UNIVERSITY of NICOSIA

Session 11

Risk management in Blockchain projects

Prof. Marinos Themistocleous
Themistocleous.m@unic.ac.cy
Twitter: @Themistocleous6

BLOC 515: Blockchain and entrepreneurship management

Session outcomes

- The concept of Risk
- The evolution of Risk Management
- Distinguish between Risk and Uncertainty
- Introduction to Risk Management
- The importance of Risk Management
- The Risk Management Life cycle

Session outline

1. Risk
2. Risk management
3. Risk management process
4. Risk identification
5. Risk lifecycle
6. Class exercise

Risk

Risk affects every aspect of Human life;

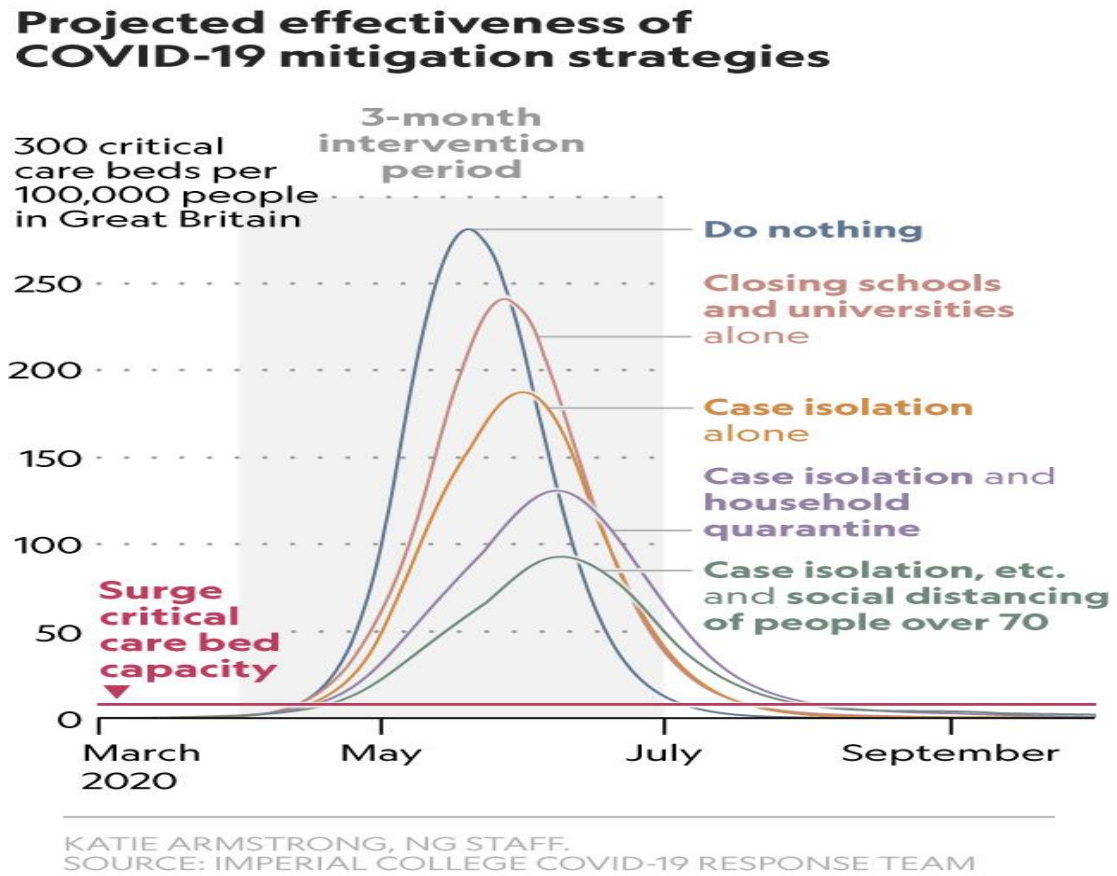
We live with it every day and learn to manage its influence on our lives.

Risk

"No…project is risk free. Risk can be managed, minimised, shared, transferred*, or accepted. It cannot be ignored."

Sir Michael Latham, 1994.

