**Sample of the book**

**Enlightened Planning**

Using Systematic Simplicity to Clarify Opportunity, Risk and Uncertainty for *Much* *Better* Management Decision Making

by

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# Foreword by Stephen Ward

*Stephen Ward is Emeritus Professor in Management, Southampton Business School, University of Southampton.*

We all engage in planning. As individuals much of our planning is of a tacit, informal nature, but for managers there is an expectation, even a requirement, that planning will be a more formalised process, with clear rationale and objectives, requiring the cooperation of various other parties. However, this clarity can be difficult to achieve, not least because complexity, uncertainty and risk must be confronted, whatever the context. Appreciating and planning appropriately for the implications of complexity, uncertainty and risk associated with different possible courses of action is a major challenge.

Whatever the enterprise, some degree of planning is necessary to achieve desired outcomes, and large projects require a great deal of planning. But common experience shows that plans frequently require major modification, become thwarted, or fall short of achieving desired outcomes, usually because of factors that were not considered sufficiently during the process of planning.

In this book, Chris Chapman explains how we can do much better, by adopting an ‘enlightened planning’ approach that systematically addresses complexity, uncertainty, and risk that really matters, together with a creative search for opportunities. The concept of ‘enlightened planning’ involves a coherent synthesis of a rich variety of concepts and analytical tools that can be used directly in a wide range of contexts.

As a practical matter, all planning and attendant decision making must make simplifying assumptions about reality. Unfortunately, managers, particularly hard-pressed ones, often seem to be attracted to simplistic approaches that limit the scope of analysis and result in important features of a planning context being ignored.

A very common example is a preference for estimates of key contextual variables that consist of unrealistically narrow ranges of possible values, or even just single value (point) estimates. Simplistic estimates of this kind can seriously compromise the credibility and usefulness of plans.

Another example is the common practice of using probability-impact grids to characterise sources of risk, with attendant simplistic assumptions that all sources of risk are derived only from a set of events that may or may not occur, and that events are assumed to be independent of one another. This practice severely restricts recognition of important aspects of uncertainty that drive risk, including knock-on effects of one event on another.

How to keep things appropriately simple in any planning process requires careful thought. Rather than uncritical use of simplistic approaches, enlightened planning calls for intelligent and critical use of simplifying assumptions in scoping planning effort that facilitates the exploration of key issues and related uncertainty that really matters. What are these key issues? They include: deciding what factors to take into account, the potential for dynamic interactions between factors, understanding the goals of all relevant stakeholders, the ambiguous nature of some goals, potential trade-offs between goals, how far ahead to plan, and how much detail to go into. Uncertainty and risk is associated not only with such features of the planning context, but also with the planning process itself.

A particularly valuable feature of this book is its focus on practice, employing detailed case studies (tales), derived from Professor Chapman’s extensive consulting experience in a wide range of planning contexts. Each of the tales in Part 2 illustrates aspects of enlightened planning, describing how recognition and understanding of key issues and what to do about them develops as protagonists progress their analysis and thinking. Each of these tales is set in a particular context, but the approaches described are readily transferrable to other organisation contexts. All the issues addressed are of strategic importance to operations management, project management, and corporate management. Most ought to be of concern at board level to ensure effective governance of planning processes, and leadership of enlightened planning.

This book is the culmination of decades of reflection about what best practice planning and decision making under uncertainty should look like. Potential readers should on no account be deterred by the length of this book, or of individual chapters. For, make no mistake, this book represents a major opportunity for all managers, and their advisors, to substantially enhance organisational performance through enlightened planning.

**Comments by other colleagues**

***Matthew Leitch*** *is a consultant, author, business school educator and risk standards committee member whose website is www.WorkingInUncertainty.co.uk*

‘Enlightened Planning’ is not just a book about how to manage risk on projects or in business planning, but if you need a book on those topics then this is an excellent choice. It does two things that are important steps forward. First, it includes a management process explicitly designed to incorporate a wide range of appropriate methods. This is not just a process which boils down to a list of risks and a procedure for doing things with them. Instead it encourages consideration of a much wider range of techniques from operations research modelling down to quick estimates. This kind of flexibility is a frequent aspiration for risk management publications but in this book Chapman successfully achieves it. Second, the book focuses on how to choose the right management technique at the right time to get the best combination of clarity and economy. It explicitly tackles something most busy managers can feel all the time, which is a drive to know and understand more, frustrated by lack of time and opportunity to do so.

The book is extensively illustrated with detailed practical examples from real life, including calculations and charts. The rich conceptual content and practical detail mean this is not a book you can read over a weekend. But tackled patiently, a section at a time, over a period, it will make most intelligent managers into better managers.

***Paul Thornton*** *was a founder and Managing Partner at The French Thornton Partnership. He is a Past President of the Management Consultancies Association and the Operational Research Society.*

French Thornton was a programme management consultancy that led numerous well-known initiatives in the financial, transport and retail logistics sectors, and my earlier management consultancy career involved a wide range of clients. As a lifelong management consultant, my career focus has been helping organisations to achieve lasting, beneficial change. Coming from an Operational Research background, my instincts were to adopt a modeling approach to whatever problems we were confronted with. If standard models didn’t adequately represent the real life complexities of the situation, then develop and extend them until they did was the basic idea. This approach risked getting bogged down in endless cycles of model development and redevelopment. However, the main alternative (and the one often favoured by macho managers) was to assert that the problem was really a simple one, and to solve that problem irrespective of how much genuine complexity was being brushed under the carpet.

I first became aware of Chris Chapman’s work in the 1980s, and we got to know each other in the early 1990s when he succeeded me as President of the Operational Research Society. Chris was providing long-term support to major corporations and utilities on projects that flew under the ‘Risk Management’banner, many of them concerned with huge capital investment programmes. Drawing on these multi-year consulting engagements, and his extensive research work, Chris has now codified significant subsequent evolution of his approach, which is set out fully for the first time in this new ‘Enlightened Planning’ book*.*

A key aspect of this new book’s approach is that much of the real world complexity is addressed by thoughtfully tailoring the overall planning process to accommodate the cultural stresses and strains within the enterprise. This frequently facilitates the use of very simple conceptual and operational tools that build on sophisticated underlying conceptual and operational tools. ‘Systematic simplicity*’* is an excellent description for this approach. For example, as discussed in Chapter 6, simple but effective quantitative probabilistic analysis can be used when assessing competitor behavior in a bidding context based on work Chris did with IBM UK and earlier work with BP International, but qualitative cultural issues also need attention, like a corporate understanding of the difference between good luck and good management, bad luck and bad management, and why people taking more risk knowing what they are doing can be crucial to organizational survival, explored in detail in Chapter 3.

I also like the ‘systematic simplicity’ approaches to cultural concerns, including sound ethics. For example, Figure 11.1 in the last chapter uses a ‘red face test’ notion Chris attributes to me, but what I particularly like is the way this simple ethical test is linked to more general ‘frowns test’ and ‘smiles test’ variants, driven by a systematic approach to important concerns which are not amenable to simple metrics but need simple systematic attention. Examples used earlier in the book in the IBM based bidding example in Chapter 6 include staff being needed if the bid is won who are already heavily committed to other crucial contracts (a ‘frown’) and a bid in a new area of business the company doing the bidding wants to develop expertise for with a view to future business (a ‘smile’). Railway safety as addressed in Chapter 9 raises more complex ethical issues involving trade-offs between monetary costs, avoided fatalities and avoided injuries, and these ethical issues are crucial and current in a wide range of important contexts.

***Professor Jeffrey K. Pinto****, Black Chair in Technology Management, Penn State University, USA.*

Creating and managing knowledge as it applies to project management has, at times, taken on the nature of a Sisyphean labor. At an age when project-based work has grown ever more common and projects of the broadest array – infrastructure, information systems, new technology and services development – represent real opportunities to advance the human condition, our understanding of how best to manage them for maximum value often remains mired in misapplication, flawed thinking, and a variety of personal and organizational biases. In short, the dichotomy is real and it is growing: between, on the one hand, the increased need for organizational undertakings best supported by projects and project management and on the other, the seemingly intractable challenges in advancing our knowledge base sufficiently to gain best use from our efforts. The data support this contradiction: the Project Management Institute reports that for every billion USD invested in projects, some 125 million USD is classified ‘at risk’, a figure that is actually growing at double digits year-on-year. Failure rates in IT projects are high and have remained depressingly stable for well over a decade. The data are clear: the need for projects is at an all-time high while the manner in which practitioners and academics alike deliver on this promise remains mired.

It is against this backdrop: a time for projects that is both highly exciting in its possibilities and rather sterner in its realization, that Professor Chris Chapman’s book is so welcome. The underlying premise of his work (and it is a message that is born out again and again in projects great and small alike) focuses on the nature of project front-end planning and offers a deceptively simple message regarding what we keep getting wrong with these processes – we continue to make the simple difficult while making the difficult seem seductively simple. Professor Chapman has been one of the leading theorists and original, holistic thinkers in the project management discipline for several decades now. In ‘Enlightened Planning’, he brings his considerable talents to bear in a work that is compelling and powerful. It offers a new way of viewing the project planning process: one that directly considers the ways in which our organizations, culture, and processes can interact to get planning done the right way. Equally welcome is the manner in which Professor Chapman illustrates these ideas, through a series of compelling case examples that show in practice the principles he espouses. I have a strong admiration for this book. Terms like ‘strategic clarity’, ‘enlightened planning’ and ‘systematic simplicity’ are certain to become more than talking points; they offer the means to reorient our thinking. They cut right to the heart of what we need to be doing to put into practice effective project planning approaches. The framework provided also links this thinking directly to planning for operations management and corporate strategy formation concerns which are directly interrelated in important ways. The final result is a thought-provoking and important work for practitioners and scholars alike.

***Professor Terry Williams*** *is Director of the Risk Institute, University of Hull, UK.*

As Professor and Head of the Management Science Department at Strathclyde University and a Professor and then Director of the Management School of the University of Southampton before coming to Hull, I have been aware of the work Chris was doing for many years. I invited him to be a key speaker at a Nato Science Programme conference in Kiev in 1996, used *Project Risk Management* (Chapman and Ward, 1997) in my book *Modelling Complex Projects* (Williams, 2002), which shares his (and my) ‘practitioner who is also an academic’ perspective, and invited him to contribute a chapter to my book *Project Governance: Getting Investment Right* (Williams and Samset, 2012). His new ‘Enlightened Planning’ book provides a reflective synthesis of his earlier work plus a comprehensive set of important new conceptual and operational tools with significant implications.

An irony of the risk management field is that it has become prone to the risk of standardized ways of considering and quantifying risk. The paper *Organising risk: discourse, power, and ‘riskification’* (Hardy and Macquire, 2016) in the Academy of Management Review has shown how organisations and ‘experts’ in risk have developed a dominant discourse which limits the way we think about risk. What the field urgently needs is thinking that takes us to the basics of what risk and uncertainty are, and looks at them in a fresh way. This book is indeed such thinking, introducing important new fundamental concepts such as ‘clarity efficiency’ and the ‘estimation-efficiency spectrum’ (although keeping some well-used ideas from previous books such as the ‘seven Ws’). Pleasingly, it aims to provide good estimates rather than the simple assumption of bias and the application of standardized contingency factors, often done following Flyvbjerg’s work. Having edited a couple of books about planning projects with scant information, this book would have given us a really useful structure on which to consider the ideas with which we had to grapple and I hope its ideas are taken up by practitioners, academics, and also by the various bodies of knowledge.

***Stephen Cresswell*** *practices as Into Risk Ltd, London UK, www.intorisk.com*

I have been an independent consultant for a decade, building on an earlier decade of experience, initially in business development in the IT and Telecoms industry, then as a project management consultant with Bombardier Transportation and the Sweett Group. My growing interest in risk and uncertainty led me to Chris’s publications in the early 2000s and I took part in his 2006 International Project Management Association ‘Managing Project Risk & Uncertainty in New Ways’ Advanced Training Course in Copenhagen. This course and subsequent reading of his publications have been a key influence in my development as a ‘reflective practitioner’ – with many of the methodologies and approaches being applied, with success and benefit, in my client assignments. Particularly important was an appreciation of how to get beyond seeing ‘risk’ in terms of independent events, treat interdependencies effectively, and meet the challenges involved in persuading clients’ personnel conditioned by simplistic approaches to change their approaches.

The ‘enlightened planning’ perspective explored in this new book involves deep thinking about strategy, uncertainty, complexity and implementation, with considerable attention to perspective and some philosophical aspects. However, this new book is also rich in simple tools and practical concepts and mantras that help with the ‘how to do it’ and 'craftsmanship' associated with planning and analysis in new ways. I fully anticipate using all aspects when faced with challenging problems. My favourite new concept is ‘closure with completeness’. The basic underlying ideas have always been there in the approaches Chris has advocated, but they are now brought together, made explicit, and named. Closure with completeness gives a very concise plain English label and rationale for the inclusion of items such as an ‘allowance for unidentified risk’ in a project cost estimate. It also naturally prompts people to question whether the analysis addresses everything relevant.

This new book builds on a consolidation of an extensive research and consulting career, drawing on both successful applications of new ideas and some lessons learned the hard way. Reading this book from beginning to end was a serious challenge, but I expect to get large return on the time invested.

***Mike Annon****, PMP, is Owner of I&C Engineering Associates, Waterford CT, USA.*

My 45 years of experience with over 50 nuclear energy and fossil fuelled power plant facilities in managerial and management consulting roles has convinced me that most organizations believe they know how to plan. However, too frequently they need to ‘rescue’ their plans at considerable cost with serious associated delays because their initial planning efforts were incomplete. Since the 1980s I have published, led workshops and managed projects with a focus on the processes, other tools and team work needed to ‘get started on the right foot’ and to rescue projects which failed to do so.

After I attended a 2009 professional training course in Chicago led by Chris based on the second edition of his book *Project Risk Management* (Chapman and Ward, 2003), I started to embed many of his ideas about new ways of looking at ‘uncertainty’, ‘risk’ and ‘opportunity’ in my work with clients. Contributing feedback comments on his book *How to Manage Project Opportunity and Risk* (Chapman and Ward, 2011) helped me to extend and update these ideas. His new ‘Enlightened Planning’ book has a wide range of further new ideas which will be incorporated into my planning efforts with future clients. I particularly like his new book’s approach to visualising what I would term ‘beginning with the end in mind’, explicitly linking the assumed project lifecycle framework plus the ‘seven Ws’ framework and a ‘goals-plans framework’ to the project planning phase structure framework which integrates these four key frameworks. It helps with the front end of project management, and with integrating operations management and corporate management team concerns, to facilitate delivering what both the project owners and the project’s ultimate ‘customer’ actually want by asking them the right questions at the right time and engaging in the right kind of dialogue.

***Rodney Turner*** *is now retired. Most recently he was Professor of Project Management at SKEMA Business School, in Lille France, where he was Scientific Director for the PhD in Project and Program Management. Rodney is Vice President, Honorary Fellow and former Chairman of the UK’s Association for Project Management, and Honorary Fellow and former President and Chairman of the International Project Management Association.*

Consider a trio of quotations:

*No battle plan ever survives first contact with the enemy.*

Field Marshal Helmuth von Moltke

[*In preparing for battle I have always found that plans are useless, but planning is indispensable*](http://www.quotationspage.com/quote/36892.html)*.*

General Dwight D. Eisenhower

[*The perfect is the enemy of the good. By this I mean that a good plan violently executed now is better than a perfect plan next week. War is a very simple thing, and the determining characteristics are self-confidence, speed, and audacity. None of these things can ever be perfect, but they can be good.*](http://www.quotationspage.com/quote/38297.html)

General George S. Patton

The quotation by Field Marshal von Moltke can suggest there is no point planning, because the plans will be wrong. But President Eisenhower, while agreeing that the battle will not evolve as the plans envisage, suggests that the process of planning is essential, because it creates a strategy for the battle, and though the battle will not evolve as the plan envisages, having done the planning, we can understand what the likely scenarios are, and respond to the scenarios that occur. General Patton takes a slightly different approach. He starts by quoting Voltaire, and says we should not aim for the perfect plan, because we will already have lost the battle. But we should aim for a good plan, one of the defining characteristics of what Chris Chapman refers to as ‘systematic simplicity’.

Henry Simon, in his concept of bounded rationality, agrees with these sentiments with ideas also supportive of a ‘systematic simplicity’ approach. We can never make a perfect decision, because we do not have all the information we need, we cannot perfectly analyse all the information we do have, and most importantly of all, we cannot foretell the future, so we do not know precisely how things will evolve. Therefore, we need to make good decisions, ones that satisfice, and not strive for perfect decisions.

Chris Chapman, in this unique book, explores how we can plan effectively in this uncertain environment. In Chapter 2 he introduces a universal planning and complexity management process that outlines how we can be better able to respond as plans unfold. This process is based on ‘systematic simplicity’, with the aim of providing good plans, based on sound interpretation of the data plus wider possibilities. In Chapter 3 he introduces a range of approaches to uncertainty using this process – the plan will not evolve precisely as envisaged, and we can’t predict the future, but we can make forecasts within sensible ranges, and plan effectively for likely scenarios. Chapters 4 to 7 further explain the use of these systematic simplicity ideas in project management areas where Chris has an established international reputation and related operations management areas. Chapter 8 addresses strategy formation and corporate planning, and Chapter 9 expands further when low probability but very high impact scenarios may be involved, on planning for the likely and unlikely scenarios, understanding the possible range of outcomes, and developing robust plans that are appropriately prudent.

This book will be invaluable to anyone involved in strategic planning or corporate decision making as well as those interested in project planning.

***Martin Hopkinson*** *is a project risk professional and author based in Winchester, UK.*

With the advent of computerised tools, our business and project planning processes have evolved to demand ever increasing levels of breakdown and detail. This book identifies why this approach has become less enlightened than we might think. For example, projects often maintain schedules with thousands of activities, employing a team of planners to keep abreast of the myriad of changes as they occur. Chris Chapman describes how these projects could improve their estimates, make better decisions and foster a progressive planning culture by limiting the number of activities to 75 or fewer. His approach involves understanding activities, interdependencies and the implications of uncertainty in greater depth. It is underpinned by a welcome clarity about the assumptions that we make when planning, often without noticing.

The book is illustrated with practical examples drawn from the author’s long experience of working with businesses and government departments in wide range of different industries and countries. If you deploy only some of the tools and techniques that are described, it is difficult to see how your planning process cannot become more enlightened.

***Jesper Schreiner****, Managing Director, Danish Project Management Association.*

I attended the Copenhagen IPMA advanced training programme on Project Risk Management provided by Chris in 2012, subsequently used his ideas as a practitioner and as a teaching consultant, and contributed a two hour session to his 2017 IPMA programme as a Visiting Speaker, discussing my experience putting his ideas into practice with clients, so I was familiar with his overall approach when reading his new ‘Enlightened Planning’ book.

What I particularly like about this new book is the way Chapter 1 clarifies key basic concepts like the relationship between opportunity, risk, uncertainty and underlying complexity, and Chapter 3 then clarifies the relationship between all the components of his ‘opportunity efficiency’ concept, using practical examples based on his work with BP, IBM UK, the UK MoD and other clients.

I also like the Chapter 7 ideas which are new to me – in particular breaking down the current practice silos within project management between risk management, estimating and other aspects of planning.

I find the new ‘Enlightened Planning’ book – and the embedded mindset of systematic simplicity – a very useful contemporary contribution to a better understanding of the fundamental complexity often encountered in the handling and the clarifying of risk and opportunities for better management decision making.

***Dr Dale F Cooper****, Director, Broadleaf Capital International, www.Broadleaf.com.au*

Chris Chapman has written an important but challenging book. It is important because it addresses matters central to most organisations: how to make important decisions when confronted by significant uncertainty. I shall return to the challenges later.

This book describes two journeys. The first is the one we readers are invited to join, an intellectual exploration as concepts are developed from relatively simple matters through to ideas that seem deceptively simple at first but are embedded in a subtle matrix of nuance that requires profound understanding and interpretation. The second is Chris Chapman’s own journey along roughly the same route, but with many of the bumps and wrinkles smoothed out to make the lives of his readers easier. This second journey, interwoven through the first, provides the justification for the steps along the way. It explains the practical circumstances in which the main concepts were developed, with case studies from some of Chris’s large clients emphasising the significant practical value and the substantial benefits that can be obtained for modest investments of time and effort.

Here I must declare an interest. I joined Chris at the University of Southampton in 1978. With a background in operational research and mathematical modelling, an understanding of psychology and a fascination with decision-making, I was drawn quickly into risk management with Chris. Our first work together was with Acres, examining the reliability of an LNG facility proposed for the high Arctic, using software Chris had developed with BP and adapted by us for the specific reliability context, combined with semi-Markov analysis that seemed innovative at the time. We went on to work together on other large projects: hydroelectric developments in Alaska and northern Alberta, upstream oil and gas off Newfoundland and oil and gas pipeline transport in Alaska, some of which are described in this book. Although our paths have diverged geographically since then, and we often use slightly different words to describe similar things, the approaches I learned from Chris, and those we developed together, are still central to my own international risk management practice.

In particular, my risk management work has always had a strong focus on practical value, on how risk management can be used to support better decisions, with a clear recognition that analysis by itself is not sufficient. This is echoed strongly in this book: uncertainty must be analysed, but only so far as is necessary to add value and make a sound decision, one that can be explained and justified clearly to stakeholders. Enlightened planning, as described by Chris in this book, provides a window into how this might be achieved.

Some of the core concepts in this book that I still use regularly (albeit sometimes using different words) are risk efficiency and opportunity efficiency, diagrams like histogram and activity trees that explore and explain important uncertainties and their inter-relationships, graphs that demonstrate key sensitivities and their practical implications, and illustrations of the differences between options so decision makers can evaluate outcomes outside the constraints of simplistic one-dimensional metrics.

Another important concept that resonates strongly with me and my colleagues at Broadleaf is that developing an understanding of the structure of uncertainty is an unequivocally necessary precursor to quantification. We have seen far too many examples of quantitative models where understanding was clearly lacking and the outcomes were at best misleading, often technically incorrect and at worst fatally flawed.

A core concept that Chris develops is clarity efficiency. This reflects the notion that there should be a balance between the amount of effort that is devoted to exploring important decisions (with the context and uncertainty that surrounds them) and the understanding that is generated for those who must make those decisions. Making such trade-offs is a critical part of enlightened planning, just as it is of risk management as we practise it.

This brings me back to the challenging aspect of this book – you need to read it carefully and with close attention to detail to form the necessary understanding and to get the most from it. There is no ‘magic formula’ that you can extract and apply in a few minutes. The answer does not leap off the page, but must be absorbed as concepts are developed along the path described here. You must follow the path, without shortcuts, to gain the enlightenment that Chris offers. Your understanding will almost certainly be different in detail from Chris’s or mine, but the effort you apply will be well worthwhile.

***Michael Pidd*** *is Professor Emeritus of Management Science in the Lancaster University Management School. He is a Past President of the Operational Research Society, a Fellow of the British Academy of Management and a Fellow of the Academy of Social Sciences.*

Systematic simplicity, via enlightened planning, is the main theme of this welcome book from Chris Chapman. Why is it welcome? Stories of large projects that exceed their initial cost estimates or fail altogether are easy to find in the media. It’s easy to criticise, but much harder to show all relevant parties how things could be done better. Introducing significant change in an organisation is never easy. Why is it never easy? Because any major corporate change requires a response that links and integrates operations management, project management and corporate management. Successfully managing such changes is particularly difficult.

Chris addresses this complex challenge using a very broadly grounded ‘enlightened planning’ approach based on many years as a professor and international consultant. The scope of the material covered, the broad intended audience, and the demonstration of important nuances involved in practice are discussed using case studies, which explore qualitative as well as qualitative concerns.

As Chris Chapman puts it, ‘there are no silver bullets, but some approaches are much better than others’. Operational Research and Management Science are sometimes defined as ‘The science of better’. This fits well the book’s advocacy of a ‘systematic simplicity’ approach based on rigorous analysis and practical insights.

# Preface

‘Enlightened planning’ provides an operational basis for an effective and efficient approach to developing a shared understanding of all relevant uncertainty and underlying complexity in order to grasp the key opportunities and avoid inappropriate risk when addressing all aspects of an organisation’s management decision making in a holistic manner. *Much better* management decision making than most current ‘good practice’ is the overall goal, a step change improvement. Even if ‘very good practice’ is the current norm, demonstrating that this is the case is a planned by-product of an enlightened planning approach, and a good reason for organisations formally embracing a variant of the approach explored in this book.

Enlightened planning in an ‘operations management’ context may include bottom-up corporate strategic planning driven by operations management concerns. Enlightened planning in a ‘project management’ context may include bottom-up corporate strategic planning driven by project management and interdependent operations management concerns. Enlightened planning in a ‘corporate management’ context should include top-down corporate strategic planning, its integration with bottom-up corporate strategic planning, corporate governance, and planning for all other corporate tasks which are not seen as part of operations management or project management.

In all contexts using an enlightened planning approach implies some uncertainty usually needs immediate attention in strategic terms, and ongoing attention to strategy and tactics as operations, project and corporate plans evolve will raise new management decision making concerns. Interdependencies between operations, project and corporate planning are often important. The underlying goals of all relevant parties are always central, and the ambiguous nature of some goals plus the need to consider important trade-offs between goals which may be complex can be crucial issues.

The focus of this book is ‘commercial organisations’ broadly defined, but both the scope of the key tools and the origins of many of the underlying concepts are much wider.

A paper by Warren Black (Black, 2017), with the title *Originals: How non-conformists will ultimately disrupt the world of Risk Management,* inspired by Adam Grant’s 2016 New York Times bestselling book *Originals, How Non-conformists Move the World*, argues that my work with Stephen Ward on ‘uncertainty management’ makes us ‘risk originals’ who will disrupt the world of ‘risk management’. Black’s paper places us in the same category as the behavioural economist Daniel Kahneman, a Nobel Prize winner and the bestselling author of *Thinking, Fast and Slow* (Kahneman, 2011). Black’s flattering assessment of my work with Stephen Ward involves a focus on features which we would not emphasise as much as alternative features because our agenda is much wider than mainstream ‘Risk Management’, and any comparison of this kind cannot be taken too far. However, there are features of our ‘enlightened planning’ approach to uncertainty management which have links to Black’s paper worth exploring briefly in this Preface and the following Overview as part of the process of explaining what this book is about and how its approach is different, with a view to tempting you to read it whatever your background, perspective and concerns.

Subjective biases are central to Kahneman’s work, a psychologist by background who is widely viewed as one of the leading founders of behavioural economics. The acronym ‘KISS’ is an illustration of a common bias towards ideas which are ‘simplistic’ in a pejorative sense when it is associated with the common interpretation ‘Keep It Simple, Stupid’. This common interpretation of KISS implies that how to keep it simple is obvious, even if you are stupid, requiring very little systematic and intelligent thought, demonstrably not the case. Overcoming this common bias towards simplistic approaches to all of an organisation’s management decision making is a central goal of this book. A very different reinterpretation of KISS, ‘Keep It Simple Systematically’, is a core mantra of the enlightened planning approach. The key aspirations are facilitating opportunities to simplify in the ‘right way’, while avoiding risks associated with simplifying in the ‘wrong way’, using systematic processes which are well-founded and make good use of intelligence and creativity to deliver effective and efficient management decision making. Associated goals are seeking approximately correct answers to the right questions in the right timeframe, which all those involved can trust, based upon appropriately shared clarity about the rationale. Associated concerns are avoiding precise answers to the wrong questions, answers that take too long, or answers which generate a lack of trust. Seeking simplicity in this enlightened manner, avoiding simplistic approaches which simplify in the wrong way, is a basic characteristic of all the approaches discussed in this book.

