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# **Triple Bottom Line Risk Management**



# Triple Bottom Line Risk Management

Enhancing Profit,  
Environmental Performance,  
and Community Benefits

Adrian R. Bowden

Malcolm R. Lane

Julia H. Martin



**John Wiley & Sons, Inc.**

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*To the rest of the “Gang of Five”*



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# FOREWORD

I would like to believe that this book is the result of a continuing process of innovative improvement that we have been fostering in our firm for many years.

In 1991, I was the chief executive officer of Woodward-Clyde, an environmental engineering consulting firm that is now part of the large, New York Stock Exchange-listed, URS Corporation. At that time I was working closely with Steve James, who had the global role to disseminate throughout our company innovative technology developed by Woodward-Clyde. During a visit to Australia, Steve was promoting a very comprehensive computer database called ERMIS (Environmental Risk Management Information System). ERMIS had been developed in Switzerland and the United States for a large French client in the automobile parts manufacturing sector. When Steve arrived in Australia, he was asked to contact Adrian Bowden in our Melbourne office, who would assess the potential of the system and possibly could become responsible for introducing it to the Asia-Pacific region.

Adrian accompanied Steve on one of his first presentations to a major client in Melbourne. Steve gave a polished and comprehensive demonstration of ERMIS that left the client representatives extremely impressed. The presentation showed that through ERMIS the client could readily access large volumes of environmental data (i.e., soil tests and groundwater analyses), link the data to compliance requirements, and flag the required management actions. ERMIS introduced the concept of environmental risk being the product of the probability of an environmental event occurring by the cost of remediation. ERMIS also used a relatively simple method to describe the uncertainty of remediation costs as probabilistic cost distribution rather than single deterministic numbers.

After the presentation, Steve asked Adrian what he thought of the prospect of providing ERMIS to the client. Adrian felt the model required too much data (at the time comprehensive environmental data were usually not available for most sites around the world), and even large corporations were not ready for ERMIS. Maybe in ten years. Adrian believed, however, that many of his clients had a clear need for a simpler tool that would use the same approach but that could be more appropriately applied to sites with incomplete environmental information.

The next day Steve and Adrian gave a modified presentation to a multinational mining company. Steve concluded the presentation by making the point that the ERMIS concept could be used in a much-simplified form to suit a wider range of conditions. The corporate risk manager for the mining company was in the audience and was facing the immediate challenge of restructuring the company-wide, third-party environmental insurance strategy in a cost-effective manner. The next day the mining company engaged Woodward-Clyde to develop a prioritized risk profile of third-party liability (both sudden and gradual) for all of its 36 sites worldwide. This assignment was successfully completed in a short time using available information and a relatively simple spreadsheet model. This project was the first time that environmental risk profiles had been applied to obtain third-party insurance.

Since that time Adrian and his colleagues have refined the method substantially, and its capability has been greatly expanded to the point where it has been shaped into a very useful approach to business risk management we refer to as RISQUE method. This method forms the core of a totally new, very successful business (Business Risk Strategies, a division of URS). The RISQUE method has now been applied by the staff at Business Risk Strategies to a wide range of applications. The method has been used to the immense benefit of a large number of diverse clients around the world.

In recognition of their contributions to the development of innovative practice, Woodward-Clyde/URS awarded both Steve James and Adrian Bowden the Yves Lacroix Prize in 1992 and in 1996, respectively.

The story of the RISQUE method and Business Risk Strategies is a good example of how an embryonic concept, when seeded in fertile ground and nurtured in the right environment, can develop into a viable business in its own right.

Jean-Yves Perez  
Executive Vice President and Director  
URS Corporation

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# ACKNOWLEDGMENTS

The authors are very appreciative of the unreserved support that URS Corporation (formerly Woodward-Clyde) has given for initiation and development of the new business that is the subject of this book. All of the projects described in the case histories were performed by Business Risk Strategies (a division of URS). We are fortunate that URS is committed to providing an environment that encourages new ideas and ways of integrating them into the triple bottom line.

