

# **PROJECT RISK MANAGEMENT : FUTURE DEVELOPMENTS**

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## **ABSTRACT**

Project risk management has been recognised for some time as a formal discipline in its own right, and there is growing consensus on the elements which comprise best practice. However the project risk management field has not fully matured and there are a number of areas requiring further development. This paper presents the author's perceptions on the directions in which project risk management might develop in the short to medium term, comprising five key areas. These are : organisational benchmarking using maturity model concepts; integration of risk management with overall project management and corporate culture; increased depth of analysis and breadth of application; inclusion of behavioural aspects in the risk process; and development of a body of evidence to justify and support use of risk management.

## **INTRODUCTION**

Risk management within projects has developed in recent years into an accepted discipline, with its own language, techniques and tools. Most textbooks in project management now include sections on risk management, and there is a growing library of reference texts specifically devoted to the subject in its own right. The value of a proactive formal structured approach to managing uncertainty has been widely recognised, and many organisations are seeking to introduce risk processes in order to gain the promised benefits.

It appears that project risk management is a mature discipline, yet it is still developing. Many risk practitioners would agree that risk management has not yet peaked, and that there is some way to go before its full potential as a management support tool is realised. A number of initiatives are under way to extend the boundaries of the subject, and there is a danger that risk management could dissipate and lose coherence if some sense of overall direction is not maintained. This paper presents five areas where the author perceives a need for active development, and which are proposed as an agenda for change in the short to medium term, covering the next three to five years.

## **THE CURRENT SITUATION**

Before detailing areas for possible development, it is helpful to survey the current position of project risk management. This draws on the author's experience as Chairman of the Risk Specific Interest Group (SIG) for the UK Association for Project Management (APM), his involvement with the Risk SIG of the US Project Management Institute (PMI), his position as a risk practitioner in the UK and Europe, and his view of current developments in the field as Editor of this journal.

Use of formal risk management techniques to manage uncertainty in projects is widespread across many industries, and there are few sectors where it is completely absent. In many areas its use is mandatory or required by client organisations, including defence, construction, IT, offshore and nuclear industries. Other sectors are recognising the potential of risk management as a management support tool and are beginning to implement risk processes within their own projects. In the UK, various government departments are implementing risk management on projects, notably the Ministry of Defence (MoD)<sup>1</sup>, and departments with IT projects which use PRINCE<sup>2</sup> or PRINCE2<sup>3</sup> guidelines developed by the CCTA.

Risk processes have been applied to all stages of the project lifecycle, from conception, feasibility and design, through development into implementation, operations and disposal. The contribution which risk management can make at each lifecycle stage is different, but is nevertheless recognised as important.

Despite this apparent widespread take up of project risk management across business at large, the extent to which risk processes are actually applied is somewhat variable. Many organisations adopt a minimalist approach, doing only what is necessary to meet mandatory requirements, or going through the motions of a risk process with no commitment to use the results to influence current or future strategy.

A significant aspect of the project risk management field is the extent of current infrastructure support available. There is a growing academic base for the subject, and risk management is included in a variety of undergraduate courses. In addition, several MSc degrees in risk management exist, and the body of research in the topic is growing. This has led to a broad risk literature, including both textbooks and journals. A number of standards and guidelines have also been published which include aspects of project risk management to varying degrees<sup>4-12</sup>, although there is no internationally accepted risk standard at the time of writing. The discipline is supported by several professional bodies, including the UK Institute of Risk Management<sup>13</sup> (whose remit is broader than just the project risk field), and project management bodies such as the UK APM<sup>14</sup> and the US PMI<sup>15</sup> (both with dedicated SIGs for project risk management). Software vendors have also provided a range of tools to support the risk process, and a growing number of consultancies offer project risk management support to clients.

One important feature is the consensus on current best practice within project risk management. The APM Risk SIG is recognised within the UK as representing the centre of excellence for the subject within the UK, and internationally the leading position of the UK in project risk management is also widely accepted. A recent publication from the APM (the “Project Risk Analysis & Management (PRAM) Guide”<sup>16</sup>) has captured the elements of current best practice as perceived by the Risk SIG, and this has been expanded and expounded elsewhere<sup>17</sup>. This covers high level principles in the form of a prototype standard for risk management, and presents a generic process. The PRAM Guide also deals with organisational issues (roles and responsibilities), psychological aspects (attitudes and behaviour), benefits and shortfalls, techniques, and implementation issues, presenting a comprehensive compilation of current practice. Other best practice documents also exist, although not with such broad coverage<sup>18,19</sup>.