Addressing all relevant planning concerns from the perspective of this enlightened planning approach is challenging. One reason is the framing assumptions must be as broad as possible, by design, with clarity about the implications of *all* working assumptions. There are no ‘silver bullets’ – and no ‘golden’ or ‘magic’ variants. However, some conceptual frameworks plus closely coupled operational toolsets are *much better* than others, and the implications of using the best available approaches drawing on a synthesis of ‘best practice’ from all relevant management practice and underlying useful theory can be ‘game changing’, not just a marginal improvement.

Successful enlightened planning depends upon the capability and culture of those involved. At the heart of success is a nuanced and well-founded corporate understanding of ‘what needs to be done’ in all relevant contexts – ‘strategic clarity’. Organisations that have strategic clarity and can deploy dependable teams that have the tactical clarity to know which tools to use and how to use them with an effective understanding of the interdependencies between operations, project and corporate management decisions enjoy an important corporate capability. In a competitive context this capability is a crucial competitive advantage.

The gist of what this book is about is enhancing your personal understanding of ‘what needs to be done’ for organisations to achieve strategic clarity. However, to understand ‘what needs to be done’, some aspects of ‘how to do it’ require an overview understanding. The central core of this book is using illustrations drawn from practice to illustrate what needs to be done *plus* the requisite overview understanding of how to do it in selected example contexts. Strategic clarity plus the requisite tactical clarity in these example contexts will provide you with a basis for facilitating ongoing development of operational forms of strategic and tactical clarity for all of the contexts of interest to you.

A key foundation level tool this book explores is clarity about the most general set of framing assumptions and habitual working assumptions to employ to achieve clarity about the best full set of working assumptions for any given context. You can integrate the understanding this provides with your current understanding and build on it in the long-term. But an immediate pay-off also provided is a closely coupled toolset of conceptual and operational tools which can be used directly and immediately.

‘Systematic simplicity’ is the term adopted by this book to characterise all variants of an ‘enlightened planning’ approach which involve different people and different organisations adopting their own particular versions of ‘enlightened planning’ conceptual and operational tools to best suit their context. The only constraint is a comparable set of shared basic foundation framing assumptions which ensure that effective and efficient communication is feasible. Terminology is an important component of all framing assumption sets, because the way basic concepts and operational tools are perceived depends upon communication.

‘Enlightened planning’ is my current understanding of what ‘systematic simplicity’ ought to involve, described using terminology which provides a basis for communication which is as simple and unambiguous but usefully nuanced as I could make it. The term ‘systematic simplicity’ will be used sparingly in this book, and it can be viewed as a complex composite concept which is not formally defined until the end of Chapter 1. However, a key characteristic of enlightened planning is the form of adaptability highlighted by the basic nature and purpose of the systematic simplicity concept as just explained. That is the rationale for using the term ‘systematic simplicity’ in the subtitle of this book and explaining its basic role in this Preface.

**Target readers** at an overview level share several important common attributes, but the key one is most of them already are, or they would like to become, effective ‘reflective practioners’ who are interested systematic approaches to keeping planning and associated management decision making simple, and even the exceptions would like more clarity about what being an effective reflective practitioner and using systematic approaches to keeping it simple ought to imply. Management decision making which is effective and efficient in a ‘best practice’ sense depends upon effective reflective practioners, and this book is about ‘best practice’ in a sense experienced ‘reflective practioners’ should be comfortable with.

A closely coupled key characteristic of the target audience is a broad range of backgrounds in terms of education and experience – this book makes no specialist knowledge assumptions, and it makes minimal general background knowledge assumptions. This was deemed essential because providing an understanding of planning which as broadly accessible as possible is an essential feature of an enlightened planning approach.

Background knowledge in specialist areas is not required, and general background assumptions are minimal, but what is required is a significant interest in sustained exploration of new perspectives, toolsets and mindsets, plus a tolerance for some very carefully pruned but still extensive ‘how to do it’ material which needs broad understanding in order to appreciate ‘what needs to be done’ with ‘strategic clarity’.

This book assumes that some target readers will have no mathematical or statistical background beyond their secondary education and a limited interest in mathematically based concepts, other target readers will be highly mathematically inclined and have a very strong formal training in mathematics and statistics, but most will occupy the middle ground. All target readers need an overview understanding of some mathematical and statistical concepts in ‘what needs to be done’ terms. This common overview understanding is provided using two frameworks via strategies introduced in Part 1 using an approach all target readers should be comfortable with and find useful.

A central challenge which writing this book had to confront directly was avoiding unhelpful detail while systematically clarifying key ‘how to do it’ concepts in sufficient depth for all target readers. As part of meeting this challenge, for some purposes target readers were characterised in four groups: ‘directors’, ‘experts’, ‘students’ and ‘other target readers’. The purpose of this decomposition was keeping it simple when considering the key implications of different perspectives and concerns. The next few pages provide initial advice for each specific target reader group. The focus is directly relevant advice for that group which should also be of interest to all other target reader groups. You may be in more than one group.

**‘Directors’** means all those in executive and non-executive director roles in private sector ‘commercial organisations’ plus their equivalents in public sector organisations. ‘Commercial organisations’ in this book means ‘providing services or products to customers at a price’. This involves a very broad interpretation of ‘commercial’ if we explicitly assume that a service receiver need not be the party paying for the service. Examples used extensively in this book include international oil and gas energy sector companies, an international computer systems company, a national railway company, a provincial electricity utility, a regional water and sewage utility, and a family owned company manufacturing lawnmowers. But the relevant spectrum is much broader, with debatable boundaries.

If you associate yourself with ‘directors’ of commercial organisations in this broad sense, and your experience base includes a reasonably broad exposure to disciplines addressing the sciences, arts and crafts of planning and management more generally, you will already have your own well-developed variant of the ‘enlightened planning’ frameworks developed in this book. In some respects your version may be significantly more enlightened than mine, as well as being wider and deeper in the areas of relevance to you. However, this book’s approach will probably challenge some reasonably fundamental aspects of your current views in a useful manner. Meeting this challenge should help you to enhance your current ‘toolset’ of concepts and operational techniques for planning.

A key challenge associated with maintaining your interest is persuading you to tolerate ‘how to do it’ detail in areas which may not be of direct interest to you in order to clarify ‘what needs to be done’. By the end of Chapter 1 you should be starting to see where this book is taking you, and why the journey may be useful, but ongoing patience is needed. The rest of Part 1 will provide much more clarity. The Part 2 tales of Chapters 7, 8 and 9 are all set at board level for major organisations, but Chapter 6 is at marketing manager level for regional sales by an international organisation, Chapter 5 begins with what appears to be a very tactical inventory management issue for a small family owned manufacturing organisation, and Part 1 needs reading first. I am very aware of good practical reasons why most board level managers are reluctant to read long books, but I hope you will be persuaded by the rest of this Preface, the following Overview, and the earlier comments by my colleagues, to treat this book as an exception.

To develop the holistic ‘what needs to be done’ framework and the associated ‘strategic clarity’ which is central to my version of enlightened planning, this book uses an approach involving reasonably close attention to selected aspects of relevant detail which is layered, section by section, and chapter by chapter. In some areas the approaches advocated depart from conventional frameworks in basic ways for reasons which need understanding by anyone with your level of corporate decision making and governance responsibilities. However, the reasons are not easily explained in advance, and clarity about the implications requires ‘how to do it’ understanding at an overview level in some key areas.

To begin to encourage you to read further, consider one illustrative example. ‘Risk management’ of many different kinds has been receiving growing attention in most organisations over many decades. However, there are many popular approaches to ‘risk management’ which do not address all relevant risk, fail to integrate the management of risk with opportunities, and do not link either to *all* relevant underlying objectives, uncertainty and complexity in an operationally effective manner. These shortcomings mean they are fundamentally flawed and require radical re-framing. Some key risk management concepts and operational tools promoted by many ‘experts’ need to be scrapped. You need to be aware of the key issues, the nature of associated controversy, and what needs to be done about it, with sufficient clarity to deal with ‘experts’ who disagree. Some of these experts may report to you, and some may serve on the same board or report to other directors. In some cases widely advocated approaches are doing more harm than good. In some cases counterproductive approaches are being promoted by professional organisations which need to be directly challenged in an open and public manner which so far they have escaped, or simply failed to respond to. Chapter 7 addresses why in the context of ‘project risk management’ in terms all board members need to understand. Preceding chapters prepare some of the ground. Chapter 8 generalises to address some very fundamental board level ‘enterprise risk management’ (ERM) issues of general concern which are frequently not part of an ERM perspective. Chapter 9 uses a broadly defined ERM perspective to consider approaches to ‘safety and security management’ which can cope with very low probability but very high impact incidents, as well as a full range of less serious variants, considering an operations management context with crucial board level corporate strategic planning implications. There are further implications for regulators and governments, and related implications in a wide range of different contexts.

To operate effectively at a director level in governance terms you need an overall understanding of ‘how to do it’ for opportunity, risk and uncertainty management issues which risk management ‘experts’ in your organisation applying common practice may have seriously misjudged. If experts have misjudged important ‘risk management’ issues in your organisation, you need to be aware of ‘what needs to be done’ about it, even if ‘getting it done’ is not your responsibility.

There are further organisation-wide ‘how to do it’ issues which you need to understand at an overview level for strategic clarity about ‘what needs to be done’. One example is an answer to the question ‘what discount rate is appropriate for capital investment decisions, and why?’, explained at a level everybody who should be interested in the question can understand and trust. You need to understand why an ‘opportunity cost’ or a ‘risk premium’ component of the discount rate is often a driver of myopic thinking, leading to a focus on high risk ‘quick-buck’ developments, and the neglect of ‘sure-thing’ opportunities, the antithesis of what is needed. You may not even need to know ‘who to ask who knows how to do it’, because that may be the responsibility of another director who will respond to your concerns using his or her access to relevant expertise. However, you need to understand important impacts of inappropriate discount rates in your areas of direct responsibility, as well as the key concepts associated with ‘what needs to be done’ by others, in order to play the effective overall corporate decision making and governance roles your position requires.

Throughout this book the treatment of ‘how to do it’ issues emphasises strategic clarity about ‘what needs to be done’ using conceptual and operational tools which make framing and working assumptions as easy to clarify and test as possible. The development of this toolset was partly driven by a need to use and explain new decision making tools at board level when the common practice alternatives had proven unsatisfactory.

You and your fellow directors are key target readers. Without your support everyone else within your organisation is likely to experience ongoing problems trying to implement key features of an enlightened planning approach, unless your organisation experiences an obvious crisis and those reporting to you are able to ‘lead from the middle’ or replace you. Effective leadership from the top and from the front is always desirable, often crucial.

If you want to apply some of the enlightened planning ideas developed in this book in your organisation, you may need early support from at least one other board level colleague. You may want internal or external short courses to ensure that everyone involved in any necessary corporate change processes understands how to move in the same direction. You may need consultancy support to help make some features operational. A crucial issue before proceeding too far will be ensuring that your organisation has a collaborative team which covers all relevant areas of expertise with the collective skillset and mindset to lead the required change management. This team will have to collectively understand ‘how to get it done in practice’ as well as ‘what needs to be done’ and ‘how to do it in principle’, including understanding how to ‘learn by experience’ as progress is made. Initial clarity needs to be ‘fit for purpose’, not fully enlightened in terms of long term aspirational goals.

**‘Experts’** includes directors who are experts, but the focus of the next page or so is those not yet at board level who are experienced managers with line management responsibilities in areas like marketing, supply chain management, production management, project management, safety and security management, corporate strategic management and risk management, plus experienced supporting staff with expertise in any of these areas. This includes consultants, who may be external or internal. You will have your own well developed views about a variant of my ‘enlightened planning’ approach which may be significantly better than mine in some areas, as well as being broader and deeper in areas of particular interest to you. However, this book can probably challenge some of your core beliefs in a useful manner, to help you enhance your current toolset and mindset for planning, even if the primary focus of your concerns is not addressed in a direct manner in this book.

Within your areas of expertise the nature of your current planning frameworks may be much richer than most of those with director level concerns. But outside your areas of expertise your planning skills may be much less developed than those with director level concerns. Further, both your perspective and your concerns may be *very* different.

One key difference is that you will find the treatment of your area of expertise lacks some of the ‘how to do it’ detail you need to ‘get it done’. You will need further reading and discussions with colleagues to put some of the principles and operational tools developed in this book into practice in your areas of expertise. Chapter 11 will address some of these ‘how to do it’ concerns on an expert area of focus basis, but only at a level of detail which is of possible relevance to experts in other areas and other target readers.

The second key difference is that you will encounter many areas of application which may seem well beyond the scope of your current concerns, exacerbating the lack of detail you would like in your areas of focus, and you will lack the overall corporate governance concerns of ‘directors’ to motivate your interest in these areas. However, you are encouraged to view this potential problem as an opportunity in several important senses. You may be seriously surprised by the usefulness of the widely applicable holistic corporate toolset of ‘clarity efficient’ approaches and operational tools which involve very little effort and cost in a very wide range of appropriate contexts, including your own. You may also be surprised by the impact on your mindset of an enhanced understanding of the importance of all experts having a shared toolset plus your potential role in collaborative approaches working across traditional planning silos with other experts in different areas with different professional perspectives.

Consider one example concern which is relevant to allof an organisation’s ‘experts’, plus all ‘directors’, ‘students’ and ‘other target readers’ – the need for a corporate-wide shared understanding of the nature of uncertainty, including the role of subjective probabilities and underlying complexity. Understanding uncertainty is a much broader concern than understanding risk. For example, the creation and use of all estimates of cost, duration or other performance measures is directly dependent upon understanding uncertainty. Understanding uncertainty is directly relevant to all experts, and it is also directly relevant to everyone else they interact with. All experts who do not have an effective and well-founded practical understanding of uncertainty need to be challenged by everyone else who does understand uncertainty appropriately, and *nobody* can afford to fail to understand ‘what needs to be done’ to provide unbiased estimates with an appropriate level of clarity.

Further, the low to high clarity range of approaches explored in ‘estimation-efficiency spectrum’ terms in Chapter 3 can be generalised to consider a low to high clarity range of both processes and embedded models relevant to any area of expertise, as demonstrated in Part 2. The overall treatment of these concerns in Parts 1, 2 and 3 should provide you with an effective holistic framework for addressing your particular interests and areas of expertise using the systematic approach to simplicity demonstrated by the examples.

A central assumption underlying this book’s approach is that you are prepared to work effectively with other experts plus other key parties in a collaborative manner, whatever your area of focus as an ‘expert’. To do this you and all those you communicate with need compatible overall conceptual frameworks and a number of common very flexible and portable operational tools. Jointly you can use these shared approaches and tools to move your organisation towards a more coherent enlightened planning perspective. Most organisations need experts who strongly promote coordination and collaboration which involves ‘big teams’ at several levels. These ‘big teams’ should not be constrained by traditional professional perspectives, traditional corporate silos, or corporate boundaries. Holistic changes which cannot be limited to your current spheres of interest may be big opportunities for you and your organisation. If you are interested in the nature of the integration and interfaces needing attention, and key aspects of what is sometimes characterised as ‘the big picture’, you will find the challenges are significant, but successfully meeting them is a very rewarding experience.

You too are a key target reader, and you are perhaps the most likely point of entry for enlightened planning approaches in your organisation. Even if the director level managers you report to are highly supportive of an enlightened approach to planning, perhaps because you have initiated and then encouraged the development of your interests jointly, to get things done you will have to ‘lead from the middle’. A management team which is led from the top, the middle and the bottom as and when appropriate, with everyone moving in the same direction, is usually the best way forward.

**‘Students’** as a target reader group includes students on university courses and participants on professional courses, but it also includes all those on an independent learning path of their own design who see themselves as ‘a student of systematic approaches to planning and associated management decision making’. All of these ‘students’ are key target readers. For any ‘student’ it is important to appreciate that this is not a textbook in the usual sense. However, it can serve as a core text, and it can also complement conventional textbooks. This book can help you to construct an ‘enlightened planning’ framework of your own design, to build on for the rest of your career. If your exposure to the sciences, arts and crafts of planning and management more generally is still in a formative stage, a crucial early acquisition is a framework to help you integrate your understanding as you test the validity of conflicting views in the literature and other inconsistent advice against actual outcomes. A coherent framework for acquiring practical experience and testing your accumulating expertise is essential for any effective ‘reflective practitioner’, along with a habit of critical reflection on what has been learned so far via a synthesis of different experiences. You need an ongoing interest in addressing the gaps in your understanding which might be filled, with priorities dependent upon current and longer term responsibilities and interests.

Avoid skimming material in a way which leads to very superficial understanding of issues that matter in terms of your acquisition of strategic clarity, and do not try dipping into topics out of sequence. Conventional textbooks are often designed to facilitate this approach, but the likelihood of misunderstanding this book is very high if this approach is taken, even by experts or directors. The reason is the layered approach to accumulating understanding because of the interdependencies involved, a key characteristic of this book which you and all other readers need to appreciate to use it effectively.

Assume you will need to read more and work with experts before this book’s framework becomes a fully functioning toolset. In an ideal world you would gain experience working with enlightened experts in an organisation led by enlightened directors, but this is not an ideal world. You will have to learn to accommodate the implications as best you can.

You are the ‘experts’ and ‘directors’ of the future, if you are not already one or both, and experts and directors are encouraged to see themselves as ‘lifelong students’ if this is not already the case. ‘Reflective managers’ who are successful directors and experts are usually lifelong students.

**‘Other target readers’** includes all those who are not comfortable within at least one of the ‘director’, ‘expert’ and ‘student’ characterisations just considered, plus anyone else who may be interested in how planning might be ‘enlightened’ or ‘unenlightened’. For example, you might be particularly interested in some of the implications for regulation and associated government policy developed in later chapters, or ‘third sector’ organisations like charitable trusts, or you might be interested in planning as an aspect of management from an academic perspective which is much less practice-driven and more focussed on specific aspects of theory than mine.

You will need to interpret as you see fit when a limited number of suggestions for particular categories of reader are made. No doubt you would have done so without me suggesting this, but I did not want you to feel neglected by a simplistic three group characterisation of target readers.

# Overview

In this book ‘telling tales’ means using examples which are case-based stories which have been retold in a way which makes understanding key messages easier and more memorable.

Tales facilitate understanding by providing practical illustrations of a wide range of broadly applicable complex concepts, like ‘risk efficiency’. Broadly applicable concepts like ‘risk efficiency’, and specific tools like the ‘decision diagrams’ used to achieve ‘risk efficiency’, are ‘portable’ in the sense that they can be used in many very different contexts. However, context always shapes the way conceptual and operational tools are used, and the nuances of their interpretation. A practical approach to planning has to accommodate ‘context’ issues. This book uses ‘tales’ to deal with a number of context dependency issues.

Part 1 uses a series of short tales. Part 2 use one longer tale per chapter. The rationale is context always needs to be understood when making decisions, and once we get beyond the introductory overviews in Part 1, tales which are chapter-sized stories are the most effective way to convey context related concerns.

Each tale is based on personal practical experience, shaped into a tale to develop key conceptual and operational planning tools in an accessible order. Discussing the credibility of the tales in Part 2 is an integral feature of the approach adopted.

Drawing upon practical experience is crucial in this book, but gives rise to potential problems of several kinds. This book’s strategy for avoiding or mitigating these problems has several strands.

In Part 1 some of the relatively short tales directly linked to real organisations are just slightly fictionalised to keep the examples simple and bring the intended messages up-to-date.

Each of the chapter-length tales in Part 2 is a story which mixes experience from more than one organisation. Four of the five tales were directly shaped by consulting relationships with one or more named organisations, but none of these tales is just a simple ‘disguised variant’ of work within named organisations at some point in the past. These Part 2 tales do not describe any real organisation in a direct way, and they are not dated by the time-period of the tale. They employ a synthesis of organisational features and broader contextual issues appropriate to communicating messages relevant to a post-2020 world which is changing at an accelerating rate.

None of the organisations mentioned have any reason not already in the public domain to be embarrassed by association with the tales, and in most cases they can be very proud of their contribution to what has become widely acknowledged as best practice. For the most part the work with clients this book draws on was a very positive experience, and when approaches I recommended were not accepted, or some aspects of their implementation did not work as effectively as intended, I am happy to take my share of any blame and concentrate on positive lessons learned. I have avoided being coy if there are useful lessons to convey, but used problems positively without dwelling on them.

A chapter by chapter overview ‘road map’ follows – provided as a preliminary to beginning Part 1 which I hope all target readers will find useful.

**Chapter 1** explores why formal planning is usually vital but often difficult and frequently inept. As part of this exploration the meaning of key words like ‘opportunity’, ‘risk’ and ‘uncertainty’ are treated as examples of framing assumptions. This approach means that the definitions used must be as general (unrestrictive) as possible, supported by working assumptions which simplify in the ‘right way’, to clarify what best practice ought to involve in any given context. Chapter 1 also provides an overview of the other basic framing assumptions and some related working assumptions the rest of the book builds on.

**Chapter 2** introduces a ‘*universal* planning and complexity management *process*’ concept, contracted to ‘universal process’ or ‘UP’. This concept is the basis for all process concerns addressed throughout this book. It is grounded on traditional and ‘soft’ OR (Operational Research or Operations Research) and broader Management Sciences ideas with the explicit use of other additional ideas I have found useful plus a provision for any further process ideas its users may be aware of. This comprehensive and explicitly open nature provides a systematic basis for thinking about all process choices. Its discussion assumes readers may have never previously encountered OR, Management Science or the basis of other key contributing components, providing an overview of all any reader needs to know about the historical basis of a conceptual and operational tool which draws on some very different perspectives and disciplines.

The direct use of this UP concept in practice as a default process is explored in Chapter 5. It is used to design and develop a ‘specific process’ (SP) in Chapter 6. It is used to adapt what is commonly referred to as a ‘generic process’ in Chapter 7. It also has an identifiable role in Chapters 8 and 9. It provides a toolset for ‘keeping it simple systematically’ in terms of processes.

A core feature of the UP is a ‘capability-culture’ concept. The capability-culture concept explicitly links the capability and culture assets an organisation has and wants to use during the development and implementation of plans to the nature of its formal and informal planning processes. It also addresses associated liabilities – missing or defective assets. Example assets are requisite skills and information. Example liabilities are untrained or badly motivated staff and incorrect information.

Chapter 2 begins with an overview of the seven phase structure of the advocated form of the UP concept and the role of the associated ‘capability-culture’ concept. The origins and evolution of this UP concept are then explored, so that you understand its provenance and the scope for modifying its basis while adjusting its nature to meet your personal concerns and the needs of your organisation.

**Chapter 3** is a central aspect of Part 1. It is practice based, but it has been built upon a synthesis of theoretical advances by acknowledged leaders in relevant areas, a characteristic of this book as a whole. It is worth exploring in much more detail than any other chapter in this Overview because the three efficiency concepts it develops are central to the enlightened planning approach as a whole, and the way enlightened planning departs from a lot of common practice.

Chapter 3 addresses achieving unbiased estimates of basic attributes like project duration or cost, using examples which allow exploration of ‘low clarity’ to ‘high clarity’ approaches while exploring the ‘estimation-efficiency spectrum’. Making use of work by Kahneman and others on unconscious behavioural estimation biases is part of ‘what has to be done’ to overcome all relevant bias effectively and efficiently, as part of the broader ‘clarity efficiency’ concept central to this chapter. ‘Clarity’ in a ‘clarity efficiency’ context implies understanding that can be communicated to all relevant people. ‘Clarity efficiency’ is about achieving any given level of clarity at the lowest feasible level of cost/effort by systematically using the ‘right kind’ of simplicity, avoiding the ‘wrong kind’ of simplicity.

Chapter 3 begins with a ‘minimum clarity’ approach designed to size expected outcomes and the uncertainty range of actual outcomes at the lowest acceptable level of clarity for a minimum level of cost/effort. The 1990s context used to provide a simple numerical and graphical example involves a UK Ministry of Defence (MoD) warship programme manager asking his team to estimate the duration of a single activity. The ‘tale’ then explores small but significant increases in clarity for very modest levels of additional effort. The focus is illustrating key issues at the low clarity end of a low to high clarity spectrum. One set of issues involves understanding why the common practice of using single value estimates is usually inappropriate and should be scrapped for most purposes, and why range-based interval estimates are usually essential. Another involves the need to distinguish and clarify aspirational targets, commitment targets, and intermediate balanced targets that may be expected outcomes (the basic ABCs of targets). A third involves the role of inescapable basic assumptions which all estimates depend upon and *everyone* involved in both *producing* and *using* estimates should understand.

The discussion then moves on to the high clarity end of the range of approaches of interest. ‘Risk efficiency’ is explored in the context of a tale about the approach to contingency planning which I developed for BP International for their North Sea offshore oil and gas projects over an eight year period beginning in 1976. This approach was used by BP on a worldwide basis for about a decade before they moved on to simpler approaches. These simpler approaches failed them in 2010 in the Gulf of Mexico, with fairly disastrous consequences. ‘Risk efficiency’ means a minimum level of risk for any given level of expected reward. Risk efficiency is a concept Harry Markowitz won a Nobel Prize for in 1990, embraced internationally by economists in a portfolio theory context by the 1960s, but still not understood or used effectively by many practitioners and theorists in many risk management contexts. An effective aggressive pursuit of risk efficiency using the conceptual and operational tools which I developed working with BP provided increased expected reward via lower expected cost *plus* less risk (an increase in risk efficiency), while *simultaneously* providing duration and cost estimates which were unbiased. This meant that projects could be delivered with *both* lower expected costs *and* less risk, usually within budgets and on time, despite some significant surprizes. By the early 1980s ‘what needed to be done’ and ‘how to do it’ was understood at board level as well as by everyone engaged in project management roles. And early confidence in this approach was verified by a decade of experience and empirical evidence. The BP operational processes and other tools were designed to cope with what we labelled ‘unknown unknowns’, as well as ‘known unknowns’ which had been identified but treated qualitatively as ‘conditions’, and ‘known knowns’ which had been quantified in probabilistic terms.

By the early 1990s a senior MoD colleague responsible for key aspects of MoD procurement processes was arguing that every £1 spent on this kind of approach by the MoD should save about £100, a massive return on investment in a risk efficiency driven approach which produced unbiased estimates as a by-product of much more effective and efficient planning.

This kind of risk efficiency driven approach is usefully perceived as an opportunity which should be seized by all organisations not currently using it, failure to do so because its benefits and nature are not understood constituting the realisation of a serious corporate capability risk. My senior MoD colleague had mixed success getting the MoD as a whole to use it for reasons relevant to central concerns addressed by this book. Many MoD experts bought into my BP based risk efficiency driven approach, which was the basis of MoD internal courses run for several years and widely acknowledged MoD best practice over several decades. However, from the outset, some MoD ‘experts’ maintained a preference for simplistic less effective approaches, still a crucial issue in need of resolution within and beyond the defence context worldwide. Some of the reasons for this, and appropriate responses, are addressed directly in all Part 2 chapters.

