

## Risk Management Processes: Cyclical vs. Linear Systems

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## **Marsh Technical Study**

**under the responsibility of James Greenhill**

### **RISK MANAGEMENT PROCESSES: CYCLICAL VS. LINEAR SYSTEMS**

Organizations face constant pressure to sustain their ability to generate value in order to achieve both financial and non-financial performance goals. For private companies this often means the creation of shareholder value, for governments the protection and well-being of their citizens, and for non-profit organizations the achievement of specific social aims.

Realizing these goals can be complicated by the volatility of risk events. Risks can be seen as irregular occurrences affecting the performance of value generating mechanisms. In some cases the event is positive, for example, favorable swings in foreign exchange rates, allowing the organization to meet and exceed its goals. Such windfalls are often welcome, though they can create unrealistic expectations of future performance, and rarely require the formation of extensive management mechanisms. In other cases, risk events have degrading effects on the value generating mechanisms and prevent goal achievement. These latter events require the suitable application of risk management resources, which can be optimized by a well designed risk management process that provides:

- disciplined methodology;
- holistic view of risks and solutions;
- consistent results that can be communicated both inside and outside of the organization.

Many organizations see value in managing risks with such processes. In one survey of public and private organizations, 84% believed that being able to manage risks on a holistic basis could

improve their P/E ratio or cost of capital. There is evidence of the value of reviewing a wide range of risks and possible solutions. In a study of Fortune 1000 companies, between 1993 and 1998, there were 100 cases of rapid loss in shareholder value due to risk events. Further study showed that in over two thirds of the cases these risks could have been mitigated or transferred using existing tools and techniques.

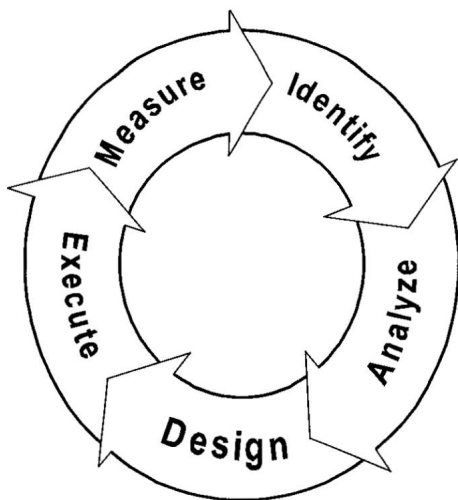
The risk management processes fall into two broad categories:

- cyclical or continuous processes that are suitable for organizations with consistent operations for the foreseeable future;
- linear processes that are better suited for organizations conducting operations with limited life-spans.

## **Risk Management as a Continuous Process**

A continuous process of risk management reflects the need to monitor changes in an organization's risk profile from altered dynamics either in internal operations or the external environment. A number of variations have been developed including the system set out by Standards Australia's AS/NZS 4360-1999 Risk Management, the risk management framework designed by HM Treasury of the UK, and the Enterprise Risk Management Framework currently being developed by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). All of these systems share similar elements or phases of identifying and assessing risks followed by designing suitable responses, implementing them, and monitoring their effectiveness. The diagram below shows the flow of these phases, each of which will be covered in further detail.

The frequency with which the cycle repeats can coincide with other reporting cycles, for example, the quarterly and annual sequence of financial reporting. Additionally an organization may choose to initiate the cycle if there is a substantial change in its profile, for example, by opening up a new facility or market. The specific risk management structure varies according to the nature of the organization (centralized or decentralized control with heterogeneous or homogeneous operations), as outlined in an earlier article by the author.



Source: Marsh ([www.marsh.co.uk](http://www.marsh.co.uk)).

## Identify

For a risk management process to be effective the organization must first identify the major risks that could impair its value generating mechanisms. However, the knowledge of risks and their potential effects are often dispersed amongst different people at various levels. Some may not even recognize that they are exposing the organization to unwanted risk.

Therefore, to ensure that significant risk issues are identified the process must cover the organization on a holistic and consistently-applied basis. A holistic approach entails reviewing all aspects of the organization's operations and considering risks that could occur from internal (facilities, personnel, work-in-progress, etc.) or external sources (economic issues, suppliers, customers, etc.). Consistent application requires adopting common definitions of various risks and measuring their potential impacts against the same standards. The definition of these standards or levels of risk tolerance are often set by senior management or the board of directors.

There are a number of tools and techniques that can support the risk identification phase. As the matrix below shows this includes passive resources (industry literature, internal documents, generic risk databases) and more active information gathering techniques (one-on-one interviews, brainstorming, Delphi methodology, surveys).

