the alignment of the (change) project to the strategic direction of the organisation, while also considering the ongoing operational priorities. It will also document (in broad terms) the organisational need, assumptions, constraints, stakeholder requirements, provisional estimates of both time and money, and high-level risks (among other factors).

Of course, the real challenge may well be that the project manager has not yet been appointed, and therefore plays no central role in coordinating these processes and the paperwork. Very few project managers are 'front-loaded' into these activities when projects first get conceived. Senior management, third parties and other internal or external stakeholders will probably do all the heavy lifting here, with the appointment of the project manager almost a secondary consideration. Given this reality, whenever the appointment does take place, the project manager must work backwards and review everything that has taken place to date to gain both a clear appreciation and a growing understanding of what the project is and what it is not. Read the feasibility study, work through the business case, look over the budget projections and talk with the stakeholders to confirm the project's justification, objectives and boundaries. Don't start planning the project unless all these have been done.

Developing the project management plan

Logically, the plan follows the proposal. And by 'plan' we mean all the subsidiary plans that each of the other nine PMBOK processes prescribe. The goal here is to have all these plans integrated into a single, comprehensive and endorsed project management plan that defines the basis of all project work (PMBOK, 2013). In case you have forgotten, those plans were:

- the scope management plan
- the time management plan
- the cost management plan
- the quality management plan
- the human resource management (HRM) plan
- the communications management plan
- the risk-management plan
- the procurement management plan
- the stakeholder management plan.

While the plan will define how the project will be executed, monitored, controlled and closed out, the finite detail within the content will be dependent on any number of project-specific factors, including the project's objectives, complexity, risk and environment, and the key baseline information—scope, time and cost. Much of this detail will be progressively elaborated, refined, approved and controlled throughout the entire project life-cycle.

And while the obvious intent of the project management plan is, in essence, to enable the project to be well managed, reality suggests it will change many times over. However, until that change request to drive the change is generated and approved, the plan stays 'as planned'. And you should only ever be working off the one plan—the last version approved.

As it is an all-encompassing document, the project plan may also support and/or link to any number of associated documents applicable throughout the project. Among others, these may include:

■ work breakdown structure (WBS)
■ risk breakdown structure (RBS)
■ change logs
■ milestone list
■ procurement documents
■ resource calendars
■ risk register
■ statement of work (SOW)
■ specifications
■ quality control measurements
■ stakeholder register
■ performance reports.

Don't forget that these documents are not just potential attachments or components of the plan; they are also part of the process that updates all relevant documents when the plan does in fact change. The identification of new risks will not only impact the risk register, but also the project plan. Failed quality inspections and testing results will trigger revisions to the plan as rework is scheduled. Variations agreed to will do exactly the same—vary the plan and any other relevant documents. Yes, all of these documents are component parts, and they do not exist in isolation—a change in one may well trigger a change in another.

Critical reflection 12.1

With the ten knowledge areas in PMBOK each producing a plan (known as subsidiary plans), the project paper trail can quickly get quite overloaded. Is there another way?

■ Review your last project plan (remember, this is more than just the schedule) and find any references (explicit or otherwise) to any of the knowledge areas.
■ Subject to your answer above, what did you learn from this review? What changes might be required in the way you integrate all ten plans in your project into the one single project plan?

Directing and managing the work

With the plan in place, what is required now is the process of 'leading and performing the work defined in the project management plan and implementing approved changes to achieve project objective' (PMBOK, 2013).

Drawing on the other processes, the required activities here will include:

■ ensuring project objectives are accomplished
■ creating deliverables in line with the planned work
■ providing opportunities for the project team to learn and develop
■ obtaining and allocating the required resources
■ establishing open communication channels
■ generating performance reports
■ engaging with stakeholders
■ monitoring risk events and treatment responses
■ documenting the lessons learned.

Managing both planned and unplanned project activities will be the constant companion of the project manager as they work to determine (or struggle with) appropriate courses of action impacting both the technical and organisational aspects of the project. These changes could impact any area of the project, including the project management plan, organisational policies, standard operating procedures (SOPs), schedules, budgets and contractual arrangements. As with the other steps discussed above, leading and managing the project work are an iterative process, as the project manager juggles meetings, corrective action, preventative action, rectification of any defects, updates to formally controlled project documents and performance reporting.

Monitoring and controlling the performance

As we now know, project plans seldom work out exactly as planned. So clearly the role of monitoring and controlling what has not only been planned, but also performed (work wise), is important. This step requires that the project progress (performance) be tracked, reviewed and reported against the project's objectives. Not only does this report the past and current state of the project, it also enables forecasts and other projections to be made in line with any revised scope, schedule and cost baselines.

Drawing from PMBOK (2013), continuous monitoring of the project throughout the life-cycle will focus on the following activities:

■ comparing actual project performance against planned performance (as per the plan)
■ assessing performance to identify what corrective or preventative actions may be required
■ recommending appropriate follow-up action
■ identifying and responding to existing, recurrent or new risks
■ maintaining accurate records
■ circulating all the relevant reports and information
■ verifying the implementation of all approved changes.

The emphasis needs to be on developing genuine measures of performance, timely monitoring and meaningful control measures. Too often, activity is seen as performance (writing a report is an activity which becomes a measure of performance if it addresses the information needed); monitoring is sporadic and generalised (with ad hoc and subjective information presented in meetings without any underlying project plan information or comparative baseline); and control is based on micro-management interventions.

Akin to continuous improvement, if it can't be observed, measured and reported (the monitoring part), it can never really be controlled. Often, all that is created is the barrage of distortion as the objective facts are smudged off the page (yes, this sounds negative, but it is also realistic). A good rule of thumb to remember is that the earlier you get into trouble in the project, and the earlier you acknowledge this and seek some help, the more your chances of getting a positive response increase exponentially. The later you leave the bad news, the more likely it is that you yourself will become the bad news.

Performing integrated change control

Change in projects is (should be) easily managed. It is the only constant you have from start to finish throughout the project's life-cycle. Beginning with complexity and uncertainty, and finishing up delivering something of measured value to the client, change will be driven by the expectations and performance of both parties: principal and contractor (buyer and seller).

The project manager is responsible (perhaps in conjunction with contract personnel) for reviewing all change requests (this is a good gauge of whether you are in fact managing the project or just carrying the can). And don't be surprised to learn that these changes are not just limited to the expectations, scope and deliverable side of the equation. Change requests also impact organisational policies, procedures and processes, and risk management—not to mention modifications to project documentation in electing to accept or reject these changes.

With a formalised, agreed and practised integrated change-control process in place from the project's inception, the project manager will ensure that only the approved changes are incorporated into the revised baseline (PMBOK, 2013). Always written and recorded in variation registers or change logs, change requests nominate the required change along with any justification and impact revisions to time and cost baselines. Working in conjunction with the project client, sponsor, executive management and/or some other change-control board, the project manager will ensure that any proposed change is reviewed, evaluated, approved, delayed, rejected or actioned, and that these decisions are communicated.

While contractual requirements will play a significant role in processing many change requests, the complexity of the project, the organisational context and the project's operating environment will equally have some bearing on just how effective change control actually is. And as with many processes, change control is not always practised for obvious reasons, including its time-consuming nature, a lack of access to stakeholders, approval delays, operational priorities taking precedence, poor documentation, or a lack of scope, schedule or cost baselines to begin with.

Close down the project

All good things come to an end (as do the not-so-good things). Recall that projects are not ongoing, operational activities that self-perpetuate over time. They are a series of time-constrained activities within predefined and managed start and finish dates.