Chapter 3 then employs the risk efficiency framework developed for BP and the BP examples in a manner used for IBM UK in the 1990s to promote taking *more* risk in a risk efficient manner at a local decision making level in a context like bidding for a £20 million contract. The goal in this context was increasing overall profitability while decreasing overall corporate risk, understanding the difference between good management and good luck, bad management and bad luck. This discussion explores what IBM and subsequent clients liked to call ‘enlightened caution’ as well as ‘enlightened gambles’. This use of the term ‘enlightened’ was the origin of the ‘enlightened planning’ label and other related uses of ‘enlightened’ in this book. Identifying ‘enlightened caution’ involves using a high clarity ‘decision diagram’ tool initially developed for BP to identify risk efficient choices. It uses what is usually referred to as a ‘stochastic dominance’ generalisation of a Markowitz approach. ‘Enlightened caution’ is an issue when one option is a potentially deceptive risk inefficient ‘unenlightened gamble’ – it involves a higher most likely reward but a lower expected reward as well as a higher level of risk because a highly asymmetric distribution with one very long tail is involved. ‘Enlightened caution’ facilitates avoiding ‘unenlightened gambles’ which involve more risk and less expected reward when it is easy to make errors of judgement if unenlightened intuition is relied upon. Without high clarity decision diagrams ‘unenlightened gambles’ may seem to be the obvious preferred choices, but high clarity decision diagrams make it clear that being capable of identifying the opportunity to avoid unenlightened gambles is crucial. ‘Enlightened gambles’ involve risk efficient gambles worth taking for the additional reward. Once these issues are understood, a linked corporate culture change can then be engineered. Once people get used to working with the new toolset, simpler diagrams or simple verbal comments with no diagrams are often all that is needed for most management decision making practice.

These ideas and their behavioural implications are explained in Chapter 3 using graphs in a way most people find clear and convincing whatever their background and interests, as part of explaining at an overview level the concept of ‘opportunity efficiency’.

‘Opportunity efficiency’ is a composite concept which is explored in ‘what needs to be done’ overview terms towards the end of Chapter 3. Opportunity efficiency involves selecting the most appropriate level of risk-reward trade-off for all relevant attributes. This requires the exercise of ‘enlightened prudence’ when relevant, reducing expected reward to avoid inappropriate risk. Opportunity efficiency also involves making appropriate trade-offs between all relevant attributes, plus choosing suitable trade-offs between clarity and the cost of clarity. Opportunity efficiency is an operational definition of ‘best practice’.

My work with IBM UK was central to a culture change programme for all senior and middle managers based on IBM’s two day Forum 2 programme, run about 40 times in the early 1990s. The IBM CEO opened the morning of the first day by outlining the strategic changes IBM had to make and explaining why the concepts to be covered by my contribution were central to those changes. I then outlined the key concepts they needed to understand until lunch time. After lunch I used a case study exercise designed with an IBM senior executive to put the general conceptual ideas into an IBM context they could associate with directly, and give them feedback on the nature of some of the changes they had to make in operational terms with cultural implications. The second day they discussed how they would implement related changes in their areas of operation. This programme was a significant success, leading to IBM corporate process and culture changes. Several follow-on consulting assignments were triggered. In addition to its role in Chapter 3, this work for IBM is central to Chapter 6.

The low to high clarity ‘estimation-efficiency spectrum’ explored by Chapter 3 provides a conceptual and operational framework which is central to an enlightened planning approach. Chapter 3 synthesises and clarifies a core portion of all my earlier work plus more recent work with a wide range of colleagues, Stephen Ward’s contributions over the last 20 years being of particular importance. It builds upon earlier work by others like Kahneman, Markowitz and those behind ‘stochastic dominance’. It treats unbiased estimates and the pursuit of opportunity efficiency defined by component risk efficiency and clarity efficiency as non-separable concepts at a framing assumption level.

Chapter 3 builds on the understanding of a very general approach set out in Chapters 1 and 2, but it uses important explicit simplifying assumptions to avoid difficult complexities, and it skips over several challenging complexities which need addressing at a foundation level.

**Chapter 4** addresses the challenging complexities which need confronting within the holistic framework this book’s approach has provided thus far. Its starting point is directly useful operational tools skipped over in Chapter 3, like a high clarity form of ‘sensitivity diagram’. Sensitivity diagrams were initially developed for BP to understand the relative importance of different sources of uncertainty in a complex model from the outset of analysis, helping analysts to build their understanding bottom-up. Selective use at board level in a top-down mode for somewhat different purposes is amongst the ideas explored. The basic ideas are relevant in a wide range of contexts. Effective use of sensitivity analysis is a core ‘best practice’ analysis capability for most of the people involved in almost any context – including planners and supporting analysts, their managers at all levels, and the organisation’s suppliers or customers, as illustrated in Part 2 chapters. A midpoint Chapter 4 topic is low clarity ‘decision diagrams’, used as simple operational tools to address risk efficiency in terms of a basic primary attribute like cost when trade-offs involving non-measurable attributes or attributes not worth measuring need consideration and may be crucial. Again the core capabilities demonstrated are widely applicable. Towards the end of this chapter the focus shifts to high clarity operational tools and conceptual frameworks for addressing multiple attributes which may involve complex ethical choices. Chapter 4 closes by exploring the limitations of formal analysis.

**Part 1** as a whole explores a wide range of foundation level framing assumptions and associated working assumptions as part of beginning to explain why some of the difficulty encountered in practical decision making contexts has been generated by both academic and practitioner ‘experts’ who are unable to distinguish between the ‘right kind’ of simplicity and the ‘wrong kind’ of simplicity. This is a difficulty which needs to be addressed by *everybody* affected – *it cannot just be ‘left to the experts’.*

**Part 2** illustrates the use of the conceptual and operational toolset outlined in Part 1, including key operational links between corporate planning, operations planning and project planning. These links include the roles of operations and project planning in the generation of bottom-up corporate strategic planning considerations which are driven by new operational requirements and their strategic relevance for the organisation as a whole. ‘Project planning’ is viewed as the management of change in a very general sense whenever this is useful. So far as I am aware these interdependences have never been addressed in terms of a holistic and collaborative framework for a wide range of target readers in the way this book does. This book explicitly acknowledges that planning in different areas can be usefully assumed to be ‘separable’ for some purposes, but interdependencies that always matter need constant direct attention, and interdependencies that may matter need routine testing for relevance and responding to when necessary. What is meant by ‘separable’ here and in many other contexts has important practical operational implications, explored throughout the book.

**Chapter 5** uses a very simple supply-side operations management context to illustrate use of the universal process (UP) developed in outline in Chapter 2. In the context of Chapter 5 the UP concept is used in a default process mode – in any context if it is not clear what process should be used, a UP is the default choice. Chapter 5 assumes readers may have no supply-side operations management knowledge and no previous OR, Management Science or cognate discipline knowledge, along with perhaps a limited interest in acquiring new knowledge of any of these areas. This UP concept is a new synthesis of what I have always understood as a practical view of the classical textbook ‘OR process or method’ and the more recent ‘soft OR’ ideas, plus further key ideas involving a ‘capability-culture’ concept suggested by authors in bestselling recent books whose perspectives are very different – Gawande (2011) and Kennedy (2014) in particular. It also integrates this basis with process phase ideas in my ‘uncertainty management’ work with Stephen Ward in a project planning context. Chapter 5 sets the scene for Part 2 in an initially very simple practical context, keeping the details of the examples as simple as possible, but explaining inherently complex issues like the role of key assumptions, the crucial role of collaboration between organisations for mutual benefit, and the difference between simple models used to understand key trade-offs and plans which go well beyond simple model capabilities.

This focus of Chapter 5 is using a UP concept in bottom-up mode with ‘the top’ at a very low level initially, but successively moving the starting position upwards, and gradually becoming more strategic. It demonstrates the importance of teamwork which is not constrained by organisational silos or professional perspectives, and the way an effective universal process can generate ‘propositions’ of strategic importance to the organisation, potentially leading to transformational changes when integrated with top-down corporate strategic planning.

As with all other chapters, the focus is ‘what needs to be done’, not ‘how to do it’. The simplicity of the context helps to keep the requisite ‘how to do it’ discussion simple. If you are a ‘director’, or an ‘expert’ with extensive experience, your initial impression may be the issues and tools addressed by this tale are seriously lacking in sophistication and strategic implications. However, there are some important nuances you are likely to find useful in the context of the overall approach, and these nuances are further developed when addressing the inherently complex concerns confronted by the rest of the book.

**Chapter 6** explores how a sales manager for the regional office of an international organisation might develop a bidding process, building on ideas developed during the IBM UK culture change programme discussed in Chapter 3. It demonstrates how a capable sales manager who understood some of the concepts developed in earlier chapters, plus a team with complementary skills, might address bidding and broader organisational issues when the context focus is demand-side driven. One of the key roles of this chapter is illustrating the use of the ‘*universal* process’ (UP) concept to design a ‘*specific* process’ (SP) for bidding. This approach generalises the use of generic models usually employed by OR processes as illustrated in Chapter 5, moving part of the way towards working with ‘generic processes’ as addressed in Chapter 7.

Subtle concerns of importance to an underlying corporate culture change management programme and a broad capability transformation programme are addressed along the way. They include identifying when some people are biasing cost estimates to accommodate strategic concerns not previously considered explicitly, which actually need simple but explicit qualitative consideration as well as numerical adjustments to estimates used for decision making in some cases. They also include using marginal costs rather than standard internal transfer prices when the difference matters, and maintaining a level playing field for internal staff groups that are competing with external organisations which are crucial strategic partners. Further, they include effective quantitative analysis of likely bid pricing behaviour by competitors coupled to non-quantifiable ‘value added’ features which potential customers might be provided with in order to win bids.

This discussion emphasises the importance of non-price concerns for both customers and vendors, and the role of trust when vendors look after their customers’ interests effectively without overlooking their own best interests. It also emphasises when taking more risk at the level addressed is essential to reduce the risk of corporate failure, and the operational implications of this kind of mindset and skillset change. No marketing or other demand-side management knowledge as assumed.

By the end of this chapter you should see why some of the key ideas explored will need further reflection in terms of the overall EP approach even if the technical bidding process issues are not a direct interest. The chapter ends with a section indicating some areas for further reflection as the book progresses to get you started.

**Chapter 7** addresses project planning in the context of a water and sewage utility. It considers planning projects like the construction of new water supply pipelines and sewage treatment plants. It provides a ‘what needs to be done’ level of understanding of the ‘how to do it’ ideas in the book *How to Manage Project Opportunity and Risk* (Chapman and Ward, 2011). I believe all members of any board ought to understand these ideas at a ‘what needs to be done’ level for a wide range of reasons. One is being capable of exercising their overall board level governance role when judging the competence of project directors and *all* project managers reporting to themselves and to other directors. I believe everybody else in all organisations who might be tempted to read this book will also find it valuable to acquire the basic ‘what needs to be done’ level of strategic clarity about change management provided by Chapter 7, some also requiring significant further ‘how to do it’ tactical clarity. Chapter 7 continues to build on all earlier chapters, following the layered approach of the book as a whole. It does not assume any prior project management knowledge.

**Chapter 8** provides a ‘what needs to be done’ level of understanding of corporate planning driven by top-down corporate strategic planning integrated with all other planning. It uses an electricity utility context, initially considering the corporate strategic planning concerns that I was asked to address as an expert witness for a Province of Ontario government enquiry into Ontario Hydro’s strategic plans at the beginning of the 1990s. Ontario Hydro wanted to build 10 new nuclear power stations over a 25 year period. I was hired by an ‘official intervenor’ to object on their behalf, funded by Ontario Hydro under Ontario government rules. My published report explored in outline what Ontario Hydro should have done in the process of explaining why their corporate strategic planning approach was inappropriate and their conclusions were unsound. Ontario Hydro withdrew their plans a week or so before I was due to present oral evidence, for reasons anticipated and addressed by my report.

Initially a radical corporate strategic change including culture changes is not discussed. The focus is given current knowledge about feasible futures in technical terms at a long-term planning horizon twenty years hence, and current understanding of the significant uncertainty about future costs and prices, what should the utility be aiming for in terms of a portfolio of power station types, and what commitments should be made for new projects which need to be started as soon as possible.

After a framework for this kind of corporate strategic planning has been developed, more radical change is explored. Corporate goals and feasible futures are reassessed in terms of corporate capability-culture issues as well as potential new technology physical facility issues. What has been termed ‘designing desirable futures’ is taken as the basis for a much broader perspective – where organisations ought to start in practice if they want to address what really matters in an iterative manner driven by goals which may not be feasible, dealing effectively with priority and precedence relationships.

This chapter also addresses capability-culture concerns which have since driven Ontario Hydro towards the kind of privatisation visited upon the UK Central Electricity Generating Board (CEGB) in the 1980s. By the end of this chapter it should be clear why all organisations need a suitable variant of the kind of corporate planning discussed in this chapter, fully integrated with the kinds of planning discussed earlier, adapted to the context the organisation has to deal with.

No background knowledge of corporate strategic planning or ERM (Enterprise Risk Management) is assumed.

**Chapter 9** extends the corporate planning framework and integrated operations and project planning frameworks provided earlier to very high impact but very low probability incidents plus a full range of less serious incident variants. It builds on a review of Railtrack’s approach to a strategic planning framework for UK railway safety management which I undertook for their head of safety in the 1990s. It also builds on a new framework derived from a review for the UK MoD over a three year period from 2010 until 2013. My understanding is this MoD work has subsequently received attention at a Nato level. The MoD consultancy addressed justifying high levels of expenditure on a portfolio of preventative and responsive contingency plans for protecting troops from non-conventional weapon attacks.

Railtrack did not take my advice, but they went bankrupt a couple of years later. My 1990s work for them would have been significantly enhanced by my 2010-13 MoD framework’s approach as generalised in this book, perhaps leading to Railtrack accepting an enhanced version of my 1990s recommendations. The reasons for Railtrack’s corporate failure were multiple and debatable, but two very serious accidents within a short time period were certainly crucial. Anticipation of this kind of possible scenario, or an even more serious scenario, coupled to effective planning to prevent or deal with such circumstances, was central to my recommendations.

The tale of this chapter integrates railway accident and malicious incident concerns, addressing potential terrorist attacks as well as accidents for a European railway system. It explains important practical reasons for this integrated approach, *including crucial simplifications* of the ‘right kind’. The key new issues relative to earlier chapter discussions are driven by the role of trade-offs between money and attributes like ‘lives’ (people killed who might not have been killed if more money had been spent or spent more effectively). It also addresses associated ‘injuries’ (over a range of levels of seriousness).

Keeping it simple but dealing with very serious levels of complexity that really matters in a formal planning framework is the central concern of this chapter.

A key aspect of the strategy is a focus on a small set of scenarios which deal with correlated metrics for attributes associated with different objectives, like levels of fatalities, levels of injuries, levels of operational disruption to the railway system, and all associated cost and lost revenue concerns, including reputational risk implications. If all the interested parties can agree what level of expenditure is appropriate to reduce the severity or probability of each scenario in this limited set of scenarios, with an initial focus on a ‘worst case’ outcome, the different parties do not need to agree in detail about their relative priorities for each component metric. This is a crucial simplification in a very complex situation, and it provides a significant opportunity which common practice overlooks.

Further, there is no need to assume that common practice metrics like ‘the value of an avoided fatality’ have to be constant for any number of fatalities, or that such metrics need to be based on cost-benefit analysis concepts which are debatable at best, at their worst lacking a moral compass and failing any ethically-driven political acceptability test. These are crucial complications which really matter, and addressing them effectively is facilitated by the linked simplifications.

Concluding discussions in this chapter explore other even more difficult trade-offs in the sense of further analytical complexities and complications, generalising the railway context approach to deal with further relevant metrics like environmental damage. One example briefly considered is the 2010 Gulf of Mexico Macondo (Deepwater Horizon) incident which has cost BP about $60 billion to date, largely driven by environmental damage consequences, although everybody on the rig involved died as well. No background knowledge of safety or security analysis and management is assumed.

**Part 2** as a whole might be summed up as follows. Chapter 7 is about delivering change which meets or surpasses the expectations of all the key stakeholders in that change whenever possible. Chapter 8 is about deciding what to change, and the resources needed, including addressing capability-culture asset and liability concerns. Chapters 5 and 6 deal with ongoing operations management issues which interface with the concerns addressed in later chapters, but they are considered first because they provide basic tools needed to understand the approaches developed in later chapters. Chapters 5 to 8 are all relevant to all organisations. Chapter 9 deals with special case issues which are crucially important whenever they are relevant, and if we generalise very serious accidents or terrorist attacks to include moderately serious environmental, cybersecurity, fraud or loss of corporate reputation issues of any other kind deserving moderately serious attention, most organisations need to think very carefully about addressing potential concerns of this kind.

**Part 3** provides further synthesis and reflection in two relatively short chapters.

**Chapter 10** provides further synthesis and reflection at an overview level to clarify ‘what needs to be done’ concerns in terms of addressing immediate and later priorities. Chapter 10 makes it clear that some of the ideas developed in Chapters 8 and 9 need attention as a first priority in practice, moving on to less urgent concerns *after* dealing with starting point concerns like overall corporate goals. By the end of this chapter you should have a consolidated understanding of the ‘strategic clarity’ all organisations need.

Chapter 10 also reflects in more detail upon public/private ownership issues which surface earlier. Some *private* sector organisations need effective planning which addresses regulatory issues and pressures. This may include the need to address the way their competitive advantage depends upon regulator or government interventions which they may be able to influence. As a special case, ‘nationalisation risk’ may be relevant. Some *public* sector organisations need to understand the pressures driving them towards privatisation, and respond effectively to ‘privatisation risk’ considering all relevant interests.

There is an upside and a downside to both private and public sector status, from a variety of perspectives. How both are implemented determines the best choices for all of the interested parties, whose interests may not coincide, context being crucial in a number of ways. You should understand some of the basic issues in a new framework by the end of this chapter, along with other ideas relevant to all organisations in both sectors. This framework might be used by readers with different agendas in very different ways.

You may have heard the mantra ‘what cannot be measured cannot be managed’, often cited by those in both private and public sector organisations. After reading Chapter 10 it should be clear why those advocating this mantra do not understand what decision making in most practical planning contexts ought to involve, or they are being deliberately misleading to serve their own agendas, or both.

By the time you have finished Chapter 10 you should also understand some of the advantages and limitations of:

1. metrics for relevant objectives,
2. quantification in appropriate probabilistic terms,
3. the role of qualitative models which structure and support formal planning,
4. the crucial way informal planning has to support all formal planning approaches,
5. the way corporate capability-culture concerns have to serve as part of the foundation for the whole edifice,
6. key limitations of approaches to decision making which do not address these concerns in an enlightened manner.

**Chapter 11** begins with a focus on teamwork and wider collaboration, unbiased decision making and contingency planning aspects of ongoing enhancement of strategic clarity and tactical clarity. Broad planning areas, approaches, perspectives, concerns and issues requiring ongoing strategic and tactical clarity enhancement are then addressed, finishing with a brief discussion of a diagram which has evolved over many years which portrays the corporate benefits of an enlightened planning approach in terms of more ‘smiles’ linked to more ‘pleasure’ and less ‘pain’. Reward, usually centred on profit metrics, is a primary concern, but ‘capability-culture’ concerns which are crucial need focussed attention, and this diagram is a useful final summary of what is involved in delivering the goals of enlightened planning.

**Parts 1 to 3** as a whole are about why some aspects of planning usually need to be sophisticated, subtle and creative, and why simplistic, inflexible approaches do not work as a general rule, but appropriate simplifications are essential and can be very powerful. Generally we all need *approximately correct answers to the right questions within the right timeframe which everyone involved can trust*. We do not want *precise answers to the wrong questions, or answers which are too late, or answers which cannot be received with well-founded trust*. The difference matters greatly, and understanding what the difference involves is what this book is about.

Regulation, politics and ethics sometimes have to be addressed, with examples in four of the five Part 2 tales. Using a broad interpretation of what regulation might involve can be very important, including ensuring that all valuable players in a market place enjoy ‘a level playing field’. The complexities involved in planning undertaken by regulators and their political masters are not addressed in detail, but some key concerns are clarified, and some of the concepts and tools developed are directly relevant to regulatory concerns. One UK regulator already moving in the suggested direction is discussed briefly in Chapter 11, and there is increasing evidence of significant international movement of this kind involving a very wide range of regulation which needs to be encouraged and facilitated. But it would be naïve to think that some very serious concerns needing attention are going to be straightforward to resolve.

Politics in the most general sense can only rarely be ignored, and ethics are almost always relevant. Although political decision making is well beyond the scope of this book, as are appropriate ethics, both are relevant to *any* enlightened planning perspective. I specifically avoid political dogma and moral imperatives. For example, when ‘good’ and ‘bad’ are discussed in ethical, political, economic or any other sense, the boundaries are always assumed to be debatable. However, this does not mean the issues involved do not matter. It means we need to be particularly careful about our assumptions and deal with important uncertainty associated with ambiguity. It also means we need to cope in a practical manner with interdependencies between political, legal, regulatory and ethical issues which may be inherently extremely complex and controversial.

The need to clarify a generalisation of the ‘uncertainty management’ ideas underlying the book *How to Manage Project Opportunity and Risk : Why Uncertainty Management Can Be a Much Better Approach than Risk Management,* (Chapman and Ward, 2011) has been the focus of my efforts on successive drafts of this book for several years. The need to do so in a carefully considered manner which would be accessible to a very broadly defined target audience has become increasingly clear each year for several decades. During this period Stephen Ward and I have been aware that our evolving ‘uncertainty management’ approach was critically acclaimed as helping to define the leading edge of international ‘best practice’ by a significant number of people. But we were also aware that many people preferred to support ‘common practice’ that they perhaps saw as ‘good practice’ which was simpler without understanding the implications of the nature of the simplicity employed. And we were concerned that many others had never come across the basic ideas we believe to be crucial. What is meant by ‘bad’ practice, ‘best’ practice and a range of intermediate ‘good’ practices remains ambiguous and controversial – issues this book confronts directly, to allow you to judge for yourself, and shape your own future version of ‘best practice’.

Much of the ‘bad’, ‘good’ and ‘best’ practice controversy is deeply rooted in the difficulties that we all have when adjusting the framing assumptions and habitual working assumptions which define our view of a ‘best practice’ approach to management decision making plus underlying planning and analysis in any context. Testing and adjusting assumptions that we have trusted for some time but may need to change is never easy. But it is a core competency for reflective managers, and it is a central concern and explicit focus throughout this book. The emphasis on this explicit focus is new relative to Chapman and Ward (2011) and my earlier publications. Chapter 1 makes a point of explaining some example shifts in my own framing assumptions, and comparable working assumptions, during the writing of later drafts of this book, in part to encourage you to think about shifting some of your routine assumptions throughout. A key message for you to take away from this book is the importance of the issues you can uncover by an explicit focus on the set of framing assumptions and comparable working assumptions which define your perspective. They really matter.

My goals when writing this book included providing you with an operational ‘best practice’ toolset for all management decision making which you can put to immediately use, plus an underlying set of conceptual frameworks you can use immediately and then build on. I hope you will find this book of immediate value, and useful as a stimulus for generalising your toolset, skillset and mindset along some of the lines explored.

# About the author

The approach to planning advocated by this book was synthesised from a career based on pursuing a practice-research-teaching-practice cycle for about 50 years. Improving practice was always a central goal in this iterative process. Understanding the way my pursuit of this goal evolved in relation to the content of this book with a kind of detail most authors do not provide may help you to better understand what this book is about and why it takes the form employed – the rationale for the approach taken to the next few pages. It should also help to underpin the candid conversational style used throughout this book, a style which seemed essential given the nature of some of the intended messages.

I was born and brought up in Toronto. A University of Toronto BASc in Industrial Engineering (1962) and a University of Birmingham MSc in Operational Research (1964) provided my initial academic grounding. An Athlone Fellowship funded by the UK Board of Trade gave me the opportunity to spend 1962-4 in the UK.

1964-5 was spent as an IBM computer sales trainee in Toronto. This built on computer systems experience working for IBM in Toronto for three summers during my undergraduate degree plus a year working in a project planning systems development role with Ferranti in London as the first part of the Athlone Fellowship. Working for IBM Canada initially, and then seeing where that led, was the ‘career plan A’ adopted while still an undergraduate.

In 1965 an offer of a lectureship (assistant professorship) in econometrics from Gordon Fisher was accepted – the opportunity was unanticipated but too good to miss. Gordon had taught one of my University of Birmingham MSc programme econometrics options, and the following year he founded the Econometrics Department at the University of Southampton as its first Professor of Econometrics. For nine years my career focus was managing a new MSc programme in Economics, Econometrics and Operational Research (OR), designing and teaching the OR content, and completing a PhD in consumer behaviour theory as a staff candidate supervised by the economist Professor Ivor Pearce. The PhD shaped my view of ‘separability’ and several closely coupled concepts which underlie the foundations of this book as a whole, building on Pearce (1964). It also provided a deep understanding of the foundations of risk management central to this book, building on Markowitz (1959). During this period, I developed a passion for research into the issues exposed by practice, initially centred on the development of consumer behaviour theory to support marketing decision making for the UK Milk Marketing Board. I also started to acquire a passion for consulting. One key client relevant to this book was Buckinghamshire County Council. On Gordon Fisher’s recommendation they hired me as an expert witness to help stop a ‘Third London Airport’ being built at Cublington. The economists David Pearce and John Wise were recruited to help, working as a fully integrated partnership. The Cublington recommendation was scrapped. We obviously cannot take full credit, but I believe we were on the right side of a complex cost-benefit analysis based argument, and some of the issues and approaches are directly related to those addressed in Chapter 9. During this period I became a senior lecturer (associate professor) and served as the assistant dean of my faculty (Social Sciences). Taken as a whole, this period was a central part of an extensive apprenticeship which significantly shaped my career and perspective. I had not seriously considered an academic career or living in England until Gordon’s offer, but never regretted my 1965 largely intuitive change of mind, despite ongoing uncertainty about the permanence of these decisions for 20 years.

For 15 months in 1974-5 I worked full-time with Acres Consulting Services in Canada. This opportunity was initiated by a three month consultancy assignment invitation from Oskar Sigvaldason. Oskar was then head of Acres Special Services Department, later president of Acres. I learned a lot about consulting, including key teamworking and client management concerns. One key study relevant to this book was leading the risk and uncertainty analysis of a proposal to reduce by one year the construction duration of a pipeline to bring high Artic gas to US markets. Another was a comparison of Canadian and US design regulations for nuclear power stations in relation to seismic (earthquake) risk. I built a lasting relationship with Acres. However, the offer of a permanent full-time role with Acres in Canada was declined. I returned to the Department of Economics in the University of Southampton, which had absorbed Econometrics while I was away. Working for Acres was immensely stimulating, and my wife Jean and I and our two young sons greatly enjoyed living in Niagara-on-the-Lake. However, with a young family I was not prepared to accommodate commuting to clients in Calgary, Edmonton, Ottawa and similar locations for a week at a time for a significant proportion of the year, and for a complex set of reasons on balance an academic career base in the UK seemed the best feasible choice.

For the next decade one focal area of my career was consulting to help clients build processes and embedded model sets which addressed problem areas with no available ‘off-the-shelf’ approaches. Through Robin Charlwood, an Acres colleague, I established an eight year relationship with BP International in London. I helped BP to develop planning and costing approaches for their North Sea operations, adopted by BP for worldwide use on all large or sensitive projects for more than a decade. In this period BP projects using the approaches I helped to develop were generally within time and cost commitments, with no surprises which could not be accommodated. Through Oskar Sigvaldason, Robin Charlwood, Gavin Warnock and several other Acres colleagues I also worked with Acres teams for other clients in Canada and the USA, building on the BP work, with any lengthy assignments scheduled so that my family could accompany me. Illustrative key clients included: Gulf Canada (Beaufort Sea and Grand Banks oil and gas project design studies, including the Hibernia oil production platform project off the east coast of Canada, where icebergs were a key concern, and platform cost uncertainty coupled to oil reserve volume uncertainty plus oil price uncertainty proved critical); Petro-Canada (a design strategy study for a pilot liquefied natural gas (LNG) project on Melville Island in the high Arctic); Fluor Engineers and Contractors Inc (a design study addressing how best to get a proposed 48 inch gas pipeline across the Yukon River in close proximity to an existing 48 inch oil line, with a wide range of relevant threats and interested parties); Potomac Electric Power Company and the US Department of Energy (comparison of energy storage via pumped hydro or compressed air in deep mines). Research driven by my consulting interests was published and I became a Reader in Management Science. The other focal area of my career during this period was helping Professor Ken Hilton develop the Department of Accounting and Management Science, which he extracted from the Department of Economics with my support. As well as teaching, I managed new MSc programmes and undertook various other academic roles. This period put into practice the maturing practice-research-teaching-practice basis of this book, initiating and shaping some of the basic ideas.

