



RISK AS AN ASSET IN PROJECT MANAGEMENT

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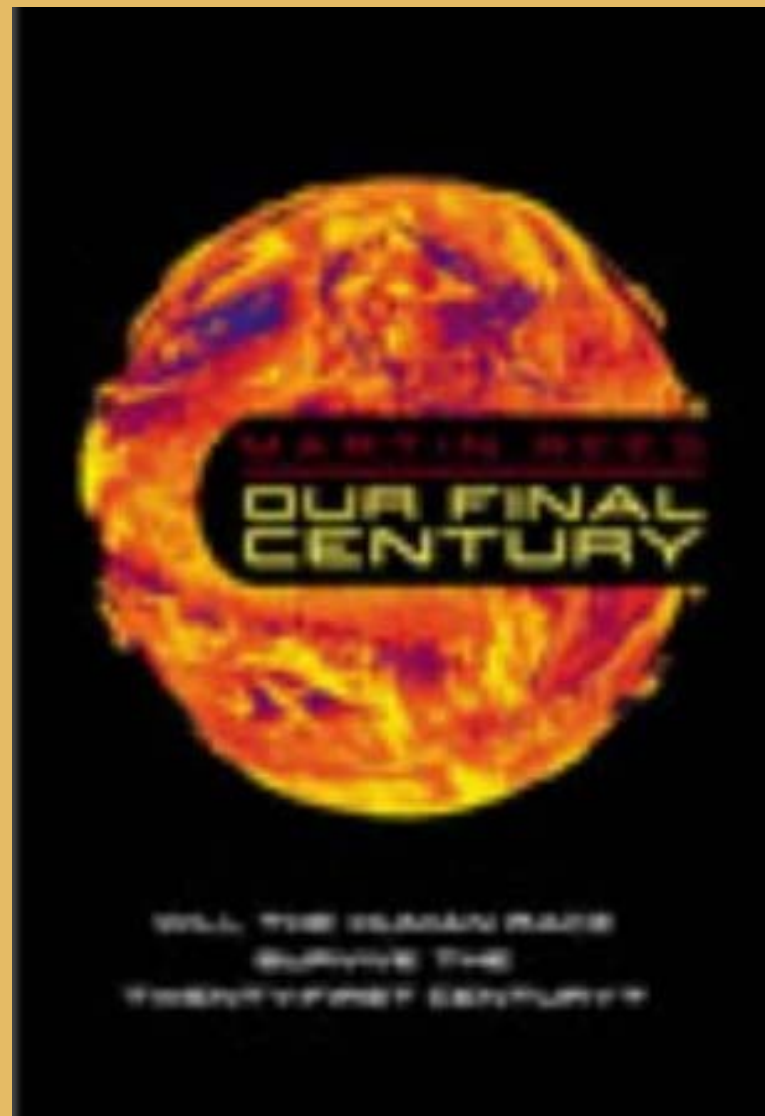
NEW ERA OF RISK IN WHICH WE ALL EXIST.

WHAT IS WRONG WITH RISK MANAGEMENT PRACTICES.

CHALLENGES IN DEVELOPING A NEW APPROACH.

**MULTIPLEX
FACILITIES MANAGEMENT**







MULTIPLY



- D** efence
- M** aintenance
- M** anagement





RECENT RESEARCH

38% Directors were not confident in their risk management systems.

59% Companies did not review risks on a regular basis.

57% Regularly declined tenders due to a lack of confidence in managing high risks OR added too large contingency and lost the job as a result.



RECENT RESEARCH

Only 29% of senior managers have received risk management training

Only 51% of companies have business continuity plans, less than 50% of organisations have ever tested them.

Most companies are totally unprepared for an emergency

PPP/PFI projects, risk management practices are highly variable, intuitive and generally unsophisticated





MULTIPLY

Facilities Management

Facilities Management is a provider of facilities, property and management services to both the Multiplex Group and a range of clients





WHY REVIEW EXISTING PRACTICES?

High risk (and opportunity) environment.

Rapid growth.

Surge in risk-related legislation.

Penalties for non-compliance becoming increasingly severe.

Customer base changing.

Pre-qualification requiring a demonstrable capability in risk management.

Corporate responsibility and citizenship evolving fast.

Risk and opportunity management is core business and essential to protect and enhance reputation.