Not only do the project closing processes formally confirm that the project has ended; they also provide an opportunity to review the project journey, to document (and hopefully institutionalise) the lessons learned and to release all the organisational (and external) resources to pursue new endeavours (PMBOK, 2013). These reviews should, in fact, form part of the project schedule to ensure they actually get done before everyone rushes for the departure gate, as it is crucial not only to know that the project is finished, but also that it has met all its objectives with comparisons made against each of the three baselines directing the project since inception: the (revised) scope, the schedule and cost baselines.

Perhaps known more often as an administrative close, Nicholas and Steyn (2008) flag a number of given activities that could be performed here in support of project management integration, including:

- create and coordinate project close-out plans and schedules
- confirm that all outstanding work has been completed
- finalise all financial transactions
- notify all relevant stakeholders and/or functional areas of the project's completion
- review all contractual agreements and notify the client when all obligations have been met
- confirm that all acceptance criteria nominated by the client have been met
- elicit valuable feedback from the client
- resolve any outstanding problems
- review the technical, budget and schedule performance
- evaluate the appropriateness of the nominated methodology
- review all the project team and stakeholder relationships
- plan to transfer project team members to other projects or their substantive position
- confirm that all surplus material disposition procedures are in place
- complete the project close-out report
- document and distribute the project review and lessons learned
- publish recommendations for future projects
- confirm that all records have been collected, collated and archived.

Perhaps the best option may be to develop a close-out checklist to ensure that

these and other activities are not missed at the end of the project. Endings are just as important as beginnings: they create a new beginning for someone. Take the time to build your personal or organisational knowledge base for the next project—it's possibly just around the corner.

What about early project termination?

I know that a lot of people believe that a project can only get terminated when they successfully finish. So much for the theory and the public misconception!

The reality is that a project can be terminated at any point in time, beginning way back when it was just a mere thought bubble all the way through to its scheduled (and official) completion. After all, any number of genuine reasons could be cited as to why the project has been terminated, including these from Meredith and Mantel (1995), which are still current today:

- The project is no longer viable.
- Support for the project has disappeared.
- Success is looking rather doubtful.
- Other options look more attractive (financially, practically, operationally, etc.).
- Resources do not have the technical competence required.
- Funding has dried up or been reallocated.
- The timeline may not be sufficient to deliver the expected outcomes.
- The market has moved and the potential for the project has evaporated.
- The client has indicated that they will no longer accept the project.
- Commercial results will take too long to become profitable.
- Other projects now have a higher priority.

Critical reflection 12.2

Any decision to terminate a project is a difficult one to make.
- Can you identify any additional reasons why a project would be terminated?
- What are the ramifications (negative and positive) of terminating a project early?

Mapping project processes

Despite the global standards, competing methodologies, best practice, proprietary knowledge, intuition and guesswork, project management remains a multi-faceted discipline.

Surrounded by uncertainty, complexity, ongoing risk, operational reality and stakeholder diversity, projects either succeed or fail. Continuing to feign ignorance, surprise, apathy or mute indifference is no longer an option for many project personnel—regardless of the project's performance and result. There are no surprises in project management. And, regardless of which methodology you favour (try to pick the best bits from them all), accept the reality that projects are change agents: born of strategy and conflicted with operational realities. By following a methodology, an approach, a technique or a series of tools, project management is both defined and constrained by process.

Under PMBOK's defined knowledge areas, functions or processes, project management is driven and ultimately governed by ten knowledge areas. They grow every four years, with the updated edition, but the essence of the challenges facing project managers and the benefits delivered to clients have not changed. These processes have been reproduced for you below for several reasons. First, they are there to refresh your memory. However, the more important justification is to get you to revisit these and see where you can improve the processes. One tool or device you can use whenever you need to analyse a process is called KRAC, which stands for:

- **K**eep
- **R**emove
- **A**dd
- **C**hange.

In other words, in any process there may be things you can keep (they work), things that can be removed (they don't anymore), things that can be added (they hadn't been thought of) and/or things that can be changed (perhaps the sequence).

Read through each of the ten PMBOK processes again (reproduced below), and give them some KRAC.

Stakeholder management

Stakeholder management includes the processes required to identify, plan, manage and control stakeholder engagement throughout the project. It involves:

- identifying stakeholders
- planning stakeholder management
- managing stakeholder expectations
- controlling stakeholder engagement.

Scope management

Scope management includes the processes required to determine and manage project expectations and deliverables, including planning, authorisation and controls throughout the project. It involves:

- planning scope management
- collecting requirements
- defining the scope
- creating the WBS
- validating the scope
- controlling the scope.

Time management

Time management includes the processes required to determine and implement the project schedule, and to manage the agreed timelines with appropriate intervention strategies throughout the project. It involves:

- planning schedule management
- defining activities
- sequencing activities
- estimating activity resources
- estimating activity durations
- developing a schedule
- controlling the schedule.

Cost management

Cost management includes the processes required to identify, analyse and refine project costs, and to ensure project costs are managed, controlled and reported

throughout the project. It involves:

- planning cost management
- estimating costs
- determining the budget
- controlling costs.

Quality management

Quality management includes the processes required to manage the quality planning, assurance, control and improvement processes and policies throughout the project. It involves:

- planning quality management
- performing quality assurance
- controlling quality.

Human resource management

HRM includes the processes required to determine the resource needs of the project, assignment priorities, development needs, performance issues and evaluation throughout the project. It involves:

- planning HRM
- acquiring a project team
- developing the project team
- managing the project team.

Communications management

Communications management includes the processes required to ensure timely and appropriate information is collected, disseminated and evaluated through managing formal structures and processes throughout the project. It involves:

- planning communications management
- managing communications

■ controlling communications.

Risk management

Risk management includes the processes required to manage the identification, monitoring, controlling and evaluation of project risks throughout the project. It involves:

■ planning risk management
■ identifying risks
■ performing qualitative analysis
■ performing quantitative analysis
■ planning risk responses
■ controlling risk.

Procurement management

Procurement management includes the processes required to manage procurement activities throughout the project. It involves:

■ planning procurement management
■ conducting procurements
■ controlling procurement
■ closing procurement.

Integration management

Integration management includes the processes required to integrate and balance the project management knowledge areas—scope, time, cost, quality, communications, human resources, risk, procurement and stakeholders—throughout the project. It involves:

■ developing project charter (proposal)
■ developing project management plan
■ directing and managing project work
■ monitoring and controlling project work

- performing integrated change control
- closing the project.

In summary

In summary, given that projects tend to evolve over time through a phased life-cycle approach, it is possible to (loosely) map each of these processes against a phase in the life-cycle.

The mapping in Table 12.1 (adapted from PMBOK, 2013) is an example of how this could be carried out, although the phased cut-offs and the apparent exclusivity between each phase will generally not be as pronounced as in the example provided. Rather, it can serve as a reminder to always consider each competency not in isolation, but as a subset of a greater plan to deliver the project on time, on budget and within scope.

Critical reflection 12.3

Life-cycle management was mentioned in the opening pages of this text, and it has just appeared above again with an attempt to loosely map each of the ten knowledge areas.
- In the light of this information, review your current or past project and then try to cross-reference where each of the knowledge areas (summary actions) has been included in your project management documentation.
- What does your answer tell you about the reality of your project management methodology and the practice of integrating all ten knowledge areas throughout your project (the life-cycle approach)?
- What changes do you need to make, who will be involved and what benefits will accrue from making these changes?