The case studies are published with kind permission of the following URS client organizations: Ok Tedi Mining Limited; Water Corporation of Western Australia; LandCorp; Eglinton Estates; Woodsome Management; Meridian Energy Limited; Boral Recycling Pty Ltd.; Waihi Gold Company; and Metrowater. The client organizations contributed immensely to each of the projects and demonstrated a willingness to apply new technology and to venture into uncertain territory.

Steve James was responsible for seeding the business initiative by introducing the concept of quantifying difficult risk events and providing backup resources during the early stages of business development. Steve, together with Jim Schaar-smith, also contributed substantially to the discussion of corporate reporting and SAB 92. Dale Cooper provided very constructive criticism that has added considerable value to the RISQUE Method.

Many colleagues gave significant assistance with projects, marketing opportunities or business development support. These people are: Martin Howell, Tom Farrell, Jean-Yves Perez, Jim Miller, Simon Lee, Leanne Gough, Andrew Firth, Harry Grynberg, Warren Pump, Jeff Smith, Stephen Hancock, Merv Jones, John Gillett, Victoria Sedwick, Dan Predpall, and Alan Gale.

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# INTRODUCTION

Risk management increasingly appears as a key theme in conferences and literature targeted at a wide range of public and private sector businesses—no longer is it the primary domain of the insurance industry. Surprisingly, the growing attention given to “risk” does not appear to be inspired by the profit-enhancing opportunities that risk management practices offer; rather it is driven by apprehension associated with a negative perception of risk.

This negativity is reinforced by publicized cases of imprisonment of corporate directors for regulatory compliance breaches, losses incurred by insurance underwriters through coverage of environmental incidents, and an increasing incidence of shareholder and broader community protests against perceived complacent and arrogant corporate behavior. Unfortunately, this preoccupation with the adverse consequences of risk events impedes recognition of the usefulness of risk management processes to optimize business practices and demonstrate corporate responsiveness.<sup>1</sup>

Businesses that want to be sustainable in the twenty-first century would be better advised to adopt the philosophy that risk management is a process of continuous improvement “directed towards the effective management of *potential opportunities and adverse effects*”<sup>2</sup> (emphasis added). From an opportunistic viewpoint, successful management of business risk has vast potential to improve the so-called triple bottom line, the social, environmental, and financial accountability of a business.<sup>3</sup> For example, the Institute of Chartered Accountants<sup>4</sup> suggests that well-executed risk management practices can potentially deliver the following types of benefits to a company:

- A process for engagement of stakeholders and improving stakeholder relations
- Greater likelihood of achieving business objectives
- Increased likelihood of change initiatives being achieved
- More focus internally on developing and implementing best practice standards
- Lower cost of capital
- Better basis for strategic direction setting



- Achievement of competitive advantage
- Reduction in management time spent “fire-fighting”
- Fewer sudden and unwelcome surprises

Our professional observations support that advice, and in this book we describe an approach that can be used to assess and quantify business risks in a way that they can be addressed proactively in a company’s business management strategy. The RISQUE method (*risk identification and strategy using quantitative evaluation*) is a multifaceted approach that is designed to help business managers make informed, defensible risk management decisions as part of a triple bottom line management strategy.

We have developed the RISQUE method by listening to our clients’ needs and trying to develop ways to apply our broad experience to a wide range of industrial sectors and business management challenges. Our collective 60 years of consulting experience in working with multidisciplinary teams has revealed that managers responsible for making business decisions frequently have difficulty in making the best use of the often complex, highly qualified, technical information provided by their internal and external advisory experts.

The RISQUE method originated from an idea that Steve James, in his capacity as a senior business strategist for Woodward-Clyde (now URS Corporation), introduced in 1992. Since then we have applied the method (and its forerunner) to many challenging new applications. These applications have included: water supply and wastewater asset management; quantification of the financial risk of acquisitions; prioritizing management of environmental issues and development of environmental risk management strategies; formulation of financial assurance strategies for landfills and mines; estimation of mine rehabilitation costs; financial benefit-cost analyses of mine tailings management options; economic analysis of landfill postclosure management strategies; and financial reporting of contingent liability.