RISK AND OPPORTUNITY MANAGEMENT SYSTEM (ROMS)



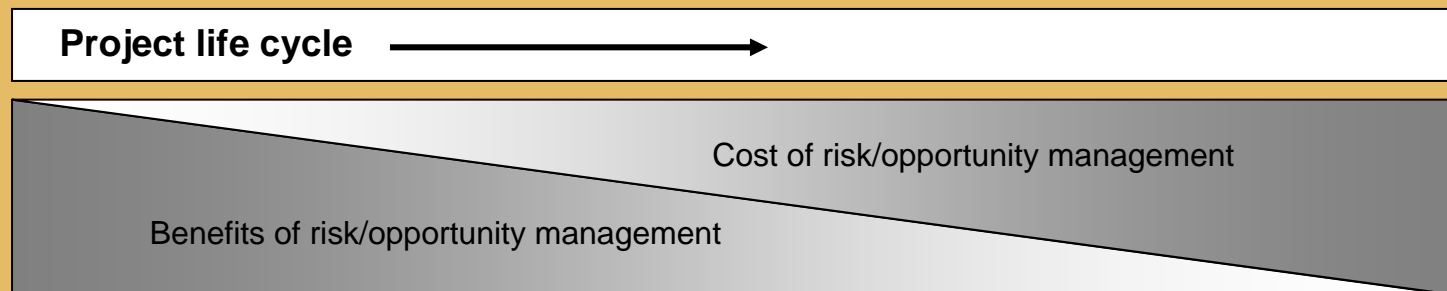
ROMS - A NEW WAY TO MANAGE RISK

Risk seen as an asset

Risk portfolios

Breaking down barriers

Pro-activity





ROMS - A NEW WAY TO MANAGE RISK

Taking responsibility

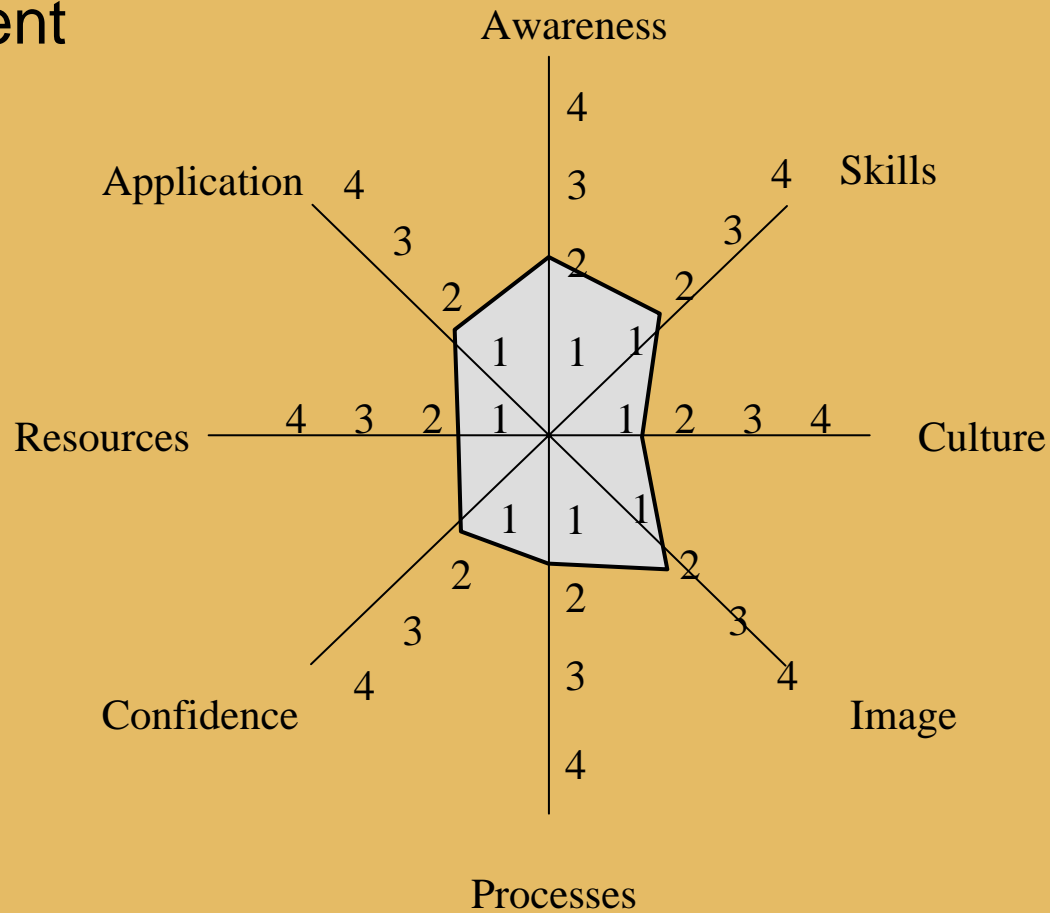
Meaningful consultation

Simple



ROMS development and implementation process

Risk Management Maturity Index





ROMS development and implementation process

FOCUS GROUPS WITH KEY STAKEHOLDERS.