Table 12.1 An illustrative matrix of the project management processes

	Concept	Planning	Execution	Finalisation
Integration	Strategic alignment	Project plan	Project performance reports Project change control	Project finalisation report
Scope	Scope identification	Scope refinement	Project change control	Project finalisation report

Time	Provisional forecasts	Schedule development	Schedule control and reporting	Project finalisation report
Cost	Provisional forecasts	Budget development	Cost control and reporting	Project finalisation report
Quality	Quality planning	Quality planning Quality assurance	Quality assurance Quality control Quality improvement	Project finalisation report
Human resources	Capability determined	Resources assigned	Performance monitored	Reassignment Project finalisation report
Procurement	Procurement planning	Procurement planning Solicitation planning	Solicitation Source selection Contract administration	Contract close-out Project finalisation report
Risk	Identification	Identification assessment analysis	Management	Evaluation Project finalisation report
Communications	Stakeholder identification	Strategy development	Project performance reports	Project finalisation report
Stakeholders	Identify stakeholders	Plan stakeholder management	Manage stakeholder engagement	Evaluate stakeholder engagement

Review questions

12.1 What is meant by the term 'project integration management'?
12.2 What role do the proposal and the project plan have in integrating project processes?
12.3 How is *managing* the work different from *controlling* the work?
12.4 Explain how a formally integrated change-control process benefits the project.
12.5 What lessons can be learned during the project close-out stage?

Case study

The room where the meeting was being held was impressive: oak table, high-back swivel chairs, muffins, gourmet coffee and a panoramic view of the city. Who wouldn't be impressed?

The answer would be most, if not all, of the people in the room, who waited patiently for the project manager (Claire) to arrive. Not only had they finally completed the project (albeit over budget and behind schedule), but they had all been told to attend this post-completion walkthrough to review the project from start to finish. Clearly the mood in the room was a mix of fatigue, fragility and possibly fear, as the project had been far from successful.

Running late as usual, Claire finally arrived laden with an assortment of coloured folders and proceeded to distribute them to the nine people seated around the table, keeping one for herself. As expected, once the folder landed in front of each person, they opened it up, curious to see what bad news it contained. To their surprise, the folders contained nothing but a blank piece of a3 paper with a large, bold heading at the top of the paper. Still curious, everyone started to look at the person's folder beside them and discovered that they all had a similar blank piece of paper—although the headings were different.

Now intrigued, they listened as Claire started the meeting. The first thing she did was write the names of the ten people in the meeting down on the board and then asked each person to call out what heading they had in the folder. Claire added integration management to her name on the board and wrote down the other nine knowledge areas, then assigned them as her project team called out what was in their folder. After a few minutes, the names of the entire team was on the board together with their allocated knowledge area.

As Claire still hadn't explained what was happening, the questions started firing from the floor. As she waited for the unanswered questions to abate, Claire wondered whether this idea of hers was going to work at all. After all, her project team had been pulled together (actually inherited would be more accurate) pretty quickly, and Claire would be the first to admit (not publicly though) that everyone including herself had little experience in project management prior to being put on this project. While everyone had survived the journey, the journey itself was a challenge from the start, with no processes (let alone unified ones), pretty dismal documentation, siloed self-interest, functional conflicts, and no agreed framework, method, techniques or tools to help plan and manage the project. Claire was nothing if not honest.

> '…the journey itself was a challenge from the start, with no processes (let alone unified ones), pretty dismal documentation, siloed self-interest, functional conflicts, and no agreed framework, method,

> techniques or tools to help plan and manage the project. ❜

Gathering her thoughts, Claire began by turning on the overhead projector and opening the single slide she had prepared. She asked everyone to read through the following points:

- creating the project proposal
- developing the project management plan
- directing and managing the work
- monitoring and controlling the performance
- performing integrated change control
- closing down the project.

Before anyone could ask a question, Claire made the following statement:

You each have a folder pertaining to one of the ten project management knowledge areas and a blank piece of paper. Please transfer all six process headings from the slide to your a3 sheet, spacing them out evenly down the page. For the next 30 minutes, you are to reflect quietly and privately (no talking) about how the knowledge you have been given could be integrated far more effectively and efficiently than it was on our last project. This activity is all about us as a team and organisation learning lessons from what we did and coming up with 'blue sky' ideas and innovative ways of improving how we plan and manage our project through a unified, consistent and cohesive approach to everything we do on a project. In 30 minutes, you will each have 15 minutes (yes, it will be a long meeting) to share your suggestions. They will not be discussed, just shared, and your input will be recorded and circulated to everyone else tomorrow. Over the next week, you are to review everyone's suggestions and amend your own ideas and bring to the meeting your complete suggestions on how to integrate your knowledge area. Please refrain from sharing ideas with each other, as I particularly value your personal insight at this stage. Our collective wisdom will be added in later.

With that, Claire closed the meeting and left the room with her project team looking bewildered and lost.

Questions

1 What do you think Claire is trying to achieve with the tasks she has set her project team (and herself)?
2 How do you feel about Claire's approach to communicating what was happening and what she wanted?
3 Can you suggest any ways in which Claire could have improved this meeting and got the same, if not a better, outcome?
4 Choose one of the ten knowledge areas yourself and complete the same exercise her team was asked to do. See whether you can come up with some 'blue sky' ideas on improving how that knowledge area gets integrated into your next project.
5 If one of the team had asked Claire to clarify why integration was so important, how do you think she would have answered?
6 What would a unified, consistent and cohesive approach to a project actually look like, and what benefits would it deliver to different stakeholders?

Appendix 1

Issue matrix

Listed below are some of the probable issues, possible causes and potential solutions you could try when the 'going gets tough'. All projects will encounter issues, problems and/or opportunities that have a variety of causes—some within the project itself and others outside the project organisation's sphere of influence and control. Irrespective of their source, each must be fully understood and dealt with promptly if the project is being actively managed for success.

The matrix endeavours to align each issue across the ten knowledge areas of PMBOK. I readily acknowledge, though, that these issues are not unitary, nor can they be easily compartmentalised in reality. Nor is any solution the sole remedy for any one cause.

Review the list below and, as with other lists in this book, add your own entries as they unfold and build your personal body of knowledge (PBOK).

Table A1.1 Issue matrix

Probable issues	Possible causes	Potential solutions
Integration management		
Poor coordination	■ Misunderstood roles and responsibilities ■ Authority not communicated ■ Little requirement for accountability	✓ Develop role statements ✓ Communicate authority and accountabilities ✓ Regularly monitor and report performance

Few guidelines in place	■ Poor organisational policies ■ Lack of commitment ■ No historical data ■ Little accountability	✓ Develop appropriate policies ✓ Ensure compliance testing ✓ Regularly monitor and report performance
Unknown stakeholders	■ Low project profile ■ Diverse interests and agendas ■ Broad geographical group ■ Little interest in the project	✓ Escalate to higher authority ✓ Develop stakeholder mapping ✓ Canvas all known stakeholders ✓ Conduct workshops and forums
Poor administrative direction	■ Conflicting priorities ■ Lack of coordinated activity ■ No processes in place	✓ Enlist functional manager support ✓ Provide scalable methodology ✓ Regularly review and audit processes
Weak attempt at planning	■ Lack of planning processes ■ Lack of supporting documents ■ No requirement to plan ■ Little value acknowledged ■ Lack of relevant standards	✓ Create planning template ✓ Develop plan with stakeholders ✓ Measure performance against plan ✓ Identify key milestone deliverables ✓ Introduce performance reporting
Poor authorisation	■ No identification of key stakeholders ■ No formal approval process ■ Little requirement for accountability ■ Few consequences for performance issues	✓ Ensure documentation is co-signed off ✓ Include (advisory) recommendations ✓ Introduce accountability ✓ Develop review and decision gates