## AIM OF THIS BOOK

The aim of this book is to inform readers of current risk management approaches and to demonstrate that a rational, quantitative method (the RISQUE method) is a sound, defensible, transparent process that is very useful for development of risk management strategies.

The RISQUE method is a risk management process that has been specifically developed in response to the recognized need to translate complex, technical, triple bottom line information into financial terms. It incorporates a quantitative risk assessment process that translates the so-called intangible or nonquantifiable environmental and social risks, such as community outcry, business reputation damage, legal culpability, and environmental impacts, into financial measures that

can be used to develop risk treatment strategies. The broad application of the RISQUE method is illustrated through a series of case studies.

By the end of this book, readers should:

- Appreciate the general concept of risk in relation to their business
- Understand the commonly used risk assessment techniques, together with their advantages and disadvantages
- Have a basic understanding of the methodology, assumptions, advantages, and disadvantages of the quantitative RISQUE method
- Have identified how the RISQUE method can be applied to specific areas within their business to reduce negative risk and increase opportunities
- Know what specialist risk assessment skills to seek to assist development of risk management strategies
- Feel equipped to implement a risk management process that will demonstrate commitment to triple bottom line management

## WHO SHOULD READ THIS BOOK

This book is intended for those professionals working in the private and public business sectors who are:

- Making decisions based on complex factors, such as multiple sites or multi-faceted events
- Responsible for ensuring that appropriate risk management processes are in place to demonstrate due diligence
- In the process of acquiring or divesting capital assets
- Required to negotiate performance bonds and financial assurances with regulatory agencies
- Structuring corporate insurance strategies
- Selecting options that require financial analysis of benefit and cost
- Determining the value of a business and its contingent liabilities

Those who would find the book useful are:

- Business managers involved in strategic planning through to operations
- Policymakers
- Regulators
- Consultants
- Students of business management and applied technology

## BOOK STRUCTURE

Part One outlines the need for risk management, describes the role of risk assessment in the risk management process, and discusses current risk assessment approaches.

Chapter 1 (“Risk Management Process”) provides background information on the nature of risk and discusses the risk management process and where risk assessment, a fundamental component, fits into the process.

Chapter 2 (“Why Use Anything Other Than Quantitative Risk Assessment?”) reviews the commonly used risk assessment practices (qualitative, semiquantitative, and quantitative) and discusses their relative advantages and disadvantages.

Part Two (“RISQUE Method”) introduces the quantitative RISQUE method and discusses development of risk treatment strategies.

Chapters 3 through 8 describe in detail the quantitative, five-stage RISQUE method. These chapters describe (using examples) how the information derived using this method can be arranged, related to common business indicators (e.g., net operating income, benefit-cost ratios, return on assets), and used to develop strategies to manage and reduce business risk.

Chapter 9 (“Benefits of the RISQUE Method”) reminds us of the advantages over other approaches and reiterates the benefits that application of the RISQUE method can provide to business managers.

Part Three describes eight case studies where the RISQUE method has been used, to demonstrate its applicability across a wide range of business activities and events. The case studies should provide many pointers to enable readers to generate ideas where the RISQUE method might be applicable to their own business. The introduction contains synopses for all case histories so that readers can quickly assess which ones they would like to study in detail.