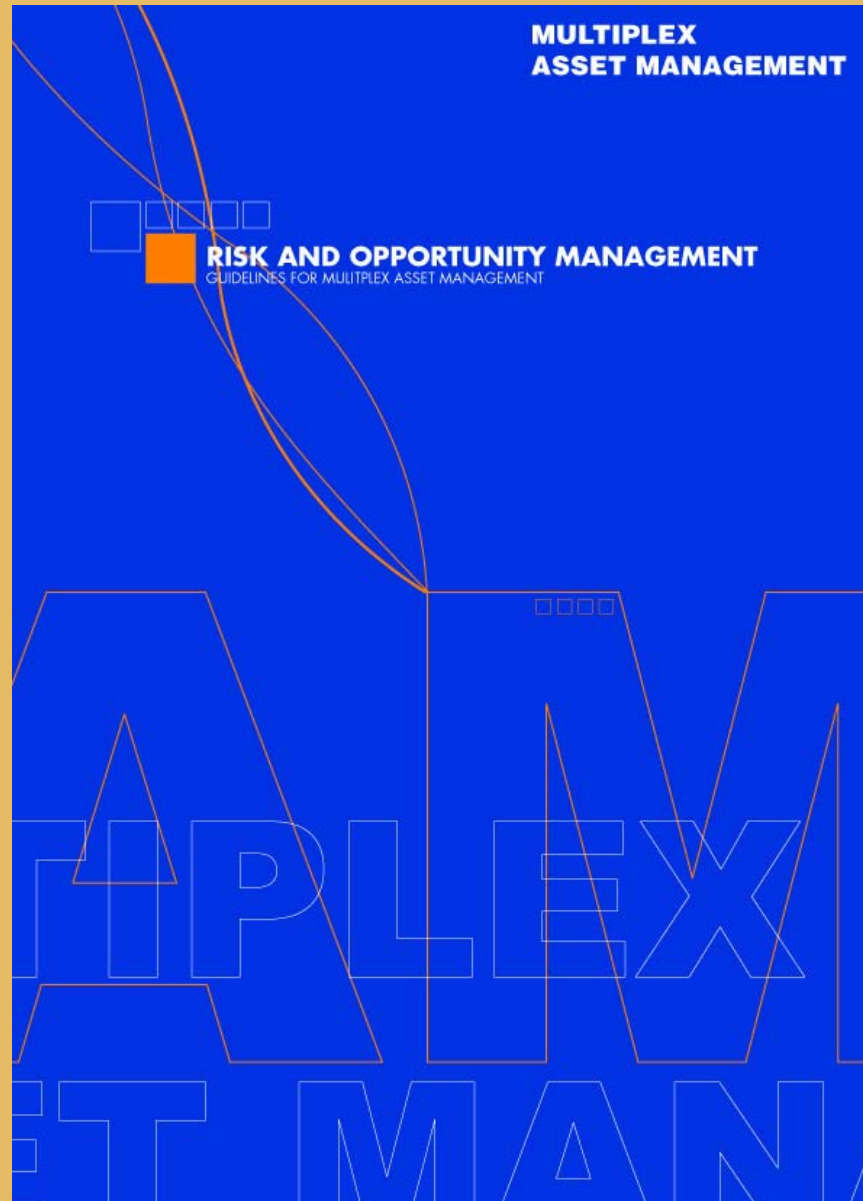
DOCUMENT THE SYSTEM

PILOT THE SYSTEM, COLLECT FEEDBACK
AND REFINE IT.





THE END RESULT





What is risk and opportunity management?

Risk and Opportunity Management is the process of systematically and collectively working to minimise risks and maximise opportunities for MAM's employees, customers and business partners. The aim is to avoid surprises and ensure that contract outcomes are achieved and, ideally, exceeded.

Risks are possible events that could impact negatively on contract outcomes. They might include equipment failure, lack of critical spares, increases in specialist service cost, security breaches, floods/storms/fire, environmental contamination, workplace accidents etc.

Opportunities are possible events that could impact positively on contract outcomes. They might include new technologies making improved performance possible, new suppliers for critical spares allowing price reductions for customers, new maintenance strategies leading to faster response times for customers, new markets for services becoming available, new staffing structures allowing wider utilisation of available expertise etc.