Risk


Projected effectiveness of COVID-19 mitigation strategies
300 critical care beds per 100,000 people in Great Britain
3-month intervention period
250
200
150
100
50
0
Surge critical care bed capacity
Do nothing
Closing schools and universities alone
Case isolation alone
Case isolation and household quarantine
Case isolation, etc. and social distancing of people over 70
March 2020
May
July
September
KATIE ARMSTRONG, NG STAFF.
SOURCE: IMPERIAL COLLEGE COVID-19 RESPONSE TEAM

Risk Management

Question

Why do you think it is important to study risk management (i.e. why are we here)?

Risk Management

Some examples

- FTX: $32 billion (Nov 2022)
- Luna Terra: $45 billion (May 2022)
- NFTs thefts $100+m (July 2021 – July 2022)
- DAO Hack: $60 million

Economy | Crypto

After Terra, Luna crashes, regulators count cost of crypto

Spectacular collapse of stablecoin puts focus on regulatory frameworks in South Korea and Singapore.

From: Counting the Cost

FTX collapse: What's next for the cryptocurrency industry?

Sam Bankman-Fried's empire sank from a value of $32bn all the way to bankruptcy.

Read more summary

19 Nov 2022

Risk

- ***Risk*** *is often thought of in terms of chance (or probability) of loss.*
- **Uncertainty** arises when an individual perceives that outcomes cannot be known with certainty.
- **Risk** is a state of nature, whereas **uncertainty** is a state of human mind?

Risk vs Uncertainty

- “Risk is a measurable uncertainty, while uncertainty is a un-measurable risk” Perry and Hayes (1985)
- “Uncertainty is a situation where no historical data exists or previous history related to the situation under scrutiny” Flanagan and Norman (1983)
- Risk is uncertainty of outcome (HM Treasury)

Risk and uncertainty in projects

- ***Risk***—"an uncertain event or condition that, if it occurs, has a positive or negative effect on a project objective"—PMI (2000, p. 127).

- Risk—"an uncertain event or set of circumstances that, should it occur, will have an effect on achievement of one or more project's objectives, with the clear understanding that risk can affect achievement of project objectives either positively or negatively"—APM (2006, p. 26).