The case studies presented in Chapters 10 through 17 provide examples of situations where the following questions have been addressed:

- “*Project Selection*”: How can we select and justify the best option? (Ok Tedi, Papua New Guinea, mine waste management options)
- “*Acquisitions*”: How much additional liability could we be acquiring? (Acquisition of large power generation assets, United States)
- “*Quantifying Intangibles*”: How can we account for “nonquantifiable” events? (Total community benefit cost analysis of land development opportunities at Alkimos, Western Australia)
- “*Community Safety*”: How can personal injury be used as a measure of risk and compared with accepted levels of societal risk? (Risk associated with a tourism venture in Fiordland, New Zealand)
- “*Financial Assurances*”: What is a realistic financial assurance to place for operation of a sanitary landfill? (Establishment of a financial assurance strategy for a large municipal landfill, Australia)

- “*Indemnity in Perpetuity*”: How much do we need to set aside for future liabilities? (Establishment of postclosure monetary bond for Waihi gold mine, New Zealand)
- “*Corporate Reporting and Insurance*”: How can we comply with reporting requirements, and what is the best insurance structure considering our risk profile? (Mining and mineral processing plants, United States and Asia-Pacific region)
- “*Asset Management*”: What asset management strategy gives us the best return? (Auckland, New Zealand, sewage pumping stations risk assessment)

At the end of the book, there is a glossary that defines the technical terms used in the book.

We hope that this book will provide readers with ideas that they can use to improve their business risk assessment processes and to formulate well-informed and defensible risk management decisions that satisfy corporate objectives to increase profit, improve environmental performance, and enhance community benefits: the triple bottom line.

## Notes

1. Corporate responsiveness describes the way in which companies address their corporate responsibilities, that is, their legal, social, economic, and environmental obligations to the communities in which they operate.
2. Standards Association of Australia, *AS/NZS 4360: Risk Management*. Strathfield, NSW: Standards Association of Australia, April 12, 1999.
3. J. Elkington, *Cannibals With Forks. The Triple Bottom Line of 21st Century Business*. Oxford: Capstone Publishing Limited, 1999.
4. Cited by M. Vincent, “Creating the Pathway for Corporate Change. Executive Briefing,” *Corporate Risk*, September 2000, p. 33.



**Part One**

**RISK MANAGEMENT**



## RISK MANAGEMENT PROCESS

Business risk is a condition involving exposure to events that would have an adverse impact on a company's objectives. Business risk is therefore a combination of the likelihood of an event occurring and the magnitude of its consequences.

The term "business risk" covers the full range of risks faced by today's companies that have potential to affect the triple bottom line. A company's business risk portfolio may include events with potential for impacts on the organization's investments, income, staff and local community welfare, occupational health and safety, the natural environment, company reputation, technological capability, security, political environment, property, and legal liabilities.

The scope of business risks is broad—risks may arise from a range of sources, as demonstrated by the following five examples.<sup>1</sup> Depending on the activities in which a business is involved, the number of risks may be reduced or expanded.

1. Strategic risk is the risk of planning failure. Strategic risks may include:
  - Poor marketing strategy
  - Poor acquisition strategy
  - Unexpected changes in consumer behavior
  - Political and regulatory change
2. Financial risk is the risk of failure of financial control. Financial risks may arise from:
  - Treasury operations
  - Lack of counterparty and credit assessment
  - Fraud and its control
  - Systemic failure
  - Poor receivables and inventory management
3. Operational risk is the risk of human actions, either willful or by omission. Examples include:
  - System mistakes
  - Unsafe practices



#### 4 / Risk Management Process

- Employee routines
  - Willful destruction
4. Commercial risk is the risk of business interruption. Commercial risks may arise from:
- Loss of key personnel
  - Supplier failure
  - Legal issues and compliance
5. Technical risk is the risk of failure of physical assets. Examples include:
- Equipment failure
  - Infrastructure breakdown
  - Fire and physical impact
  - Explosion and/or sabotage
  - Pollution
  - Natural events

Business risks arise from the occurrence of risk events—those events that might reasonably be considered to have the potential to occur over the lifetime of a business. For example, a large storage tank fire, in a well-operated fuel tank farm (with a 50-year design life), would not be expected to occur over a 30-year period, if safety measures have been implemented to decrease both the likelihood of a fire and the magnitude of the consequences. Nevertheless, there remains a very low likelihood that a large fire actually will occur within that time frame, and therefore this eventuality should be considered as a risk event worthy of assessment.