## AREAS FOR FUTURE DEVELOPMENT

The current situation in project risk management outlined above represents a position where there is broad consensus on the fundamentals, with a mature and agreed process, supported by a comprehensive infrastructure. The core elements of project risk management are in place, and many organisations are reaping the benefits of implementing risk processes within their projects and wider business, despite the variable depth of application. There are however a number of areas where the discipline needs to develop in order to build on the foundation which currently exists. It is this author's belief that development of the following five areas would greatly enhance the effectiveness of project risk management :

- organisational bench-marking using maturity model concepts
- integration of risk management with overall project management and corporate culture
- increased depth of analysis and breadth of application
- inclusion of behavioural aspects in the risk process
- development of a body of evidence to justify and support use of risk management

Each of these areas is discussed in turn below, outlining how project risk management might benefit from their inclusion.

## ORGANISATIONAL BENCHMARKING

An increasing number of organisations wish to reap the benefits of proactive management of uncertainty in their projects by developing or improving in-house project risk management processes. It is however important for the organisation to be able to determine whether its risk processes are adequate, using agreed measures to compare its management of risk with best practice or against its competitors. As with any change programme, benchmarks and maturity models can play an important part in the process by defining a structured route to improvement.

The *Risk Maturity Model* (RMM)<sup>20,21</sup> was developed as a benchmark for organisational risk capability, describing four increasing levels, with recognisable stages along the way against which organisations can benchmark themselves. The various levels can be summarised as follows :

- The *Naïve* risk organisation (RMM Level 1) is unaware of the need for management of risk, and has no structured approach to dealing with uncertainty. Management processes are repetitive and reactive, with little or no attempt to learn from the past or to prepare for future threats or uncertainties.
- At RMM Level 2, the *Novice* risk organisation has begun to experiment with risk management, usually through a small number of nominated individuals, but has no formal or structured generic processes in place. Although aware of the potential benefits of managing risk, the Novice organisation has not effectively implemented risk processes and is not gaining the full benefits.
- The level to which most organisations aspire when setting targets for management of risk is captured in RMM Level 3, the *Normalised* risk organisation. At this level, management of risk is built into routine business processes and risk

management is implemented on most or all projects. Generic risk processes are formalised and widespread, and the benefits are understood at all levels of the organisation, although they may not be fully achieved in all cases.

- Many organisations would probably be happy to remain at Level 3, but the RMM defines a further level of maturity in risk processes, termed the *Natural* risk organisation (Level 4). Here the organisation has a risk-aware culture, with a proactive approach to risk management in all aspects of the business. Risk information is actively used to improve business processes and gain competitive advantage. Risk processes are used to manage opportunities as well as potential negative impacts.

Each RMM level is further defined in terms of four attributes, namely *culture*, *process*, *experience* and *application*. These allow an organisation to assess its current risk processes against agreed criteria, set realistic targets for improvement, and measure progress towards enhanced risk capability.

Since its original publication<sup>20</sup>, the RMM has been used by several major organisations to benchmark their risk processes, and there has been considerable interest in it as a means of assisting organisations to introduce effective project risk management. Other professional bodies are expressing interest in development of benchmarks for risk management based on the principles of maturity models<sup>22,23</sup>, and this seems likely to become an important area for future development.

## INTEGRATION OF RISK MANAGEMENT

Project risk management is often perceived as a specialist activity undertaken by experts using dedicated tools and techniques. In order to allow project teams and the overall organisation to gain the full benefits from implementing the risk process, it is important that risk management should become fully integrated into both the management of projects and into the organisational culture. Without such integration, there is a danger that the results of risk management may not be used appropriately (or at all), and that project and business strategy may not take proper account of any risk assessment.

At the project level, integration of risk management is required at three points.

- The first and arguably most important is a cultural issue. The project culture must recognise the existence of uncertainty as an inherent part of undertaking projects. The nature of projects is to introduce change in order to deliver business benefits. Any endeavour involving change necessarily faces risk, as the future state to be delivered by the project differs from the status quo, and the route between the two is bound to be uncertain. Indeed there may be a direct relationship between the degree of risk taken during a project and the value of the benefits which it can deliver to the business (the “risk-reward” ratio). It is therefore important for the project culture to accept uncertainty and to take account of risk at every stage. The existence of risk and the need to manage it proactively within projects should not be a surprise.
- Secondly, risk management must become fully integrated into the processes of project management. Techniques for project definition, planning, resourcing, estimating, team-building, motivation, cost control, progress monitoring,

reporting, change management and close-out should all take explicit account of risk management. It is often the case that risk management is seen as an optional additional activity, to be fitted into the project process if possible. The future of effective risk management depends on developing project processes which naturally include dealing with risk.

