Managing the Unknown
Managing the Unknown
A New Approach to Managing High Uncertainty and Risk in Projects

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John Wiley & Sons, Inc.
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Project management, as an important part of our disciplinary background, has been close to our interests for a long time and has been part of our professional experience as consultants, program directors, and, in one case, dean at INSEAD. The research on which this book is based began in 1996, when we became interested in project risk management and, in particular, methods that might help project managers to deal with novel projects.

We first explored real options and contingent decision-making in projects, a “new” method from the finance discipline that was widely discussed in the mid-1990s. This turned out to be a dead end, as the powerful analytical methods from finance did not sufficiently carry over to project management, an environment where much less information is available than in financial markets. In project management, these methods were wonderful in theory but required too many assumptions to apply in practice.

As we worked with project managers and wrote cases about the projects we analyzed, we began to realize that our concerns with managing novel projects were not so much with the existing project risk management (PRM) methods per se—as these methods were quite well developed over many years—but with the very concept of risk itself. We felt that the concept of risk, as discussed in PRM, was not entirely appropriate for novel projects. The first practical lessons we learned from these project managers were summarized in a Sloan Management Review paper in 2001. But we also understood that we needed a conceptual framework to help us understand how seasoned project managers of novel projects dealt with uncertainty and risk, and how a project team might in principle deal with it.

We realized that a key reason many projects fail is because organizations do not recognize the fundamental difference between project novelty and project risk. This thinking led to a publication in Management...
Science (2002), in which we examined the key difference between project risk and project novelty. We defined two critical characteristics of novel projects: unforeseeable uncertainty and complexity. We also identified two fundamental approaches that were, in principle, possible in the presence of unforeseeable uncertainty and complexity. We referred to these new approaches as selectionism and learning.

These theoretical considerations gave us a “roadmap,” a lens through which we could gather evidence and examine the projects with which we worked. We discovered that, while selectionism and learning had, of course, been discussed before, a complete approach to managing novel projects was missing. How should organizations and project management teams approach novel projects? How do they diagnose the level of project novelty, how do they build the organizational capabilities to deal with novel projects, and finally, how do they go about managing these projects?

This, then, is the new thinking and the contribution of this book. Selectionism and learning can be viewed as a powerful arsenal of weapons in the face of high novelty and unforeseeable uncertainty in projects, an arsenal in addition to established project risk management methods. The book explores the nature of unforeseeable uncertainty, of “unk unk”s and explains the concept of selectionism and learning. Then, most of the book tries to develop operational and actionable methods and tools that managers can use to evaluate selectionism and learning and to put them in practice. This book may be interesting for academics, but we are addressing an audience of practicing managers, and we hope they find it useful.

We are indebted to the many project managers with whom we have worked and from whom we have learned—in our case research and in our management seminars at INSEAD, where the participants learn from us, but where we also learn invaluable insights from them.

We also thank our colleagues, notably Christian Terwiesch and Svenja Sommer, the collaboration with whom has helped us think through many issues. We are indebted to Jean Cropper, who helped us turn our clumsy language into readable English.

If this book makes a small contribution to the project management profession, we feel proud, and the tremendous effort was worthwhile.

Fontainebleau and Singapore,
May 2005

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Nearly all managers engage in project management. The rapid change in the competitive climate, the internationalization of the economic environment, and the rise in customer power have rendered business activities less repetitive. Today, all managerial tasks contain elements of project management. In older textbooks, project management was often identified in the context of industrial activities, such as construction, product development, or the introduction of new technologies. The most important challenge in these projects was often to handle myriad tasks and relationships, and the focus of project management methods was on complexity. But today’s projects are much broader, encompassing, among other activities, internal or external consulting, launching market campaigns, developing software, or implementing mergers or acquisitions. These new projects are often less complex than the traditional ones, but they also often break new ground and are therefore confronted with more uncertainty. This book is about highly novel projects that have to cope with a high level of uncertainty.