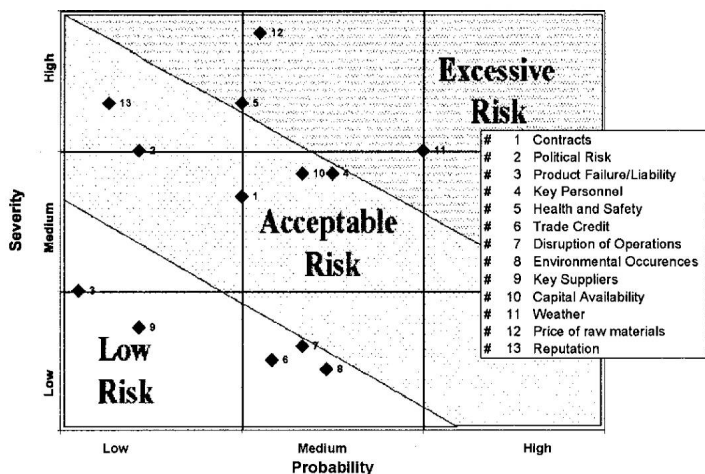
The internal review is supplemented by external sources which represent a larger pool of information providing insights on risks that the organization may not have previously considered.

		Level of Interaction	
		Low (Passive )	High (Active)
Source of Information	External	<ul style="list-style-type: none"><li>• Literature review</li><li>• Generic databases / risk lists</li></ul>	<ul style="list-style-type: none"><li>• One-on-one interviews, focus groups or surveys with:<ul style="list-style-type: none"><li>– industry experts</li><li>– members of organization's peers</li><li>– customers</li><li>– suppliers</li></ul></li></ul>
	Internal	<ul style="list-style-type: none"><li>• Corporate documents</li><li>• Auditor reports</li></ul>	<ul style="list-style-type: none"><li>• One-on-one interviews, focus groups or surveys with:<ul style="list-style-type: none"><li>– senior management</li><li>– division heads</li><li>– key personnel</li></ul></li></ul>

Source: author's work.

The purpose of this phase is to produce a:

- list of risks that could affect the organization;
- general assessment of the impact of those risks. This is often defined on the basis of severity of a loss and its frequency of occurrence which can be displayed as a risk map (as shown below);
- general prioritization of risks, indicating which ones should be analyzed further.



Source: author's work.

## Analyze

With the completion of the identification phase, the organization will have a general idea as to which risks should be of the greatest concern. However, this strategic overview may not provide sufficient information for developing remedies.

In-depth analysis of prominent risks may be required to determine their root causes and to measure more precisely their effect on value generating mechanisms. This analysis would not only look at risks on an individual basis, but as a part of the organization's overall risk portfolio.

During this process the organization would draw on the most appropriate tool for obtaining required information. Some risks may be suitable for numerical analysis which facilitates comparison to the organization's tolerance level, while more intangible risks often require more elaborate methods. The matrix below indicates some of the tools commonly used in this phase.

	<b>Cause</b>	<b>Measure</b>
Process mapping; flowchart	x	
Problem analysis: location, timing, distinctive aspects	x	
Case & Effect diagrams (fishbone)	x	
Affinity diagram	x	
Failure Mode & Effect Analysis (FEMA)	x	
Interrelationship diagram	x	
Scenario analysis	x	x
Actuarial analysis		x
Value at Risk (VAR)		x
Cash Flow At Risk (CFAR)		x
Source: author's work.		

No matter which tools are used, the goals of this phase are to complete a sufficient analysis of risks in order to determine:

- which ones should be the priority for risk management resources;
- what form the risk management response should take.

## **Design**

At the start of this phase the organization has an improved understanding of the individual and collective effects of the major risks. The organization can now determine its optimal response to each risk. These responses fall into four general categories:

**Acceptance** – The organization absorbs the risk as a part of doing business, for example, choosing to continue production of a profitable product that may soon become obsolete.

**Avoidance** – The organization steps away from situations that could produce a risk exposure, for example, circumventing certain countries in order to avoid inherent political risks.

**Control** – The organization looks to minimize the occurrence or effects of a risk, for example, developing succession plans to minimize the disruptions in case a key person is incapacitated or departs.

**Transfer** – The organization moves the risk to a third party. This could be done contractually via such mechanisms as hold harmless agreements or limitations of liabilities. There are also a number of financial options including:

- hedging agreements, including futures, forwards, swaps etc.;
- insurance where the organization is indemnified by a third party upon the occurrence of a pre-determined risk event;
- hybrid or alternative risk financing programs which combine the characteristics of different financial disciplines – for example, a catastrophe bond which is a form of debt financing that embeds the trigger mechanism of an insurance policy that must be tripped in order for the organization to receive the funds.

Within the context of designing a risk management response, consideration should be given to ensure it:

- fits within the best cost-benefit trade-off – i.e. reducing risk to an acceptable level without excessive expense;
- is suitably placed as a structural function within the organization;
- takes advantage of effective risk management systems that may already be in place.

## **Execute**

Upon completing the design phase the responses will be ready to be implemented and operated on an organization wide basis. As these responses do not work in isolation, their integration with other functions must be actively managed, their performance in supporting the achievement of organizational goals measured, and their presence communicated to stakeholders.