For the purposes of risk quantification, the magnitude of the risk is calculated as the mathematical product of the likelihood of the risk event occurring and the consequences. A risk event may pose a high risk because it is likely to occur frequently, although the consequences may not be substantial in financial terms. A risk event also may pose a high risk if it has a low likelihood of occurrence but the consequences will be substantial in financial terms. A risk event that poses an “extreme” risk to the business will represent both a high likelihood of occurrence and substantial financial consequences.

It is important to recognize from the outset that identification and characterization of risks is an inherently subjective process that may be highly influenced by the personal beliefs, training, and experience of the individuals who make judgments about the risks.

For example, the risks posed by the presence of a large water storage dam are likely to be perceived quite differently by a civil engineer as compared with a crop farmer living downstream of the dam. Similarly, the operational risks posed by a gold mine are likely to be perceived differently by the company’s corporate financial controller compared with the company’s on-site environmental manager.

Given the intrinsic subjectivity of human perspectives, it is unrealistic (and risky) to expect one or two experts or company managers to be able to develop a comprehensive and balanced profile of a company's business risks.

## WHY MANAGE RISK?

Although many managers use risk management principles both formally and informally in their day-to-day work, prudent managers will adopt a structured approach to risk management to ensure that risks are identified and addressed in a consistent manner. In order to perform risk assessment and to develop a risk management strategy, business managers need to understand the concept of risk and the risk profile that businesses face.

Some business activities are inherently complex or challenging, and particular attention to risk management is warranted, irrespective of their scale. In large projects there may be substantial potential losses unless the project activities are managed carefully. Such projects often involve unbalanced cash flows, requiring large initial investments before any returns are gained. Other smaller projects or activities also may be inherently risky because they involve unusual or nonroutine activities. Such activities are new technology, work in unfamiliar locations, unusual legal or contractual arrangements, and/or special consideration of issues (political, economic, or financial aspects; sensitive environmental, social, or safety issues; or regulatory or licensing conditions).

The commercial and legal consequences of failure to adequately identify, understand, and manage risks can be substantial. Increasingly, due diligence clauses in legal statutes, corporate governance requirements, and corporate social responsibility principles require companies to identify and manage their risks. For example, the Australian Stock Exchange requirement for disclosure of corporate governance practices (in accordance with rule 4.10.3) includes a requirement to define the "Board's approach to identifying areas of significant business risk and putting arrangements in place to manage those risks."<sup>2</sup>

Adverse consequences of inadequate risk management practices can include<sup>3</sup>:

- Costs of sanctions (fines, imprisonment, personal liability of directors and managers)
- Civil claims (common-law damages)
- Legal costs in defending criminal and civil actions
- Statutory and common-law cleanup obligations
- Natural resources damages claims
- Direct lender liability
- Adverse publicity
- Loss of staff morale

- Increased insurance premiums
- Increased establishment costs (seed investment)
- Increased financing costs
- Future liability to provide indemnification agreements and warranties
- Revocation of regulatory licenses and permits

Clearly, these adverse consequences are not in the commercial interests of organizations that want to demonstrate that they are responsible and sustainable investments for shareholders. Identification and assessment of business risks therefore play an important role in both strategic and operational decision making.

All business managers usually attempt to identify strategic and operational risks for those aspects with which they are familiar. Most organizations have some level of risk management in place, although commonly the measures focus on their core areas of operation and are aimed at reducing negative impacts on the financial bottom line.

For example, every gold mining company is exposed to variation in gold price, a fundamental operational risk to that business. As a matter of course, the astute financial controller typically has access to reliable knowledge of the likely price variations and their timing, and takes action to reduce the risk. A commonly applied risk management action is to place hedging contracts. This action reduces the risk to an acceptable, or practical, level, although there is likely to be some degree of residual risk that the hedging contracts will be ineffective.