For nearly a decade the focus of my career then shifted significantly. I had become a Professor of Management Science with a personal chair, and Head of the Department of Accounting and Management Science. I now made a full commitment to maintaining an academic career base. Ken Hilton had increased the size of our department by 50%. I increased it by a further 100%, adding two new groups with professorial leadership: Finance & Banking and Information Systems. My consultancy became more UK focussed. I started accepting invitations to work through UK based consultants, including work with Sir William Halcrow and Partners of direct relevance to Chapter 9. Some consultancy was undertaken through the university. Examples central to this book include several studies helping National Power to develop BP type approaches to building electricity generation stations, and a series of studies over the period 1993-5 helping UK Nirex to plan a repository for nuclear waste disposal and deal with Department of the Environment (DoE) arguments about deferring the project. The DoE adopted an HM Treasury mandated real discount rate of 6% when 3% would have been more appropriate in terms of my arguments at the time. HM Treasury’s own post-2003 advice is consistent with my 3%, for directly related but different reasons. These issues are important in private as well as public sector contexts, and the reasons are explored in Chapter 7. I pursued research conventionally funded by research councils and professional bodies as well as the MoD and other organisations, some directly relevant to this book. Involvement with professional bodies began, including accepting an invitation to act as founding chair for the Association for Project Management (APM) Specific Interest Group on Project Risk Management. I started to spend more time teaching experienced managers, including a significant culture change programme for IBM UK, their ‘Forum 2’ programme. This was a two day in-house event run about 40 times, introduced by their CEO on each occasion, built around my input, central to Chapters 3 and 6. This wider set of activities and concerns reduced the time available for consultancy, but it did not weaken the practice-research-teaching-practice basis of my career, and prototype variants of many of the key ideas in this book matured during this period.

A five year break from university management roles then involved a different slight shift in focus, centred around two years as President of the Operational Research Society.

Three years as Director of the Southampton University Management School (SUMS) then involved a new university management role. I was appointed Director with a transformation mandate by a new Vice-Chancellor. While I had been Head of the Department of Accounting and Management Science the University had established SUMS as a separate Management School to provide MBA’s and other post-experience courses. My advice to avoid making these activities separate was rejected, but SUMS had my support once that decision had been made. The new Vice-Chancellor wanted SUMS fully integrated with the University, located on campus, made profitable, and made reputable in research terms. These objectives were achieved in the planning horizon which I eventually set myself. My successful exit strategy from my role as director involved recommending that the current the Head of the Department of Accounting and Management Science took over as director of a new Management School created by a full merger of SUMS plus the department, with me in supporting roles to help complete the transition. Outcomes included doubling MSc and MBA student numbers, an RAE (Research Assessment Exercise) rating of five (the top rating on the scale used for UK research assessment at that time) for the new Management School, and strengthened relationships with the faculties of Engineering and Mathematics. The latter was facilitated by founding the Centre for Operational Research, Management Science and Information Systems (CORMSIS), with the director’s post alternating every two years between Management and Mathematics, initially held by the Professor of OR in Mathematics, Paul Williams. The new School of Management has continued to evolve, becoming the Southampton Business School (SBS) in 2014. CORMSIS has thrived with a series of directors focussed on collaboration within and beyond the university, the sustained joint efforts of Sally Brailsford (Management/SBS) and Chris Potts (Mathematics) being particularly important. A separate but overlapping Centre for Risk Research (CRR), founded in 1990 by Johnnie Johnson (Management/SBS), which he led with great success until retiring at the end of 2018, also thrives and continues to evolve. Both centres embrace an emphasis on practice and a broadly defined perspective.

From 1991 until 1993 I served as an expert witness providing a critical review of Ontario Hydro’s strategic plans for the next 25 years, central to Chapter 8.

In 1992 and 1996 I served as a Business and Management Studies panel member for the Research Assessment Exercise (RAE). The judgements of these panels determined the distribution of the research funding component of the UK government’s university funding for business and management for two four-year periods. At the invitation of the panel’s chair as his ‘quantitative analysis expert’ I unobtrusively but explicitly confronted the management and governance implications of different people arguing for different weightings when using quantitative measures of attributes which do not lend themselves to simple metrics plus important non-measurable concerns when important decisions have to be made by a group of people with very different perspectives and agendas, and the need to use available measures coherently as far as possible, issues which are central to this book as a whole.

In 1999 I was elected an Honorary Fellow of The Institute of Actuaries. My work on their joint working parties with the Institution of Civil Engineers on risk management guides addressing projects, then whole enterprises, then operations, shaped the three component separability structure for all management decision making adopted by this book.

From 1997 to 2003 I served as a non-executive director of Southern Water, with three different chairmen of the board and three different ownership structures, useful in terms of background for Chapter 7, and direct governance experience relevant to Chapters 7 to 9.

There are a number of relevant differences between advising other organisations and taking your own advice when directly engaged in management and governance functions. My operations, project and corporate management experience as a head of an academic department, my change management experience as a management school director, a variety of other academic and professional roles, and my board level governance experience as a Southern Water non-executive director, all reinforced my consultancy experience in a manner relevant to the overall ‘practice basis’ for this book. They were all modest roles in corporate terms, and you may not see universities as ‘commercial organisations’, but each helped to shape and let me directly test some of the concepts and other tools discussed in this book, and they all influenced my views on requisite skillsets and mindsets in ways directly relevant to this book. They were an integral part of the education and practical experience basis that underlies my current perspective. That is the primary reason for mentioning them here, as part of explaining ‘where I am coming from’ before you start Chapter 1, to help you see where this book might take you. One secondary reason is encouraging you to see ‘commercial organisations’ through a broader lens than you might be used to, with a wide range of objectives. A defining characteristic of this book is encouraging a broader view than you may be used to of most of the concepts involved.

In 2004 I retired from my full-time academic post, became an Emeritus Professor on a part-time contract, and accepted an invitation from Mike Nichols to become a Senior Associate of the Nichols Group. Three subsequent consultancy studies are directly relevant to this book.

In 2005 I worked in Venice with Gavin Warnock and Robin Charlwood, renewing our Acres connections begun in 1974. Both had been Acres vice-presidents, but now had their own consultancy companies, Gavin based in Edinburgh, Robin in Seattle. We worked through Gavin’s Monitor (International) Ltd. Our client was Consorzio Venezia Nuova, the contractor for the MOSE flood protection scheme for Venice. We were successful in persuading the government that the cost estimates had to be significantly increased because earlier risk provisions based on conventional ‘received wisdom’ estimation methodologies were biased on the optimistic side. The MOSE project proceeded, with construction due to complete in 2018. This study helped to shape Chapters 3 and 7.

In 2006 and 2007 I worked with Mike Nichols and a small team to help him write a report for the Secretary of State for Transport which explained why UK Highways Agency cost estimates were consistently optimistically biased, despite following HM Treasury guidelines on these issues, and what to do about it. I then supported a team of Nichols consultants help the Highways Agency start to implement our recommendations, initially revising all current cost estimates in a manner approved and supported by HM Treasury. At that time Mike Nichols was Chairman of the Association for Project Management. We met when he chaired the joint working party of the Institution of Civil Engineers and the Institute and Faculty of Actuaries that I served on which produced the *RAMP Risk Analysis and Management of Projects* (1998 and 2005) guides. These Highways Agency studies and the RAMP guides also helped to shape Chapters 3 and 7.

From 2010 until 2013 I provided advice to the UK Ministry of Defence (MoD) on appropriate frameworks for justifying high levels of expenditure on preventative and mitigating measures for low probability non-conventional weapon attacks on troops, a form of analysis also relevant to terrorist activities. A generalisation of the framework developed underpins Chapter 9, along with earlier work on strategic approaches to safety for Railtrack.

The book *How to Manage Project Opportunity and Risk: Why Uncertainty Management Can Be a Much Better Approach than Risk Management* (Chapman and Ward, 2011) was the extensively rewritten and retitled third edition of *Project Risk Management: Processes, Techniques and Insights* (Chapman and Ward, 1997 and 2003). The 1997 first edition was a critically acclaimed modest bestseller, with roughly a third of its sales in Europe, a third in North America, a third in the rest of the world, Chinese and Greek language versions. Significant evolution in perspective was involved in the 2003 and 2011 editions.

This book’s Chapter 7 continues the evolution outlined by Chapman and Ward (2011), developing it from a broader perspective. The rest of this book continues the same evolution and clarification in terms of a scope which has been further broadened to include all aspects of planning needing effective integrated treatment within private and public sector commercial organisations. Its focus is practice in a rapidly changing post-2020 world. Its evolution has been the focus of my professional activities over the last few years.

Promoting the use of ‘enlightened planning’ ideas in any ‘systematic simplicity’ forms its users find appropriate in whatever ways I can is central to my future professional goals.

# Part 1 Foundations

***Chapters 1 to 4 contents indicating sections within chapters***

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# Chapter 1 Why planning is usually vital but often difficult and frequently inept

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This chapter begins the process of clarifying why planning is usually vital but often difficult and frequently inept. Several further goals are also pursued throughout this chapter. The central further goal is providing an overview of key foundation-level concepts, using a layered approach, each layer building on earlier discussion. Another important related goal is beginning to clarify why some significant departures from common practice planning are needed, including aspects of common practice which are widely believed to be good practice.

The next two sections outline what ‘planning’ means in this book. A third section explores key implications of ‘enlightened planning’ (EP) at an overview level. This is followed by a series of sections introducing specific defining features of enlightened planning. The final section provides a summary with linked inferences. By the close of this chapter you should have an overview understanding of why planning is usually vital but often difficult and frequently inept, what is implied by enlightened planning terms like ‘strategic clarity’, and why it may be worthwhile investing the time to read the rest of this book if you already are, or you would like to become, an effective ‘reflective practitioner’ with an interest in approaches to planning and associated management decision making which keep it simple systematically.

## Formal planning and related informal planning

‘Plans’ sometimes begin as very simple descriptions of a concept or intent. Plans may evolve into explicit base plans (like an aspirational target ‘plan A’ – what an organisation would like to do assuming there are no new significant opportunities or big problems) plus contingency plans (‘plan B’, ‘plan C’, and so on – a set of alternative plans to be used if circumstances arise which make ‘plan A’ inappropriate). Base plans plus contingency plans usually need to include ways to capitalise on possible good luck as well as possible bad luck. Contingency plans frequently have to address ambiguous scenarios involving ‘unknown unknowns’ of the ‘any other unspecified major opportunity or problem’ variety. ‘Plan A’ may need refinement, relabelling it as A1, and then replacing A1 with A2 followed by A3 to incorporate proactive adjustment of the base plan to better cope with uncertainty prior to plan implementation. One or more contingent ‘exit plans’ may be prudent, as well as prior plan B and plan C contingency planning.

Sometimes ‘plans’ are usefully described as ‘policy’, in the sense that ‘plans’ are broadly defined strategies for making specific kinds of decisions rather than plans for use on a single occasion. Sometimes ‘plans’ are usefully described as ‘process’, in the sense that ‘plans’ are a flexible process for implementing policy. Sometimes ‘plans’ are usefully defined as ‘procedures’ or ‘protocols’, in the sense that ‘plans’ are sets of rules for implementing policy with minimal room for creative interpretation normally assumed. ‘Plans’ may address activities, resources, designs, operating policies, strategies, operational rules, formal contracts and informal relationships.

The basic role of all of the ‘planning’ addressed by this book is effective and efficient approaches to management decision making in ‘commercial organisations’. ‘Commercial organisations’ are broadly defined to include all product and service providers who charge a price for what they provide. The example organisations considered in Part 2 span a wide range of examples, but a much wider range of application areas and planning concerns is within the scope of the approaches explored in this book.

Planning may involve significant amounts of underlying analysis. In some contexts you and many others may regard ‘analysts’ as a more appropriate term than ‘planners’ for those doing the work referred to as planning in this book. Further, many of the people involved in planning who this book addresses as key target readers may prefer to see themselves as ‘managers’, not ‘planners’ or ‘analysts’, with ‘planners’ and ‘analysts’ reporting to them.

Target readers may serve their organisations in a wide variety of roles, as project managers, marketing managers, corporate strategy managers, or managing directors, for example. A key premise this book is based upon is all target readers need to be able to communicate effectively and efficiently about ‘planning’, using a shared common language and shared key assumptions about other important concerns.

You can interpret the word ‘planning’ in plain English terms, along with most other words used in this book. However, to ‘keep it simple’ this book’s default interpretation of ‘planning’ is *formal* planning, including all associated formal analysis.

The roles of formality when planning include ensuring that all of the people involved in creating and shaping the plans make explicit what they have in mind. Associated purposes include testing assumptions and conveying information to other people who need to understand the implications of the plans in various ways. These other people may need to understand the plans because of the need for mutual support when ‘component teams’ of a ‘big team’ adjust their component plans and actions to the plans of other component teams. This is a key contingency planning issue within a broader concern for coordination and collaboration as part of effective and efficient teamwork. Other specific reasons for shared understanding relevant to some players may include their role in helping to execute the plans, their role in helping to test the plans, and their role in approving the plans. Controlling the relationship between what planners had in mind initially and evolving development and realisation of the plans may also be a crucial role for formality. Ongoing learning from experience and more general corporate knowledge capture may be further reasons of considerable importance for employing formal planning rather than relying on informal planning.

Assumed ‘non-players’ may become relevant players if they are not prepared to tolerate the plans – a potentially serious risk. But those initially assumed to be in opposition to or indifferent to plans may become important allies if mutual opportunities are identified – a potentially important opportunity.

Making specific aspects of planning formal involves crucially important implications for associated informal planning. Sometimes these implications are just mentioned in this book, sometimes they are developed immediately, and sometimes they are developed later at a more convenient point in the overall dialogue.

All relevant planning concerns must be dealt with via one of three options:

1. formal planning,
2. informal planning,
3. being ignored.

Clarity about which of these three options is being used to deal with each category and area of planning, as well as ensuring appropriate option choices, is a central aspect of the ‘strategic clarity’ concerns which formal planning has to address.

Sometimes informal planning of some aspects is more appropriate than formal planning, and where the line is drawn between formal and informal treatment is often crucial. Usually effective understanding of informal planning using more sophisticated structures and more detail is a crucial basis for effective formal planning. All formal planning certainly needs underpinning by background informal planning. Almost invariably effectively implementing formal plans involves further detailed informal planning plus creative leaps and real-time responses to unfolding events. ‘Constructive insubordination’ can be crucial – departing from prescribed formal plans which are inappropriate, even in military or emergency service contexts, where disobeying orders or protocols is generally discouraged in fairly harsh terms.

Any holistic formal planning process has to integrate formal and informal components and anticipate how best to encourage creative implementation in addition to creativity at the outset and creativity throughout the planning process. Deciding whether formal or informal treatment is the most appropriate option raises complex concerns, and simply ignoring planning issues raises further quite different concerns which also have complex implications. The core issues include ‘capability-culture’ considerations involving the capabilities provided by the relevant players and systems and the culture these capabilities are embedded in.

Two ‘modes’ of planning are distinguished: ‘top-down’ and ‘bottom-up’. In top-down mode ‘goals’ at the current decision making level are the starting point, asking questions like ‘what are we trying to achieve, and what matters most?’ In bottom-up mode the starting point is decomposing what we *think* needs to be done to get to where we *think* we want to go, asking questions like ‘how are we going to do it, how long is it going to take, and how much is it going to cost?’ The use of ‘we *think*’ implies we may change our mind.

Sometimes ‘the top’ needs moving up or ‘the bottom’ needs moving down in terms of the organisational hierarchy or scope of analysis, as part of considered revisions to the planned approach through an iterative process.

Multiple iterations are a central process feature of many of the most effective and efficient formal approaches to planning. Planned iterations can be a cost-effective feature of immense importance, built into processes with this in mind. But unplanned iterations may prove essential because of earlier errors of judgement. Unplanned iterations may be very costly.

This kind of planned plus unplanned iterative process is often inherently complex. It is always important to keep planning processes as simple as possible for all those involved. However, oversimplification in the ‘wrong way’ can have seriously dysfunctional implications, and how to simplify in the ‘right way’ may not be obvious unless the approach to simplicity employed is well-informed and systematic.

## Planning application areas

To keep this book’s discussion as simple as possible all relevant planning is decomposed into three very broad application areas:

1. operations management,
2. project management,
3. corporate management.

These three application areas need separable treatment because significant differences in approach need attention, but they are interdependent in important ways.

Each of these three application areas can be further decomposed, and often this is important in practice. However, the greater the level of decomposition, the more difficult and crucial treating interdependency issues becomes, and the importance of commonalities may be lost.

‘Operations management’ is sometimes interpreted as the day-to-day management of ongoing operations with a focus on short-term planning for the physical systems used by an organisation plus input supply chains. However, in this book ‘operations management’ and all embedded ‘operations planning’ also addresses the ongoing operation of all other systems and resources, including output marketing chains. Further, generating corporate strategy propositions to address future operations concerns is a crucial aspect of the interdependence between operations and corporate planning. Using this broad interpretation of operations planning, all Part 2 chapters involve a central concern for different kinds and levels of operations planning, with key roles for a traditional ‘Operations Director’ in Chapters 7, 8 and 9.

‘Corporate management’ effort and associated ‘corporate planning’ may be focussed on formulating corporate strategy in a top-down planning mode in some organisations. For some people this kind of strategic planning is the focus of all corporate planning. But in this book corporate management and all embedded corporate planning includes five aspects:

1. Top-down corporate planning – which starts by clarifying the corporate mission or vision in terms of goals and then moves on to strategic planning top-down to achieve those goals effectively and efficiently.
2. Corporate planning which involves the strategic scope of operations and project planning intersecting with the rest of corporate planning.
3. Planning for all corporate resources and capabilities needing attention which may not be covered fully, if at all, by operations planning or project planning, including corporate information systems, corporate finance and human resources functions.
4. Dealing with all relevant interdependency concerns not picked up elsewhere.
5. Effective corporate governance addressing everything that matters, including all relevant capability-culture concerns.

Consideration of corporate planning in a top-down sense and its integration with other corporate planning is deferred until Chapter 8, so that we can build on earlier discussion of component concerns. But corporate governance as well as lower levels of governance is directly relevant to all Part 2 chapters, as are interdependencies.

‘Project management’ in this book can be interpreted as the management of change in a very general sense. ‘Project planning’ led by a ‘Projects Director’ and all comparable project planning requiring effective integration with both operations and corporate management is addressed explicitly in detail for the first time in Chapter 7. But the approach developed in Chapter 7 underlies all the other chapters. Chapters 3 and 4 use examples primarily drawn from project planning contexts, and core ideas they illustrate are central to this book as a whole. An immediate consequence is project planning is usefully explored in a little more detail now.

‘Project planning’ is often given a relatively narrow interpretation which is focussed on delivering ‘assets’ which are physical systems. This is a convenient focus for the contexts addressed directly in Chapter 7 and most Chapter 3 and 4 examples. However, this discussion requires interpretation in terms of a much broader scope for project planning, a scope which embraces delivering any kind of change, with a linked very broad view of the assets a project may deliver. For example, the asset delivered may be a change in corporate understanding resulting from a new planning process which helps to drive associated corporate culture changes, illustrated in Chapter 6.

Sometimes it is very useful to distinguish ‘programmes’ and ‘portfolios’ (of projects or programmes) from simpler ‘project’ concepts. This book assumes this will be done when relevant. But it sticks to a simple ‘project planning’ label most of the time, with a broad interpretation of ‘projects’ which includes all programme and project portfolio concepts.

Project planning as discussed in Chapter 7 involves four key frameworks which this book refers to as ‘the four Fs’:

1. a project (asset) lifecycle framework,
2. a seven Ws framework,
3. a goals-plans relationships framework,
4. a process framework.

‘The four Fs’ terminology provides a useful label or ‘handle’ for a key conceptual structure, a handy contraction of ‘*four* key conceptual and operational *frameworks*’.

Each of these four frameworks is a ‘gateway concept’, and the way the complete set of four frameworks which make up ‘the four Fs’ work together in an integrated manner is an example of a higher level form of composite ‘gateway concept’. In the language of ‘learning and teaching’ a ‘gateway concept’ is a portal facilitating entry into a way of thinking about an important set of lower level basic concepts and operational tools which helps to structure our overall understanding and make that understanding operational (Biggs and Tang, 2011). In this particular case the four Fs concept is a portal for understanding key aspects of project planning as an integrated interdependent coherent whole, in the sense that it is central to understanding how to approach all aspects of project planning. Each of the four component frameworks is itself a portal for understanding a range of concepts and issues with key interdependencies.

Project lifecycle frameworks are usefully defined in terms of the asset provided by the change involved, including use of the asset until disposal by the project owners. However, as an illustration of the practical complications needing effective resolution, everyone involved has to accommodate the implications of contractors often favouring a different view of project lifecycles than their clients. A ‘conceptualisation’ stage followed by three more stages is a simple common practice portrayal for both clients and contractors. The other three stages viewed from a client’s perspective are usually ‘planning’, ‘execution & delivery’ and ‘utilisation’. But contractors often use ‘planning’, ‘execution’ and ‘delivery’, dropping the ‘utilisation’ stage if this does not involve them, and decomposing ‘execution & delivery’ because interfacing with different groups of people with different objectives are involved.

These common practice four stage project lifecycle portrayals are significantly elaborated for two basic reasons. One reason is recognising the crucial role of governance and capturing corporate learning at ‘gateway stages’, a further lower level ‘gateway concept’ in several senses. The other reason is recognising the crucial significance of different people with different concerns being involved as the initial concept evolves into a planned and delivered functioning asset and that asset is then employed.

The seven Ws framework is a generalisation of Rudyard Kipling’s ‘six honest serving men’. It begins with the ‘who’ (the parties involved), the ‘why’ (the objectives of all relevant parties) and the ‘what’ (the design of the asset being created). All of the ‘seven Ws’ are formally developed and linked via an influence diagram to different kinds of plans, building on the lifecycle framework.

A goals-plans relationships framework has to be built upon the project lifecycle and seven Ws frameworks. Its purpose is to develop clarity about the relationships between the very broad top level corporate goals being pursued by an organisation and the project plans being used to achieve selected aspects of those goals. For example, the national railway company central to Chapter 9 is associated with a corporate mission statement like ‘The best railway travelling experience in Europe, delivered to our passengers by railway staff who understand and care about what good service means, including comfort, safety, punctuality, and convenience at a cost which is fair and good value’. ‘The best railway travelling experience in Europe’ might be interpreted as their central composite corporate goal, with everything that follows viewed as interdependent component central goals which need a balanced approach bearing in mind the different preferences of different parties. These central goals might be associated with a list of attributes like travelling comfort, punctuality, safety and reasonable fares. A central set of criteria associated with overall costs might aggregate overall expected annual costs and associated cost risk involving high-side variations from expected values, assuming that realised costs drive fares and corporate profits. All of the other goals might have various metrics. Assumptions about the central ‘goals’, their component ‘attributes’, and the bottom level ‘criteria’ relationships with plans, collectively define the overall ‘goals-plans relationships’ of interest for project plans.

Goals, attributes and criteria can all be referred to as ‘objectives’ in a hierarchy involving crucial and complex interdependencies. You may prefer alternative terminology, but all those involved in any given organisation need clarity about well-defined relationships between the plans of interest, relevant top level central goals, all associated attributes, and component criteria. This book assumes that a framework for ‘goals-plans relationships’ covers the whole range and all relevant interdependencies, with the ‘goals’, ‘attributes’ and ‘criteria’ hierarchy distinctions just made used as convenient working assumptions.

To deliver formal project planning as a fully integrated approach, a project planning process framework is the final component of the four Fs. This process framework has to use an iterative phase structure which builds on the frameworks provided by the project lifecycle stages, the seven Ws, and the goals-plans relationships. This fourth framework and its interactions with the first three is the central concern of Chapter 7, with implications for all Part 2 chapters.

Currently you may not think about project planning as the management of change in terms of explicitly using this four Fs concept. But by the end of this book the case for explicit corporate recognition of some variant of this perspective and the four Fs framework should be clear. Any organisation not using one common explicit four Fs concept is using one or more implicit variants, and incompatibilities associated with different versions and missing key features may be the cause of important planning failures.

Corporate and operations planning contexts need variants of the project planning four Fs concept which is both broadly comparable and compatible. Compatibility is required to address interdependencies between corporate, operations and project planning. Variants of the planning horizon aspects of the project lifecycle, the seven Ws and the goals-plans relationships framework concepts are used throughout Part 2, within a common overall approach to decision making processes. By the end of this book the case for explicit corporate recognition of this role for the four Fs beyond project planning should be clear.

If you now perceive ‘planning’ for the purposes of this book from the perspective outlined so far, it should be reasonably clear already why some aspects of planning in a formal structured manner are usually vital, and why a comprehensive understanding of ‘what needs to be done’ is not always obvious to all of those responsible for planning approach choices, or perceived in the same way by everybody involved. You may also see why a very broadly defined approach to planning is a useful perspective on all associated management decision making.

The rest of this book will build on this overview of ‘planning’, to clarify inherent planning difficulties, and to lay the foundations for exploring effective practical ways to resolve these difficulties.

## What ‘enlightened planning’ (EP) means at an overview level

The approach to planning advocated in this book is referred to as ‘enlightened planning’, contracted to ‘EP’.

The scope of EP includes creating, enhancing, shaping, testing, interpreting and implementing all relevant plans from operations, project and corporate management perspectives using management decision making frameworks which include process management components building upon variants of the four Fs.

‘Enlightened’ is used in a plain English sense. But for the purposes of this book the term ‘enlightened planning’ involves an effective, efficient, robust, flexible and creative approach to a long list of interrelated planning concerns. These concerns include:

1. obtaining a shared understanding of *all* relevant uncertainty to the extent this is both possible and useful, with *no* significant blind spots;
2. obtaining a shared understanding of underlying complexity to the extent this is useful, with a well-founded overview appreciation of what is not understood;
3. creating a rich set of opportunities and seizing all appropriate opportunities;
4. taking appropriate risk, but avoiding imprudent or unnecessary risk;
5. making appropriate trade-offs between all relevant competing objectives;
6. integrating an organisation’s operations, project and corporate planning roles;
7. collaborating with other organisations whenever this is valuable;
8. making all assumptions as explicit, internally coherent and consistent as possible;
9. ensuring an appropriately shared common understanding of all assumptions that really matter;
10. facilitating clarity about which parties are responsible if key assumptions do not hold.

This list implies EP has very ambitious goals, but if any goals of importance to you or organisations of interest to you have been missed, they can be added to help you shape any organisation’s own variant of EP. The EP concept has a flexible design, to facilitate variant development in different ways for organisations with different concerns.

The term ‘enlightened planning’ and its contraction to EP are useful for a number of reasons. Your immediate and very reasonable response to this assertion might be ‘this particular choice of label is too pretentious or too ambitious’. To dampen this concern, *enlightened* planning was chosen to characterise a plausible but deliberately ambitious ‘aspirational target’ which is worth seeking. Plausible aspirational targets can be very useful if an opportunity management emphasis is important, and this feature of the EP approach seems worth emphasis to me. By the end of this book the value of planning to meet ambitious aspirational targets as well as making decisions based on realistic expectations with appropriate contingencies defining commitments and suitable contingency plans ready to meet crisis and disaster should be clear. However, if you are not convinced by the choice of ‘enlightened planning’ as a label for any reason, change it to something you prefer once you are confident you understand what EP as I currently see it is about, and how your version might usefully emphasise different concerns. There are certainly very good reasons for using different labels in some contexts. The ‘enhanced planning’ alternative label preserving the EP contraction used in Chapter 7 is just one example of a number of suitable options.