Few change controls	■ No formal or known change process ■ Little understanding of change impacts ■ No accountability	✓ Develop a change-control process with justification, impact analysis and approvals
Scope management		
Poorly defined scope	■ Insufficient time to scope the project ■ Lack of stakeholder involvement ■ Emphasis on starting the project, not on planning the project	✓ Meet with all stakeholders ✓ Formally document and distribute the scope ✓ Seek ratification and signoff
Inaccurate estimates	■ Insufficient time allocated ■ Inadequate estimating tools ■ Unrealistic expectations ■ Insufficient time ■ No baseline or historical data	✓ Adequate estimating tools ✓ Greater involvement from technical personnel ✓ Clearly documented requirements ✓ More time to estimate
Scope creep	■ Scope poorly defined originally ■ Inadequate scope change documentation ■ Missing standards ■ No supporting technical documents ■ No subject-matter experts (SMEs)	✓ Clearly define and document the scope at the concept stage ✓ Enforce the scope change protocols ✓ Inform relevant stakeholders of the required tradeoffs
Schedule complexity	■ Ill-defined task relationships ■ Poorly 'decomposed' schedule ■ Lack of progress milestones	✓ Experiment with the schedule ✓ Identify appropriate achievement milestones ✓ Allow more time for planning

	■ Insufficient planning	
Omission of required work	■ Poorly defined scope ■ Insufficient planning ■ Lack of technical personnel ■ Poor tracking of scope changes	✓ Document and communicate the scope ✓ Increase accountability for scope changes
Poor problem or opportunity definition	■ Insufficient time ■ Lack of 'due process' ■ Missing stakeholders ■ Differing agendas	✓ Allow sufficient planning time ✓ Increase involvement and participation of stakeholders
Lack of alternative solutions	■ Insufficient time ■ Poor understanding of the problem ■ Hidden agendas	✓ Brainstorm and rank options ✓ Present alternatives to stakeholders
Failing to document assumptions	■ None made ■ Importance not appreciated ■ Inadequate documentation	✓ A requirement that all supporting documentation is submitted prior to approval
Failing to get required signoff	■ No accountability ■ Classifying the work as operational ■ Lack of identification of key stakeholders	✓ No signoff—approval, budget and authority ✓ Increase accountability on decisions taken
Time management		
Falling behind schedule	■ Changes to scope ■ Resource rescheduling and/or replacement ■ Low morale ■ Poor planning	✓ Increase resource loading ✓ Access additional funding ✓ Vary the scope ✓ Increase performance incentives
Inaccurate estimates	■ Insufficient planning time	✓ More specialists involved

	■ Lack of historical data ■ Missing standards ■ Lack of technical detail	✓ Increased time to estimate ✓ Access to better estimating tools and data
Ahead of schedule	■ Inaccurate planning ■ Detail missed in reporting ■ Genuine time efficiency gains ■ Downgrade in work quality	✓ Regularly review performance ✓ Reward genuine resource performance ✓ Investigate scope additions (and cost revisions)
Missed deadlines	■ Poor schedule management ■ Lack of timely reporting ■ Little accountability ■ Constant schedule revisions	✓ More visible management ✓ Regular reporting ✓ Increased accountabilities ✓ Penalties for performance breaches
Inability to escalate changes	■ Lack of escalation process ■ No sponsor or senior stakeholder ■ Lack of technical understanding ■ Poor monitoring and control	✓ Develop escalation process ✓ Assign change-control 'owner' ✓ Spend more time investigating initial scope
Work performed out of sequence	■ Poor task sequencing ■ Lack of monitoring and control ■ Poor team performance ■ Schedule not developed in a participative way	✓ Reassess the schedule ✓ Re-confirm task start/finish dates ✓ Regularly monitor and review
Variances outside acceptable range	■ Inaccurate estimates ■ Unexpected changes to scope ■ Poor tracking and	✓ Renegotiate all estimates ✓ Evaluate access to contingencies ✓ Downgrade the quality

	reporting ■ Authorised changes	and quantity of work ✓ Accept substitute products and services

Difficulty in reporting
performance
	■ No performance criteria
	■ No deadlines or
	  milestones
	■ Poor management
	■ Diverse work group and
	  skill set
	■ Metric is too precise
	■ Not everything can be
	  measured
		✓ Agree performance
		  metrics
		✓ Identify appropriate
		  reporting time periods
		✓ Reinforce and reward
		  performance to plan
		✓ Reassess deadlines and
		  milestones
		✓ Develop a suite of
		  metrics

High degree of rework	■ Poorly understood scope
	■ Low skilled resources
	■ Insufficient time to
	  complete work
	■ Operational work
	  conflicts
	■ Poor quality standards
	■ Poor control over
	  performance
		✓ Reassess quality
		  requirements
		✓ Ensure resources are
		  appropriately trained
		✓ Consider outsourcing the
		  required expertise
		✓ Introduce penalty clauses
		✓ Provide technical
		  support

Lack of schedule detail	■ Poorly defined scope
	■ Incomplete work
	  breakdown structure
	  (WBS)
	■ Lack of technical
	  resources
	■ Poor planning tools
		✓ Define the scope—
		  completely and
		  accurately
		✓ Increase the level of task
		  breakdown

Failing to experiment
with the schedule
	■ Time pressure
	■ Focus on the outcome,
	  not the schedule
	■ Poor identification of the
	  project constraints
		✓ Provide sufficient time
		  for experimentation
		✓ Increase stakeholder
		  involvement in the
		  scenarios

Cost management		
Inaccurate estimating	■ Lack of historical data	✓ Increased time

	■ No access to SMEs ■ Insufficient time	✓ Access to experts, tools and processes ✓ More detailed specification
Cost blowouts	■ Poor estimating ■ Incomplete scope ■ Changes to the original scope ■ Poor contract management	✓ Put contingency funding in place ✓ Identify the source ✓ Increase control and reporting frequency
Unexpected variations	■ Lack of accurate monitoring and reporting ■ Unauthorised work being completed ■ Changes to scope	✓ Formal variation approval process ✓ Maximum limits and delegations ✓ Contract performance reviews
Poor financial delegation	■ Stalled approvals ■ Incomplete work ■ Unauthorised work being completed ■ Contractor performance breaches	✓ Communicated delegations and authority ✓ Agreed escalation process ✓ Increased contract administration
Hidden costs	■ Wrong type of contract ■ Poorly understood contract terms and conditions ■ Poorly defined scope ■ Ill-defined quality requirements	✓ Contract review ✓ Detailed specification review ✓ Assessment of work quality performed
No tracking of actuals	■ Little accountability ■ No formal reporting process ■ Data is not acted on ■ Real-time delay in reporting data	✓ Develop reporting template ✓ Adoption of real-time reporting ✓ Comparison of planned and actual costs ✓ Use of time-phased

| | | budgeting |
| | | ✓ Monitoring cash-flow expenditures |

Quality management

Poor quality design	■ Lack of quality objectives, standards, definitions and criteria ■ No quality planning ■ Lack of stakeholder support ■ Ill-defined scope	✓ Documented agreement on required standards ✓ Detailed specification ✓ Supporting technical documentation ✓ Third-party peer reviews and audits ✓ Incentives for design improvements
Lack of quality control	■ No commitment to quality ■ No agreed standard ■ No monitoring, measurement and reporting process ■ High inspection costs ■ Lack of relevant expertise	✓ Agreed standards and definitions ✓ Scheduled inspections ✓ Varied measurement methods ✓ Access to third-party expertise
High inspection and testing costs	■ Reliance on manual processes and systems ■ Excessive failure/fault rates ■ Dependent on external agencies ■ Poorly defined quality standards ■ Difficulty in measuring quality	✓ Automated systems ✓ Use of sampling techniques ✓ Detailed specifications ✓ Greater emphasis on quality planning ✓ Change suppliers, SMEs ✓ Balance costs against outcomes
Poor compliance	■ Lack of appropriate standards ■ No legal requirement ■ Poorly defined specification	✓ Agreed standards and definitions ✓ Scheduled inspections ✓ Penalties for non-compliance