Unlike their comprehension of the familiar or obvious “core” risk (e.g., the gold price), business managers often have less understanding of the risk events associated with other operational aspects of their businesses, even though the events may present considerable financial exposure. For the gold miner, such events could include, for example, adverse community reaction to a change in mine operations that company management had anticipated to have a negligible social impact. Such risks may not be recognized or may be underestimated because they are “unfamiliar” to the company decision-makers.

This differentiation between “familiar” and “unfamiliar” is important because collectively these risks make up the entire business risk profile. To perform a comprehensive business risk assessment and develop a whole of risk management strategy, business managers need to understand the concept of risk and their organization’s risk profile.

Residual risk is that which remains beyond the identified, managed risks. An organization’s risk acceptance is determined by how much residual risk it is prepared to carry. While the assumption is that the level of residual risk is acceptable, experience suggests that this is often not the case. Most organizations do not have an understanding of the magnitude of their residual risk, and therefore the firms cannot objectively determine whether the level is acceptable.

The lack of understanding of residual risk has been accepted largely because organizations have not had the tools with which to quantify its magnitude. Uti-

lization of an appropriate risk management process is an effective way to make the external knowledge base more accessible.

## WHAT ARE THE APPLICATIONS OF RISK MANAGEMENT?

The risk management process consists of a continually reviewable cycle of risk criteria formulation, risk assessment, risk reduction, and review. It is a logical process that provides for systematic identification, analysis, and evaluation of risks in order to lead to development of an appropriate risk treatment strategy. The process enables risk treatment actions to be formulated based on the source of the risk and on the components of risk (likelihood and consequence). The application of this process can ensure that:

- All risks of relevance to the success of the business are identified
- Identified risks are understood, in terms of the range of potential consequences they represent and their likelihood of occurrence
- Assessment is undertaken of individual risks relative to the other risks to support priority setting and resource allocation
- Strategies for treating the risks take account of opportunities to address more than one risk
- The process itself and the risk treatment strategies are implemented cost effectively

This process can be applied to all stages in the life cycle of a business or project. Examples of the applicability of this process include:

- *Prefeasibility appraisal of a proposal:* Strategic decisions must be made, often on the basis of limited market and technical information, to reject the proposal, to postpone it, or to proceed with more detailed feasibility studies.
- *Marginal projects:* A decision may be required as to whether or not to undertake a project, when the return calculated on the basis of the best estimates of capital requirements and cash flows is close to the target rate of return.
- *Volatility:* When a business activity involves unusual risks or uncertainties or potentially volatile market prices, there may be a wide and unpredictable range of possible rates of return. Risk assessment can provide a financial measure of this uncertainty.
- *Options analysis:* Strategic decisions may be necessary when choosing between alternative business opportunities for a project or concept that has already been justified at an earlier prefeasibility or feasibility stage.
- *Tactical decisions:* Risk assessment may be appropriate for tactical decisions when developing detailed plans or specifications for an approved concept.

- *Operational safety improvements and technical hazard reduction:* Specialized risk assessment is critical when implementing potentially hazardous projects and for the systematic review of risk treatment options.
- *Exit strategies:* When planning for decommissioning of an operation nearing the end of its life, risk assessment may be used to determine the appropriate remediation, closure, or divestment options.

## WHAT IS THE RISK MANAGEMENT PROCESS?

The generally accepted approach to risk management comprises a series of steps, as depicted in Figure 1.1 and listed below:

- Step 1. Define the context and risk management criteria
- Step 2. Identify the risks
- Step 3. Assess the significance of those risks
- Step 4. Identify, select, and implement risk treatment options
- Step 5. Perform monitoring, review, and corrective actions

Each step offers a convenient milestone for reporting, review, and action. Each subsequent step is dependent, and builds, on the work completed in the previous step, providing an evolving understanding of the issues and development of progressively more robust risk management actions.

The following subsections describe each of those steps and their interrelationships.