The ‘tools’ in the ‘toolset’ for enlightened planning provided by this book range from broad principles and general processes to specific graphical formats, from conceptual devices to operational techniques, covering most aspects of formal planning. The associated requisite ‘skillset’ includes supporting craft skills, which can be crucial. The ‘mindset’ issues which EP has to address have a very broad nature. The toolset issues are the focus of this book, but skillset and mindset concerns will be touched on and sometimes developed when relevant.

EP uses a planning perspective and the terminology of planning to address concerns often considered using other terminology and different conceptual frameworks, such as decision making, decision analysis, decision theory, decision support, portfolio theory, risk management, uncertainty management, problem solving (or resolving or dissolving) and the use of various approaches to ‘messes’ (used in both the plain English sense and the technical sense of ‘systems of interconnected problems’) via various forms of systems analysis.

A basic feature of any formal planning is the nature of the assumptions employed in the planning process. An enlightened approach to planning formally distinguishes two basic types of assumptions: framing assumptions and working assumptions.

This distinction helps to clarify the process of testing assumptions, which is important because the ‘right kind’ of simplifying assumption is an opportunity and the ‘wrong kind’ of simplifying assumption is a risk.

From an EP perspective:

*‘Framing assumptions’ define our perspective.*

*‘Working assumptions’ are assumptions of convenience,*

*selected to make a complex reality tractable*

*in an effective and efficient manner.*

‘Framing assumptions’ for EP purposes include *habitual* working assumptions which we do not test, because for all practical purposes any working assumptions which have an effect comparable to framing assumptions which are defined in more fundamental terms are indistinguishable in their effect.

One example of a framing assumption from an EP perspective is ‘all organisations need explicit specific forms for each component of the four Fs concept, defined by suitable working assumptions’. This is not likely to prove contentious.

Another example of an EP framing assumption is ‘uncertainty’ is appropriately defined simply as ‘lack of certainty’ in ‘nominal definition’ terms. This example is contentious for some people. It will be explored shortly, to couple this simple ‘nominal definition’ to an underlying ‘elaborated definition’ which provides greater clarity at a framing assumption level. Associated working assumptions will also be explored to further enhance overall clarity about the meaning of the word ‘uncertainty’.

One example of a ‘working assumption’ is any particular operational form developed by any specific organisation for the general project lifecycle concept which was explored briefly in the last section as part of the four Fs concept for project planning. Many other examples will be developed in every chapter.

The EP ‘framing assumption’ concept and its relationship with working assumptions is explored throughout this chapter, and further developed later. The core role of framing assumptions is the facilitation of an enlightened approach to choosing working assumptions, including a robust basis for effectively testing both virtually permanent ongoing working assumptions and very provisional initial working assumptions at the start of an analysis.

At a conceptual level there may sometimes be a case for distinguishing framing assumptions which define fundamental beliefs from working assumptions we habitually use without testing them. We may habitually use assumptions we know are not strictly true without testing them because we trust them, because we do not know how to test them, or because it has never occurred to us there was any need to test them. To ‘keep it simple systematically’ the EP ‘framing assumption’ concept explicitly avoids exploring these distinctions, but if they are of interest to you whatever complexity is deemed useful can be added, as for all EP framing assumptions.

In Part 1 the focus is framing assumptions which shape basic conceptual, process and other operational toolset choices. Part 2 tales also explore the implications of organisations using inappropriate framing assumptions in a much broader sense, involving mindset assumptions as well as toolset assumptions. For example, the general manager of the organisation which Chapter 5 is centred on begins with the simple longstanding personal mindset assumption that he is running a family owned manufacturing company as well as very simple toolset assumptions, but when he is stimulated into beginning to adopt a less restrictive mindset and toolset framing assumption perspective, he and the rest of his management team start to explore significant organisational transformation possibilities. Chapters 8 and 9 address radically rethinking the nature of both mindset and toolset framing assumptions which are comparatively complex. Other Part 2 chapters also address what might be viewed as habitual untested working assumptions which include mindset and toolset assumptions with inappropriate framing assumption implications.

EP involves a new way of looking at a rich variety of mainstream approaches, but the basis of EP is not new – its considerable ambitions would not be credible if it were. From the outset this book acknowledges key contributions to the basis of EP when this is useful for most readers or particularly helpful for some readers with directly relevant background.

Features of EP explored in this book which are new include significantly enhanced visibility of:

1. controversial framing assumptions about concepts, processes and other toolset components which need clear understanding for any variant of EP or any coherent alternative to EP which you or any organisations of interest to you may subscribe to;
2. interconnected fundamental problems with some features of ‘received wisdom’ (conventional thinking and common practice) which need rejecting by any EP variant;
3. useful relationships between decision support processes for managing all relevant uncertainty (framed in terms of associated opportunity and risk plus underlying complexity) which are ‘universal’ (very general) and other decision support processes which are ‘specific’ (to an organisation or approach or other context features to various degrees);
4. the role of teamwork and broader collaboration considerations as an integral part of the overall framework for approaches to planning;
5. the role of capability and culture considerations as part of the relevant context concerns plus further context issues.

Seeing your current toolset for planning from an EP perspective provides a basis for reflecting on your current approaches as well as enhancing your mindset and skillset. Seeing other people’s approaches from an EP perspective will inform well-founded critiques of received wisdom and effective synthesis across different ‘schools of thought’. Serving both of these purposes are central missions for this book, and understanding some key areas of contention may be very important for you. The nature of the cases against particular approaches which are currently entrenched in your world view may need particular clarification. Assistance with your critique of received wisdom where its failures are a serious concern for you may also be important. For all target readers these concerns are addressed as directly as possible. In some areas this means confronting concepts you may initially see as beyond your usual comfort zone in terms of ‘how to do it’ detail. However, you should see the point reasonably quickly, and as far as possible what any target readers could reasonably see as unnecessary detail has been minimised.

## Dealing with process design choices

A general planning difficulty is ‘how do we choose or design and develop the most appropriate process for planning in any given context?’ At all levels of decision making in all organisations these process choice concerns require attention, and a systematic approach which clarifies the issues associated with keeping it simple in the ‘right way’ can make the process choices both more effective and easier. These choices are crucial to an organisation’s success, they are not easy, and there is a lot of scope for errors of judgement if a clear and coherent framework for making them is not available to everyone involved.

These choices are also highly controversial, with many different competing claims about both ‘what needs to be done’ and ‘how to do it’. Dealing with the considerable difficulties involved in these important and controversial process design choices is a central EP concern.

Three closely coupled EP framing assumptions are:

*All but the simplest of planning should be based on systematic exploratory processes.*

*All planning processes should use a systematic toolset to clarify uncertainty and complexity,*

*building suitable variants of this toolset into the resulting plans as and when this is useful.*

*Opportunity is always a central concern, but risk is often important and sometimes crucial.*

These framing assumptions underlie the most general approach to choosing or designing and developing a suitable planning process which I have found useful in practice, including testing the validity of alternative process options as part of the process. It is outlined and its provenance briefly explored in Chapter 2. It is referred to as a ‘*universal* planning uncertainty and complexity management *process*’, usually contracted to ‘universal process’ or ‘UP’. All following chapters build upon this UP concept, a key EP tool with both conceptual and operational roles.

One key role for the UP concept is providing a default planning process if it is not clear what other approach might be appropriate, illustrated by the tale of Chapter 5. A second key role is providing a process for building a planning process for a specific context, referred to as a ‘*specific* planning uncertainty and complexity management *process*’, contracted to ‘specific process’ or ‘SP’. This second role is initially illustrated by the tale of Chapter 6. A third key role is providing a process for adapting what is now commonly called a ‘generic process’ (a process developed for general use). This third role is illustrated by the tale of Chapter 7. Building on all of these roles, a UP can be used as a basis for making comparisons between potentially suitable alternative planning processes and component models, testing relative effectiveness and efficiency, as illustrated throughout Part 2. In a related but further additional role, Chapter 8 uses a UP indirectly to define an appropriate overall framework for corporate planning. Chapter 9 then extends this Chapter 8 role to consider dealing with low probability high impact incident scenarios plus a related set of less serious incident scenarios within an appropriate corporate planning framework.

As an aside or footnote on a minor point of detail just in case you wondered, using ‘a UP’ implies saying ‘UP’ using two words (‘u’ and ‘p’), for consistency with SP and EP. Should you prefer one word and ‘an UP’, that alternative is obviously an option. You may prefer alternatives for any of my EP terminology choices for good reasons, and what concepts are called is not an important issue unless the label significantly colours the meaning or common uses of the concept in ways that really matter.

## The simplicity dilemma and the enlightened simplicity response

‘Enlightened simplicity’ is at the heart of a UP and enlightened planning in general – my current view of what Stephen Ward labelled ‘constructive simplicity’ (Ward, 1989) plus systematic approaches to using constructive simplicity which we have jointly pursued since the 1990s and others have pursued for many years using various labels. Whatever you chose to call it, the ‘enlightened simplicity’ concept has been developed to address a widely-understood and crucial ‘simplicity dilemma’. Stated simply, the ‘simplicity dilemma’ is:

*Everybody obviously wants simplicity when making decisions in planning processes,*

*but the issues may be very uncertain and inherently extremely complex,*

*so how do we choose the ‘right kind’ of simplicity and avoid the ‘wrong kind’ of simplicity?*

The essence of an enlightened response to this simplicity dilemma involves seven key aspects:

1. It depends upon a common joint understanding of all the relevant issues in points 2-7 below at an appropriate level by all the parties involved, although some people may need to understand some issues in much greater depth than others.
2. It is crucially dependent upon the context.
3. It requires explicit understanding of the ‘working assumptions’ employed to reduce complexity.
4. It involves explicitly testing all working assumptions and revising them when appropriate to improve robustness whenever working assumptions may be crucial to important choices, including decision making process choices.
5. It requires an explicit understanding of ‘framing assumptions’ which define an overall perspective, including the approach taken to testing working assumptions for robustness.
6. It requires effective and efficient integration of operations, project and corporate planning roles.
7. It requires knowledge and craft skills from all relevant disciplines which have been integrated into a coherent and unified whole.

You may decide to add to or rearrange these seven key aspects by the time you finish this book, but they are a useful starting position to work with in the meantime.

Three key concerns follow from this seven aspect view of enlightened simplicity – again you may wish to extend or modify this list later:

1. If any organisation does not have a common understanding of the limitations of its framing assumptions, it will fail to understand the limitations of its collective knowledge and skills.
2. If those leading decision making use knowledge and skills from relevant disciplines which employ incompatible framing assumptions without dealing with the implications, an organisation’s collective perspective will lack coherence.
3. If those involved do not understand the dissonance involved in an incoherent perspective, or its implications in terms of lack of robustness, or the limitations of the collective knowledge and skills employed, they will be surprised by the mistakes that are made, and they will keep making the same or similar mistakes.

This book is about using enlightened simplicity for decision making in formal planning frameworks and related informal planning frameworks so we can integrate relevant knowledge and craft skills from all relevant disciplines and perspectives and learn from our experience. It is about hanging our learning and experience on a framework which is as general, flexible and robust as possible.

## The framing assumptions mantra

A popular quote known as ‘Occam’s razor’, attributed to William of Occam (1285-1349), is often cited in a form like:

*No more things should be presumed to exist than are necessary.*

The basis of both ‘enlightened planning’ and ‘enlightened simplicity’ is a version of Occam’s razor in the form of ‘the framing assumptions mantra’:

*Keep your framing assumptions as general as possible,*

*because you cannot routinely test framing assumptions for robustness,*

*as you can and should for all working assumptions.*

A ‘mantra’ used in this way is a framing assumption, and the framing assumption mantra is a defining feature of enlightened planning.

As pointed out earlier, ‘working assumptions’ are assumptions of convenience. Working assumptions are simplifications to make a complex reality tractable and easier to deal with in an effective and efficient way. Working assumptions should be explicit, and they should be routinely tested during enlightened planning processes to ensure that they are not misleading, with a clear understanding that this is *much* easier said than done.

As also pointed out earlier, ‘framing assumptions’ define our overall perspective. We can test framing assumptions by hypothesising more general framing assumptions as part of a process of reflective review of past experience, testing these hypotheses in the future. But in most operational decision making contexts it is not practical to propose and test suitable new framing assumptions in the middle of any given planning exercise.

Deliberately pre-planned development exercises for planning processes may allow extensive testing of framing assumptions, and sometimes this can be a very useful approach, with several examples provided latter. But in most circumstances, we need to do our operational planning using a framing assumption perspective we are comfortable with, and it is often convenient to also use explicit working assumption option sets that we are familiar with.

Because testing framing assumptions is inherently difficult, and routine testing of framing assumptions in the middle of decision making processes is not practical, it follows that all EP framing assumptions should be as general and unrestrictive as we can make them, by design. Further, the greater the generality achieved, the broader the scope for appropriate working assumption choices, enhancing the scope for choosing the ‘right kind’ of simplicity while avoiding the ‘wrong kind’ of simplicity.

While drafting this book I have hypothesised more general framing assumptions than those used earlier in a number of areas, to see if this might be useful, and continued this process until further tests did not seem likely to prove productive. The extent to which framing assumptions and related key working assumptions have or have not been tested empirically has been clearly identified, to help you judge the validity of any advocated framing assumptions which differ from those you currently subscribe to. You, and organisations of interest to you, might wish to continue this process in some contexts. But testing framing assumptions is not something anyone will have the time or inclination to do routinely when trying to make operational decisions in practice – the time pressures will normally prevent it.

‘Doing better next time’ based on past failures is a common and essential basis for testing alternative framing assumptions plus key associated working assumptions. Both individuals and organisation taking a reflective approach to learning from experience routinely test and evolve their framing and working assumptions based on earlier misjudgements. Part of the cost of learning by experience in this way is the pain caused by the earlier mistakes, usefully viewed as lost opportunities to have done better. Reading books and papers or attending courses which challenge beliefs, and discussing concerns with mentors and other colleagues, can play a similar but much less painful role.

One of this book’s goals is to help you learn what you need to know to take an enlightened approach to planning with as little pain as possible. However, to make effective use of reading this book you will need to test the EP framing assumptions and associated working assumptions used by this book against your own current framing and working assumptions as your reading progresses, not always a straightforward or painless task. You will then need to further test your resulting framing and working assumptions in practice, confirming the replacement of your own earlier framing assumptions with better (more general) ones and related working assumptions with better (more effective and efficient ones) whenever you establish a case for doing so.

To put this in more enticing light, the ultimate goal is ‘more reward’ plus ‘more smiles’ in the ‘more pleasure’ and ‘less pain’ sense discussed using Figure 11.1 in Chapter 11, a portrayal of systematically searching for opportunities while avoiding risks which reflects capability and culture concerns in a holistic manner using an EP approach.

## Stealth assumptions which matter

If colleagues or any other relevant players in a joint decision making process are using framing assumptions or dependent working assumptions which are seriously dysfunctional because they are restrictive in inappropriate ways, something needs to be done about it as soon as possible. The same issue arises if we discover that we are using inappropriate framing assumptions or dependent working assumptions ourselves.

‘Stealth assumptions’ which matter are defined as framing or associated working assumptions which we or other people seem to be using with seriously dysfunctional implications when adopting any approach which does not make sense from the broadest feasible EP perspective. These stealth assumptions may be explicit, consciously adopted because of a failure to recognise the implications of bad advice, which may be based on conventional wisdom which is unwise. But stealth assumptions may be tacit, the result of following other peoples’ bad practice without questioning its basis. Stealth assumptions *which matter* are viewed as important sources of concern in this book, serious sources of risk which need to be avoided.

It is generally very difficult to understand some of our own deeply seated stealth assumptions, but we can sometimes identify them when we generalise our perspective via new insights. This happened to me a lot when writing this book, because I was particularly focussed on generalising my framing assumptions in order to develop a coherent and holistic framework which would help you to generalise yours. However, seeking the most general perspective feasible has been a conscious goal for many years, and the insights sometimes revealed are one of the ‘pleasant surprises’ life has to offer.

We cannot know what other people are actually thinking, but we can usually surmise or hypothesise an explanation for other peoples’ behaviour in the form of ‘stealth assumptions’. Sometimes this is very useful.

## Confronting the terminological quagmire

All key words used as technical terms, and some key multiple-word technical terms, are conceptually important in any planning framework. From an EP perspective all words given an important technical terminology role are usefully seen as very basic and important tools, with interconnected operational as well as conceptual implications.

Some key words are as fundamental to EP as the UP concept and the four Fs. This is because specific meanings for crucial words which are restrictive can limit perspectives as much as processes or models or any other conceptual or operational tools which lack generality. Key words which are conceptually limiting are a form of seriously dysfunctional framing assumption, stealth assumptions which really matter.

Over several decades the importance of avoiding restrictive technical definitions for key words has become more and more obvious to me and many colleagues. However, many other people, including some close colleagues and friends, have strongly defended restrictive views. In a few of these cases the definitions involved are not restrictive in obvious ways, and assuming the differences do not matter may seem reasonable. But in some cases the definitions adopted are so highly restrictive their numerous critics have argued vigorously for decades that they should be abandoned.

Some people defending demonstrably inappropriate definitions insist that their restrictive views must be appropriate because they are endorsed (or seem to be endorsed) by published guides and standards, some of these guides and standards being seen as highly reputable and beyond reproach. Some of the most vigorous arguments I have been involved in have taken place on working parties for reputable guides and standards, but none of these guides or standards reveal this controversy, and some attempt to embrace a range of views with a serious and regrettable level of ambiguity and inconsistency. This is also true of other guides and standards I am aware of, although comparable controversy has been involved in all of the many cases I have discussed with contributing authors. This makes the nature and purpose of all guides and standards controversial and contentious in ways which are not generally understood. This section explores some of the immediately relevant implications for planning processes. You will find it useful to understand these implications now, whether or not guides and standards and the technical issues they address are of any direct ongoing interest.

The terms ‘uncertainty’, ‘opportunity’, ‘risk’, and ‘complexity’ are a core quartet, particularly in need of clarity. From an EP perspective, what is meant by these four key words is a very good example of why being clear about ‘framing assumptions’ matters, why the way framing assumptions relate to associated ‘working assumptions’ matters, and why understanding these issues helps to clarify the nature of the stealth assumptions which matter associated with common practice you need to avoid.

This section explains how we can escape the terminological quagmire which common practice is bogged down in, and why doing so is essential. Relying on guides and standards and textbooks or papers by authors whose opinions are based on guides and standards is not a viable route to safe ground.

The EP approach developed in this section may initially seem unnecessarily pedantic – but the concern is keeping it as simple as possible with the flexibility and nuanced clarity which all planners and decision makers need in practice. It is an example of the more general concern for keeping it simple in the ‘right way’, avoiding keeping it simple in the ‘wrong way’. It illustrates the value of an initial investment in capability to achieve massive ongoing payoffs in terms of more clarity for less effort.

### Uncertainty

Uncertainty is inherent in all aspects of planning and associated management. You need a clear understanding of how to perceive and deal with uncertainty, and organisations need a clear shared understanding. Consider the closely coupled pair of simple nominal definitions:

*‘Uncertainty’ means ‘lack of certainty’ and ‘uncertain’ means ‘not certain’.*

When discussing any aspects of ‘uncertainty’ the ‘lack of certainty’ definition has been the simple plain English interpretation of preference for me and a number of colleagues for many years. We have not explicitly used ‘uncertain’ means ‘not certain’ quite so much, but its usage was always implicit because they are just two ways to define the same concept.

Over the past decade several colleagues have explicitly rejected these ‘one-part’ ‘lack of certainty’ or underlying ‘not certain’ definitions for the purpose of defining professional guidelines on working parties I have served on. Their grounds for doing so have been that this kind of simple definition is circular. My strenuous objections have been overruled. There were no hard feelings about it, but I remained unconvinced and unrepentant, without really understanding the nature of the underlying issues driving our differences in opinion.

From an EP perspective the underlying problems are now clear to me, confirming that my intuitive concerns were valid. This EP perspective did not emerged until the fourth draft of this book, and understanding the nature of the clarification process should help you to understand the rationale of the EP perspective now advocated.

The starting point for this clarification was linking the ‘one-part’ very simple ‘nominal definitions’ provided above to an ‘elaboration definition’ developed using dictionary definitions as well as technical definitions, testing to see what this elaboration definition might reveal. Standard dictionary definitions (using several recent editions of the Concise Oxford Dictionary to get started) suggested three quite different meanings for ‘uncertain’:

1. not certainly known or knowing;
2. unreliable;
3. changeable or erratic.

Circularity is clearly involved in the ‘one-part’ nominal definitions provided above – there is no disagreement on this issue. However, that is also the case for the ‘not certainly known or knowing’ dictionary meaning of ‘uncertain’. Amongst the colleagues rejecting ‘lack of certainty’ or ‘not certain’, the common preference for ‘unknown’ or ‘not known’ misses the extremely important nuance ‘may be partially known’ interjected by ‘not certainly’ in the first dictionary meaning, as well as completely missing the second two dictionary meanings. These omissions matter.

The EP position now advocated is using the one-part ‘*nominal* definitions’ ‘lack of certainty’ or ‘not certain’ as usefully simple summary components of the ‘*overall* definition’, but explicitly interpreting these one-part nominal definitions using a ‘three-part’ ‘*elaboration* definition’ which involves all three dictionary definitions for ‘uncertain’, *so that no important dictionary meanings or nuances are lost*. This makes the EP ‘overall definitions’ approach (nominal plus elaboration definitions) as general as possible.

Having established the generality of this ‘overall definition’ approach for EP framing assumption purposes, briefly consider what lies behind some alternative common restrictive definitions which everyone needs to avoid. There are technical definitions of ‘uncertainty’ and ‘uncertain’ which insist that probabilities cannot be associated with uncertainty. For about 50 years this idea has been explicitly rejected as inappropriately restrictive by most well-informed experts, and an EP approach follows suit. However, a dysfunctional link between ‘uncertainty’ and a lack of ‘probabilities’ lingers on, in the sense that many people still regard a lack of objective probabilities and uncertainty as closely coupled if not synonymous, and a lot of inept planning is the direct result.

The reasons most well-informed experts now reject this connection may be clear to you already. If not they should be clear by the end of Chapter 3. But it may be helpful for you to understand now that arguing probabilities cannot be associated with uncertainty is usually grounded on a classical decision analysis perspective rejected by modern decision analysis in the 1960s, when subjective probabilities became accepted as proper probabilities which should embed objective probabilities as a component part if relevant data was available and worth using, but a lack of data should not preclude using probabilities defined as statements of belief, following acknowledged experts like Howard Raiffa (1968). The economist Frank Knight (1921) is often blamed for the initial confusion, but the classical decision analysis framing assumptions are probably a fairer target, if blame is an issue.

From an EP perspective decision makers can always use subjective probabilities to describe uncertainty whenever that is helpful, but sometimes not doing so is preferable, for reasons outlined in Chapter 3.

It is often extremely useful – arguably crucial – to use working assumptions which build on this comprehensive overall definition of ‘uncertainty’ and ‘uncertain’ to clarify what is involved. These working assumptions provide valuable conceptual tools with important operational implications.

During the 1970s and 80s I used working assumptions involving what I now see as three explicitly envisaged ‘portrayals’ of uncertainty, and for about two decades prior to the fourth draft of this book four portrayals of uncertainty seemed useful. I am now convinced that adding a fifth portrayal is very important.

The EP perspective advocated in this book uses the *framing assumption* that multiple portrayals of uncertainty are crucial. For present *working assumption* purposes, five portrayals of uncertainty can be operationally useful:

1. ‘event uncertainty’,
2. ‘variability uncertainty’,
3. ‘ambiguity uncertainty’,
4. ‘capability-culture uncertainty’,
5. ‘systemic uncertainty’.

The most recent addition is number four, a need for number three emerging in the 1980s. The ordering of the list was designed to simplify the explanations to follow.

**‘Event uncertainty’** is inherent in some contexts, in the sense that ‘a machine failing or not’ may be seen as a form of uncertainty associated with a simple event happening or not. However, event uncertainty may also be associated with a scenario representing a complex range of outcomes involving many attributes which is treated as a discrete event on an outcome branch of a decision tree. For example, Chapter 9 will consider a ‘catastrophic incident scenario’ associated with a railway involving a conditional expectation of 350 fatalities (associated with a range from 200 to 1200+), plus an associated conditional expectation of injuries with degrees of seriousness on many scales, plus a further associated conditional expectation of physical damage to the railway system with ongoing operational cost and lost revenue implications, plus reputational damage and the implications of law suits and fines which may lead to bankruptcy of the railway company. This incident will be treated *for some purposes* as a discrete event which may result from earlier decisions, but that is a working assumption, a convenient portrayal of extremely complex circumstances, not an inherent event concept. Chapter 3 develops a range of much simpler ‘scenario’ examples of event uncertainty using a ‘histogram and tree’ (HAT) framework to provide coherent framing and working assumptions for an approach based on an ‘event uncertainty’ portrayal which links it to all the other portrayals of uncertainty.

**‘Variability uncertainty’** may be inherent in the sense that uncertainty about ‘good or bad weather’ in terms of a lay-barge being able to lay an oil or gas pipeline in the North Sea during a one month period may be viewed on a continuous variable scale over the range zero to 31 ‘lay’ (working) days. However, variability uncertainty may also be a very useful way of portraying uncertainty about the total cost of an offshore project – which is a mixture of inherent variability uncertainty, event uncertainty, ambiguity uncertainty, capability-culture uncertainty and systemic uncertainty.

**‘Ambiguity uncertainty’** can be a particularly useful portrayal of uncertainty associated with knowledge we would like to have which could be acquired at low cost relative to the expected cost of carrying on without this knowledge. However, it can also be an important way to look at some uncertainty which will be partially reduced as a result of ongoing planning processes, the implementation of plans and the passage of time. Ambiguity uncertainty is a generalisation of what some decision analysis literature approaches address via ‘the value of information’ in ‘perfect information’ and ‘imperfect information’ forms.

**‘Capability-culture uncertainty’**encompasses the uncertainty underlying all relevant ‘human error’ issues, interpreted to include the underlying basis of all associated lack of capability and behavioural risk concerns plus relevant supporting systems concerns. Gawande (2011) provides an example discussed in more detail in Chapter 2 which links human capability issues to associated systems – Boeing’s approach to supporting aircrew faced with very serious low probability incidents which uses an on-board computer-based information system. A well-trained co-pilot can use the system to access the best advice available in a very short time period to prevent an accident. A system of this nature can cover a huge range of issues most pilots will never encounter, and it can be kept updated from a wide range of sources. All four of the alternative portrayals of uncertainty may be viewed within or overlap this portrayal. This way of looking at uncertainty draws on all three of the dictionary meanings, incorporating associated nuances as well.

**‘Systemic uncertainty’** may be reasonably straightforward or exceedingly difficult to characterise. At the relatively straightforward end of the spectrum, ‘systemic uncertainty’ may underlie the sum of the uncertainty associated with a sequence of activities in a project in the sense that if one activity is delayed, a second following activity may be more likely to be delayed, and knock-on effects including cascade effects may make the delay worse. Two somewhat different types of dependence may be involved, one associated with the chance of initiating conditions, the other associated with consequences and responses to consequences. Both might be addressed in statistical dependence terms or in causal dependence terms. While early responses to specific problems and general responses to sets of accumulating problems may dampen accumulating delays, consequential positive and negative feedback loops can be complex and difficult to disentangle. The relationships involved can become very complex very quickly if we keep digging, even in a relatively straightforward project planning context limited to how long a sequence of activities might take. Much more complex situations can be associated with contexts involving concerns like macroeconomics and geopolitics.