What is a project? A project can be defined as a sequence of activities undertaken to accomplish a temporary endeavor (with a defined completion date) to create a unique product or service. Projects represent an organizational tool to respond to risks. They are made up of temporary structures, they use flexible methods, and they are dismantled after the work is done. Each project is unique in some respect: It can be a new project, meaning that the tasks have not been done before, or there can be spatial separation, indicating that the resources are assembled at a separate place. Each project is thus managed slightly differently from other projects or ongoing repetitive processes. In short, projects are temporary structures and management methods that allow companies to be flexible and to respond to risks.
The ability of an organization to use temporary structures to flexibly respond to risks has gained in relevance in many business contexts. While projects and project management methods have historically been relegated to the R&D, infrastructure, IT, and defense-related industries, projects and the language of projects have now become ubiquitous in a wide variety of industries, organizations, and functional areas. Projects are now seen as an important strategy to manage change in organizations. This reflects an increase in uncertainty and velocity in many industries, which has prompted prediction in the popular press that “the old organizations and career tracks will be obliterated in the future.”

This has brought about a critical look at projects, starting with empirical evidence of the prevalence of project failure. The Project Management Institute (PMI) states that over 70 percent of projects in large organizations fail to meet their stated objectives. A study of large engineering projects by Miller and Lessard found that only 45 percent of these projects met most of their stated objectives, while 19 percent met only a subset of their objectives, 16 percent had to be significantly restructured, and fully 20 percent were abandoned. The picture is no better for startup venture projects. Before the 1997–2001 bubble, nearly 50 percent of the value created by venture capital firms was a result of the 6.8 percent of their investments that actually achieved a return of 10 times or more. Battery Ventures reported that of 153 companies it backed, 25 went public, while 43 were acquired—and 25 companies went out of business.

Many reasons are given for this rather poor record of project success, ranging from technical or market uncertainty, poor leadership, and multiple stakeholders with differing interests. Too often, these failures to meet stated project objectives are interpreted by organizations as failures on the part of the project management team, negatively affecting promotions and bonuses. While each of these reasons may be present in various projects, we will argue that the main reason for project failure is that organizations do not recognize the fundamental difference between project novelty and project risk.

An understanding of project risk and project risk management (PRM) has been around for a very long time. Project risk management has become an integral part of project management and is an established, formalized, and widely used project management method. This is reflected by a steady stream of technical books on the topic.

Project risk is often defined as the product of the probability of an event’s occurrence and the extent of its impact. In other words, what is the probability that an event will occur, and what is the extent of impact of this event on the project, as planned, if it does occur? PRM techniques have thus been developed to help organizations to identify possible uncertain events, assess their potential impact (positive or negative) on the project plan, prioritize these events for action, and develop preventive, mitigating, and contingent actions in response to these foreseen events. PRM even goes so far as to foresee that not all events can, or will, be predicted, and
that organizations must be prepared to quickly improvise a response to this “residual risk” to get the project back on track. Issues of project leadership, stakeholder management, and supplier relationships are all dealt with in an attempt to create a project infrastructure and environment that can flexibly respond to events in order to bring the project back under control, should events, both foreseen and unforeseen, arise.

But project novelty is not the same as project risk, and novel projects pose fundamentally different challenges than do risky projects. Novel projects, by definition, cannot be planned. In novel projects, there are either too many “unknown unknowns” (unk unks) or there is too much complexity, or both. There is no “real” project plan around which to apply standard PRM techniques. Contingency planning makes little sense, as the major risks are unknown. In this context, complexity means that even if events could be foreseen, the interaction of events is so complex that contingency plans would be impossible to draw up. Novel projects pose unforeseeable uncertainty and are complex in nature, and this is necessarily so because only such projects offer sustainable rents. Simple projects are easily copied and their rents competed away. Increasing industry dynamics and sophistication force project managers to push the envelope in seeking new markets and new technologies.