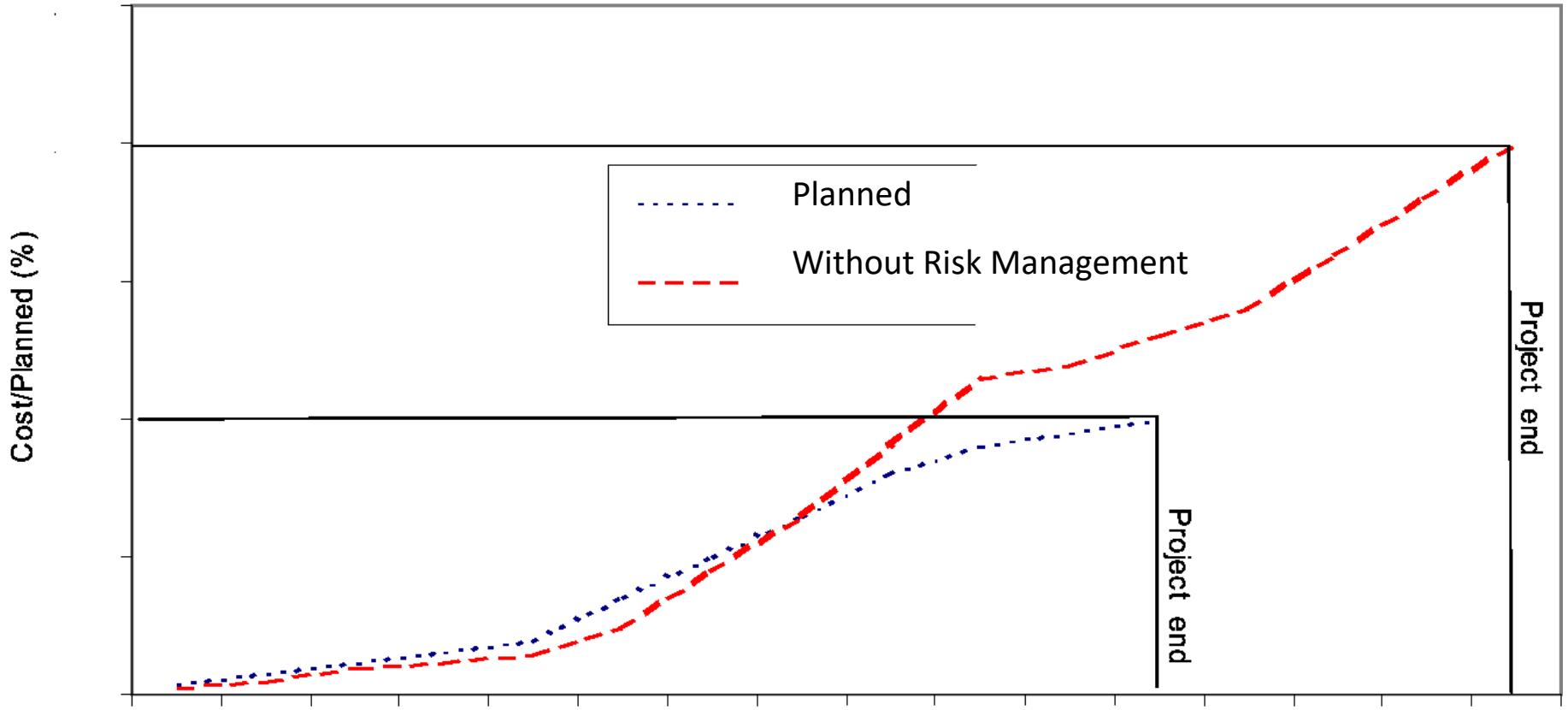
Types of risks

- Project risks
- Product risks: (quality – performance)
- Business risks

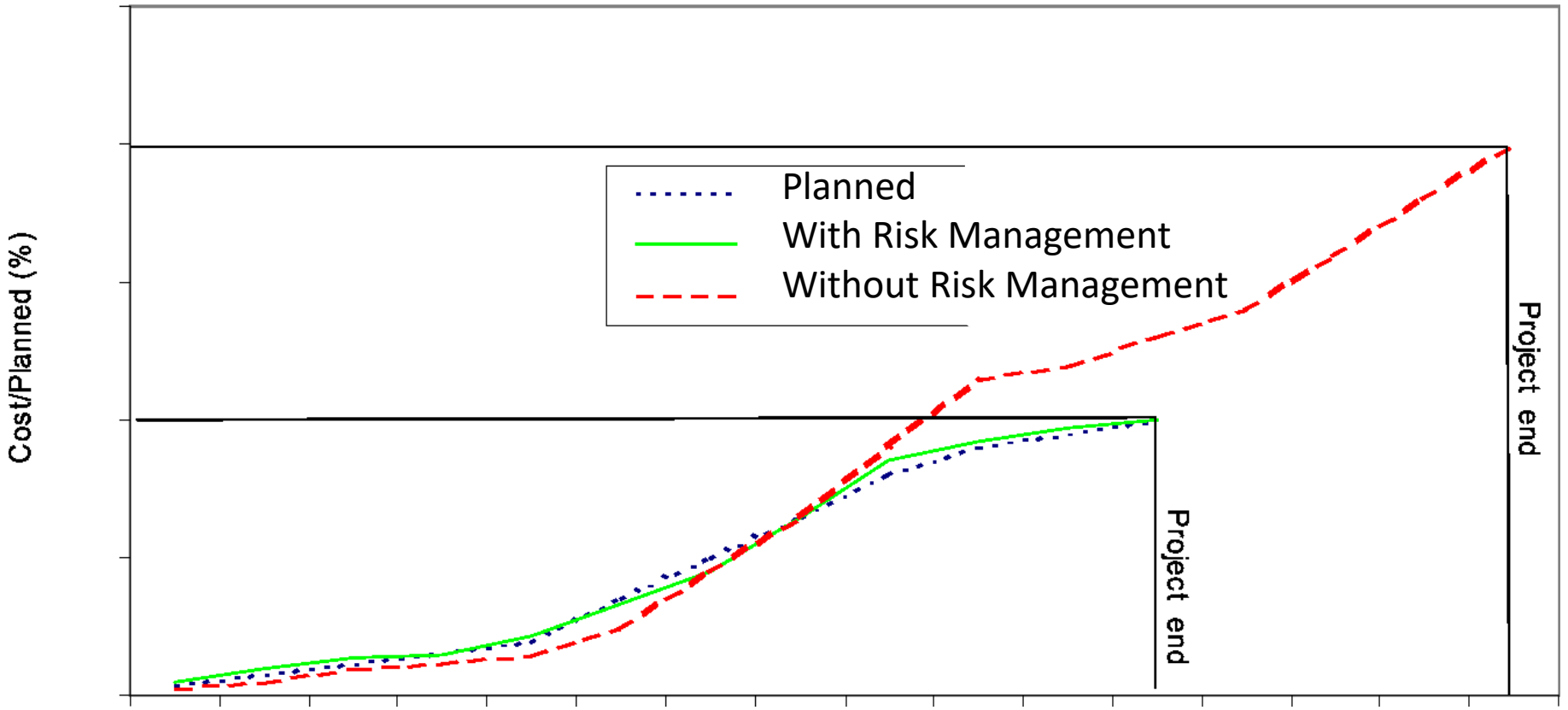
The importance of risk management

- Risk management is a way of thinking.
- Planning a project is all very well in theory:
  - Work breakdown structures
  - Gantt charts
  - Scopes of work
  - Scope, schedule, budget, resources
  - PERT (Project Evaluation & Review Technique) charts