**All five portrayals of uncertainty** may be involved, with important interdependencies which systemic uncertainty might portray. Concepts involving uncertainty which may be beyond the bounds of conventional analysis, like ‘black swans’ (Taleb, 2007), ‘exceptional uncertainty’ (Marshall, 2015) and ‘radical uncertainty’ (King, 2016), need to be associated with all five when relevant, sometimes as components of what this book calls ‘unknown unknowns’.

**‘Unknow unknowns’** is a term which I initially used in 1970s work with BP, in a way discussed in Chapter 3. I now see ‘unknown unknowns’ as a useful EP term for uncertainty which may be unknowable, but might be knowable if we were more capable or had more time, and *often* is simply not worth understanding any better in the current context at this particular time. This ‘unknown unknowns’ kind of uncertainty might be associated with any of the five portrayals just outlined, and linked to uncertainty beyond the bounds of conventional analysis. For example, ‘Black swans’ is now a well-known term for uncertainty missed by conventional thinking in a financial analysis area (Taleb, 2007), with wider implications. ‘Radical uncertainty’ is a term formally defined to go beyond conventional economic thinking in a book on global economics including underlying geopolitical issues by Mervyn King (King, 2016), a distinguished economist who was Governor of the Bank of England from 2003 to 2013. There are many ways of looking at ‘unknown unknown’ concepts, and you may have your own preferred terminology, but it is convenient to have one unifying concept which serves all of the purposes of the ‘unknown unknows’ EP concept. Forms of systemic uncertainty which may be extremely difficult to clarify include links between capability-culture uncertainty and ambiguity uncertainty – like an unknown ability to deal with non-predictable initiating events which can turn a potential crisis into a catastrophe very quickly, the role of feedback loops between parties to a project whose objectives are not aligned which can lead to a complete breakdown in relationships which means everybody is in serious trouble, and economic or geopolitical issues. Forms of uncertainty which simply may not be worth resolving at present include the events which might disrupt the detailed plans for executing a project which we have not yet decided to undertake and may reject if better opportunities are identified. Dealing with some of the relatively straightforward kinds of unknown unknown is not that difficult if we understand ‘what needs to be done’ and ‘how to do it’, but the capability required to do so effectively is not currently as widely available as it might be.

**Risk/uncertainty distinctions** are important in this book, with uncertainty underlying risk. For example, ‘systemic uncertainty’ is an uncertainty management term for the uncertainty underlying what some people call ‘systemic risk’. From an EP perspective, risk and uncertainty should not be confused, for reasons we will start to explored shortly. Systemic risk, risk associated with variability, and risk associated with events are all well-known risk management concerns, although they are not always considered in the same framework by all risk management experts. Risk associated with human factors and related systems failures are also well developed areas by those who focus on these areas. Risk associated with ambiguity is often implicit, but addressing ambiguity explicitly is not a new idea. Explicitly addressing all five of the portrayals of sources of uncertainty which this book assumes may underlie risk, and linking this to a broad EP interpretation of ‘unknown unknowns’, may be novel – I have not encountered it before. But others have used variants of the same basic ideas, and what really matters is everyone who needs to explicitly employing these five portrayals of uncertainty, plus an effective and efficient overlapping ‘unknown unknowns’ concept, whenever this is useful, avoiding any relevant blind spots. Ways of doing so are demonstrated later.

**Four general observations** **about key words** are worth brief reflection before moving on.

First, we all want simple definitions, but useful simple definitions with an element of circularity may be in need of elaboration. One kind of elaboration is illustrated by the explicit referral to all three dictionary definitions for ‘uncertain’ discussed above. More generally, an ‘elaboration definition’ approach to the ‘overall definition’ for EP framing assumption purposes *may* be a useful approach.

Second, this kind of simple nominal definition is ‘nominal’ in two senses: it needs a closely coupled elaboration definition, and even the elaboration definition is nominal in the sense that if you prefer a slightly different dictionary definition this is not a problem.

Third, as we will see shortly, some nominal definitions may need to deal directly with multiple meanings because there is no useful simple one-part definition, circular or otherwise.

Fourth, having obtained the framing assumption generality that we need in terms of the simplest feasible overall definition, we may also need elaboration in terms of specific identified working assumptions – like five portrayals of uncertainty – to provide operational ways of looking at the general concepts delivered by unrestrictive framing assumptions.

**A general concern** **addressed by this EP approach to definitions** is the need to avoid a ‘Red Queen syndrome’. In *Alice in Wonderland* (Carroll, 1865), the Red Queen declares ‘words mean exactly what I want them to mean’ (because I am the Queen, and anyone who disagrees will lose their head). None of us are Red Queens, even when serving as the authors of standards and guides, and we do not live in Wonderland.

### Opportunity

Recognising and exploiting all feasible opportunities to improve plans is a key aspect of all enlightened planning. Consider direct use of the three-part nominal definition:

1. *‘Opportunity’ means ‘a favourable situation’; or*
2. *‘a situation with a good chance of a favourable outcome’; or*
3. *‘a potential favourable outcome’.*

The first two meanings are key dictionary meanings which are clearly different, while the third is arguably a very special case of the first, and there is no simple one-part definition in circular form or any other form.

Not until the fourth draft of this book was underway did it become clear to me that none of these meanings on its own is a suitable overall definition in the sense an EP approach requires, there is no simple definition that captures all three of these meanings with requisite clarity, circular or otherwise, *and* all three meanings are actually crucially important aspects of what we all mean by ‘opportunity’ in different contexts. All three meanings are worth including separately in the direct three-part approach to the ‘*nominal* definition’ used above, further enhanced by any alternative variants you think are important.

Along with *some* colleagues I have subscribed to the third definition as a technical definition of ‘opportunity’ for *some* purposes for many years. But it is now clear that we were *implicitly* using a more general interpretation which included the first two parts of this three-part definition for other purposes, and this inconsistency was unhelpful. We did not have a simple one-part circular equivalent to the uncertain and uncertainty definitions, and we do not need one. What we do need is a three-part (or more) approach to a nominal definition concept for ‘opportunity’.

My colleague Matthew Leitch has in effect been telling me this for some time. For example, when providing feedback on a draft of Chapman and Ward (2011) he argued that he saw opportunities as ‘a set of circumstances which made it relatively easy to do what you wanted to do’ – a very useful illustration of a variant of the first dictionary meaning in an ‘opportunity efficiency’ context which is ignored by the third meaning. It took Stephen Ward’s suggestion to carefully study dictionary definitions linked to also reappraising useful technical definitions for ‘the penny to drop’ – I have been a slow learner on this issue. However, I have not been as slow as those in the risk management ‘experts’ community who have continued to insist that ‘opportunities’ are ‘favourable events’ in an ‘upside risk event’ sense, or continued to promote tools which imply this perspective without careful and explicit health warnings.

Limiting ‘opportunities’ to ‘favourable events’ is obviously too restrictive. It results in a focus on event uncertainty which ignores variability uncertainty, ambiguity uncertainty, capability-culture uncertainty and all forms of systemic uncertainty. Indeed, what actually prompted my formal ‘favourable potential outcome’ interpretation was an attempt to explicitly avoid a ‘favourable event’ interpretation when its promoters became vocal and strident in the 1990s, keeping it simple in a comparable manner. But a one-part definition restriction involved a serious mistake. I had fallen into the common trap of being simplistic because of a well-intentioned wish to keep it simple, avoiding simplifying in one ‘wrong way’, but still simplifying in another ‘wrong way’. Explicitly embracing the first two definitions as well as the third helps to clarify some of the very important more complex roles and nuances of ‘opportunity efficiency’, addressed in outline shortly, in more detail in Chapter 3 and all following chapters. This clarification is very useful, and a three-part nominal definition which needs no elaboration definition is the simplest feasible way to achieve the needed generality of ‘opportunity’ from an EP perspective.

### Risk

Recognising and deciding what to do about risk is an important part of all management activity, and risk should be a key concern in all planning processes. Risk is not just the province of specialist risk management experts.

Consider the two-part nominal definition:

1. *‘Risk’ is ‘the possibility of unfavourable outcomes’; or*
2. *‘a person or thing that could cause unfavourable outcomes’.*

Until the need for the definitions of uncertainty and opportunity just discussed became clear, my focus was on the first part of this two-part nominal definition of ‘risk’. But both of these two quite different meanings for ‘risk’ are well worth making explicit.

The second part of this definition is particularly rich in implications when coupled to recognising the crucial role of ‘capability-culture uncertainty’. For example, a ‘risk’ may be a thing or a person which is an inherent source of risk, ‘an accident waiting to happen’ in common parlance, a ‘hazard’ in some peoples’ terms. One key associated uncertainty may be how long it will take to happen, but all five portrayals of uncertainty may be relevant, not just events. For example, if a person is unreliable, badly trained, poorly motivated, or not suitably supported by the systems they work with, in plain English we can say they are a risk or a source of risk, even if nothing has happened yet, and we have no real idea what sort of misfortunes might be forthcoming.

From an EP perspective there is no need for an underlying elaboration definition, but working assumptions which build on this two-part nominal definition of ‘risk’ to provide additional clarity are very important. One aspect of desirable clarity is developing an effective understanding of the issues involved in ‘risk appetite’ concerns. These concerns can be fairly simple or very complex. A suitably general framework for thinking about risk appetite in terms of an attribute like profit or loss with a monetary metric requires recognition that as the probability or size of a potential loss increases, the appetite for more risk may change. Further, different relevant parties may have very different risk-reward preferences. Explicitly accommodating these issues effectively may be important. Relatively simple practical ways of implementing this general framework are available in some contexts, but others require more sophistication.

From an EP perspective, a lot of common practice is based on definitions of ‘risk’ which are far too narrow. For example, briefly consider the definition ‘risk = probability x impact’. This is the most unacceptably narrow technical definition of ‘risk’ available. It is what many ‘risk experts’ meant by ‘risk’ 50 years ago, and some still do. The directly linked definition of ‘opportunity’ is an ‘upside risk event’ variant of the ‘downside risk event’ definition. Joint use of these definitions implies risk and opportunity necessarily involve events (or conditions) which either happen or do not happen. That is, risk and opportunity are limited to ‘event uncertainty’ from an EP perspective, which involves unacceptable stealth assumptions which matter greatly. ‘Variability uncertainty’, ‘ambiguity uncertainty’, ‘capability-culture uncertainty’ and ‘systemic uncertainty’ concepts may overlap, but they collectively cover *much* *more* than just ‘event uncertainty’. Sometimes fundamental changes in the nature of the issues which need addressing become very clear if we replace an ‘event uncertainty’ basis for ‘risk’ with an EP nominal definition, in addition to order of magnitude increases in the scale and importance of the potential uncertainty involved.

If you understand the operational implications of the five portrayals of uncertainty, it will be obvious that a focus on risk associated with event uncertainty is seriously myopic, because it excludes the other four kinds of uncertainty. Basic problems remain even if advice linked to using an event-based risk concept urges concern for causes. Skilled users of event-based approaches may address causal uncertainty structures in great detail, but they may be blind to other crucial aspects of uncertainty. All risk management approaches which use framing assumptions limiting ‘risk’ to ‘event uncertainty’ need to be re-framed, and some associated tools need to be scrapped.

Further, ‘risk = probability x impact’ implies that ‘risk’ can be measured by the expected outcomes of possible events as defined by this equation, completely ignoring the variability uncertainty associated with events, never mind the variability uncertainty incorporating correlation (systemic uncertainty) and embedded ambiguity which the mean-variance formulation of relevant ‘risk’ developed by Harry Markowitz (1959) captures via variance and underlying covariance, and alternative working assumptions can address in other frameworks. Completely ignoring variability in the sense of possible departures from expected outcomes when defining risk should *never* be tolerated – it is almost beyond belief that anyone currently claiming to be a ‘risk expert’ could seriously support such an approach. Surprisingly, many ‘risk experts’ still seem to believe this is an appropriate starting position for considering risk, even in contexts where the variability aspects of risk matter enormously. Chapter 9 provides one key example.

Some risk management experts think that an event-based definition of risk requires a linked restrictive definition of ‘issues’, whenever a probability of one is involved. Some also think that an event-based definition of risk implies that *objective* probabilities of the events occurring are required – otherwise we are talking about ‘uncertainties’ with unknown or unreliable subjective probabilities. Those who subscribe to this latter view see ‘risks’ and ‘uncertainties’ as mutually exclusive, although some others see the terms ‘risk’ and ‘uncertainty’ as interchangeable equivalents.

This kind of limiting and confusing thinking about risk, opportunity, and uncertainty is clearly interconnected in complex ways, linked to underlying assumptions about what is meant by other key concepts – like probability.

The confusion which widespread support for these restrictive framing assumption positions adds to an already difficult set of planning concerns is demonstrably unhelpful. The inevitable result is unnecessarily inept treatment of risk, uncertainty and opportunities, usually adding to, compounding and confusing the nature of further reasons for widespread planning difficulties. Illustrative examples will be explored to clarify what is involved later.

### Complexity

Effective and efficient planning requires a ‘fit-for-purpose’ level and form of understanding of complexity associated with both the planning context and the planning process being used. Consider the very simple one-part nominal definition:

*‘Complexity’ means ‘lack of simplicity’.*

This definition is clearly circular in the same sense as ‘uncertainty’ defined as ‘lack of certainty’ is circular. Dictionary definitions of complexity mention ‘component parts’ and ‘complicated’. Experts with a focus on complexity often make distinctions between situations which are ‘complex’ and situations which are just ‘complicated’. For example, Gawande (2011) illustrates the difference using ‘putting someone on the moon is complicated’, but ‘bring up children is complex’. These are just different kinds of ‘complexity’ for present purposes, related to the number of relevant factors and the extent of their interactions. There is no reason why you should not make these distinctions using multiple-part elaboration definitions or working assumptions if and when doing so is useful. But for the purposes of this book, there are no obvious disadvantages to limiting the ‘overall definition’ of ‘complexity’ to a simple one-part nominal definition, with a provision for further working assumptions where this is useful.

Complexity is assumed to underlie uncertainty when we do not fully understand complexity, and complexity is viewed as pervasive and not easily characterised or separated from uncertainty. Uncertainty is assumed to underlie opportunity and risk.

### Some further nominal definitions

Having explored the meanings for three of the four crucial key words in considerable detail, followed by a relatively light touch approach to the fourth, we can now use a relatively light touch approach to generalise this nominal definition concept for six further key terms which need nominal definitions to clarify the discussion to follow.

Each of these further nominal definitions began as a simple plain English definition, used to capture associated technical definition concerns for many years. But each has now been carefully tested against dictionary definitions and common technical interpretations, to maintain as much simplicity as possible without being restrictive or excluding any useful nuances. The six further nominal definitions are:

1. ‘probability’ means ‘a subjective measure of likelihood which may embed data-based objective measures’,
2. ‘robustness’ incorporates ‘resilience’ and comparable concepts when they do not need separate treatment,
3. ‘scenarios’ are qualitative or quantitative analysis constructs,
4. ‘separable’ means ‘able to be separated’,
5. ‘synthesis’ incorporates ‘synergistic synthesis’ in the usual sense of going beyond a simple sum of the parts plus going beyond the current scope of analysis in an imaginative and creative manner whenever this is appropriate,
6. ‘analysis’ incorporates ‘synthesis’ in the broad sense just defined and includes understanding all key aspects of interconnectedness and context.

Restrictive technical definitions for any of these words should be avoided. You may prefer to view some of these further nominal ‘definitions’ as explicit working assumptions, not ‘definitions’ in the framing assumption sense associated with the four nominal definitions considered first. For example, I see the ‘probability’ definition above as a crucially important framing assumption, but the ‘robustness’ definition as a convenient working assumption. You or your organisation may want to add to these six.

It was convenient to provide these nominal definitions in the order used, but it is convenient to provide brief clarification of each working bottom-up.

**‘Analysis’** explicitly avoids precluding any specific approaches or separating analysis from linked synthesis in terms of the broad interpretation of synthesis just defined. Sometimes it will be useful to use the word synthesis separately or in conjunction with analysis for emphasis, usually implying a broad interpretation of synthesis without being tedious by repeatedly saying so.

**‘Synthesis’** in the broad sense defined above is usefully illustrated with a simple example. You might arrange an afternoon business meeting of importance several weeks in advance in a city some distance away which you do not know. When you come to plan the trip to get there, you might discover your initial base plan for travelling during the morning of the meeting day involves unanticipated complications which could lead to you being late for the meeting. Train or airplane leg ‘A’ followed by a connection to ‘B’ and then ‘C’ might involve a significant chance of a failed connection, for example. Standard analysis approaches to contingency planning might involve making plans to tackle leg ‘C’ differently depending on the outcome of legs ‘A’ and ‘B’. But contingency planning approaches using analysis incorporating a broad view of synthesis might suggest going a day early, perhaps spending time doing some work that could be particularly productive while you have no other distractions, or perhaps going several days early and making a mini-holiday of the extra time in an unfamiliar city or nearby countryside, possibly taking someone with you so you can both enjoy the opportunity. An imaginative creative leap well beyond the initial analysis is triggered by a problem initially addressed via conventional analysis and synthesis. This approach to synthesis is a core characteristic of EP in all contexts. Chapter 5 provides more extensive examples, as do Chapters 6 to 10.

**‘Separable’** adopts the basic dictionary plain English interpretation ‘able to be separated’, but it also facilitates explicit use of a much broader technical definition than usual, of the form ‘a working assumption implying a sequential treatment selected to make interdependence assumptions which are as appropriate as possible’. For example, if an iterative process has sequential component phases 1 … n, phase separability implies that the phase partitions are useful because different kinds of issues are conveniently separated in this decomposition structure, and it also implies that the ordering reflects useful precedence relationship assumptions. The first pass through the process assumes that phase 1 can be addressed without knowing the outcomes from phases 2 … n, the first pass through phase 2 can be addressed knowing the outcome of phase 1 but not the outcome of phases 3 … n, the first pass through phase 3 can be addressed knowing the outcome of phases 1 and 2 but not the outcome of phases 4 … n, and so on. A second complete pass can readdress phase 1 knowing the first pass outcomes for all n phases, in some circumstances in effect just addressing marginal changes. Provided an iterative process converges to a stable overall assessment, full interdependence between all the issues addressed in all the phases is a viable framing assumption. Separability is just a working assumption, which employs a structure chosen for effectiveness and efficiency. The underlying basis of this interpretation is a form of pairwise separability used throughout this book. A ‘what needs to be done’ intuitive understanding developed via examples will be provided for all readers as needed as this book progresses. For those interested in more ‘how to do it’ detail, the initial exploration in Chapman (1974 and 1975), based on Pearce (1964), is further developed and updated in Chapman and Ward (2002).

**‘Scenarios’** are usefully visualised using a wide range of approaches, some involving ‘quantitative’ interpretations (probability based), some involving purely ‘qualitative’ interpretations (no probabilities), as advocated by authors like MacNulty (1977), Schoemaker (1992 and 1995) and van der Heijden (1996).

**‘Robustness’** is defined in general terms to include ‘resilience’, and comparable concepts like ‘redundancy’, whenever it is useful to do so for simplicity and comprehensiveness. A concern for robustness in a very broad sense is central to an EP approach, as a key aspect of a ‘keep it simple’ perspective. Distinguishing concepts like resilience and robustness, or using several words when one will do, is not helpful much of the time, but sometimes helpful distinctions can be made. For example, there are times when it is useful to associate ‘robustness’ with effective testing of prior planning analysis in a general sense, to tease out any working assumptions which are not appropriate, including assumptions driving a lack of resilience, but also associate ‘resilience’ with plans which embody a post-implementation ability to respond to circumstances which could not have been anticipated. This may help to clarify how resilience will be used as part of an overall strategy to achieve robustness.

**‘Probability’** is a tool for quantifying *some* uncertainty *when this is useful*, using a modern decision analysis view of subjective probabilities for framing assumption purposes which embeds anobjective probability basis when this is appropriate. It is important to recognise there is no such thing as an objective probability for making decisions if anything other than the data is relevant and any of the statistical analysis assumptions may not be strictly true. For example, the future may not replicate the past associated with the available data. Using an objective data-based probability involves a statement of belief, whether or not decision makers and their analysts care to recognise this is the case. It is also important to recognise that no data may be available, if data is available its quality may be debatable, and it may not be cost effective or feasible to use data in the time available. While some people like a zero to one scale for probabilities all of the time, others find a percentage scale or a ‘1 in x chance’ or a ‘return period of y years’ useful some of the time, and whatever approach is judged most appropriate for the context is the working assumption adopted by this book.

### Nominal definitions as a whole

The high level of clarity sought when addressing these ten general (unrestrictive) nominal definitions usefully clarifies the use of these words in the rest of this book. But this does not mean that the use of these words cannot be given alternative interpretations using clearly articulated assumptions whenever this is helpful. Provided the differences do not lead to different decisions they do not matter. However, if they do lead to different decisions you need to test the implications, looking for stealth assumptions that really matter. What *always* matters is framing assumptions which are as general as possible, plus working assumptions which are fit-for-purpose, with clarity about the role and implications of all relevant assumptions.

## Risk efficiency, clarity efficiency and opportunity efficiency

Three interdependent ‘efficiency’ concepts frame an EP approach to overall planning efficiency and effectiveness. Because routine repetition of ‘efficiency and effectiveness’ would be tedious, this book follows the convention established by the Markowitz ‘risk efficiency’ term, explicitly embedding ‘effectiveness’ as well as efficiency concerns in each of the three EP terms:

1. ‘risk efficiency’,
2. ‘clarity efficiency’,
3. ‘opportunity efficiency’.

Consider ‘risk efficiency’ first, because in the context of this section risk efficiency is the simplest place to start to understand all three EP efficiency concepts.

### Risk efficiency

As explained in the Overview when discussing Chapter 3, the use by BP of an approach to planning North Sea projects based on risk efficiency delivered lower expected costs, *plus* less risk, *plus* reliable estimates of project cost and duration, *simultaneously*. Risk efficiency is also the basis of many other planning benefits explored in Chapter 3 in relation to IBM UK and the UK MoD, elaborated in Chapter 4 and all Part 2 chapters.

From an EP perspective:

*‘Risk efficiency’ means a minimum level of risk*

*for any given level of expected reward.*

The term ‘risk efficiency’ is usually associated with Markowitz and a mean-variance interpretation of risk, but EP requires a much more general interpretation.

To begin to appreciate what risk efficiency means in generalised EP terms, it can be useful to start with the common simplifying working assumptions in a Markowitz portfolio analysis context:

1. only one attribute is of interest, referred to as ‘reward’,
2. reward is measured by total profit,
3. we can estimate probability distributions for all of the components of expected profit and associated risk,
4. all of these probability distributions are Normal (Gaussian) and unconditional.

Given these working assumptions, ‘expected reward’ is a ‘best estimate’ of what should happen on average, formally defined as the first moment about the origin of the associated probability distribution. Overall portfolio expected reward can be expressed as a linear function of component investment values multiplied by their expected rewards per monetary unit invested. ‘Variance’ associated with ‘expected reward’ is a suitable surrogate measure for risk associated with any given expected reward, because Normal distributions are fully defined by their mean (expected value) plus their variance (a measure of spread relative to the mean, formally defined as the second moment about the mean). That is, as the variance gets bigger, the probability of any given downside departure from the expected value increases, so ‘risk’ in terms of the EP nominal definition unambiguously gets bigger. Overall portfolio variance involves a quadratic functional form for combining all component variance and covariance terms.

Chapter 3 will explore approaches which are simpler *and* less restrictive assuming that one measurable reward attribute is relevant, maintaining only the first of these four working assumptions. Chapter 4 will start to explore the more difficult situations when multiple attributes are involved. All further chapters will build on this basis, with some particularly complex and contentious multiple attribute concerns addressed in Chapters 8 and 9.

### Clarity efficiency

Now consider the second aspect of EP efficiency – ‘clarity efficiency’, a focal point for an EP implementation of ‘enlightened simplicity’.

*‘Clarity efficiency’ means a minimum level of planning cost/effort*

 *for any given level of relevant clarity.*

The word ‘clarity’ in this book can be given a plain English meaning if the context is a general discussion, but if the context is the role of ‘clarity efficiency’ or the ‘strategic clarity’ and ‘tactical clarity’ concepts discussed shortly, an associated working assumption is ‘clarity’ means ‘relevant insight which can be shared’.

If relevant understanding of key issues of concern which require a degree of common understanding cannot be communicated effectively to all those who need to understand, we do not have ‘clarity’ in a ‘clarity efficiency’ sense.

Achieving a higher level of clarity while simultaneously expending less planning cost/effort and then making sure that the trade-offs between clarity achieved and the marginal planning cost/effort of more clarity is appropriate is what enlightened simplicity is about, a central feature of an EP approach.

The practical issues requiring confrontation include:

1. clarity is not a single attribute,
2. most of the relevant multiple attributes are not measurable,
3. what ‘relevant clarity’ implies is complex in a dynamic sense.

Chapters 3 and 4 deal with these difficulties by carefully ordering the issues addressed to keep the discussion as simple as possible. Part 2 confronts the practical implications of these difficulties in a range of contexts, systematically exploring how non-measurable multiple attributes and other aspects of the complexity involved can be accommodated with a minimal level of planning cost/effort, tailoring the approach to the contexts involved.

The dynamic nature of the complexity associated with ‘relevant clarity’ arises because the clarity which is relevant depends upon what our planning process is trying to achieve, and our understanding of our planning goals may evolve as the planning process proceeds in a manner which is partially but not wholly predictable. For example, in the concept stage of a project we need initial clarity about the robustness of the business case for proceeding with a project concept, and we can predict approximately how that robustness will grow if there are no really big surprises as project definition proceeds. However, big surprises are both frequent and inherently unpredictable. Chapters 3 and 4 will explore some predictable aspects in a preliminary way, further developed in all later chapters. Chapter 5 will initiate exploration of some unpredictable aspects which the rest of Part 2 builds on.

### Opportunity efficiency

The third aspect of EP efficiency, ‘opportunity efficiency’, is formally defined in terms of three key component assumptions.

*‘Opportunity efficiency’ requires:*

*risk efficiency with respect to all relevant attributes,*

*plus appropriate trade-offs between risk and reward for each attribute,*

*plus appropriate trade-offs between all attributes.*

‘Opportunity efficiency’ is clearly a very complex composite concept. But it would be unacceptably naïve not to face this complexity and deal with all aspects of it to the best of our ability.

One aspect of this complexity is clarified and amplified if we recognise that clarity efficiency attributes are directly relevant and we also insist upon the explicit working assumption:

*Both ‘relevant attributes’ and ‘appropriate trade-offs’*

*should be judged by all parties with legitimate concerns.*

Opportunity efficiency builds on both the risk efficiency and the clarity efficiency concepts, neither of which is simple and straightforward. Opportunity efficiency can be seen as the basis of effectiveness as well as efficiency, in the sense that achieving both effectiveness and efficiency in an appropriately balanced manner with a balance that may vary over time is the same thing as achieving opportunity efficiency. Opportunity efficiency can also be seen as a crucial way of viewing ‘best practice’, in the sense that opportunity efficiency is an operational definition of what ‘best practice’ *ought* to mean from an EP perspective.

It would be surprising if you did not have an initial intuitive feel for most aspects of what opportunity efficiency involves. If you are mathematically inclined, intuitively it is a kind of ‘universal optimality’ concept, going beyond conventional ‘global optimality’ concepts used by mathematicians in the sense that it considers trade-offs between the cost of seeking optimality and the virtues of ‘satisficing’ behaviour and the use of ‘coping strategies’ in a stochastic framework which goes beyond the limitations of probability distribution representation of uncertainty in a quantified form. If you are not mathematically inclined, you may find the rejection of conventional ‘global optimisation’ in favour of a practical emphasise driven by clarity efficiency usefully encouraging, and the decomposition structure intuitively attractive.