What are the benefits of MAM's Risk and Opportunity Management System?



MAM operates in a highrisk and highopportunity environment and its success depends upon its ability to manage risks and opportunities effectively. MAM's Risk and Opportunity Management System is designed to benefit MAM, its staff, customers and business partners through:

MAM's business is managing risks and opportunities effectively

- **Higher Performance** - Emphasis on planning resulting in fewer unforeseen problems and more opportunities for improvement.
- **Greater efficiency** - Focussing on value-adding activities and the elimination of unnecessary costs.
- **Higher quality contract data and documentation** - Better quality information on which to make informed decisions.
- **Optimum utilisation of our people's experience and skills** - Creation of a motivated workforce producing new and innovative ideas.
- **Open and trusting relationships** - With MAM staff, customers, business partners and external stakeholders.

Do I have to comply with these guidelines?



Every person working on an MAM contract must familiarise themselves with these guidelines.

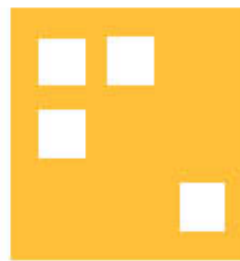
You must comply with these guidelines when:

- You make a decision that could involve significant risks or opportunities for MAM's employees, customers or business partners.
- You detect a significant risk or opportunity during the course of a contract, regardless of whether it affects your interests or not.

These guidelines are applicable to all levels, activities, functions, departments and business units within MAM. They also apply to any organisation that enters into a contract for the supply of goods or services on any MAM contract. Risk and opportunity management will be required under such contracts and compliance with these guidelines will need to be demonstrated, along with the necessary resources, skills and attitude to do so.

Management responsibilities for ensuring that these objectives are achieved are described in **Appendix B**.

Risk and opportunity management is everyone's responsibility.



What support is available?



Support is available. Use it and ask for more if you need it.

MAM will provide the necessary support and training to enable you to manage your risks and opportunities effectively. A risk and opportunity management team has been created with specific responsibilities for implementing, managing, monitoring and updating these guidelines. The generic structure of this team is depicted below and you should consult them if you have any queries or problems.

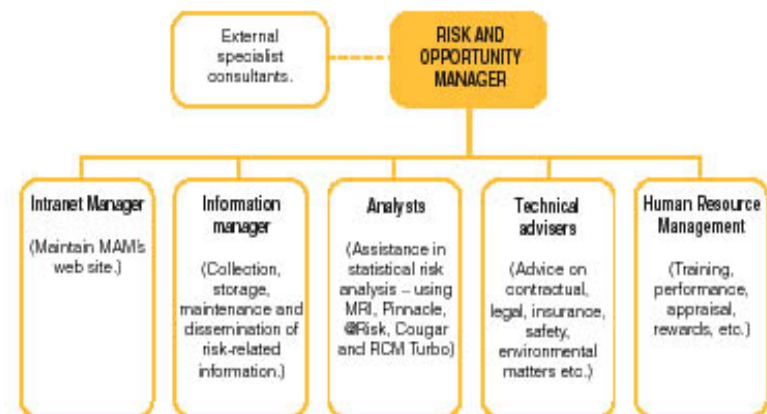


Figure 3: MAM's risk and opportunity management team.

MAM has also established a risk and opportunity management section on its intranet site (<http://www.mam.com.au/>). The site allows those working on MAM facilities to share, visualise and communicate information about risks and opportunities with customers, staff, sub-contractors, suppliers, consultants and authorities, anywhere in the world. On the MAM site you will find:

- These guidelines.
- Standard forms which can be downloaded for use.
- A dedicated facility-specific ROMP template.
- A data-base which provides information to help you manage risks effectively.
- A library of useful references.
- A risk and opportunity management noticeboard that is continually updated with useful tips, contacts and information.
- A discussion page that will enable managers to share their experiences.
- A suggestion box that allows managers to provide ideas for improvement.
- A helpline where you can consult an expert by e-mail for further information.

When do I start risk and opportunity management?

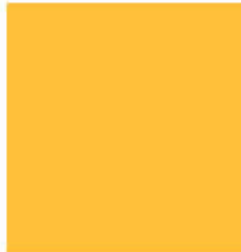
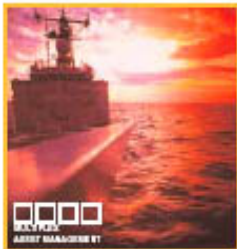


Every time you make a decision, you create risks and opportunities. The risk and opportunity management process commences when you are making a decision that involves significant risks and opportunities for MAM's staff, customers and business partners. The process should continue until your objectives have been fully achieved or ideally, exceeded.