The fundamental logic of the PRM mind-set does not address novel projects. PRM preplans contingencies and flexibility around a project plan and then “triggers” them as events unfold. This approach works fine as long as all risks are identified, or as long as residual risks are simply events that temporarily take the project off its planned course. The basic backbone of PRM is that there is a real project plan, one that can be implemented, albeit with some contingent or mitigating actions thrown in. When unforeseen events arise, the project team can improvise its way back to the basic project plan because it is never too far away from it.

Serious problems arise when the PRM mind-set and toolbox are applied to novel projects. Because one cannot have a project without a plan, a project plan will inevitably be drawn up for the novel project. As the project is “novel,” rigorous PRM techniques will be applied to ensure that all potential risks are identified, assessed, and prioritized, and that preventive, mitigating, and contingent actions are developed. Solid, experienced project leadership will be allocated to the project, supplier relationships will be considered, and good project governance will be installed, all around the idea that when unforeseen events arise, the project team, its suppliers, and its stakeholders will all be prepared to improvise a “solution” to these unforeseen events and bring the project back on plan. But, of course, there is no project plan. The plan is but a starting point, an illusion, a simple sketch. The basic backbone of PRM, the project plan, does not really exist.

This creates tremendous problems for the project team. All the PRM efforts provide a level of comfort to all the parties involved that the project, as planned, is feasible. The team is convinced that their job is to implement the plan, without properly appreciating the challenges that lie ahead. As
unforeseen events arise, they try to improvise their way “back” to the project plan. But the project, as planned, may not have been feasible, and this leads to two common stages of behavior. In the first stage, the project team makes promises that the project will be back on track after some degree of effort. The improvisational effort is undertaken, and the project is still not back on track. This cycle continues for a while until the second-stage behavior manifests itself: The team suddenly realizes that the project plan was simply stakes in a desert, and they wonder how they got out there themselves. All their effort had been concentrated on following the stakes in the ground, instead of doing what they really should have done: discovering where the stakes should be going.

**Operational Risk Management and PRM**

Before we explain how this book starts from PRM and then turns to managing unforeseeable uncertainty, we must distinguish project risk from the term “(enterprise) risk management,” which has been prominently discussed in the business press since the banking and accounting fraud scandals of the late 1990s. In both finance and strategy literatures, one can find other definitions of operational risk than the one we will use with respect to projects.

With the Asian crisis and the bursting of the financial markets bubble in 2000, attention has focused on market risks, credit risks, liquidity risks, and legal/regulatory risks. Then, in the wake of corporate governance and fraud scandals, such as Enron, Tyco, Ahold, Parmalat, and Arthur Andersen, the interest conflicts between stock market analysts and investment bankers within large, universal banks, and many others turned attention to what the financial community began to call “operational risk”: the risk of direct or indirect loss resulting from inadequate or failed internal processes, people, and systems or from external events, the latter also being called “operational strategic risk.”

In the context of business strategy, *strategic risk* is defined as “an unexpected event or set of conditions that significantly reduces the ability of managers to implement their intended business strategy.” Strategic risk comprises operations risk, asset impairment risk, and competitive risk. Operations risk results from the consequences of a breakdown in a core operating, manufacturing, or processing capability. Any operational error that impedes the flow of high-quality products or services has the potential to expose the firm to loss and liability. At the aggregate business level, there have also been recent attempts to cover property, product liability, employee crime, and exchange risks with integrated insurance policies. Overall, however, operational risk is not as well understood as market or credit risk (in particular, mathematical models are not as fully developed), and many financial institutions manage operational risk on an ad hoc basis.

There are important differences between “operational risk management,” as seen by strategy and financial services, and PRM. PRM is more focused than operational risk management because it looks at projects only.
Contribution and Plan of the Book

At the same time, it is more general because it considers any possible event that may change the execution of the project plan or the plan itself, over the course of the project. PRM is more operational than operational risk management because it is directly concerned with the work of the project team—namely, what they need to do and how flexible they must be in responding to stochastic events. Finally, the notion of “risk” is more general in PRM: In contrast to operational risk, project risk may represent not only a downside (such as adverse events that threaten the project) but also an opportunity, or upside (such as an unexpected application of a project result). PRM should include both guarding against unpleasant surprises and taking advantage of opportunities.