  - Critical path analysis etc.
- Following extensive planning, you can officially start the project.
- However.....

The importance of risk management



The importance of risk management



What is risk management?

Many (similar) definitions exist:

- "*The art of RM is to **identify** risks specific to an organisation and to **respond** to them in an appropriate way. RM is a **formal process** that enables the **identification**, **assessment**, **planning** and **management** of risks*".

  Merna & Al-Thani, Corporate Risk Management, 2nd Edition, p. 2 (2008)

- "*RM is considered to be a **process** for **identifying**, **assessing**, and **responding** to risks associated with **delivering an objective** (e.g. a project)*".

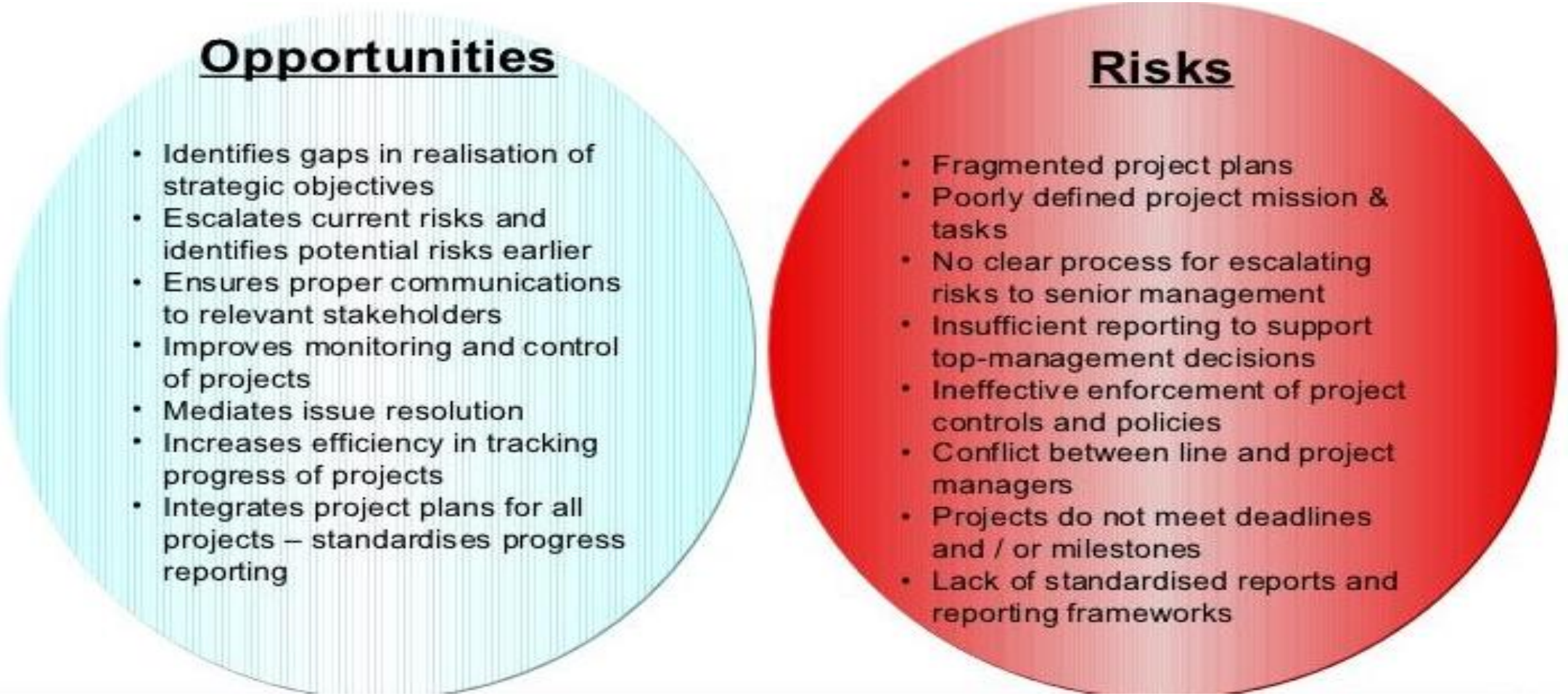
  S. J. Simister, Qualitative and Quantitative Risk Management, in The Wiley Guide to Managing Projects, Chapter 2, p. 30, (2004)