	■ Lack of contract management	✓ Varied measurement methods ✓ Access to third party expertise
Reworking activities	■ Low-skilled resources ■ Changes to scope ■ Poor expectation of quality outcome ■ Inferior equipment and materials	✓ Limit the scope changes ✓ Ensure suitable resources ✓ Allow sufficient time
Little continuous improvement	■ No formal process ■ Little incentive ■ Gains difficult to evaluate/quantify ■ Highly reactive workplace	✓ Provide incentives ✓ Document and publish improvements ✓ Regularly monitor, review and amend performance ✓ Benchmark against third parties ✓ Develop best-practice mindset
Human resource management		
Lack of stakeholder involvement	■ Poor communication ■ No sense of ownership in the outcomes	✓ Meet regularly with stakeholders ✓ Identify their reporting requirements
Human resources unavailable	■ Poor scheduling ■ Conflicting projects ■ Inadequate skill sets	✓ Identify alternative resources ✓ Experiment with schedule implications
Lack of suitable equipment and facilities	■ Insufficient funds to upgrade ■ Contractual requirements ■ Insufficient time to acquire equipment ■ Requirement not identified early in the	✓ Identify this need early in the project ✓ Obtain required funding allocation ✓ Document and communicate the risk

	project	
Lack of administrative support	■ The project is not the prime focus ■ Poorly communicated requirements ■ Lack of project manager's authority	✓ Administrative staff to attend project meetings ✓ Project manager's authority clearly communicated to all
Low team morale	■ Excessive workloads ■ Ineffective project manager ■ Poor team dynamic	✓ Workshop the issues ✓ Investigate workloads ✓ Review group dynamic
Lack of support from senior management	■ Little appreciation of project management ■ Treating projects like operational activities ■ Pressured by others to produce results fast	✓ Appoint a project sponsor ✓ Communicate the required support ✓ Adopt a project management approach
Lack of commitment to the project	■ Lack of project management training ■ Unclear expectations ■ Inappropriate organisational structure	✓ Early involvement of stakeholders ✓ Clearly defined, documented and circulated scope ✓ Appropriate organisational structure
Project manager lacks power and authority	■ Wrong manager nominated ■ No delegated power and authority from senior managers ■ Lack of assertive communication skills	✓ Appropriate selection criteria for project manager ✓ Communicated delegations from senior management
Sudden changes to team members mid-project	■ Poor morale ■ Inappropriate organisational structure ■ Lack of respect for manager and other team	✓ Work with the team ✓ Manage (and diffuse) any organisational and/or project conflicts

members

No sense of achievement within the team	■ Late involvement in the project ■ Poorly led by the project manager ■ Poorly defined scope ■ Inadequate rewards systems ■ Lack of achievement milestones	✓ Set regular milestones to acknowledge achievement ✓ Personalise rewards ✓ Involve the team as early as you can in the design of the project
Dysfunctional team	■ Wrong mix ■ Poorly managed ■ High workloads ■ Poor conditions ■ Role ambiguity ■ No motivation and/or rewards	✓ Change the team, their roles and/or the manager ✓ Free up communication ✓ Give team greater input into their actions
Communications management		
Escalating issues	■ Lack of protocol for managing these ■ Poor communication between stakeholders ■ Ineffective manager	✓ Established protocols ✓ Regular meetings with consensus ✓ Manager with communication, negotiation and conflict resolution skills
Poorly run meetings	■ Ineffective chair ■ No time limit set ■ Failing to stick to the agenda ■ The meeting was not required	✓ Take a plan to the meeting—and stick to it ✓ Reduce the agenda ✓ Appoint a rotating chair ✓ Give participants meeting roles (something to bring, report, discuss…)
Failure to 'learn lessons'	■ No time as the next project begins ■ Stakeholders have	✓ Establish this as a 'must complete' phase ✓ Regularly meet with

	already disbanded ■ The lessons will not change anything ■ No skills in auditing the project	other project stakeholders to share ideas and feedback
Incomplete reports	■ Poorly defined requirement ■ Little accountability ■ Difficulty in obtaining information ■ Masking schedule problems	✓ Provide templates ✓ Link decision-making to reported information ✓ Increase accountability measures
Increasing conflict	■ Ineffective manager ■ Lack of conflict resolution strategies ■ Poor communication channels ■ Excessive workloads ■ Uncontrolled scope changes ■ Poor team dynamic	✓ Change your conflict resolution style ✓ Encourage open, honest and, where required, direct communication ✓ Experiment with the team mix
Failure to audit the project	■ Lack of appropriate tools ■ Seen as adding no value ■ Will change nothing	✓ Make it a 'must complete' ✓ Increase opportunities to meet with other project personnel
Little project documentation	■ No organisational requirement ■ No accountability ■ Lack of training	✓ Make approval, budget and authority dependent on documentation
Risk management		
Lack of stakeholder involvement	■ Unknown stakeholder group ■ Inability to assign risk to stakeholders ■ Lack of understanding on	✓ Escalate to higher authority ✓ Allocate sources of risk to key stakeholders ✓ Put the project on hold

	risk impacts ■ Little accountability	until buy-in ✓ Communicate potential consequences
Failing to identify risk	■ No time allocated ■ No access to past risk registers or tools ■ Poorly trained personnel ■ Failure to understand the risk profile of the project stakeholders	✓ Develop risk template ✓ Publish the prior risk register ✓ Archive all project risk registers ✓ Scan both internal and external environments ✓ Include risk discussion in all meetings ✓ Regularly monitor and review existing risks
Poor risk assessment	■ No formal process ■ Lack of expertise ■ Greenfield project with no historical data ■ Dynamic internal and external environments	✓ Develop risk template ✓ Widely consult experts ✓ Develop a range of quantitative tools ✓ Include risk discussion in all meetings ✓ Regularly monitor and review existing risks
Inadequate treatment strategies	■ Lack of detailed analysis tools ■ Lack of categorising risk ■ Volatile environments ■ Lack of trained personnel ■ Reliance on existing and standard operating procedures	✓ Establish escalation protocol ✓ Consider, accept, mitigate and avoid strategies ✓ Regularly monitor and review existing risks ✓ Assign to appropriate resource ✓ Reassess schedule impacts
Failure to update the risk register	■ Failure to source risk changes ■ Lack of skilled personnel ■ Lack of risk management	✓ Allocate stakeholders' risk-management strategies ✓ Communicate the fact

	tools	that risk is fluid across the project

Procurement and contract management

Poor procurement practices	■ No procurement plan ■ Poorly understood scope ■ Internal expertise ■ Limited complexity and impact	✓ Procurement planning processes ✓ Trained procurement specialists ✓ Justifiable 'make or buy' criteria
Difficulty in engaging suppliers	■ Lack of detailed market search ■ Shortage of market expertise ■ Evaluative criteria too severe ■ Buoyant market conditions ■ Inappropriate contract	✓ Extended canvass of marketplace ✓ Delay project ✓ Fragment project into smaller deliverables ✓ Upskill in-house resources ✓ Review specification detail ✓ Modify contract conditions
Prolonged negotiations	■ Extremely competitive marketplace ■ Unfair contract terms and conditions ■ Poorly defined specification	✓ Engage third-party experts ✓ Jointly develop contract terms and conditions ✓ Postpone the project
Poor contractor performance	■ Poorly defined specification ■ Little performance management and reporting ■ Low skill set ■ Lack of schedule coordination	✓ Detailed specification ✓ Documented performance criteria ✓ Scheduled milestones and deadlines ✓ Replacement resources
Contract revisions	■ Scope changes ■ Latent conditions	✓ Redefine scope ✓ Revise specification