Contribution and Plan of the Book

In this book, we make two main contributions. First, we begin by discussing project risk management (PRM), because novel projects have a lot to do with risk and PRM is the best toolbox available to handle them. Then we explore the implications of unforeseeable uncertainty in novel projects, and we demonstrate that they render PRM methods insufficient and require fundamental modifications in the logic of project management itself. Thus, we offer a different way of looking at the problem of managing novel projects: Rather than working harder, straining to consider more possibilities in planning and formal risk management, we propose that one must recognize that project novelty fundamentally renders planning approaches inadequate. In such cases, project managers must make use of two fundamentally different approaches: learning, or a flexible adjustment of the project approach as one learns more about the project, its environment, and their interactions (as opposed to a contingent approach that utilizes planned “trigger points”), and selectionism, or pursuing multiple approaches, independently of one another, and picking the best one ex post.

Second, these approaches must be managed differently from each other and from the traditional planning approach; they require different project mind-sets, different project infrastructures, and different supplier and stakeholder relationships. Project sponsors must be aware of these differences if they are to help build the organizational capabilities critical to managing novel projects and to properly support these novel projects within a possibly hostile organization.

While the important events and courses of actions cannot be foreseen in novel and complex projects, the project team, more often than not, has a good feel for the complexity of the project and for the limitations of its own knowledge, thus preventing it from falling victim to unk unk. The team can, at the outset, put in place the competencies, infrastructure, and relationships appropriate to the challenge at hand. This is what we propose in this book, and for which we offer tools. These tools are not as quantitative and precise as traditional PRM tools, reflecting the more difficult nature of the challenges that confront novel projects. Yet we set out to convince the reader that they can make an enormous difference to the project.
In Part I of this book, we present two contrasting examples of current PRM practice and then propose an extended view of PRM. Chapter 1 describes a PRM best practice example, while Chapter 2 illustrates the limitations of PRM practice in novel projects. Chapter 3 proposes a broader view of PRM and demonstrates that, in the presence of unks, project management itself must follow an extended logic. We distinguish fundamental sources of uncertainty and expand the PRM toolbox in order to address uncertainty from all these sources.

Part II is the conceptual heart of the book, where we explain what a project can do in the face of unforeseeable uncertainty, not only in terms of PRM but by changing the project management approach itself. Chapter 4 offers a diagnosis tool for recognizing the type of uncertainty at the outset of a project and outlines the two fundamental approaches to unks, selectionism and trial-and-error learning. Chapters 5 and 6 explain and give examples of learning projects and selectionist projects, respectively. Chapter 7 develops tools for choosing between the two and for combining them and the strengths of each.

Part III develops tools for managing learning and selectionist projects facing unforeseeable uncertainty on three fundamental dimensions. Chapter 8 defines the culture and mind-set that are necessary to be successful in the face of unks, a mind-set of experimentation and learning rather than of executing planned tasks and achieving established targets. Without such a mind-set, tools will not be successful. We also discuss what this means for the profile of the members of the project team. Chapter 9 describes the required project infrastructure, the systems that need to be put in place for planning, monitoring, coordinating, evaluating, and exchanging information. These management systems must vary according to what fundamental project management approach is chosen.

Chapter 10 discusses the collaboration with partners, an increasingly important way of organizing large projects with wide-ranging technologies. Managing partners becomes more challenging in the presence of unks, as unexpected surprises tend to unbalance the interests of the players involved (even if they were perfectly aligned at the outset), which produces an often irresistible temptation to behave opportunistically in order to safeguard one’s own interests. The chapter describes how flexible project governance with limits of acceptable behavior can be achieved using a collection of contracts, informal agreements, mutual stakes and ownership, repeated interactions (into the future), experience, and personal relationships that are necessary in order to withstand the pressures of unexpected surprises.