However, it would also be surprising if you were not concerned about the multi-faceted nature of opportunity efficiency, and the operational implications of the implied approaches to seeking opportunity efficiency in practice. These concerns will be addressed – that is what this book is about. But there is no easy direct route to resolving your concerns – they will have to be addressed gradually as this book progresses.

The essence of what this book is about is using opportunity efficiency as an operational approach to achieving best practice, with a view to avoiding the common ambiguity if not outright confusion about what ‘best practice’ and ‘good practice’ actually mean. We all know ‘very bad practice’ when we see it, if it is bad enough. Most of us know ‘very good practice’ when we see it, if it is good enough. What is much more difficult is deciding what ‘best practice’ *ought* to mean in advance in the context of a particular organisation, and then getting a group of people to agree to pursue it with a common vision and shared conceptual and operational tools, with effective leadership from the top, the middle and the bottom as appropriate.

To reinforce your initial intuitions, to outline in broad terms where we are going, and to indicate why getting there matters, consider a one paragraph overview of a few clues.

Clarity about what is meant by ‘risk appetite’ in terms of all relevant attributes can be an important part of opportunity efficiency. Relevant concerns include everyone in an organisation understanding why an aggressive approach to financial risk up to a limit determined by each individual’s role may be both sound and essential practice, but an aggressive approach to reputation risk will not be tolerated. In terms of key trade-offs between attributes, important concerns may include issues like appropriate trade-offs between expected levels of environmental security, expected levels of safety in terms of fatalities and injuries, expected levels of cost or profit, and all associated potential departures from expectations. At simpler levels opportunity efficiency addresses trade-off questions like ‘how much is it worth to finish a project earlier than currently expected, perhaps by increasing the cost, or perhaps by reducing the functionality of what is being delivered?’ At the simplest level, the concern may be ‘if all we want is an unbiased estimate of an activity’s duration to plan the rest of a project, what does a minimum clarity approach to estimation involve, and what kinds of additional clarity might be worthwhile if they were available for a modest level of additional effort?’

This very simple overview of what opportunity efficiency addresses is not going to resolve all of your concerns, and there is no simple way to do so, because opportunity efficiency is an inherently complex concept. However, Chapters 3 and 4 will explore some basic aspects successfully addressed by organisations like BP International and IBM UK in the 1970s, 80s and 90s, successfully employed by many other organisations during that period and since, along with some key complexities, all further developed in later chapters. *Achieving* opportunity efficiency and *achieving* enlightened planning are synonymous, involving the same goals viewed through a different lens. Both need understanding developed in a layered manner. The rest of this book will gradually build your understanding of opportunity efficiency, layer by layer, as an integral part of building your understanding of EP.

You may find it helpful to see opportunity efficiency as another composite ‘gateway concept’, at a higher level of composition than the four Fs discussed at the outset of this chapter. Risk efficiency and clarity efficiency are component gateway concepts.

## Framing multiple objective trade-off approaches

One section in Chapter 4 briefly outlines the nature of ‘goal programming’ as a general *conceptual* basis for framing all multiple objective planning approaches. Goal programming uses a mathematical programming approach to providing a consistent basis for assessing alternative operational procedures for achieving opportunity efficiency trade-offs using ‘shadow price’ and ‘shadow cost’ concepts. Mathematical programming tools are never used directly in this book, and those who are not mathematically inclined should be comfortable with the Chapter 4 treatment of this issue and the way it is used throughout this book. However, shadow price and cost concepts are crucial components of an EP understanding of both simple and complex trade-offs in opportunity efficiency terms, another important gateway concept or portal which provides a very general conceptual basis for simple operational tools which all target readers need to understand.

Risk efficiency in Markowitz mean-variance terms can be interpreted in terms of a goal programming perspective to address the trade-offs between the criteria ‘expected reward’ and ‘reward risk’ when reward involves a single attribute like profit – two criteria associated with a single attribute. But more general multiple attribute contexts can also be addressed.

One important example of the role of this goal programming perspective is the EP approach to discounted cash flow assessments outlined in Chapter 7. Common practice approaches to discounted cash flow analysis are usually based on *framing* assumptions that imply a single ‘hurdle rate’ test associated with the discount rate is appropriate. In Chapter 7 a case is made for a multiple ‘hurdle rate’ test approach within a simple iterative procedure which uses a discount rate based on the expected cost of capital and avoids embedding consideration of any other criteria in the discount rate. It argues that it is a serious error to embed the implications of risk premiums or opportunity costs associated with other possible uses for the capital in the discount rate. Multiple hurdle rate tests in an iterative process are required for all concerns beyond an expected return which covers the expected cost of capital. A single hurdle rate discounting test is often seriously misleading, even if return on capital is the only concern. For example, including an inappropriate ‘risk premium’ in the discount rate can drive organisations away from key opportunities involving very low risk long payoff profile projects, towards very high risk ‘quick-buck’ projects, the exact opposite of what is intended and needed.

HM Treasury (2003) explicitly recognised the multiple hurdle rate test requirement in a public sector context, the first publication to do so that I am aware of. Chapman, Ward and Klein (2006) clarifies the goal programming perspective underlying the 2003 HM Treasury position in a public sector context, using disposal of nuclear waste by UK Nirex as the example context, and Chapman and Ward (2011) extends the approach to private sector decisions in the way it is used for a private sector water and sewage utility in Chapter 7.

Chapter 9 employs the same underlying goal programming conceptual framework approach, plus a ‘revealed preference’ interpretation of trade-offs, leading to a more complex but still practical operational approach, the most complex level of generalisation of this framework used in this book.

Most Part 2 chapters use simpler interpretations within the same overall conceptual framework, beginning with simple conventional opportunity cost approaches in Chapter 5. Shadow price and cost concepts are a generalisation of ‘opportunity cost’ concepts in common widespread use long before the mathematical programming basis of goal programming was developed in the 1950s.

This very general framing of all multiple objective approaches provides EP with a coherent framework for assessing different operational procedures in different contexts, to achieve clarity efficiency as well as risk efficiency and overall opportunity efficiency. This avoids a range of common practice pitfalls. The discounting issues in Chapter 7 and the trade-offs between money, lives and injuries in Chapter 9 are the most obvious examples of common practice pitfalls discussed in this book, but there are further less obvious implications.

## Stochastic modelling framework choices

Chapter 3 introduces the use of a very simple ‘histogram and tree’ (HAT) framework for understanding all of the individual sources of uncertainty which are modelled in quantitative (probabilistic) terms for stochastic modelling purposes in this book. The HAT framework facilitates thinking about uncertainty in continuous variable histogram forms or discrete variable probability tree forms, using graphs or tables or both in ways most people can follow fairly easily even if they are not numerically inclined. It makes the use of parametrically defined specific probability distribution choices an option when this is clarity efficient, but it avoids ever making them a required framing assumption.

Chapter 4 uses a single section to explain how this framework can deal with multiple sources of uncertainty involving a range of dependence structures using discrete probability arithmetic approaches. These approaches facilitate understanding stochastic modelling using numerical examples portrayed by graphs and linked tables which are kept as simple as possible in Part 2. This section also briefly explains how standard Monte Carlo simulation procedures can be employed to produce comparable results, and the role of other computational approaches and related conceptual frameworks.

This HAT conceptual and operational framework is another EP tool which contributes to the opportunity efficiency of the approach as a whole, helping to overcome common practice shortfalls like ineffective treatment of dependence and weak treatment of sensitivity analysis by both analysts and the managers using their analysis. Without a HAT framework many people are confused about how to choose between alternative approaches to stochastic modelling, with competing claims from advocates of components of a HAT approach which can seem incompatible alternatives, like decision trees, methods based on moments, and Monte Carlo simulation. All target readers need a basic common understanding of clarity efficient and opportunity efficient option choices, even if they are senior managers who are users of analysis provided by others and they are usually not interested in analysis details.

## Risk management failures as part of a very complex mess

Understanding what opportunity efficiency involves, why it matters, and how to achieve it, is not easy. However, ignoring the implications is not a good idea, and although failing to achieve opportunity efficiency is frequent, this need not be the case.

To illustrate why the pursuit of opportunity in an opportunity efficiency sense is worth the effort, whatever your role and organisational context, consider the nature of the case against a common practice risk management view of ‘risk’ which goes well beyond specific risk management technical problems in areas like the Chapter 9 safety concerns, taking a much wider and deeper view.

Components of this generalised perspective are developed in *every* Part 2 chapter. For example, generalisation of risk efficiency in this book goes well beyond the reasonably obvious generalisations of a traditional ‘mean-variance’ approach like the use of ‘stochastic dominance’. It includes the need for a clear view of *all* appropriate objectives in multiple attribute terms in all contexts. It also includes addressing objectives which cannot be measured in any direct sense, or are not worth trying to measure. Further, it includes recognising that sometimes making decisions with a focus on expected cost, revenue or profit values, *explicitly ignoring all associated variability and risk*, may be opportunity efficient, *any* effort devoted to risk management in these circumstances wasting time and money as well as distracting people from what really matters.

Chapter 5 reflects this perspective using a simple ‘risk management’ perspective which does not even employ the term ‘risk management’ – it is simply not relevant. Chapter 6 uses a more sophisticated ‘risk management’ perspective, but the term ‘risk management’ is still not relevant. Chapter 7 addresses dissolving an existing ‘project risk management’ department, to formally integrate a transformed version of what its members currently do into the toolset, skillset and mindset of a single fully integrated Projects Group team. This integrated team treats ‘estimating’, ‘risk management’ and ‘planning driven by a search for opportunities’ as inseparable, because the ‘problems’ needing confrontation involve a ‘mess’ of interconnections which are too complex to address successfully in any other way. The associated ‘mess’ becomes more complex in Chapter 8, well beyond the scope of most ‘Enterprise Risk Management (ERM)’, still more complex in terms of some particular issues in Chapter 9.

Those insisting on using *framing* assumptions for risk management which are too narrow should be *much more* vigorously publically criticised than is currently the case, with *all* the relevant people whose concerns are impacted understanding why ‘risk management’ is an issue which cannot be left to the ‘risk management experts’ in specific areas. But ‘the mess’ involving ‘risk management’ is by no means attributable to risk management experts on their own – it is also attributable to everyone else who has failed to see that risk management issues are part of a much bigger mess, the tip of a proverbial iceberg. The volume of ice underwater represents the extent of further more general concerns which go well beyond a collective view of all common practice risk management concerns, as illustrated in all Part 2 chapters.

## The good or bad behaviours and practices mantra

An EP approach uses the general notion that ‘bad practices and behaviours can drive out good practices and behaviours unless good practices and behaviours are promoted and protected and bad practices and behaviours are contested and constrained’.

As a simple example, an organisation setting up a bidding process to deal with contractors providing or modifying a corporate asset needs to ensure that the ‘good’ potential contractors have a level playing field, and the bidding process does not favour ‘bad’ potential contractors lacking expertise or ethics. This is part of a broader concern for good client-contractor relationships from a client perspective. If the least competent and biggest liar wins, that is in part a consequence of bad planning by the client.

The interpretation of this notion as illustrated by this simple example can be generalised, and its implications extended in several ways. For example, if ‘good’ contractors keep losing, ‘good’ contractors may need to take collective action to create a level playing field, or do much more to help their potential clients become more enlightened, or both. In some cases ‘good’ contractors and ‘good’ clients may need to take collective political action, to ensure that market places are not permanently damaged by unscrupulous players who a majority of the population would be better off without. In some contexts this kind of response by the suppliers or customers of goods or services may drive important regulatory and legal changes. In general, markets which involve a level playing field are not a simple matter. An EP approach can help to address the complexity in a clarity efficient and opportunity efficient manner, explored briefly in later chapters.

Generalising this notion means encouraging good behaviours and practices in any one of a diverse variety of ways which are central to the EP concept as a whole – including making effective and efficient use of good teamwork, appropriate collaboration, and corporate understanding of the difference between good management and good luck, bad management and bad luck. The role of this form of generalisation is important enough to state the general notion as an explicit EP mantra. For simplicity we can contract ‘good behaviours and practices’ to ‘the good’, with a comparable interpretation of ‘the bad’. The ‘good or bad behaviours and practices mantra’ can then be stated simply and concisely as:

*Promote and protect the good, contest and constrain the bad.*

What is ‘good’ and ‘bad’ is of course debatable, but this does not make the issues unimportant, it just increases the difficulties involved which makes the need for an effective approach more important.

A mantra of this kind can be viewed as a framing assumption. It is a framing assumption which is well-worth keeping in mind in a world with an uncomfortably high level of bad behaviours and practices. It is also worth bearing in mind that a less obvious but sizable proportion of the players at both individual and corporate levels are very open to being motivated to deliver good behaviours and practices, and very willing to respond positively to effective promotion and protection of the good, provided the bad are effectively contested and constrained.

## Two further enlightened planning mantras

‘KISS’ is commonly interpreted as ‘keep it simple, stupid’. A mantra which is central to enlightened planning is ‘the redefined KISS mantra’:

*Keep it simple systematically.*

This redefinition was Stephen Ward’s idea, to capture systematic use of his ‘constructive simplicity’ concept as it was evolving towards the EP concepts of enlightened simplicity and opportunity efficiency embracing risk efficiency and clarity efficiency in our early work together. Our joint project risk management publications have used it for many years. It is central to the clarity efficiency concept and the opportunity efficiency concept as a whole.

We all have a natural desire to keep it as simple as possible, which induces a natural bias to oversimplify *even if* we avoid a simplistic ‘keep it simple, stupid’ approach and ‘keep it simple systematically’ in a clarity efficiency sense. To emphasise the role of opportunity efficiency, another very useful mantra is ‘the second mile mantra’ in the form:

*Always go the second mile in terms of erring on the side of more clarity*

*when making decisions with important implications,*

*making a point of avoiding the ‘wrong level’ of simplicity*

*as an inherent aspect of avoiding the ‘wrong kind’ of simplicity*

*when misjudgements may have serious consequences.*

Part of the rationale is a practical need to deal with the asymmetric implications of too little versus too much clarity when trying to assess an appropriate trade-off between further clarity and the associated cost/effort. Viewing the ‘wrong level’ of simplicity as an inherent aspect of the ‘wrong kind’ of simplicity is a useful general reminder we need opportunity efficiency as well as clarity efficiency as part of the ‘right kind’ of simplicity.

## Strategic clarity and tactical clarity

Now consider two very high level composite concepts relevant to operations, project and corporate planning contexts from two closely coupled but quite different perspectives.

The two concepts are ‘strategic clarity’ and ‘tactical clarity’. These two concepts have an inherent complexity driven by their composite nature. Like opportunity efficiency, they require gradual clarification as this book progresses. But they need understanding in terms of overview definitions before the end of this opening chapter.

The two perspectives are your personal perspective and the perspective of your organisation, using ‘your organisation’ as a convenient contraction of ‘any organisation of interest to you, now or in the future, with a focus on one you are currently embedded in if this is relevant’.

*‘Strategic clarity’ from the perspective of your organisation means ‘everyone in the organisation has appropriate clarity (shared understanding) about “what needs to be done” by themselves and by those they interact with in all relevant teams to achieve all relevant corporate goals in EP terms’.*

*‘Tactical clarity’ from the perspective of your organisation means ‘everyone in the organisation has appropriate clarity (shared understanding) about “how to do it” for all the common ground EP tasks which have to be understood for strategic clarity plus further “how to do it” toolsets, skillsets and mindsets for all the tasks they have to take responsibility for or assist with’.*

*‘Strategic clarity’ from your perspective means ‘as a target reader you have appropriate strategic clarity about “what needs to be done” including key common ground “how to do it” concerns relevant to all your roles in your organisation’.*

*‘Tactical clarity’ from your perspective means ‘as a target reader you have appropriate clarity about “how to do it” for all the common ground EP tasks which have to be understood for strategic clarity plus further “how to do it” toolsets, skillsets and mindsets for all the tasks you have to take responsibility for or assist with’.*

These terms are bound to seem even more ambiguous than opportunity efficiency at this stage, in part because they are even higher order gateway concepts than opportunity efficiency. But by the time you finish Part 1 they should be starting to become useful shorthand labels or ‘handles’ for what this book aims to provide.

‘Strategic clarity’ is explored in this book in terms of key ‘what needs to be done’ issues which need a holistic perspective appropriately shared by all members of an organisation. Each organisation will have to address their own complete set of ‘what needs to be done’ concerns to achieve overall strategic clarity, drawing on their current strengths and confronting their most pressing weaknesses. Very different organisations will need perspectives which may have novel and unique features. One vision of strategic clarity will not fit all organisations, and your personal vision of strategic clarity will have to depend upon your roles within an organisation as well as your experience and knowledge to date and your career plans for the future. The focus of this book is providing a strategic clarity concept which facilitates adaptation to the context as needed.

‘Tactical clarity’ as explored in this book is about key ‘how to do it’ issues which need a holistic perspective in order to understand relevant strategic clarity concerns. Strategic and tactical clarity concerns are not separable – they involve complex overlaps and interdependences. If people do not have an overview understanding of what is involved in ‘how to do it’ terms in some key areas they will not understand ‘what needs to be done’. But each of the key ‘how to do it’ areas explored in this book involve many further issues which experts in these areas will have to address.

Put slightly differently, this book’s approach to strategic clarity is as comprehensive as possible, while its focus on tactical clarity is limited to the common ground essential to strategic clarity, avoiding tactical clarity detail which target readers do not need to understand for strategic clarity.

As an illustrative example of what the rest of Part 1 aims to achieve in these terms, Chapter 3 begins with a very simple ‘low clarity’ approach to unbiased clarity efficient estimates of how long a project activity might take, gradually adding more clarity for a minimal increase in cost/effort. It then begins to explore interdependent ‘efficiency’ issues, involving risk efficiency, clarity efficiency and opportunity efficiency concerns. This ‘estimation-efficiency spectrum’ is explored throughout Chapter 3 maintaining working assumptions which keep the discussion as simple as possible. Chapter 4 addresses relaxing some of these assumptions. By the conclusion of Chapter 4 you should understand the basis of strategic clarity, including requisite tactical clarity. The focus of Chapters 3 and 4 is estimating and closely coupled efficiency concerns which everyone involved in providing estimates or using estimates ought to have in any organisation aspiring to strategic and tactical clarity. This Part 1 focus is relevant to all target readers, and each chapter in Part 2 will enrich this understanding in different ways for very different contexts and kinds of organisations.

Your perspective and your organisation’s perspective on strategic and tactical clarity are ‘gateway concepts’ at a very high level of composition. If you have strategic clarity you have an operational understanding of all the gateway concepts like opportunity efficiency and the four Fs which are needed to make a significant contribution to your organisation in EP terms, but you may need a lot more tactical clarity in particular areas of responsibility.

Your organisation’s needs are much more complex than your needs, because they involve capability-culture issues for the organisation as a whole.

For some readers who usually associate ‘strategy’ exclusively with corporate planning there may be a risk of possible confusion because strategic clarity plus tactical clarity concepts are being used in project and operations planning contexts as well as corporate strategy contexts. However, we have to think both strategically as well as tactically in *all* planning areas, so we cannot avoid confronting this complication. Indeed, organisations need both strategic and tactical clarity about the key interdependencies between corporate, project and operations planning to make an enlightened planning approach fully operational. In part this is demonstrated by the need to address bottom-up strategic planning in operations and project planning contexts, but it is also demonstrated in other ways throughout this book. You may find it useful to regularly remind yourself that ‘strategic clarity’ is about ‘what needs to be done’, while ‘tactical clarity’ is about ‘how to do it’.

## Systematic simplicity as a composite concept

‘Systematic simplicity’ is the basis of strategic clarity plus tactical clarity as you see it, as your organisation sees it, and as others see it, assuming that an appropriate variant of an enlightened approach to all operations, project and corporate planning incorporating a systematic approach to keeping it simple has been adopted. Enlightened planning including enlightened simplicity is my particular variant of the ‘systematic simplicity’ concept. You and your organisation may need your own versions of some of the conceptual and operational frameworks, including alternative terminology, adapting my advocated enlightened planning approach to better suit your context.

A ‘common ground’ term for the composite concept which defines what we are seeking from different but closely coupled perspectives is useful for several purposes. One key purpose is to emphasise that you and your organisation should feel free to tailor both conceptual and operational tools as well as their terminology to best suit your own context. Assuming this is done, we need a label for the implied common ground, and ‘systematic simplicity’ is my suggestion, because ‘keeping it simple systematically’ is at the core of any ‘best practice’ systematic approach to planning.

Further purposes will be explored later via the website discussed briefly at the end of this book, accessed via ‘enlightenedplanning.uk’ or ‘systematicsimplicity.uk’. These further purposes will involve ongoing adaptation and development of EP concepts using a shared view of the need to ‘keep it simple systematically’ as the starting point.

## A summary with linked inferences

A summary of why planning is usually vital but often difficult and frequently inept concludes this chapter, along with linked inferences about how EP can help to ease the difficulties and reduce the level of inept planning to more acceptable levels.

### Why planning is usually vital

For reasons initially explored in the opening two section on what this book means by the word ‘planning’ and the role of planning in different areas, it should be reasonably clear why some aspects of planning in formal terms are usually vital, as is related informal planning.

Consolidating these reasons with those touched on in later sections suggests the following:

1. Plans need common understanding by a significant number of people for a range of different reasons.
2. A lot of planning is done in different ‘silos’ for very good efficiency-driven reasons, but corporate effectiveness means interdependences need special care in terms of communication between components of formal planning process structures, as in the need to coordinate operations, corporate and project planning.
3. Governance and control as plans evolve and then get implemented is crucial, usually at several levels: project managers, boards, and regulators for example.
4. Organisational learning and knowledge capture as experience is gained is essential, usually at several different levels, with crucial common ground.

### Why planning is often difficult

You may have begun this book thinking that ‘what needs to be done’, and why it is often difficult, are reasonably obvious. But some new concerns may have surfaced already, and both new and familiar concerns involve difficulties that you may be able to address in new ways based on this book’s conceptual and operational tools.

Consolidating key issues raised in this chapter, reasons why planning is often difficult include the following:

1. Different people need a common understanding of plans, but their information needs and their perspectives and conceptual frameworks can vary significantly, depending upon their role. Ensuring that plans address the right questions on behalf of all the relevant players, and provide approximately correct unbiased answers in a suitable timeframe, is rarely straightforward.
2. People who work in silos can become acclimatised to working in separate bubbles with minimal communication between groups. Making sure that they collaborate effectively is crucial. All relevant people need to understand the full range of outcomes associated with sources of uncertainty others face which they may be able to help to manage for better overall corporate performance. This is usually easier said than done. However, the payoffs from doing so are huge, and there is no excuse for ignoring this or any of the other difficulties planning practice has to confront.
3. Testing working assumptions effectively while plans are being evolved by planners as well as during governance gateway stages prior to implementation of plans is rarely straightforward, and effective and efficient contingency planning to deal with working assumptions which may not hold is almost never straightforward.
4. Correctly inferring *exactly* what needs learning from experience, and capturing the knowledge that really matters, is inherently difficult.
5. Even if an organisation has a fully developed enlightened planning capability and culture, the collective implications of inherent difficulties can be very daunting.
6. Confusion caused by the multitude of conflicting and restrictive concepts and tools promoted by different interest groups involved in decision making and associated planning makes an inherently difficult situation significantly worse, and resolution of this self-inflicted set of difficulties in the near future is unlikely. Confusion about what ‘risk management’ ought to mean is just the tip of a very big iceberg, with all sorts of associated ‘growlers’ (little icebergs), like how can organisations distinguish between good luck and good management, bad luck and bad management.

### Why planning is frequently inept

Meeting all of the vital planning needs for organisations in a way which overcomes all of the important difficulties in a clarity efficient manner with the most appropriate trade-off levels between different clarity attributes and the effort/cost involved is demanding.

If *everybody* involved is not clear about what needs to be done in broad ‘big picture’ terms, plus their role in doing it, and how to execute their role, inept planning is frequently the almost inevitable result. Only one weak link in a chain will cause a chain to fail, but multiple people not having clarity in terms of this basic requirement will have a cumulative effect.

Some of the people involved have to ensure that appropriate risk-reward trade-offs are made using suitable decision making tools effectively and efficiently, coping with both good luck and bad luck positively within a culture which understands and pursues opportunity efficiency in an effective manner. If any key players providing these toolsets, skillsets and mindsets do not understand what needs to be done and how to play their role effectively, inept planning will be the consequence.

Achieving opportunity efficiency may be difficult, but it can be reasonably simple in some contexts. We have to seek simplicity systematically, and confront complexity when it really matters. This is at the heart of what ‘best practice’ ought to be about in effective operational terms. *If we pretend the issues facing us are simpler than they really are, this does not make them simpler. It just confuses people, and makes overcoming the results of this confusion an additional set of problems and concerns which could have been avoided.*

Some people are routinely hampered and confused by ‘best’ or ‘good’ practice standards based on assumptions which are inappropriately restrictive, seriously aggravating what are already inherently difficult planning concerns. In principle this problem is not necessary, but in practice until it is resolved you will have to confront the implications as best you can.

### Key inferences from this section and earlier aspects of this chapter

If your organisation is already highly effective and efficient, exploring the scope for your organisation finding further ‘opportunity efficiency’ improvements via an EP approach may provide only marginal benefits. But the reassurance that a fresh perspective on your organisation’s approach confirms that ‘best practice’ is already in place may still prove extremely useful. In particular, it may help to clarify what your organisation means by ‘best practice’, and its ability to maintain its current high levels of performance when circumstances change, including coping with a run of bad luck. Simply assuming your organisation does not need to test its capability and culture in this way may be very risky.

If your organisation is well short of ‘opportunity efficiency’, the scope for improvement will mean the effort involved in developing an effective opportunity efficiency driven EP approach more than pays for itself.

EP is not a ‘silver bullet’. But it offers a fresh perspective, based upon synthesising many tried-and-true perspectives. In particular, it offers a way forward which will resolve some of the unnecessary difficulties and easily avoidable sources of inept decision making for those prepared to invest the effort. If key players in an organisation make a collective effort to understand the overall EP agenda, they can begin implementing the key ideas that matter the most for their context with a view to what is easiest and most productive first. However, before they even make preliminary implementation plans, they need an understanding of the available possibilities. You may be able to help your organisation with this.

One way to look at this overall goal is you achieving strategic clarity in order to assist your organisation to achieve strategic clarity. You and everyone else will also need to acquire the further tactical clarity needed to play your roles, but strategic clarity needs to lead tactical clarity, so starting with a focus on strategic clarity is appropriate.

*There are ‘no free lunches’*. A significant investment in time and effort may be required to significantly enhance EP competence by individuals and organisations. But the payoffs can involve a massive return on the investment, with no significant risk. The risk associated with a failure to seek feasible competence enhancements may be very high, and it will not be understood if the issues are not addressed.

This chapter has laid part of the foundations for Parts 2 and 3, by introducing key concepts which frame the recommended approach to planning at an overview level, as a first step in explaining what enlightened planning addresses and involves.

This chapter has also provided brief initial outline answers to the questions ‘why is planning usually vital but often difficult and frequently inept?’ You might reasonably see these initial answers as little more than the source of a set of further questions which need much more developed answers. But the complex interdependency of the issues to be considered in a layered manner in following chapters makes this inevitable.

One aspirational target for this chapter was encouraging you to pursue more developed answers to the new questions raised by reading the rest of this book. Even if you ‘daunt easily’, it is important to avoid being too daunted by the scope of the issues which need to be addressed, the complex interdependencies involved, and the combined length of the remaining ten chapters. You will find it useful to develop a full understanding of the ‘what needs to be done’ aspects of strategic clarity. Difficulties understood and overcome are transformed into opportunities, and the processes involved can be very satisfying. Difficulties misunderstood or ignored do not go away. They simply become chronic liabilities and threats, ongoing sources of anxiety, possibly leading to disaster.

