



Risk management and mitigation in Research project

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Introduction

The goal of project management is to ensure that a project reaches its objective within the predefined **quality, timeframe, and cost**.

Challenges:

1. Reasons **internal to the project**, related to poor project definition:

- Poor definition of the objective,
- Insufficient resources,
- Insufficient competencies,
- Poor planning, etc.

2. Reasons **external to the project**, the materialization of **risks** that are unpredictable:

- Change in the environment of the project,
- Accident,
- Unexpected decisions by stakeholders,
- Technical failure, etc.



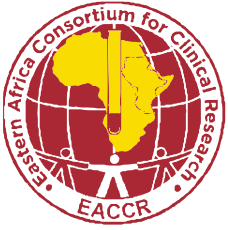
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Definitions

Risk: An uncertain event or set of events that will have an effect on the achievement of objectives if it occurred. This can have a positive or a negative outcome.

An opportunity: An uncertain event that could have a favorable impact on objectives

A threat: An uncertain event that could have an adverse impact on objectives.

The risk management process makes the risks visible and helps manage them in a transparent way.



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Risk management



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1. Risk Identification

Project risks may be identified by different methods:

- Review of documentation
- Information gathering from the stakeholders
- A Cause-and-Effect Analysis can be done by taking each of the department's objectives and identifying issues (both positive and negative) that may impact the objectives.
- SWOT analysis
- Expert judgment.



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Categorization of risks

Identified risks should be classified:

- Technical
- People
- Financial
- Political
- Regulatory
- Organizational
- Competitor

A risk breakdown structure (RBS) with an increasing level of detail.



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2. Risk Assessment/analysis

The **impact** of each risk on the project is quantitated by estimating the **probability of occurrence** of the risk and its **severity**

UVRI uses a 4x4 matrix to plot the likelihood and impact and therefore assess risk exposure



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4x4 matrix

Impact	Very High	VH/L	VH/M	VH/H	VH/VH
	High	H/L	H/M	H/H	H/VH
	Medium	M/L	M/M	M/H	M/VH
	Low	L/L	L/M	L/H	L/VH
		Low	Med	High	Very High
		Likelihood			



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Risk assessment

The top right corner of the matrix is known as the, “top quadrant.” These are the risks with the highest likelihood and impact and would tend to be the areas where action plans would be focussed to either mitigate against a threat or maximise an opportunity.

Risk mitigation has a cost and not all risks can be mitigated. The result of risk prioritization is the list of risks that will be in the risk mitigation plan. The other risks will be maximized as accepted.



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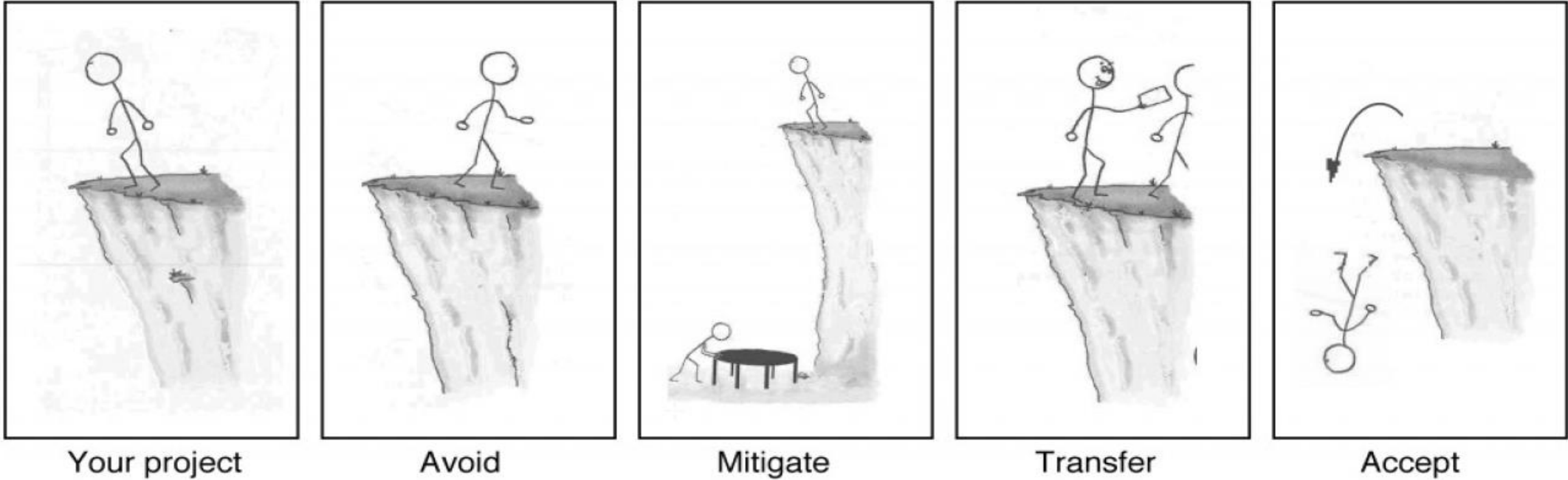
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3. Risk response planning



The four possible ways to respond to risk.

Source: *Barron & Barron Project Management for Scientists and Engineers*



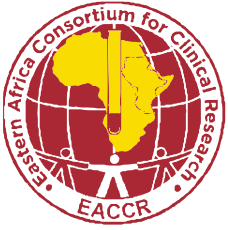
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Possible responses

- 1. *Avoid*:** The Most preferred way to handle risk. It implies changing the situation so that the risk can no more happen or with a negligible probability.
- 2. *Mitigate*:** Most common way to handle risk. It consists in taking actions to minimize the damage caused by the materialization of the risk. The action may also reduce its probability of occurrence.



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Possible responses

- 3. *Transfer*:** The risk still exists and has the same probability of occurrence, but the damage done will not be paid by the project. Buying insurance is a way to transfer risk.
- 3. *Accept*:** It is for a risk that cannot be transferred, mitigated or avoided. The impact will not be reduced if it happens, but at least a plan can be defined about how to handle its consequences without creating additional damage (contingency planning). This is typically done by governments when they get prepared for catastrophic events like tsunamis, forest fires, or hurricanes.



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4. Opportunity response planning

Similarly, there are four ways to respond to opportunities.

1. **Exploit:** The resource is directly exploited to reduce the time to complete the task or its cost.
2. **Enhance:** The opportunities can be enhanced by investing more money to obtain more or to finish earlier.
3. **Share:** The benefit of the opportunity may be shared with a third party that is able to take more benefit from the project. It may be the case if a partnership or a joint venture is created.
4. **Accept:** The opportunity is taken advantage of, but is not actively pursued.



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5. Risk monitoring and controlling

Once the risks have been identified and a **risk mitigation plan** has been established, it must be implemented and its implementation must be monitored.

Any evolution in the probability of risks' occurrence and severity should also be followed-up.

The identified risks and associated mitigation plan should be made visible to the project team either in the physical project room or on the project intranet.



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Thank you



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sources

- Project Management, Barron M & Barron AR, OpenStax-CNX, <http://cnx.org/content/col11120/1.10/>, 2016
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