Chapter 11 addresses the project stakeholders. Stakeholders are parties that are not formally involved in the project (as opposed to the partners in Chapter 10) but are affected by the project, interested in it, and can influence it through formal means and informal means and the application of power. The presence of unks renders an appeal to rational interests insufficient—interests may change along with the content of the project over time, as unks emerge.
Finally, Part IV elevates the discussion from project management to senior management. While project management must execute the project and deal with the unk unks, senior management shapes the project’s environment and is responsible for enabling the project team to respond to unexpected events. Thus, senior management has a significant responsibility in making novel projects successful. Chapter 12 outlines three areas of responsibility that senior management should keep in mind.

This book is meant as a resource for project teams that have to deal with novel projects. We offer a number of tools and ideas for your inspiration, but even then, we realize that this does not make managing novel projects trivial. Dealing with unknown unknowns is inevitably uncomfortable and dangerous. We hope this book provides some guidance or red thread in the chaos of dealing with the many unexpected and hard-to-interpret events that will inevitably arise in novel projects.
Endnotes

1. This is a standard definition; see, for example, Meredith and Mantel 2003, p. 8.

2. An increase in velocity, and thus the need for project management, has been observed by a number of researchers, for example, Kloppenborg and Opfer 2002, Pinto 2002, and Kerzner 2003. The conclusion that career tracks will be obliterated can be found, for example, in Stewart 1995. This latter conclusion is premature.

3. See Sahlman 1990. He reports that of the 383 companies studied between 1969 and 1985, 34.4 percent experienced a partial or total loss of invested capital, 49.8 percent returned between 0 and 5x, and 9.8 percent returned between 5 and 10x. While the Internet bubble for a while promised spectacular returns, VCs are now back to the times before 1997 and have actually begun to focus more on incremental projects.


5. The focus on market, credit, liquidity, and legal risks is observed in Crouhy et al. 2000, p. 35. The term “operational strategic risk” is coined ibid, p. 479. The focus on inadequate or failed internal processes, people, and systems or on external events is described in Basel Committee Publications 1998, and Harmantzis 2003.


7. Integrated insurance policies are described in Meulbroek 2001. The diagnosis that operational risk is often managed ad hoc is in Crouhy et al. 2000, p. 484.
A New Look at Project Risk Management
Imagine you are planning a climbing expedition up the Matterhorn, one of the most spectacular mountains in the Alps. As a project management expert, you produce a detailed plan and specify routes, expected distance travel times, budgets for equipment, shelter and food, and so on. In addition, you have to worry about what might go wrong: A storm may move in, for example. For such an eventuality, you need to build buffers into the plan: extra time and/or extra equipment (perhaps an emergency tent or ice picks). You also need to plan decision points; for example, if the storm moves in before noon, we turn around, and if it catches us at 4:00 P.M., we take refuge in an emergency shelter. This exercise of anticipating risks is the essence of project risk management (PRM).

Project risk management can be defined as the “art and science of identifying and responding to project risk throughout the life of a project and in the best interest of its objectives.” PRM extends project planning by identifying, appraising, and managing project-related risks. Risk, in turn, is defined as “the implications of the existence of significant uncertainty about the level of project performance achievable” and is seen as having two components: first, the probability of occurrence, and second, the consequences or impacts of occurrence.

PRM has become an established, formalized, and widely used project management method. This method offers a powerful set of tools that help companies to keep downside risks under control and to take advantage of upside opportunities. In some industries, such as engineering, construction, or pharmaceuticals, anticipating and managing downside risks is essential to remain in business. In other industries, the ability to seize opportunities can greatly enhance profitability. For example, the manager of one power generation engineering company told us, “Thinking proactively through risks enables us to fill the ‘white spaces’ in our contracts to our advantage. We proactively interpret undefined events in our favor. ‘User training costs money? Well, that was not specified, so it’s clear that you must pay it.’ This protects us from the customer interpreting the event in his favor, and sometimes, we even manage to seize an opportunity and sell it to the client for additional profit.”