You should start managing risks and opportunities when making decisions not afterwards. This allows you to minimise potential risks and maximise potential opportunities.



Figure 4: MAM's continuous risk and opportunity management process.



What is the first step?



Effective risk and opportunity management does not have to be complicated. Match the complexity to your specific circumstances.

The first step in risk and opportunity management is to decide upon an approach that is appropriate to your particular circumstances. Risk and opportunity management does not have to be complex to be effective and the benefits are not confined to large and complex facilities or business activities. While these guidelines prescribe a standardised approach to risk and opportunity management, they are flexible enough to enable you to make choices according to your specific circumstances.

You may decide to adopt a highly complex or simple approach but the most important thing is to justify it. To assist, MAM have adapted a simple four-level system that is described below.


COMPLEXITY	LEVEL	DESCRIPTION
Simple  Complex	1	A minimum standard to be employed in all decisions that involve any significant risks and/or opportunities to MAM's employees, customers and business partners.
	2	A standard to be employed in decisions about business activities of medium risk and opportunity.
	3	A standard to be employed in decisions about business activities of high risk and opportunity.
	4	A standard to be employed in decisions about business activities of exceptionally high risk and opportunity.

Table 1: MAM's four-level system

IDENTIFYING your risks and opportunities

Risk and opportunity identification is the first stage of the risk and opportunity management process. It is important because an unidentified risk or opportunity cannot be managed.

In making decisions, MAM requires you to do all that is reasonably practicable to identify potential risks and maximise potential opportunities to MAM's employees, customers and business partners. Everyone working on an MAM contract must take responsibility for identifying the risks and opportunities inherent in their decisions and, where possible, be vigilant to those of other decision-makers.

Although formal responsibilities for risk and opportunity identification are set down in these guidelines, risk and opportunity identification should be an integral part of MAM culture and an automatic way of working.

The process of risk and opportunity identification involves two main steps, which are depicted below with key questions to ask at each stage.

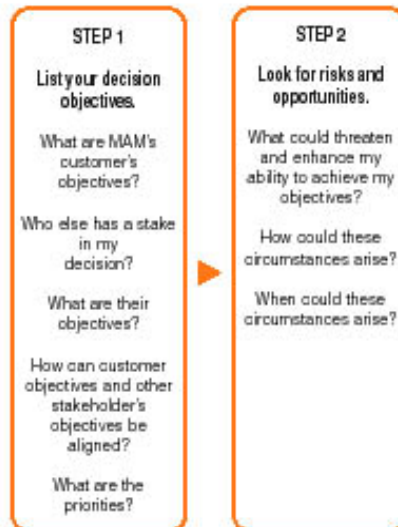


Figure 6: MAM's risk and opportunity identification process

The following two sub-sections will guide you through each stage in Figure 6.

You must do all that is reasonably practicable to identify risks and opportunities in your decisions and be vigilant to those of other decision makers.

It is your responsibility to identify the risks and opportunities in your decisions.

ANALYSING your risks and opportunities

Having identified a potential risk or opportunity, to MAM, its employees, customers and business partners, MAM requires that you do all that is reasonably practicable to analyse and assess its magnitude. Do this in consultation with key stakeholders and do not attempt to do this in isolation.

Risk analysis will help you to identify:

- The relative magnitude of different risks and opportunities you have identified.
- Where you need to take action immediately.
- Where you need to develop action-plans for future activities.
- Where you should allocate your resources for dealing with potential problems and opportunities.

You must do all that is reasonably practicable to accurately analyse and assess the magnitude of risks and opportunities.

Do not work in isolation.



CONTROLLING your risks and opportunities

Risk control is the penultimate stage of the risk and opportunity management process. The purpose is to use the report and information provided by the Nominated Risk Assessor to decide:

- Whether a response is justified.
- What that response should be.
- How the response should be implemented.
- When the response should be implemented.
- Who has responsibility for implementing the response.

Having identified and analysed risks and opportunities, the penultimate step is controlling them.



MONITORING, reviewing and learning from your risks and opportunities.

Monitoring, reviewing and learning is the final stage of the risk and opportunity management process. The purpose of this stage is to ensure that:

- Each person involved in the implementation of a control response does as planned.
- Control measures have the desired impact.
- MAM staff and external stakeholders are kept informed of progress towards implementation and resolution.
- Further risks or opportunities that may arise during implementation are detected and responded to.
- Lessons are learnt for future risk and opportunity management.