- Thirdly, risk tools must integrate seamlessly with tools used to support project processes. Too often differing data formats result in a discontinuity between the two, leading to difficulty in using risk outputs directly within project tools. It should not be necessary to use a specialist toolset for risk management, with import/export routines required to translate risk data into project management tools. At the practical level this would go a long way towards improving the acceptability and usefulness of risk management to project teams.

In addition to these tactical-level integration issues, there is a broader need to develop strategic risk-based thinking within organisational culture. The denial of risk at senior management levels is a common experience for many project managers, and this can dilute or negate much of the value of implementing risk management in projects, if decision-makers at a higher level do not properly take account of risk. This author contends that there is a need for a cultural revolution similar to the Total Quality Management (TQM) phenomenon, if the required degree of organisational culture change is to be achieved. As with quality, risk management must be seen as an integral part of doing business, and must become “built-in not bolt-on”, a natural feature of all project and business processes, rather than being conducted as an optional additional activity.

Such a development might be termed Total Risk Management (TRM), requiring a change in attitudes to “think risk”, accepting the existence of uncertainty in all human endeavours, adopting a proactive approach to its management, using a structured process to deal with risk (for example identify, assess, plan, manage), with individuals taking responsibility for identifying and managing risks within their own areas of influence. Clearly the implications of a TRM movement could be far-reaching, and further work is required in this area to define and promulgate the principles and practice of TRM, drawing on the previous experiences of TQM practitioners.

## INCREASED DEPTH AND BREADTH

There is general consensus about the risk management process as it is currently applied within projects, covering the techniques available for the various stages and the way in which risk data is used. Further development is however required to improve the effectiveness of risk techniques, both in their degree of operation and functionality, and in the scope of the situations where they are applied. These two dimensions of improvement are termed depth of analysis and breadth of application.

The current level of risk analysis is often shallow, largely driven by the capabilities of the available tools and techniques. Qualitative assessments concentrate on probabilities and impacts, with descriptions of various parameters to allow risks to be understood in sufficient detail that they can be managed effectively. Quantitative analysis focuses on project time and cost, with a few techniques (such as Monte Carlo simulation or decision trees) being used almost exclusively. There are a number of

ways in which this situation could be improved, leading to an increased depth of analysis :

- Development of better tools and techniques, with improved functionality, better attention to the user interface, and addressing issues of integration with other parts of the project toolset.
- Use of advanced information technology capabilities to enable effective knowledge management and learning from experience. For example it may prove possible to utilise existing or imminent developments in artificial intelligence, expert systems or knowledge-based systems to permit new types of analysis of risk data, exposing hitherto unavailable information from the existing data set (see for example references 24 and 25).
- Development of existing techniques from other disciplines for application within the risk arena. Risk analysis for projects could be undertaken via methods currently used within such diverse areas as system dynamics, safety and hazard analysis, integrated logistic support (ILS), financial trading etc. Tailoring of such methods for risk analysis may be a cost-effective means of developing new approaches without the need for significant new work.

The scope of project risk management as currently practised is fairly limited, tending to concentrate on risks with potential impact on project timescales and cost targets. While time and cost within projects are undeniably important, there are a number of other areas of interest which should be covered by the risk process. The breadth of application could be enhanced in the following ways :

- Risk impacts should be considered using other measures than project time and cost, and should include all elements of project objectives such as performance, quality, compliance, environmental or regulatory etc. The inclusion of “soft” objectives such as human factors issues might also be incorporated, as it is often the people aspects which are most important in determining project success or failure. In addition, the impact of risks should be assessed against the business benefits which the project is intended to deliver.
- The scope of risk processes should be expanded beyond projects into both programme risk management (addressing threats to portfolios of projects, considering inter-project issues) and business risk assessment (taking account of business drivers). While there are existing initiatives in both of these areas<sup>26,27</sup>, there is value in moving out from project risk assessment into these areas in a bottom-up manner, to ensure consistency and coherence.

## BEHAVIOURAL ASPECTS

There is general agreement on the importance of human behaviour in determining project performance<sup>28</sup>. This however is not usually translated into any formal mechanism for addressing human factors in project processes, including risk management. Future developments of project risk management must take more account of these issues, both in generating input data for the risk process, and in interpreting outputs.