The methods used for integration will depend on the form of the organization's risk management structure. A centralized function would be able to oversee most aspects of the integration, while a decentralized function would require the co-ordination amongst the various risk management groups. To facilitate execution, individuals with specialized knowledge are often designated to be 'champions' for the implementation and management of specific risk responses. A progress matrix, an example of which is shown below, is a common tool used by senior management for tracking the champions' progress.

<b>Risk</b>	<b>Nationalization</b>	<b>Loss of key person</b>	<b>Product Recall</b>
<b>Likelihood</b>	Very Low	Moderate	Moderate
<b>Severity</b>	High	High	Very High
<b>Solution</b>	Monitor political stability, obtain political risk insurance	Implement succession planning	Review contingency plans and media relations plan
<b>Priority</b>	Low	Moderate	High
<b>Ownership</b>	Jane Smith	Carl Jones	Joe Reese
<b>Status</b>	Await quote from broker	Draft plans completed for senior management	Desk top simulation to be held in next quarter
Source: Management of Risk – A Strategic Overview,			

Performance measures should be recorded on a regular basis for later analysis. These measures could relate to direct performance, for example, measuring the frequency of risk incidents before and after the implementation of new responses or the reduction in the total cost of risk. The other possibility is to measure performance against indirect indicators, such as improved P/E ratios, lower cost of capital or enhanced reputation.

As part of the execution strategy the structure and goals of the risk management processes should be communicated to internal and external stakeholders in order to increase acceptance and to reap the maximum return value.

## Measure

Upon completion of the execution phase the designed risk management systems will be in place. As they operate they will produce streams of risk management performance information. However, receiving the data alone is not a useful exercise. To be of value the data must be:

- compiled into a usable format and analyzed;
- communicated to the appropriate groups – it is worth noting that while this information is often provided to audit personnel, they are largely limited to compliance issues. Other

review bodies, for example, board level risk committees, must be engaged in the process of using the information to enhance risk management;

- carried forward as feedback in the start of the next risk management cycle.

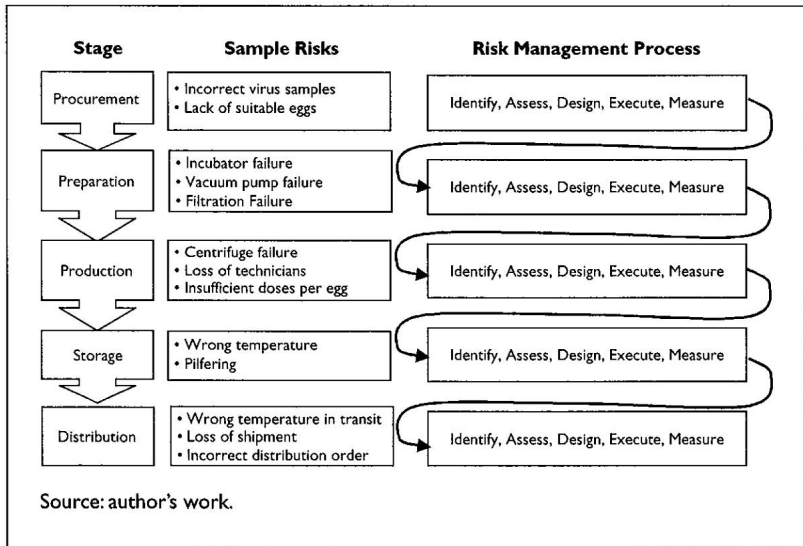
## **Risk Management as a Linear Process**

The cyclical risk management process is suitable where the organization is going to repeat the same or similar operations for the foreseeable future. Based on the feedback of previous cycles the organization has the opportunity to hone its risk management systems.

However, there are cases where operations go through distinct stages only once, which limits the opportunity to build on previous experience. Each stage has a unique set of risks and any risk event could impair the ability of downstream stages in developing value. Therefore, a greater level of focus and application of resources may be required when reviewing value generating mechanisms and their risk issues.

Examples of linear processes include construction projects, the integration or divestiture of an operation, or the completion of a 'one-time' contract, such as vaccine production. For a vaccine to be effective, it must be produced and administered before a population becomes infected. A break-down in any stage could prevent or delay vaccine distribution.

As the diagram below indicates, the same risk management phases are used as in the cyclical process. However, since the value generating mechanisms differ in each stage, each set of risk management phases is relatively independent, and the feedback from the measurement phase would have limited impact on the design of downstream risk management processes.



## CONCLUSION

These processes are a general overview of the phases an organization goes through in managing its risks. Depending on the organization's needs, it will adapt the processes as required and could use and integrate input from a combination of linear and cyclical processes. The end result is that the organization establishes a disciplined and robust risk management process for protecting value generating mechanisms.

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