You will need to monitor the implementation of your controls carefully and respond accordingly.



How do I use the pro-active risk and opportunity identification techniques listed in Table 2?

Influence Diagrams

Influence diagrams can help reveal how and when a risk or opportunity might arise by plotting the chains of events that lead to them. An example is provided below, which shows contributory events (diagonal arrows) that combine to produce a cost-overrun (the risk and horizontal arrow).

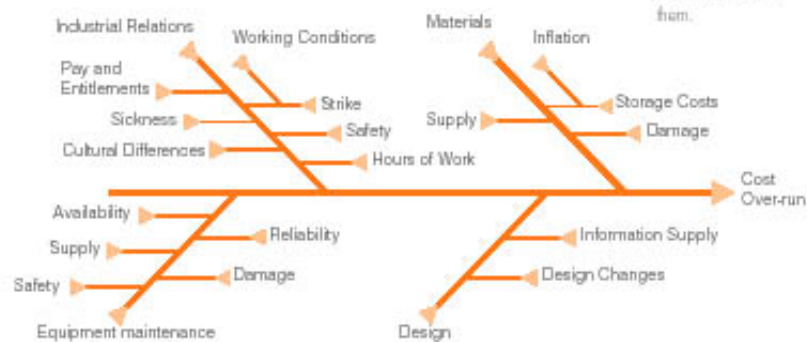


Figure 9: Typical influence diagram 1.

Constructing an influence diagram is simple and involves dividing the main risk or opportunity into its sub-components until its origins are identified. This process can be facilitated by working backwards from the eventual risk or opportunity, asking "what could cause?" questions. In the above example relating to a cost target failure, the chain of events depicted would have evolved from asking the following questions:

1. What could cause a cost overrun?
Answer – Industrial relations problems, materials problems, equipment maintenance problems, design problems etc.
2. What could cause materials problems?
Answer – supply problems, storage problems, damage etc..
3. What could cause high storage costs?
Answer – inflation etc.

You should use the form provided in **Appendix F** to record any risks or opportunities identified, considering how and when a risk or opportunity might arise.

¹ Adapted from Skin, LY (1998) Risk Management, In Bar, R and DeValece, C (ed) Building It in, Arnold, London.



Influence diagrams reveal how a risk or opportunity could arise by plotting chains of events that lead to them.

How do I use the pro-active risk and opportunity identification techniques listed in Table 2?

By inserting relationships/influences between components within a system map, a systems influence diagram can be produced highlighting further potential sources of potential risks and opportunities in the relationships themselves. This is illustrated below.

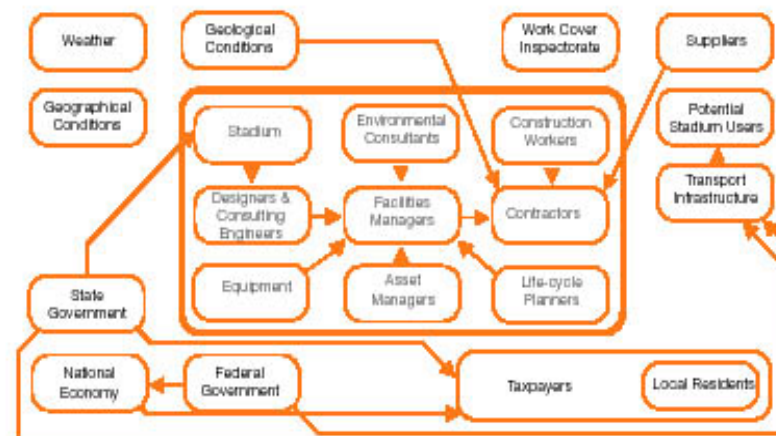


Figure 12: Typical system influence map of a stadium project 1.

You should use the form provided in **Appendix F** to record any risks or opportunities identified, considering how and when a risk or opportunity might arise.



How do I calculate probabilities?

LEVEL 4

Simulation

The problem with sensitivity analysis is its assumption that one can test variables in isolation, whereas in practice, variations in one variable are linked to variations in another. This can be redressed to some extent by simulation techniques, which have been developed to consider how a particular combination of circumstances can impact upon a contract's success.

Simulation is able to show how different combinations of circumstances can affect decision outcomes.