PRM, then, is concerned with achieving the stated project goals in spite of risks (see Smith and Merritt 2002), although it ideally includes influencing the “base plan” and even the project design, and revising the targets when necessary. While the details differ, authors agree that PRM consists of four conceptual steps (see Figure I.1): Identify risks beforehand; classify and prioritize them according to probability and impact; manage them with a collection of preventive, mitigating, and contingent actions that are triggered by risk occurrence; and embed these actions into a system of documentation and knowledge transfer to other projects.

In Part I of this book, we present two examples of project risk management. The first example, the PCNet project, describes one of the many IT integration projects undertaken as part of the takeover of RBD, Inc. by the diversified resources company Metal Resources Co. from July 2001 to September 2002. We consider this to be an excellent example of how solid application of PRM techniques in the appropriate project environment can produce good results.
Part I: A New Look at Project Risk Management

The second example, the CircoRed project, describes the design and construction of a plant in Trinidad to produce direct-reduced iron (DRI), as part of a joint venture between Cleveland Cliffs, one of the largest iron ore suppliers to blast furnace integrated steelmakers in the United States, Lurgi Metallurgie GmbH, a metallurgical process engineering company, and LTV Steel, who wanted to use DRI in a mini-mill they were building in Alabama. We consider this to be an excellent example of what happens when standard PRM techniques are applied to novel, first-of-a-kind projects. As is often seen in such cases, the project ran into unexpected problems that delayed completion for several months, it ran over budget, and it was eventually blindsided by an unexpected turn in the market.

In Chapter 3, we draw the lessons from the two examples and characterize the types of uncertainty that require PRM. Based on this classification, we outline under what circumstances which of the various methods of PRM are appropriate. In addition, we extend the PRM toolbox by discussing additional methods that are relevant but have not been presented in the same context. Control-and-fast-response is a method of dealing with high task complexity, and project contracts are used to coordinate multiple stakeholders in the presence of relationship complexity. Finally, we introduce two approaches to unforeseeable uncertainty, both of which can extend PRM: trial-and-error learning, or the repeated redefinition of the project over time, and selectionism, or the use of parallel candidate trials, the best of which is chosen ex post. These will be further discussed in Part II of the book.
Endnotes

1. The definition of PRM can be found in Chapman and Ward 1997, p. 10; see also Wideman 1992. The definition of risk is in Chapman and Ward 1997, p. 7. The components of risk are described in DoD 2001, p. 5.


PRM Best Practice: The PCNet Project

1.1 Background
In 2002, the first-tier diversified resource company, Metal Resources Co., headquartered in Austin, Texas, announced a cash offer for the Winnipeg-based metals company, RBD, Inc. The offer was recommended by the RBD board to its shareholders and then swiftly executed. The combined companies formed the second largest mining and resources company in the world. In 2004, Metal Resources Co. had activities in 28 countries, with $29 billion in sales, 40,000 employees, and leadership positions in aluminum, nickel, copper, uranium, gold, carbon steel metals, diamonds, manganese, and various specialty metals used in steel production.
The acquisition execution placed heavy emphasis on synergies, that is, on gross annual cost savings. Five top-level integration areas were put in place to capture the savings: IT infrastructure, HR systems and processes, financial systems and processes, operational integration, and organizational integration. The total synergy target amounted to $1.9 billion in annual gross operating cost savings.

One of the important merger activities was a consolidation of the IT systems of the two companies, a huge undertaking involving 900 IT employees throughout the combined company. Not only had the IT integration achieved its own target of $210 million in savings, but it also critically enabled the other merger areas by providing a transparent, integrated, and reliable application platform. Max Schmeling, the enterprise CIO, was responsible for executing the IT integration.

A pre-integration team planned the integration project in detail over a period of nine months, up to October 2002. The team started from an overall target (“get $210 million in annual savings by consolidating the IT structure”) and successively broke this target down to more and more detailed tasks. Within each consolidation area, large projects were defined, then subprojects, and then detailed tasks that could be assigned. In total, 110 projects were to be executed in parallel by project managers and sub-project managers, supported by a central project office. The projects would have to be carefully coordinated, as some of them served as enablers for others, and all competed for the same scarce staff time.