Risk management (RM) in practice

- RM is about working out what could happen tomorrow and doing something about it today.
- RM is the planned and systematic approach to the identification and quantification of risks, the appraisal and selection of options for managing and controlling these risks, and the implementation of the selected options.
- These definitions clearly indicate a **structured** rather than a **haphazard** approach to RM (i.e. it follows a **process**).

Risk umbrella

Risks can be positive: Opportunities



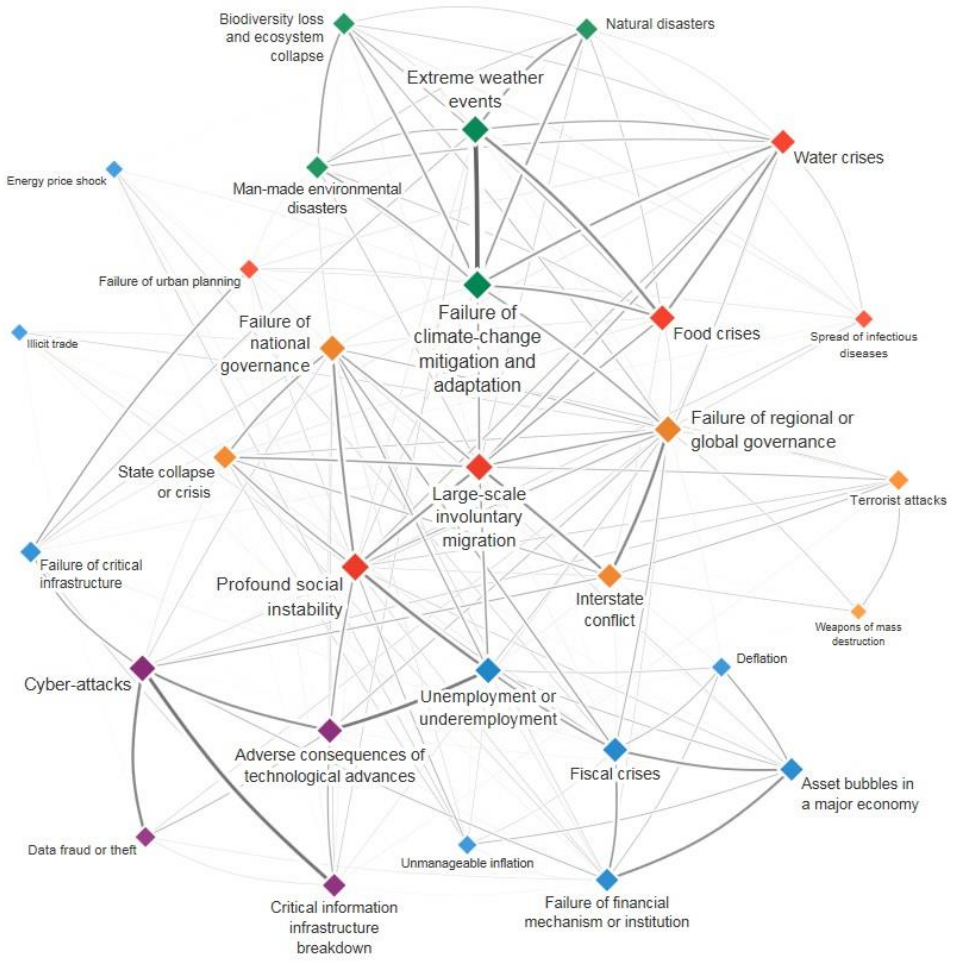
Risks, opportunities and uncertainties

DISCIPLINE	RISK	OPPORTUNITY	UNCERTAINTY
Economics	Risk refers to events subject to known or knowable probability distribution (Knight, 1921)	In business literature, a positive environmental impact is usually described as an opportunity (Ansoff, 1980)	Uncertainty is a situation for which it is not possible to specify numerical probabilities (Knight, 1921) Uncertainty is a state in which individual actors find it impossible to attribute a reasonably definite probability to the expected outcome of their choice (Keynes, 1937)
Psychology	Risk is the fact that the decision is made under conditions of known probabilities (Stanford Encyclopedia of Philosophy, 2009)	Opportunity consists of the particular configuration of the field of forces surrounding a person and his or her task that enables or contrains that person's task performance and that are beyond the person's direct control (Blumberg and Pringle, 1982).	Uncertainty is a state of mind characterized by a conscious lack of knowledge about the outcomes of an event (Head, 1967)
Philosophy			Doubt presupposes certainty (Wittgenstein, 1986)
Org. theory			Uncertainty emanates from a set of objective but largely unmeasured environmental characteristics (Jauch and Kraft, 1986)
Common sense (dictionary)	The possibility of something unfortunate happening at some time in the future; the situation that could be dangerous or have a dire result (Oxford Dictionary of Current English, 2005)	A favorable juncture of circumstances; a chance of advancement or progress (Merriam-Webster Dictionary on-line, 2011)	Uncertainty is the state of being uncertain; something you cannot be sure about (Oxford Dictionary of Current English, 2005)
Project management	Risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one project objective, such as time, cost, scope or quality (PMBOK, 2004)		

Risks interconnections

The Global Risks Interconnections Map 2019

How are global risks interconnected?



(from WE Report 2019)