Considerable work has been done on the area of heuristics<sup>29</sup>, to identify the unconscious rules used when making judgements under conditions of uncertainty. There is however less insight into risk attitudes and their effect on the validity of the risk process. If risk management is to retain any credibility, this aspect must be addressed and made a routine part of the risk process. A reliable means of measuring risk attitudes needs to be developed, which can be administered routinely as part of a risk assessment in order to identify potential bias among participants. Accepted norms for risk attitudes could be defined, allowing individuals to be assessed and placed on a spectrum of risk attitude, perhaps ranging from risk-averse through risk-neutral to risk-tolerant and risk-seeking. Once potential systematic bias has been identified it can then be countered, leading to more reliable results and safe conclusions. The impact of risk attitude on perception of uncertainty should be explored to allow the effects to be eliminated.

A further result of the inclusion of a formal assessment of behavioural characteristics in the risk process would be the ability to build risk-balanced teams. This would permit intelligent inclusion of people with a range of risk attitudes in order to meet the varying demands of a project environment. For example, it is clearly important for a project team to include people who are comfortable with taking risks, since projects are inherently concerned with uncertainty. It is however also important that these people are recognised and that their risk-taking tendency should be balanced by others who are more conservative and safety-conscious, in order to ensure that risks are only taken where appropriate.

Work is in progress in this area<sup>30,31</sup>, but it is important that this should be fully integrated into mainstream project risk management, rather than remaining a specialist interest of psychologists and behavioural scientists. The standard risk process must take full account of all aspects of human behaviour if it is to command any respect and credibility.

## SUPPORTING EVIDENCE

A number of studies have been undertaken to identify the benefits that can be expected by those implementing a structured approach to risk management<sup>32</sup>. These include both “hard” and “soft” issues.

“Hard” measurable benefits include :

- Better informed and achievable project plans, schedules and budgets
- Increased likelihood of project meeting targets
- Proper allocation of risk through the contract
- Better allocation of contingency to reflect risk
- Ability to avoid taking on unsound projects
- Recording metrics to improve future projects
- Objective comparison of risk exposure of alternatives
- Identification of best risk owner

“Soft” intangible benefits from the risk process include :

- Improved communication

- Development of a common understanding of project objectives
- Enhancement of team spirit
- Focused management attention on genuine threats
- Facilitates appropriate risk-taking
- Demonstrates professional approach to customers

The widespread use of project risk management suggests that people are implicitly convinced that it must deliver benefits. It is however difficult to prove unambiguously that benefits are being achieved. There is therefore a genuine need for a body of evidence to demonstrate the expected benefits of the risk process. Problems currently arise from the fact that existing evidence is either *anecdotal* (instead of providing hard measurable data) and *confidential* (accessible data is required, including both good news and bad). Also projects are *unique* (data requires normalising), and *different between industries* (evidence should be both generic and specific).

In the absence of a coherent body of irrefutable evidence, the undoubted benefits that can accrue from effective management of risk must currently be taken on trust. Overcoming this will require generation of a body of evidence to support the use of formal project risk management, providing evidence that benefits can be expected and achieved, and convincing the sceptical or inexperienced that they should use project risk management.

The intended audience of such a body of evidence would fall into several groups, each of which might seek different evidence, depending on their perspective on project success. Possible groups include the client/sponsor, project manager, project team and end user. For each group, the body of evidence should first define a “successful project” from their perspective, then consider whether/how risk management might promote “success” in these terms, then present evidence demonstrating the effect of risk management on the chosen parameters.

## CONCLUSION

The short history of project risk management has been a success story to date, with widespread application across many industries, and development of a core best practice with a strong supporting infrastructure. Although project risk management has matured into a recognised discipline, it has not yet reached its peak and could still develop further.

This paper has outlined several areas where the author believes that progress is required. In summary, adoption of the proposed agenda for development of project risk management will result in the following :

- An accepted framework within which each organisation understands its current risk management capability and which defines a structured path for progression towards enhanced maturity of risk processes (via organisational benchmarking).
- A set of risk management tools and techniques which are fully integrated with project and business processes, with the existence of uncertainty being recognised and accepted at all levels (via integration of risk management).

- Improved analysis of the effects of risk on project and business performance, addressing its impact on issues wider than project time and cost (via increased depth of analysis and breadth of application).
- Proper account being taken of human factors in the risk process, using assessment of risk attitudes to counter systematic bias and build risk-balanced teams (via behavioural aspects).
- Agreement on the benefits that can be expected from implementation of a formal approach to project risk management, based on an objective and accessible body of evidence which justifies those benefits (via supporting evidence).

It is argued that attention to these areas will ensure that project risk management continues to develop beyond the current situation. Project risk management must not remain static if it is to fulfil its potential as a significant contributor to project and business success. The areas outlined in this paper are therefore proposed as an agenda for development of project risk management in the short to medium term, producing an indispensable and effective management tool for the new millennium.

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