# References

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Ackoff, R. L. (1974) *Redesigning the Future*. John Wiley and Sons, Chichester.

Ackoff, R.L. and Sasieni, M.W. (1968) *Fundamentals of Operations Research*. John Wiley and Sons, New York.

AIRMIC/ALARM/IRM (2010) *A structured approach to Enterprise Risk Management (ERM) and the requirements of ISO 31000*. Association of Insurance and Risk Managers (AIRMIC). Association of Local Authority Risk Managers (ALARM), Institute of Risk Managers (IRM), London.

Ambrose, S.E. (1994) *D-Day, June 6, 1944: The Climatic Battle of World War II*. Touchstone, New York.

Ansoff, H.I. (1984) *Implanting Strategic Management*. Prentice-Hall International, Englewood Cliffs, NJ.

APM (1997) *PRAM Project Risk Analysis and Management Guide*. Association for Project Management (APM), Norwich.

APM (2004) *PRAM Project Risk Analysis and Management Guide,* second edition. Association for Project Management (APM), Norwich.

Baker, G. (2018) *US capitalism: not dead yet.* The Times, 27 October, Saturday review, 14.

Becker, H.S. (1983) Scenarios: a tool of growing importance to policy analysts in government and industry. *Technological Forecasting and Social Change*, 23, 95-120.

Biggs, J. and Tang, C. (2011) *Teaching for Quality Learning at University: What the Student Does*. Society for Research into Higher Education & Open University Press, McGraw Hill, Maidenhead.

Black, W. (2017) *Originals: How non-conformists will ultimately disrupt the world of Risk Management*. Downloaded from <https://www.linkedin.com/pulse/orginals-how-non-conformists-ultimately-disrupt-world-warren-black>, 12 May 2017.

Boehm, B. and Turner, R. (2003) Using risk to balance agile and plan-driven methods. *Computer*, 36(6), 57-66.

Boehm, B. and Turner, R. (2004) Balancing agility and discipline: evaluating and integrating agile and plan-driven methods. *Proceedings of the 26th International Conference on Software Engineering.*

Byrne, L. (2017) *Tech Kings must learn from our great entrepreneurs.* The Times, 10 October, 26.

Carne, M. (2017) *The state of rail*. Letters to the Editor, The Times*,* 14 January, 26.

Carroll, L. (1865) *Alice’s Adventures in Wonderland*, commonly contracted to *Alice in Wonderland*, Lewis Carroll being the pseudonym of Charles Lutwidge Dodgson. Use the web for a range of current publishers.

CCRM (2011) *Final Report on the Investigation of the Macondo Well Blowout.* Deepwater Horizon Study Group (DHSG) of the Centre for Catastrophic Risk Management (CCRM), The University of California at Berkeley, available online as a pdf.

Chapman, C.B. (1974) Modular portfolio selection: an introduction, in Dickinson, J. P. (editor), *Portfolio Analysis: Book of Readings*. Saxon House/Lexington Books, Farnborough.

Chapman, C.B. (1975) *Modular Demand Analysis: An Introduction in the Context of a Theoretical Basis for Consumer Demand Analysis*. Saxon House/Lexington Books, Farnborough.

Chapman, C.B. (1979) Large engineering project risk analysis. *IEEE Transactions on Engineering Management*, EM-26, 78–86.

Chapman, C.B. (1988) Science, engineering and economics: OR at the interface. *Journal of the Operational Research Society,* 39(1), 1-6.

Chapman, C.B. (1992) *Risk Management: Predicting and Dealing with an Uncertain Future*. Exhibit #748, Province of Ontario Environmental Assessment Board Hearings on Ontario Hydro's Demand/Supply Plan, submitted by the Independent Power Producers Society of Ontario, 30 September.

Chapman, C.B. (1992b) My two cents worth on how OR should develop. *Journal of the Operational Research Society*, 43(7), 647–664.

Chapman, C.B. (2002) Constructively simple probabilities: taking the guesswork out of risk management. Eleventh Annual Symonds Lecture in Association with the Health and Safety Board of the Institution of Civil Engineers (ICE), London.

Chapman, C.B. (2006) Key points of contention in framing assumptions for risk and uncertainty management. *International Journal of Project Management*, 24, 303-313.

Chapman, C.B. (2012) Assessing the proposal. Chapter 3 in Williams T. M. and Samset, K. (editors) *Project Governance: Getting Investments Right*. Palgrave Macmillan, Basingstoke.

Chapman, C.B. and Cooper, D.F. (1983) Risk engineering: basic controlled interval and memory models. *Journal of the Operational Research Society*, 34(1), 51–60.

Chapman, C.B. and Cooper, D.F. (1983b) Parametric discounting. *Omega—International Journal of Management Science*, 11(3), 303–310.

Chapman, C.B. and Cooper, D.F. (1985) A programmed equity redemption approach to the finance of public projects. *Managerial and Decision Economics*, 6(2), 112-18.

Chapman, C.B., Cooper, D.F. and Cammaert, A.B. (1984) Model and situation specific OR methods: risk engineering reliability analysis of an L.N.G. facility. *Journal of the Operational Research Society*, 35, 27–35.

Chapman, C.B., Cooper, D.F., Debelius, C.A. and Pecora, A.G. (1985) Problem solving methodology design on the run. *Journal of the Operational Research Society*, 36(9), 769–778.

Chapman, C.B., Cooper, D.F. and Page, M.J. (1987) *Management for Engineers*. John Wiley and Sons, Chichester.

Chapman, C.B. and Harwood, I. (2011) Optimal risk-taking and risk-mitigation, in Cochran, J.J. (editor in chief) *Wiley Encyclopaedia of Operations Research and Management Science*. John Wiley and Sons, New York.

Chapman, C.B., Hawkins, C.J. and Ward, S.C. (1984) Pricing Policy Models: a case study in practical OR. *Journal of the Operational Research Society*, 33(7), 597-603.

Chapman, C.B. and Howden, M. (1997) Two phase parametric and probabilistic NPV calculations, with possible deferral of disposal of UK Nuclear Waste as an example. *Omega, International Journal of Management Science*, 25(6), 707-14.

Chapman, C.B. and Ward, S.C. (1992) Financial control of portfolio management decisions. In Ezzamel, M. and Heathfield, D. (editors), *Perspectives on Financial Control: Essays in Memory of Kenneth Hilton.* Chapman and Hall, London.

Chapman, C.B. and Ward, S.C. (1994) The efficient allocation of risk in contracts. *Omega – The International Journal of Management Science*, 22(6), 537–552.

Chapman, C.B. and Ward, S.C. (1996) Valuing the flexibility of alternative sources of power generation. *Energy Policy*, 24(2), 129–136.

Chapman, C.B. and Ward, S.C. (1997) *Project Risk Management: Processes, Techniques and Insights*. John Wiley and Sons, Chichester.

Chapman, C.B. and Ward, S.C. (2002) *Managing Project Risk and Uncertainty: A Constructively Simple Approach to Decision Making*. John Wiley and Sons, Chichester.

Chapman, C.B. and Ward, S.C. (2003) *Project Risk Management: Processes, Techniques and Insights*, second edition. John Wiley and Sons, Chichester.

Chapman, C.B. and Ward, S.C. (2008) Developing and implementing a balanced incentive and risk sharing contracts. *Construction Management and Economics*, 26(6), 659-669.

Chapman, C.B., Ward, S.C. and Bennell, J.A. (2000) Incorporating uncertainty in competitive bidding. *International Journal of Project Management*, 18(5), 337-347.

Chapman, C.B., Ward, S.C., Cooper, D.F. and Page, M.J. (1984) Credit policy and inventory control, *Journal of the Operational Research Society*, 8(12), 1055-1065.

Chapman, C.B., Ward, S.C. and Klein, J.H. (2006) An optimized multiple test framework for project selection in the public sector, with a nuclear waste disposal case-based example. *International Journal of Project Management*, 24, 373-384.

Checkland, P.B. (1981) *Systems Thinking, Systems Practice*. John Wiley and Sons, Chichester.

Checkland, P. B. and Scholes, J. (1990) *Soft Systems Methodology in Action*. John Wiley and Sons, Chichester.

Churchman, C.W., Ackoff, R.L. and Arnoff, E.L. (1957) *Introduction to Operations Research*. John Wiley and Sons, New York.

Coleman, A. (2017) When doing good is great for business: socially responsible franchising is a growing trend which can benefit business and the community. *Raconteur insert in The Times,* 5 September.

Cooper, D.F. and Chapman, C.B. (1987) *Risk Analysis for Large Projects: Models, Methods and Cases*. John Wiley and Sons, Chichester.

Cooper, D.F., Grey, S., Geoffrey, R. and Walker, P. (2005) *Project Risk Guidelines: Managing Risk in Large Projects and Complex Procurements*. John Wiley and Sons, Chichester.

Cooper, D.F., Bosnich, P.M., Grey, S.J., Purdy, G., Raymond, G.A., Walker, P. and Wood, M.J. (2014) *Project Risk Guidelines: Managing Risk with ISO 31000 and IEC 62198*. John Wiley and Sons, Chichester.

Cooper, R. (1995) *When Lean Enterprises Collide: Competing Through Confrontation.* Harvard Business School Press, Boston.

Cox, L.A. (2008) What’s wrong with risk matrices? *Risk Analysis*, 28(2), 497-512.

Crossland, D. (2017) *Carmakers ‘colluded on technology for years’.* The Times, 22 July, 53.

Curtis, B., Ward, S.C. and Chapman, C.B. (1991) *Roles, Responsibilities and Risks in Management Contracting (Special Publication 81)*. Construction Industry Research and Information Association (CIRIA), London.

Dasgupta, A. and Dasgupta S. (1966) Crop-planning in a risky environment. Read to the European Meeting of the Econometric Society, Warsaw.

DoE (1994) *Review of Radioactive Waste Management Policy Preliminary Conclusions: A Consultative Document, Radioactive Substances Division*. Department of the Environment (DoE), Room A523, Romney House, 43 Marsham Street, London SW1P 3P4.

Dowie, J. (1999) Against risk. *Risk Decision and Policy*, 4(1), 57-73.

Dublin, C.I. and Lotka, A.J. (1930) *The Money Value of a Man*. Ronald Press, New York.

Duckert, G.H. (2010) *Practical Enterprise Risk Management: A Business Process Approach*. John Wiley and Sons, Chichester.

Eden, C. (1988) Cognative mapping, a review. *European Journal of Operational Research,* 4, 1-13.

Fischoff, B. (1982) For those condemned to study the past: heuristics and biases in hindsight, Chapter 23 in Kahneman, D., Slovic, P. and Tversky, A. (editors), *Judgment Under Uncertainty: Heuristics and Biases*. Cambridge University Press, New York.

Flood, R. L. (1999) *Rethinking the Fifth Discipline: Learning Within the Unknowable*. Routledge, London and New York.

Flyvbjerg, B., Bruzelius, N. and Rothengatter, W. (2003) *Megaprojects and Risk: An Anatomy of Ambition*. Cambridge University Press, Cambridge.

Freudenburg, W.R. and Gramling, R. (2010) *Blowout in the Gulf: The BP Oil Spill Disaster and the Future of Energy in America*. MIT Press, Cambridge, MA.

Friedman, L. (1956) A competitive bidding strategy. *Operations Research*, 4, 104-112.

Gawande, A. (2011) *The Checklist Manifesto: How to Get Things Right*. Profile Books Ltd, London.

Gold, B. and Vassell, C. (2015) Using risk management to balance agile methods: a study of the Scrum process. *2015 2nd International Conference on Knowledge-Based Engineering and Innovation (KBEI).*

Goodwin, P. and Wright, G. (2014) *Decision Analysis for Management Judgement*, fifth edition. John Wiley and Sons, Chichester.

Greenspan, A. and Wooldridge, A. (2018) *Capitalism in America: A History.* Allen Lane, London*.*

Grey, S. (1995) *Practical Risk Assessment for Project Management.* John Wiley and Sons, Chichester.

Harari, Y.N. (2014) *Sapiens: A Brief History of Humankind.* Harvill Secker, London.

Hardy, C. and Macquire, S. (2016) Organising risk: discourse, power and “riskification”. *Academy of Management Review*, 41(1), 80-108.

Hawkins, C.J. and Pearce, D.W. (1971) *Capital Investment Appraisal*. Macmillan Studies in Economics, Macmillan, London.

Hertz, D.B. (1964) Risk analysis in capital investment. *Harvard Business Review, 42(1), 95-106.*

Hillson, D. (2004) *Effective Opportunity Management for Projects: Exploiting Positive Risk*. Marcel Dekker, Inc, New York.

Hillson, D. (2009). *Managing Risk in Projects*. Gower, Abingdon, Oxon.

Hillson, D. (2012) *History of the Special Interest Group on Project Risk Management of the Association for Project Management*. APM Press Limited, High Wycombe.

HM Treasury (2003) *The Green Book: Appraisal and Evaluation in Central Government*. HM Treasury, 1 Horse Guards Road, London SW1A 2HQ.

HM Treasury (2003b) *The Green Book Supplementary Guidance – Optimism Bias.* Downloaded from www.hm-treasury.gov.uk, November 2010.

HM Treasury (2014) *Improving Infrastructure Delivery: Project Initiation Routemap Handbook*. Downloaded from www.gov.uk/government/organisations/infrastucture-uk, February 2015.

HMSO (1991) *Economic Appraisal in Central Government: A Technical Guide for Government Departments*. HMSO, London.

Hopkinson, M. (2011) *The Project Risk Maturity Model: Measuring and Improving Risk Management Capability.* Gower, Farnham, Surrey.

Hopkinson, M. (2016) *Net Present Value and Risk Modelling for Projects.* Gower, Farnham, Surrey.

Hopkinson, M., Close, P., Hillson, D. and Ward, S. (2008) *Prioritising Project Risks: A Short Guide to Useful Techniques.* Association for Project Management (APM), Princes Risborough, Bucks.

Hubbard, D.W. (2009) *The Failure of Risk Management - Why Its Broken and How to Fix It.* John Wiley and Sons, Hoboken, New Jersey.

Humble, J., Molesky, J. and O’Reilly, B. (2015) *Lean Enterprise: How High Performance Organisations Innovate at Scale*. O’Reilly Media, Sebastopol, California.

Hyde, L. (2007) *The Gift: How the Creative Spirit Transforms the World*. Cannongate, Edinburgh. First published in the US and Canada in 1983 by Random House.

International Standard (2009) *ISO 31000 Risk Management – Principles and Guidelines*. ISO, Switzerland.

ICE and IFoA (1998) *RAMP Risk Analysis and Management for Projects*. Institution of Civil Engineers (ICE) and the Institute and Faculty of Actuaries (IFoA). Thomas Telford, London.

ICE and IFoA (2005) *RAMP Risk Analysis and Management for Projects – A Strategic Framework for Managing Project Risk and its Financial Implications,* second edition. Institution of Civil Engineers (ICE) and the Institute and Faculty of Actuaries (IFoA). Thomas Telford, London.

Johnson, L. (2017) *Every board needs a member of the awkward squad*. The Sunday Times, 7 May, 12.

Johnson, L. (2018) *Bosses discover it pays dividends to put workers first.* The Sunday Times, 24 June, 9.

Kahneman, D. (2012). *Thinking, Fast and Slow*. Penguin Books, London.

Kahneman, D., Slovic, P. and Tversky, A. (1982). *Judgment Under Uncertainty: Heuristics and Biases*. New York: Cambridge University Press.

Kaplan, R.S. and Norton, D.P. (1992) The balanced scorecard – measures that drive performance. *Harvard Business Review*, 70(1), 71-79.

Kaplan, R.S. and Norton, D.P. (1993) Putting the balanced scorecard to work. *Harvard Business Review*, 71(5), 134-147.

Kaplan, R.S. and Norton, D.P. (1993b) Using the balanced scorecard as a strategic management system. *Harvard Business Review*, 71(1), 75-85.

Kaplan, R.S. and Norton, D.P. (1996) *The Balanced Scorecard: Translating Strategy into Action*. Harvard Business School Press, Boston.

Keeney, R.L. and Raiffa, H. (1976) *Decisions with Multiple Objectives.* John Wiley and Sons, New York.

Keeney, R.L. and Van Winterfeldt, D. (1991) Eliciting probabilities from experts in complex technical problems. *IEEE Transactions on Engineering Management*, 38(3), 191–201.

Kennedy, P. (1998) *A Guide to Econometrics*, fourth edition. MIT Press.

Kennedy, P. (2014) *Engineers of Victory: The Problem Solvers who Turned the Tide in the Second World War*. Penguin Books, London.

King, M. (2016) *The End of Alchemy: Money, Banking and the Future of the Global Economy.* Little, Brown Book Group, London

King, M. and Mercer, A. (1985) Problems in determining bidding strategies. *Journal of the Operational Research Society*, 36, 915-923.

King, M. and Mercer, A. (1991) Distributions in competitive bidding, *Journal of the Operational Research Society*, 42 (2), 151.

Knight, F. (1921) *Risk, Uncertainty and Profit*. Houghton Mifflin, Boston.

Lea, R. (2017) *Water firms risking their own demise.* The Times, 18 October, 37.

Lea, R. (2017) *Chinese in the driving seat with deal for Volvo Lorries.* The Times, 28 December, 43.

Leitch, M. (2008) *Intelligent Internal Control and Risk Management*. Gower, Aldershot, Hants.

Leitch, M. (2013) *Working in uncertainty: What is ‘risk culture’ and how can ‘risk culture’ be changed*. From [www.workinginuncertainty.co.uk/risk\_culture.shtml](http://www.workinginuncertainty.co.uk/risk_culture.shtml), downloaded 14 Nov 2013.

Lester, A. (2013) *Project Management, Planning and Control: Managing Engineering, Construction and Manufacturing Projects to PMI, APM and BSI Standards*, sixth edition. Butterworth-Heinemann, Oxford.

Lewis, M. (2017) *The Undoing Project: A Friendship that Changed the World.* Penguin Random House, UK.

Lichtenberg, S. (2000) *Proactive Management of Uncertainty using the Successive Principle*. Polyteknisk Press, Copenhagen.

MacNulty, A.A.R. (1977) Scenario development for corporate planning. *Futures,* 9 (2), 128-138.

Markowitz, H. (1959) *Portfolio Selection: Efficient Diversification of Investments*. John Wiley and Sons, New York.

Marshall, T. (2015) *Prisoners of Geography: Ten Maps That Tell You Everything You Need To Know About Global Politics.* Elliot and Thompson Limited, London.

Mingers, J. and Gill, A. (1997) *Methodology: The Theory and Practice of Combining Management Science Methodologies*. John Wiley and Sons, Chichester.

Mintzberg, H. (1994) *The Rise and Fall of Strategic Planning*. Prentice Hall, New York.

Mintzberg, H., Ahlstrand, B. and Lampel, J. (1998) *Strategy Safari*. Prentice Hall Europe, Hemel Hempstead.

Moder, J. J. and Philips, C.R. (1970) *Project Management with CPM and PERT*. Van Nostrand, New York.

Morris, P.W.G. (2009) Implementing strategy through project management: the importance of managing the project front end. Chapter 2 in Williams, T.M., Samset, K. and Suannevag, K.J. (editors) *Making Essential Choices with Scant Information: Front End Decision Making in Major Projects*. Palgrave Macmillan, Basingstoke.

Morris, P.W.G. (2013) *Reconstructing Project Management*. John Wiley and Sons, Chichester.

Muller, R. and Turner, J.R. (2010) *Project-Oriented Leadership*. Gower, Abingdon, Oxon.

NUREG (1975) *US Nuclear Regulatory Commission Reactor Safety Study – An Assessment of Accident Risk in US Commercial Power Plants*. WASH-1400, NUREG-75/014.

Nichols, M. (2007) *Review of Highways Agency’s Major Roads Programme: Report to the Secretary of State for Transport*. Nichols Group London. Available on the Department for Transport (UK) website at [www.dft.gov.uk/pgr/roads/nicholsreport/](http://www.dft.gov.uk/pgr/roads/nicholsreport/)

Overman, S. (2014) *The Conscience Economy: How a Mass Movement for Good is Great for Business*. Bibliomotion, Brookline, MA 02445.

Pagnamenta, R. (2017) *Fukushima disaster is still radiating fallout nuclear industry wishes to avoid.* The Times, page 41, 3 August 2017.

Pearce, I.F. (1964) *A Contribution to Demand Analysis*. Oxford University Press, Oxford.

Perrow, C. (1984) *Normal Accidents: Living with High Risk Systems*. Basic Books, New York.

Perrow, C. (1994) Accidents in high risk systems. *Technology Studies*, 1(1).

Pearson, G. (2012) *The Road to Co-operation: Escaping the Bottom Line*. Gower, Farnham Surrey UK, and Ashgate Publishing Company, Burlington Vermont USA.

Pidd, M. (1996) *Tools for Thinking : Modelling in Management Science*. John Wiley and Sons, Chichester.

Pinto, J.K. (2016) *Project Management: Achieving Competitive Advantage,* fourth edition. Pearson.

PMI (2008) Project risk management, Chapter 11 in *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, fourth edition. Project Management Institute (PMI) Inc, Newtown Square, Pennsylvania.

PMI (2009) *Practice Standard for Project Risk Management*. Project Management Institute (PMI) Inc, Newtown Square, Pennsylvania.

PMI (2013) Project risk management, Chapter 11 in *A guide to the Project Management Body of Knowledge (PMBOK® Guide)*, fifth edition. Project Management Institute (PMI) Inc, Newtown Square, Pennsylvania.

PMI (2017) Project risk management, Chapter 11 in *A guide to the Project Management Body of Knowledge (PMBOK® Guide)*, sixth edition. Project Management Institute (PMI) Inc, Newtown Square, Pennsylvania.

PMI (2017b) *Waterfall Methodology Agile Approach.* Downloaded from <https://www.pmi.org/learning/library/waterfall-methodology-agile-approach-5821>, 17 April 2017.

Purves, L. (2017) *Small acts of kindness that can save a life.* The Times, 3 July, page 27.

Rail Safety & Standards Board (2006) *RSSB T430 – Definition of VPF & the Impact of Societal Concerns – Final 30/1/2006*. Oxford Risk Research and Analysis, Clarendon Enterprise Centre, Oxford.

Raiffa, H. (1968) *Decision Analysis: Introductory Lectures on Choices Under Uncertainty*. Addison Wesley, Reading, MA.

Reason, J. (1990) *Human Error*. Cambridge University Press, Cambridge.

Reason, J. (1997) *Managing the Risks of Organizational Accidents*. Ashgate, Farnham Surrey.

Ricard, M. (2018) *Altruism: The Science and Psychology of Kindness.* Atlantic Books, London. Earlier hardback edition 2015, French edition 2013.

Rifkind, H. (2017) *For generation rent, owning things is history.* The Times, 3 October, 31.

Rivett, P. (1994) *The Craft of Decision Modelling*. John Wiley and Sons, Chichester.

Rivett, B.H.P. and Ackoff, R.L. (1967) *A Manager’s Guide to Operational Research*. John Wiley and Sons, Chichester.

Rosenhead, J. (1989) *Rational Analysis for a Problematic World: Problem Structuring Methods for Complexity, Uncertainty and Conflict*. John Wiley and Sons, Chichester.

Rosenhead, J. and Mingers, J. (2001) *Rational Analysis for a Problematic World Revisited: Problem Structuring Methods for Complexity, Uncertainty and Conflict*, second edition. John Wiley and Sons, Chichester.

Rubin, K. (2013) *Essential Scrum.* Addison-Wesley, Upper Saddle River, N.J.

Ruthkopf, M.H. (1983) *Auctions, Bidding and Contracting: Uses and Theory*. New York University Press, New York.

Samuelson, W. (1986) Bidding for contracts. *Management Science*, 32(12), 1533–1550.

Sasieni, M.W., Yaspan, A. and Friedman, L. (1959) *Operations Research: Methods and Problems*. John Wiley and Sons, New York.

Schoemaker, P.J.H. (1992) How to link strategic vision to core capabilities. *Sloan Management Review*, 34 (1), 67-72.

Schoemaker, P.J.H. (1995) Scenario planning: a tool for strategic thinking. *Sloan Management Review*, 36 (2), 25-40.

Senge, P.M. (1990) *The Fifth Discipline: The Art and Practice of the Learning Organization*. Doubleday, New York.

Taleb, N.N. (2007) *The Black Swan: The Impact of the Highly Improbable*. Allen Lane, Penguin Books Ltd, London.

Tamiz, M., Jones, D. and Romero, C. (1998) Goal programming for decision making: An overview of the current state-of-the-art. *European Journal of Operational Research,* 111, 569-81.

Taylor, F.W. (1911) *The Principles of Scientific Management*. Harper and Brothers, New York and London.

Temple, M. (2016) First public address as Chair of the Health and Safety Executive. Twenty Fifth Capita Health and Safety Lecture, The Royal College of Surgeons, London.

Toffler, A. (1970) *Future Shock.* Random House, London.

Turner, J.R. (1992). *The Handbook of Project Based Management: Improving Processes for Achieving Your Strategic Objectives*. McGraw-Hill, New York.

Turner, J.R. (2014) *Gower Handbook of Project Management*, fifth edition. Gower Press Aldershot.

Tweedley, N. (1995) *Winning the Bid: A Manager’s Guide to Competitive Bidding*. Financial Times Pitman, London.

van der Heijden, K. (1996) *Scenarios: The Art of Strategic Conversations*. John Wiley and Sons, Chichester.

Ward, S.C. (1989) Arguments for constructively simple models. *Journal of the Operational Research Society*, 40(2), 141–153.

Ward, S.C. (2005) *Risk Management Organisation and Management*. Institute of Risk Management (IRM) Series. Witherby & Co. Ltd, London.

Ward, S.C. and Chapman, C.B. (1988) Developing competitive bids: a framework for information processing. *Journal of the Operational Research Society*, 39(2), 123–134.

Ward, S.C. and Chapman, C.B. (1994) Choosing contractor payment terms. *International Journal of Project Management*, 12(4), 216–221.

Ward, S.C. and Chapman, C.B. (1995) Evaluating fixed price incentive contracts. *Omega – The International Journal of Management Science*, 23(1), 49–62.

Ward, S.C. and Chapman, C.B. (2008) Stakeholders and uncertainty management in projects. *Construction Management and Economics*, 26(6), 563-578.

Ward, S.C., Chapman, C.B. and Curtis, B. (1991) On the allocation of risk in construction projects. *International Journal of Project Management*, 9(3), 140–147.

Williams, T.M. (2002) *Modelling Complex Projects*. John Wiley and Sons, Chichester.

Williams, T.M. (2008) *Management Science in Practice*. John Wiley and Sons, Chichester.

Williams, T.M., Samset, K. and Suannevag, K.J. (2009) *Making Essential Choices with Scant Information: Front End Decision Making in Major Projects*. Palgrave Macmillan, Basingstoke.

Williams T.M. and Samset, K.J. (2012) *Project Governance: Getting Investments Right*. Palgrave Macmillan, Basingstoke.

Woods, D. D., Dekker, S., Cook, R., Johannesen, L. and Starter, N. (2010) *Beyond Human Error*, second edition. Ashgate Publishing Ltd, Farnham.

Woolsey, R.E.D. (2003) *Real World Operations Research: The Woolsey Papers*. Abe Books.

Wynne, B. (1992) Uncertainty and environmental learning – reconceiving science and policy in the preventative paradigm. *Global Environmental Change*, June, 111-127.

Yamane, T. (1973) *Statistics: An Introductory Analysis*, third edition. Harper & Row, New York.

Zenger, T. (2016) *Beyond Competitive Advantage.* Harvard Business Review Press.