	■ Performance breaches ■ Termination agreements	✓ Review contract terms and conditions
Conflicts and disputes	■ Unfair terms and conditions ■ Scope revisions ■ Quality inspections and testing ■ Escalating variations and costs ■ Unnecessary approval protocols ■ Decision-making delays ■ Penalty clauses	✓ Engage third-party experts ✓ Develop escalation protocol ✓ Withhold payments ✓ Review approval processes ✓ Revise specification
	Stakeholder management	
Limited access	■ No authority ■ Role and responsibility not communicated ■ Access blocked by senior management	✓ Formal communication of positions ✓ Circulate stakeholder register ✓ Authorised distribution lists ✓ Escalate issue to sponsor ✓ Pre-book meeting time and circulate agenda and/or questions in advance ✓ Use social and multimedia
Difficulty in managing stakeholders	■ No clear relationships established ■ No authority ■ Conflicting priorities	✓ Stakeholder forums and meetings ✓ Escalate to senior management ✓ Refer to escalation process ✓ Address priority issues with operational manager

Little authority	■ No project-relevant position description ■ Lack of executive management support	✓ Develop project position descriptions ✓ Communication of appropriate project structure ✓ Schedule stakeholders' meet and greet forums ✓ Develop stakeholder communications plan
Wavering participation	■ Lack of involvement ■ Sit outside the project ■ Contributions ignored	✓ Allocate meaningful work ✓ Flag expertise and experience ✓ Release after contribution has finished
Excessive power and influence	■ Senior management positions ■ Prior knowledge and experience ■ Technical expertise ■ Personality type	✓ Include in all communications ✓ Take every opportunity to publicly recognise their contribution ✓ Use as coaches and/or mentors ✓ Enlist the support of the sponsor
Lack of performance	■ No direct role ■ Limited instructions ■ Competing demands ■ Poor supervision ■ Low skill set	✓ Supervise closely ✓ Break-up the work into smaller components ✓ Escalate to senior management ✓ Replace with other stakeholders ✓ Provide detailed instructions ✓ Suggest self-monitoring
Lack of reporting	■ Time demands ■ Distain for reporting ■ Inability to measure	✓ Set reporting dates ✓ Develop agreed performance criteria

- ✓ Provide reporting template
- ✓ Publish actions resulting from reports

Appendix 2

Linking theory and practice activities

The information presented in this book has been written in line with PMBOK (2013), personal experience and my reflections drawn from both clients and students.

While each chapter has covered content, reflection and questions (to reinforce and assess your level of understanding of the key points), reading alone will not always, nor automatically, translate into best-practice application where it counts the most—in your workplace and on your real-life projects.

To facilitate this transfer, the following exercises have been constructed to give you the opportunity of applying the knowledge and skills learned with reference to a workplace project. Each exercise contains a number of questions which follow the project life-cycle approach as they address one or more of the topics covered.

The exercises relate to:

- business case
- project proposal
- work breakdown structure (WBS)
- network diagram
- critical path calculation
- Gantt chart
- lead and lag time
- resource levelling
- finalising the budget

- capturing the baseline
- measuring actual performance
- performance reporting
- project completion
- project evaluation.

Business case

1 What business need (or opportunity) has been identified?
2 What is the background to the need?
3 What alternatives have been identified to address the need?
4 What objective criteria will be used to assess each alternative?
5 What benefits have been identified (qualitatively or quantitatively)?
6 Have costs and funding arrangements been considered?
7 What risks and suggested treatments have been identified?
8 Has an indicative timeframe been nominated?
9 Has the option of doing nothing been considered?
10 Have you justified the preferred alternative?
11 Have you recorded this information in a comprehensive, logical and well-presented document?
12 Has written approval been received authorising the project?

Project proposal

1 With reference to a 'real-life' project, think about why the project was created (rationale, justification, strategic alignment, objectives, benefits…).
2 Who are the stakeholders involved in the project (including the sponsor)?
3 Who will be the project manager and have they the prerequisite authority, visibility and accountability required?
4 What are the project deliverables (process and output)?
5 Identify all relevant (indicative) information relating to time, budget, performance and people.
6 Document all the inclusions (what *will* be done) and exclusions (what *will not* be done).
7 Identify all possible risks, constraints, assumptions and dependencies.
8 Reflect on all the information captured. Is there a consensus on what the

project is, how it will be managed and what it will deliver?

9 Add any additional information required to support and/or interrogate the project (level of commitment, acceptance criteria, existing priorities, quality definitions, procurement strategies…).

10 Gain written signoff from the sponsor.

Work breakdown structure (WBS)

1 Design the appropriate format and layout for a WBS.

2 Review the scope inclusions and exclusions.

3 Brainstorm with the team members and subject-matter experts (SMEs) on what work has to be performed.

4 Break the project down into appropriate key phases (stages or 'chunks') and individual tasks.

5 Identify each task with a unique identifier (number).

6 Calculate the elapsed time (duration) that each task will take.

7 Record tasks sequentially (as much as possible and ignoring opportunities to do work concurrently).

8 Identify all milestones.

9 Determine the predecessor relationships between all tasks and/or milestones.

10 Using the resource matrix, assign resources (human and physical) to the tasks, concentrating on the task needs, resource availability, skill sets, charge-out costs and other criteria.

11 Calculate the required resource effort (work hours) to complete each task.

Network diagram

1 Draw a network diagram of your project, reflecting the detail captured in the WBS. If you find flaws or errors in your logic as you draw the network, please ignore them and continue. They will be corrected shortly.

2 Remember, time flows from left to right. The size of the network circles or boxes is irrelevant, as is the length of the lines drawn. Try to keep your relationship lines from crossing over if possible (it helps to follow the network's logic).

3 Ensure that each task is identified and that task duration/effort is also shown.

4 Examine the network and review the logic it displays.

5 Does the schedule contain any errors? Are tasks linked unnecessarily? Have you accidentally omitted important tasks from the network? Do the task relationships make sense? Are there any tasks which 'dangle' in the network? Do any tasks 'loop' in the network?

6 Having (possibly) identified a number of flaws in your project's logic, redraw the network correctly, fixing any scheduling errors identified earlier. Feel free to improve the schedule as well by altering relationships, by changing the scheduling of tasks, or by doing tasks in parallel.

7 Compare the revised schedule with the earlier version. Note any improvements and justify the 'new' logic to all stakeholders.