### Step 1: Define Context and Risk Management Criteria

The objectives of this step are to:

- Establish the organizational context within which risk assessment is to take place
- Specify the main objectives and outcomes required
- Identify a set of criteria against which the identified risks can be evaluated
- Define a set of key elements for structuring the risk identification and assessment process

**Context.** The purpose of defining the business context is to ensure that there is a clear understanding of the responsibilities and accountabilities at each level in the organization and to identify where ambiguities or weak links may exist that may compromise the organization's ability to manage its risks. The context is used to develop an understanding of the organization's commitment to, and capability of,

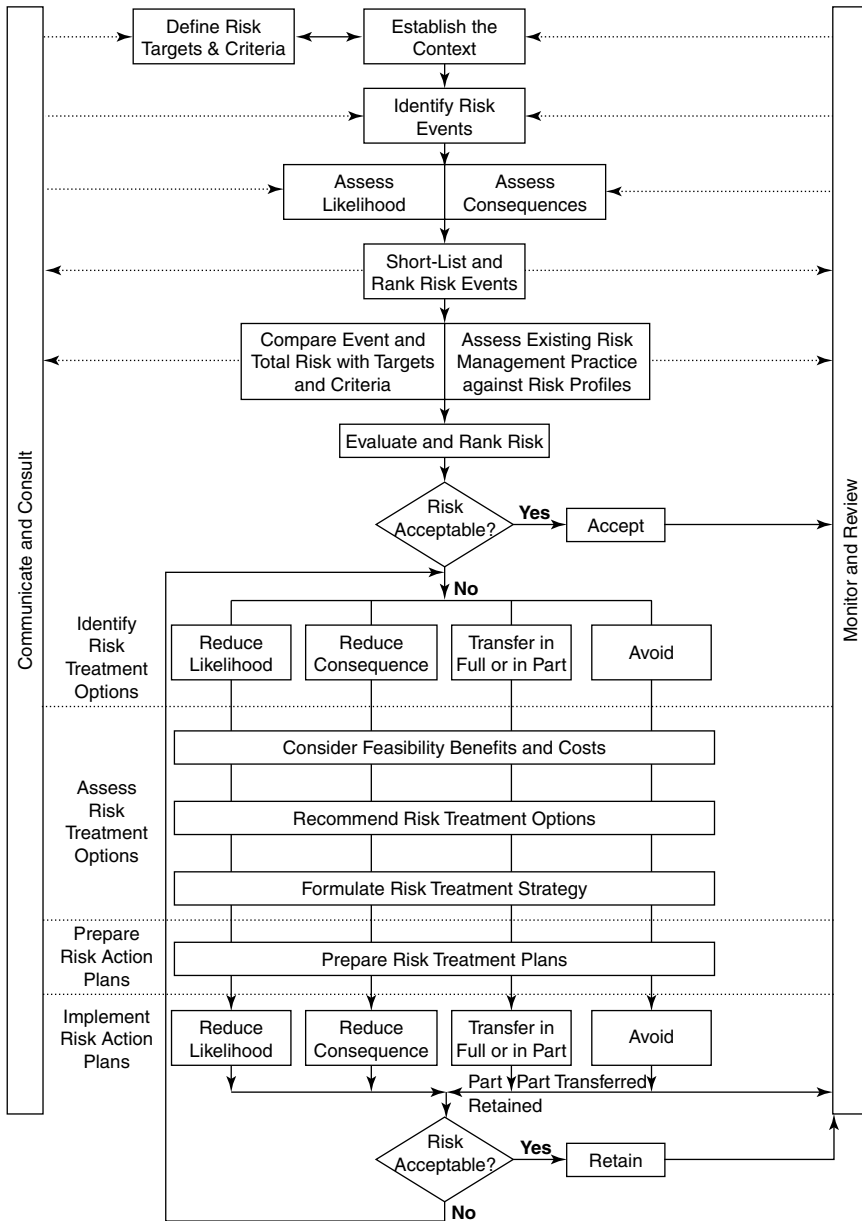


Figure 1.1 Overview of the risk management process.