Simulation is a sampling method which randomly draws values from the full range of individual probability distributions developed for a decision. It provides a systematic evaluation of alternative decision strategies and outcomes and searches for the optimum one. Computers are essential to undertake this process and the number of variable combinations can run to 1000s. In effect, the computer acts as an experimental laboratory where the contract can be run over-and-over again in different combinations of circumstances/assumptions. The output of this process is a probability distribution for your whole decision, which combines all the individual probability distributions of the different risks and opportunities associated with it. A typical simulation output is illustrated below.

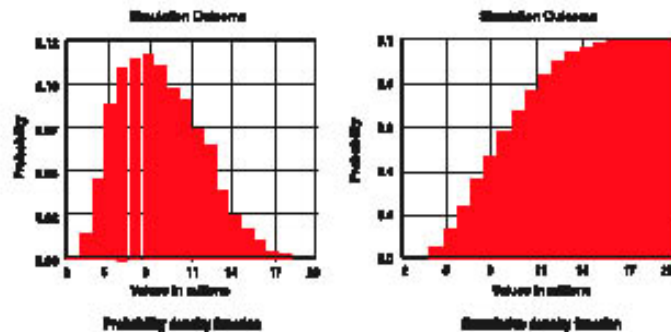


Figure 20: A simulation output.

In the above example, the most likely value for the project (see probability density function) is just over \$8m, which might become our bid. Also, since the graph is skewed to the right, there is a greater chance of being over this value than under which is illustrated in the cumulative density function graph. This illustrates the levels of probability that we can deliver a contract for any specific price. For example, we are almost certain to be able to undertake this contract for \$20m (Probability of 1) but we only have a 17% (Probability of 0.17) chance of undertaking it for \$5m. This is very useful for indicating levels of risk in making different decisions.

How do I calculate probabilities?

LEVEL 4

Sensitivity analysis

Sensitivity analysis indicates the relative impact of different risks and opportunities upon objectives.

All decisions will have an array of risks and opportunities with different probability distributions. However, some risks may be more significant in terms of their potential impact upon your objectives than others. Sensitivity analysis allows you to rank the relative importance of different risks and opportunities and, thereby manage your resources more effectively. In essence, it identifies the multiplier effect of different risks upon your objectives, indicating how sensitive the contract is to changes in the magnitude of each. It involves asking "what if?" questions and experimenting with the assumptions underlying a contract strategy. For example, a capital expenditure decision to specify a french manufactured chiller unit could face a whole variety of risks but be particularly sensitive to supply problems.

The output of sensitivity analysis is a "spider diagram", as illustrated below.

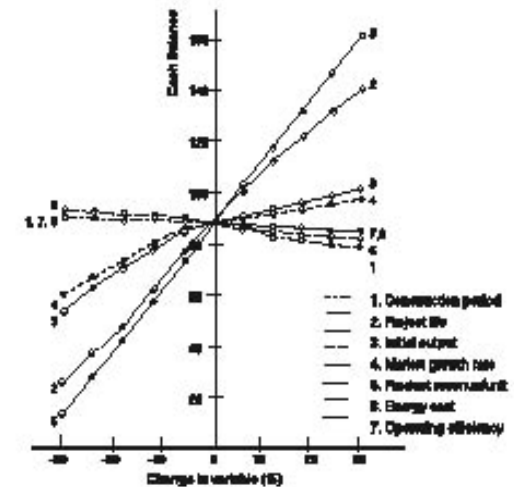


Figure 19: Spider diagram.

4. HJ Smith (1998) *Cost Risk Management in Construction projects*, Blackwell Science, Oxford, UK.



HOW DOES ROMS WORK?

STEP 1

Stakeholder analysis and common objectives.



STEP 2

Identify risks and opportunities to those objectives.



STEP 3

Assess their magnitude and prioritise them.



STEP 4

Develop an action plan to minimise risks and maximise opportunities.



STEP 5

Monitor action plan and review it, if needs be.

STEP 6

Learn lessons and improve practices.

Record the whole process in a **ROMP**





FLEXIBILITY

COMPLEXITY	LEVEL	DESCRIPTION
Simple ↓ Complex	1	A <i>minimum standard</i> to be employed in all decisions.
	2	A standard to be employed in decisions of <i>medium</i> risk and opportunity.
	3	A standard to be employed in decisions of <i>high</i> risk and opportunity.
	4	A standard to be employed in decisions of <i>exceptionally high</i> risk and opportunity.