Critical path calculation

1 Trace through all the network diagram 'paths' and record the total (end-to-end) duration for each path.

2 Calculate the early start and early finish dates in the network by doing a forward pass through the network.

3 Calculate the late start and late finish dates in the network by doing a backward pass through the network.

4 Identify the critical path/s (the longest path/s) and mark with small parallel lines or with another colour.

5 Determine which tasks in the network are not critical and have float.

6 Assess the implications and/or challenges the critical paths and float present.

Gantt chart

1 Using an accurate timescale (perhaps graph paper), draw the project plan as a 'to scale' Gantt chart.

2 Include all stages, tasks and milestones, along with any deadlines.

3 Show all task dependencies clearly.

4 Try to limit specific start/finish dates (where possible) as it removes the flexibility needed by schedules.

5 Mark both the critical path/s and the tasks with float.

6 Reflect on both the elapsed task durations and the resource effort timelines.

7 Does the schedule present with a degree of complexity or ease?

8 Can some tasks be split to spread the time period (without increasing costs)?

9 Can the project be crashed to an earlier finish date and how would this affect costs?

Lead and lag time

1 Investigate opportunities to reschedule tasks with lead time (overlap and compress the project timeline).
2 Is there any risk in using lead time?
3 What other challenges and efficiencies does this present?
4 Investigate opportunities to reschedule tasks with lag time (delay and extend the project timeline).
5 Is there any risk in using lag time?
6 What other challenges and/or efficiencies does this present?

Resource levelling

1 Examine the schedule and locate the tasks where resources have been over-allocated.
2 Identify replacement resource allocations and/or other options.
3 Are there any quality issues regarding expected performance?
4 Assess the cost and time implications of these (internal or external) resourcing options.
5 Discuss these options with the sponsor for evaluation and approval.

Finalising the budget

1 Identify all the resource variable costs (rates of pay…) for each task.
2 Identify all the resource fixed costs (overheads…) for each task.
3 Consider whether any contractual conditions exist regarding costs and payments.
4 How confident are your estimates and have you communicated this?
5 Is any contingent funding available?
6 Determine the cash-flow requirements for the scheduled and costed work.
7 Determine the budget for the scheduled work.
8 Reflect the budget as a time-phased budget.

Capturing the baseline

1 Experiment with changing the resources, task duration, costs, sequence and so
   on to model different schedule scenarios.
2 Have you considered both internal and external dependencies?
3 Does the schedule reflect all travel, meeting and reporting time periods?
4 Confirm the 'final' project schedule.
5 Circulate to all stakeholders for approval.
6 Retain this version as the baseline for future comparisons.

Measuring actual performance

1 What change-control processes do you have in place?
2 Prepare a document that would accurately capture any scope changes.
3 What measure of performance will you use to track work completed?
4 Demonstrate the progress completed on the Gantt chart.
5 Would milestones be useful to track progress to date, and why?
6 How often should you monitor performance?
7 What role does risk play in tracking actual performance?
8 Update all associated documents, reflecting current status and forecast
   completion information.

Performance reporting

1 What information do the different stakeholders of a project require?
2 Develop a communications plan that reflects the stakeholders' communication
   needs.
3 Why should progress, status and completion reports be documented?
4 What performance information will you produce under the progress, status and
   forecast reports?
5 What are the likely causes of scope creep and how might this be mitigated?
6 What corrective and/or remedial action might be required to bring the project
   back on budget and on schedule?
7 What reinforcement action might be required to keep the project performing on
   budget and on schedule?

Project completion

1 What acceptance criteria have you established with the client?
2 With the project completed, what responsibilities do you now have?
3 How do you ensure compliance and completion?
4 Prepare a project close-out report.
5 What lessons have been learned throughout this project?
6 How will these be communicated and acted on?

Project evaluation

1 What benefits (outcomes) were identified in the business case?
2 How were these benefits to be measured (quantitatively and/or qualitatively)?
3 Has the project delivered all of these benefits?
4 Is additional monitoring and reporting required for any outstanding benefits?
5 Prepare a benefits realisation report.

Appendix 3

Project management templates

The following document templates represent the fifteen most fundamental and common documents used throughout any project:

- Business case
- Project register
- Project proposal
- Correspondence register
- Requirements matrix
- Meeting template
- Project plan
- Risk register
- Change request
- Payment claim
- Performance report
- Earned value report
- Finalisation report
- Lessons learned log
- Benefits realisation report

They are available to download at no charge from https://allenandunwin.com/projectmanagement.

Glossary

Acceleration Fast-tracking delivery and/or completion dates earlier than originally scheduled (also known as fast-tracking).

Acceptance criteria The conditions that must be met prior to client handover.

Accountability Answerable for the work that has been allocated to you and for which you are responsible.

Accuracy The degree of correctness in quantitative assessment.

Activity Another term for 'task', or the work performed throughout a project.

Activity duration Time period nominated to complete the activity.

Actual cost The actual cost incurred in completing the work.

Agile A methodology associated with software development, involving adaptive planning, evolutionary development, collaboration and continuous improvement.

Agreement Document (or verbal agreement) defining intentions between two or more people.

Analogous Use of historical data in estimation.

Assumptions Things believed to be true but not tested or confirmed.

Audit Objective observation and/or assessment of contracted performance against agreed criteria.

Authority The formal or informal right to decide what has to be done and who performs the work.

Back-loading Scheduling project activities to start as late as possible.

Bar chart A graphical display (with or without a timeline) of schedule data.

Baseline The original and agreed plan for the project's activities.

Benchmark An acceptable level of performance.

Benefits Measurable returns generated by the project following finalisation.

Budget The approved estimate for the project.

Budget at completion The total cost of all the budgeted project activities.

Business case A formal or semi-formal assessment of one or more options with a recommendation to do, or not do, something.

Calendar The nominated work hours for the project and stakeholders.

Change The process of moving from one position to another.

Change control A formal (or semi-formal) process for assessing and authorising change.

Change request A formal proposal to modify some aspect of the project.

Claim An assertion for payment, consideration or some right.

Classification Criteria to assess the scale and priority of different projects.

Client The party benefiting from the project result.

Communication The process of exchanging information between the sender and the receiver.

Compliance Conforming to an agreed rule, standard, law or expectation.

Conflict A situation involving different perspectives that needs to be resolved.

Constraints Any restrictions or barriers impacting the project.

Contingency An amount held in reserve to cover changes and/or variations.

Contract A formal and legal agreement between two or more parties, creating obligations that must be discharged.

Contract administration Managing the legal relationship and obligations between the contracted parties.

Contract close-out The resolution and completion of all legal obligations between the parties.

Control The management process of comparing actual performance with planned performance, analysing variances, evaluating possible alternatives and taking appropriate corrective action where needed.

Corrective action Changes made to bring the expected performance of the project into line with the planned performance.

Cost The amount of money required to perform the work.

Cost controlling Controlling changes to the project budget.

Cost estimation Estimating the cost of the resources needed to complete project activities.

Cost variance The difference between the actual cost of the work completed and the planned value.

Crashing Taking action to compress the project duration for the least cost.

Critical activity Any activity or event on a critical path or paths, which must start and finish on time for the project to finish on time.

Critical path The series of activities that determines the earliest completion of the project.

Critical path method 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).

Culture The invisible hand directing organisational behaviour.

Deadline A scheduled date that must be met.

Decomposition A hierarchical breakdown of the scope into discrete units of work.

Delegation Transferring responsibility for carrying out set tasks to subordinates.

Deliverable Any measurable, tangible, verifiable output, result or item that must be produced to complete a project or part of a project. This may include process documentation (deliverables).

Dependency A dependent relationship between two or more activities.

Diversity Stakeholders with a variety of differences.

Duration The amount of time required to complete a project activity.

Earned value The budgeted value of completed work.

Earned value management Quantitative measurement of project progress and value.

Effort The amount of resource units required to complete activities.