In September 2002, Max Schmeling pulled his direct reports and operating company CIOs into one room (about a dozen people). He presented them with the work breakdown structure that the planning team had produced. He said, “Nobody leaves this room before every one of the 110 savings opportunities has a name on it.” The first outcome of this two-day marathon meeting was a project structure that clearly assigned project accountabilities, as well as a corporate sponsor for each project, to help them drive change through the organization. The key projects within the IT integration were “General” (mainframe decommissioning, Unix integration, and office consolidation at the various sites of the previous companies), knowledge management (including the consolidation of portals, intranets, yellow pages, instant messaging, collaboration tools, and publishing), the ERP program (moving to an enterprisewide SAP installation encompassing HR systems and financial reporting across both companies), the Web applications center, IT strategy (which was to connect the IT changes to head counts and reengineered processes, and strategic IT sourcing), and the PCNet project, on which our project risk management (PRM) example focuses.

The last piece, not producing bankable savings but critical nonetheless, was the “Time Zero” project: The IT systems were changed while
1.1 Background

simultaneously running the business. Critical systems, such as e-mails, global address lists, help desks, and all business applications (but not, for example, cross-unit calendar lookup), had to work on day one. Without this minimal functionality, the business damage would have been too great, and resistance would have prevented a successful execution of the migration.

The second outcome of the marathon meeting was a “Gantt Chart from Hell,” which filled an entire wall. This was a preliminary plan showing how the 110 projects would be sequenced, and when they would reach their critical milestones and, ultimately, completion. In addition to encompassing a large number of tasks, the planning job was made even harder because the 110 projects had to be coordinated with the other synergy projects and with the activities of the operating companies, who were responsible for carrying out numerous activities.

1.1.1 The PCNet Project

The PCNet project encompassed four network infrastructure migration areas (see Figure 1.1): (1) worldwide standard desktop environment, mostly the exchange of the 40,000 companywide desktops, standardizing on Windows XP desktops (HP) and laptops (IBM); (2) a global communications network, consolidating the corporate network (which had previously been centered on the bottlenecks in California and Texas) around six hubs, with added bandwidth to the rest of the network and further internal redundancy; (3) a standard network server infrastructure using Windows 2000, with a greatly reduced number of network routers; and (4) an enterprise security and directory system, going from multiple directories, security systems, and firewalls down to one each. Multiple directories caused headaches when, for example, executives were reassigned and stopped receiving their e-mails until the IT staff had located the directory in which they had been filed.

The business case called for a total savings net present value (NPV) of $115 million, with a project budget of $149 million. This was based on direct savings from infrastructure costs alone, but the project was the key enabler of the whole merger, not just the IT integration. It enabled additional savings, including cutting 130 different applications in the Finance area alone, and it later made the transition to an enterprisewide ERP system much faster and smoother.

The network integration included the reconciliation of outsourcing decisions that had been made differently in the previous companies. For example, Metal Resources had outsourced mainframe, telecom, and the help desk to EDS, while RBD had outsourced the server environment and the help desk to IBM. To move fast, IT management decided to move the entire package to EDS (the provider who already had the bigger share) and to take some server services back in-house.
The PCNet project organization included a project management office, a group for implementation and operations, and a planning group comprising several analysts who compiled business cases and risk analyses, and maintained the tracking tools. Embedded in the master plan for IT integration, the PCNet planning group developed and maintained its own plan and milestones (Figure 1.2). Much of the actual work (such as physically installing routers in basements and desktops in offices) was performed by local staff in the operating companies; the central project organization coordinated, standardized, oversaw time plans, and centrally sourced the standardized components.

1.2 Risk Identification

Risk identification is concerned with recognizing, at the outset, the factors that may make the project plan obsolete or suboptimal. Thus, risk identification is an important part of project planning. It represents a thorough homework exercise that allows the project organization to be prepared when adverse events strike, offering ready-made (rough-cut) solutions, based on which a team can respond quickly.