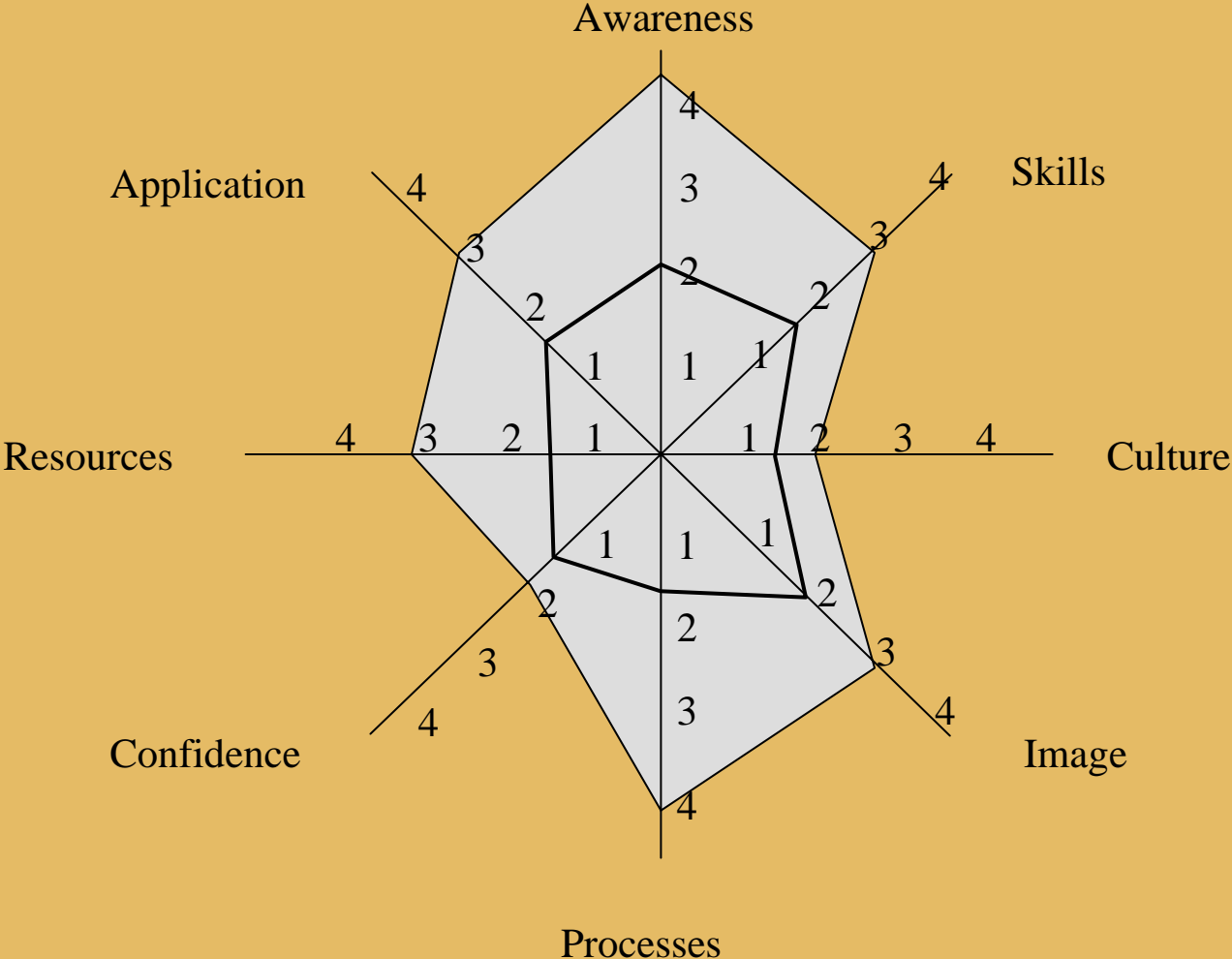


DECENTRALISATION

SUPPLY CHAIN RISK MANAGEMENT



BENEFITS?





BENEFITS?

Visible statement of core values and commitment to best practice.

Simplification and standardisation of MFM's systems and practices.

High quality project documentation.

Fewer unforeseen problems and more opportunities.

Reduced insurance premiums

Open and transparent relationships with business partners.



BENEFITS?

Better use of peoples' experience and expertise.

Confidence in ability to manage risky projects

Greater efficiency, competitiveness and profitability

Happy customers and more business



CONCLUSION

In theory, the perfect ROMS is deceptively simple to produce.

Easy to change peoples' behaviour but difficult to keep it changed.

Educate you supply chain and clients.

Senior management commitment is critical to success.

Beware of the risks of risk management.