Elaboration Progressive and iterative process of increasing the level of detail as more accurate information becomes available.

Elapsed time The time required to complete the work.

Escalation The hierarchical progression of issues and problems to a higher authority.

Estimate An attempt to quantify a period of time or cost required for an activity.

Estimated cost at completion Actual costs to date plus revised costs for all outstanding work.

Ethics A set of moral values embedded culturally, professionally and/or organisationally.

Exclusion The work expressly agreed to be omitted from the project.

Fast-track Schedule compression involving sequential tasks being performed in parallel.

Finish date A point in time associated with an activity's completion.

Fixed-price contract Allows for all the work to be completed at a fixed price, regardless of the cost or effort involved.

Float The amount of time that an activity may be delayed from its early start without delaying the project finish date.

Forecast A prediction of future events or conditions based on available information (and measured against the plan and reality).

Front-loading Scheduling project activities to start as soon as they can.

Functional manager The manager responsible for a particular section of a

department within the organisation.

Gantt chart A graphical display showing tasks, their duration, timelines and sequencing.

Governance Compliance with legal requirements and other regulations.

Histogram A vertical bar chart displaying resource loading across the project.

Inclusion Work expressly agreed to and included in the project's scope.

In-parallel activity Activities that occur simultaneously.

In-series activity Activities that follow each other in a linear sequence.

ISO International Organization for Standardization.

Issue Outstanding problem (perhaps a risk) that needs resolution.

Integration Coordination of all planning and managing processes and documentation to perform the project.

Lag time An intentional delay between the finish of the predecessor and the start of the successor activity.

Leadership Demonstrating the ability to guide other individuals, teams or entire organisations in achieving outcomes.

Lead time An intentional acceleration of the start of a successor task following the completion (in part) of the predecessor activity.

Lean A methodology focused on waste minimisation without sacrificing productivity, quality and customer satisfaction.

Lessons learned Information gathered during the project that would benefit others.

Levelling Attempts to balance (smooth) resource allocations.

Life-cycle The evolution of the project over a number of predefined stages.

Kick-off A meeting to formally launch the project and cover essential information.

Kick-out A meeting to formally close the project and cover essential information.

Management Activities revolving around planning, leading, organising and controlling.

Maturity The level of development measured against known criteria.

Methodology An accepted and applied system of procedures, practices, rules and techniques.

Milestone A significant event or point in time in the project, signifying the commencement and/or completion of a major deliverable.

Monitoring The capture, analysis and reporting of project performance, usually compared to a plan.

Motivation The innate or extrinsic factors driving performance and behaviour.

Network diagram A sequenced diagram (also known as PERT) reflecting

activity, duration, predecessor and relationship attributes.

Not-for-profit Non-government body operating for reasons other than making a profit.

Objective The strategic position or targeted end point/s for the project.

Operations Day-by-day routine work that forms the core business performed.

Outcome Measurable benefit resulting from the project.

Output Physical deliverable(s) from the project.

Parametric The use of an algorithm around project parameters and historical data to calculate cost or duration.

Path Any continuous series of connected activities in a project network diagram from the start of the project through to its completion.

Percentage complete An estimate, expressed as a percentage, of the amount of work that has been completed on an activity or group of activities.

Performance management A semi-formal process to assess individual performance against known criteria to reinforce required performance and identify performance gaps.

Performance report Collecting and disseminating information about project performance (past, current and future against the plan) to help ensure project success.

Planned value The budgeted cost of all scheduled work.

PMBOK The project management body of ten knowledge areas known as the de facto global standard.

Portfolio manager A manager responsible for a number of strategic projects.

PRINCE2 Process-based project management methodology.

Priority The analysis of multiple projects, risks or other variables, with a view to ordering different response levels.

Process A systematic series of inputs and outputs directed at causing an end result.

Procurement The process of acquiring goods and services, either internally or externally.

Program manager A manager responsible for a suite of interrelated projects

Progress The measure of completed work to date (as measured against the plan).

Project A temporary and unique series of goal-oriented activities undertaken to create an agreed outcome.

Project life-cycle A collection of generally sequential project phases, the name and number of which are determined by the control needs of the organisation or organisations involved in the project.

Project management The application of knowledge, skills, tools and techniques to project activities in order to meet stakeholder needs and expectations from a

project.

Project management office (PMO) A central office (strategic or administrative) for coordinating all things relating to the project.

Project manager The person responsible for planning and managing a project.

Project organisation The parent organisation that manages the project.

Project plan The formal document capturing all the detailed planning on how the project will be executed.

Project team Individuals working with and supporting the project manager in delivering the project result.

Proposal Document confirming the project status and capturing the initial expectations.

Quality Subjective measures of tangible and/or intangible characteristics needed to satisfy requirements.

Register Document recording relevant project information (e.g. risk, issues).

Requirement An agreed capability, condition or other formally imposed specification or other nominated characteristic.

Resources Human and physical units assigned to project activities.

Resource levelling Any form of network analysis in which scheduling decisions (start and finish dates) are driven by resource management concerns (e.g. limited resource availability or difficult-to-manage changes in resource levels).

Resource planning Determining what resources (people, equipment, materials) are needed in what quantities to perform project activities.

Result An agreed output (or outcome) of the project.

Risk The potential positive and/or negative events that could impact a project.

Risk breakdown structure (RBS) A hierarchical representation of categorised risk.

Risk profile The preferences displayed when responding to risk.

Rolling wave planning The continual development, elaboration and iteration of planning processes.

Schedule The planned dates for performing activities and meeting milestones.

Schedule variance The difference between the value of the work completed and the planned value.

Scope The sum of the products and services to be provided through the project.

Scope change Any change to the project scope. A scope change almost always requires an adjustment to the project cost and/or schedule.

Scope creep Any change (authorised or not) to the project scope baseline.

SMART An acronym of setting objectives: specific, measurable, achievable, realistic, timeframe.

Specification *See* requirement/scope.

Sponsor The person providing the resources and support for the project while also demonstrating visible support to enable the project's success.

Stakeholder Organisations and individuals who are involved in or may be affected by project activities.

Start date A point in time associated with an activity's start, usually qualified by one of the following: actual, planned, estimated, scheduled, early, late, target, baseline or current.

Statement of work (SOW) A narrative description of products or services to be supplied under contract.

Status A measure of the current state of the project at the reporting date (measured against the plan).

Strategy A plan to achieve an agreed result.

Subject-matter expert (SME) Someone who has the required (technical) expertise required by the project.

SWOT Analysis of strengths, weaknesses, opportunities and threats.

Task A common term to describe the project activity, work or requirements.

Task relationship The dependencies between two or more project activities. There are four types of logical relationships:

  1 *finish-to-start:* the 'from' activity must finish before the 'to' activity can start
  2 *finish-to-finish:* the 'from' activity must finish before the 'to' activity can finish
  3 *start-to-start:* the 'from' activity must start before the 'to' activity can start
  4 *start-to-finish:* the 'from' activity must start before the 'to' activity can finish.

Template A predefined and partially completed document allowing information capture, presentation and assessment.

Time The nominated period allowed for the project (also known as the schedule).

Time-material contract Allows for approved work to be completed period by period.

Time-phased budget Budgeted costs displayed across nominated time periods.

Variance Any difference between planned and actual estimates (in time or costs).

Variance at completion (VAC) Calculates the changes in costs (high/low) to complete the project.

Work breakdown structure (WBS) A deliverable-oriented grouping of project elements that organises and defines the scope of the project. Each descending level represents an increasingly detailed definition of a project component.

Project components may be products or services.

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Index