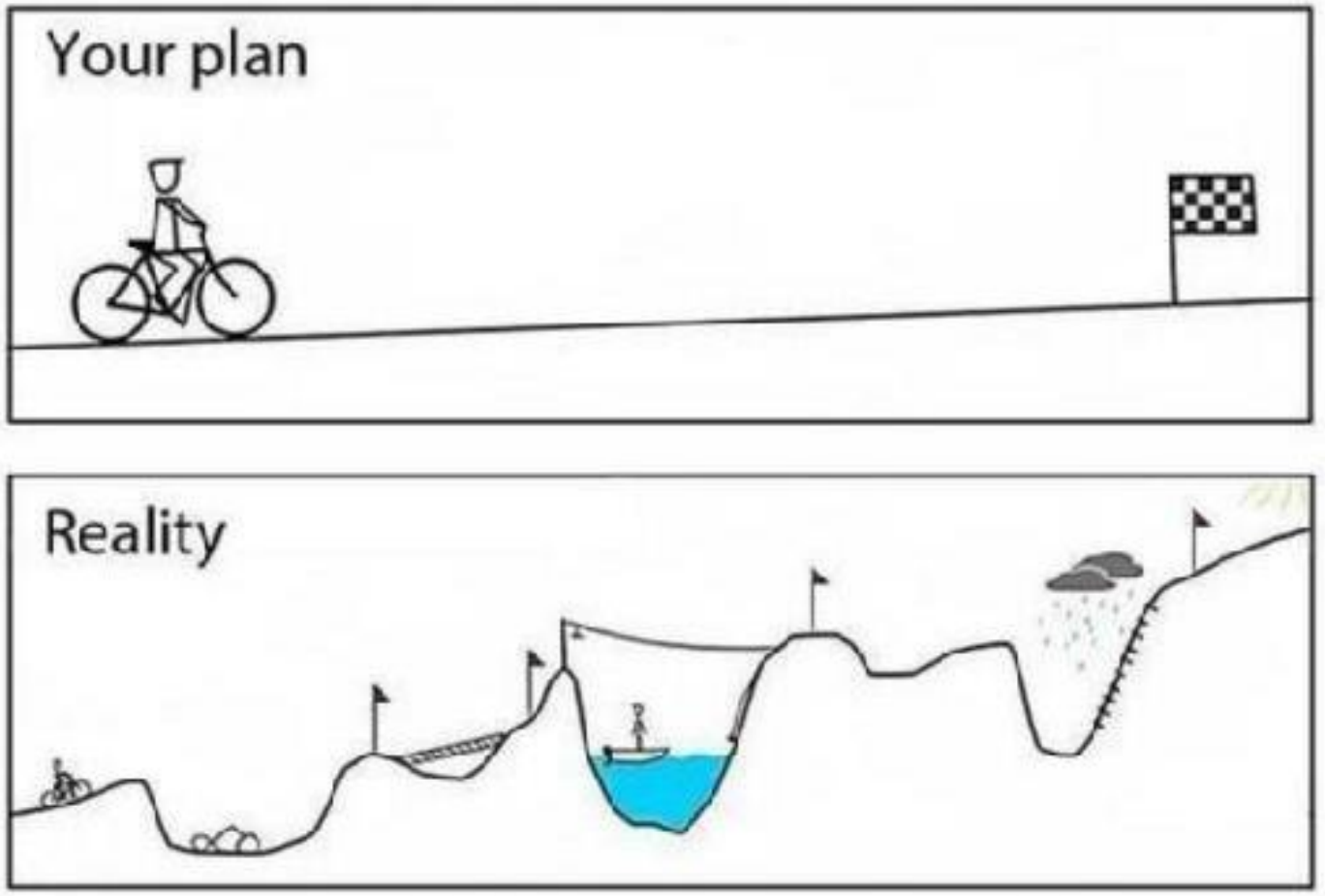
Project risks

Project risks have several attributes as follows:

- They are generally known at the beginning of the project.
- They can exist at a specific point in the project or can persist through the life of the project.
- They can materially impact the outcome of the project if the risk comes true.
- There is a reasonable likelihood that the risk could come true.
- They are extraordinary to normal project management.

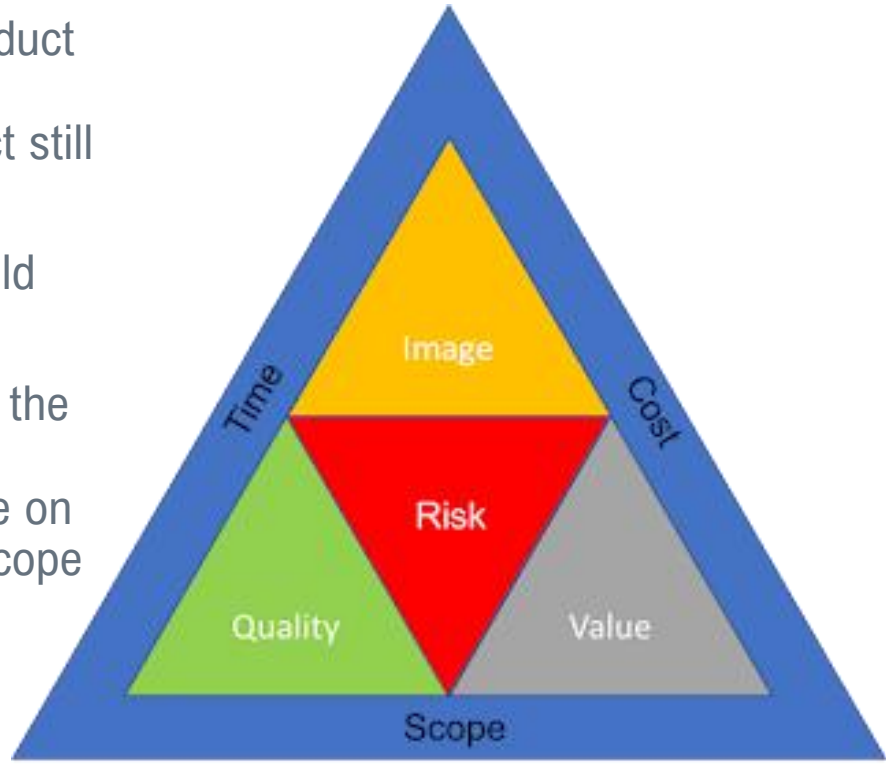
Project risks

The Reality: When you plan you need to accommodate changes and the surprises during the project life cycle



Triple constrain

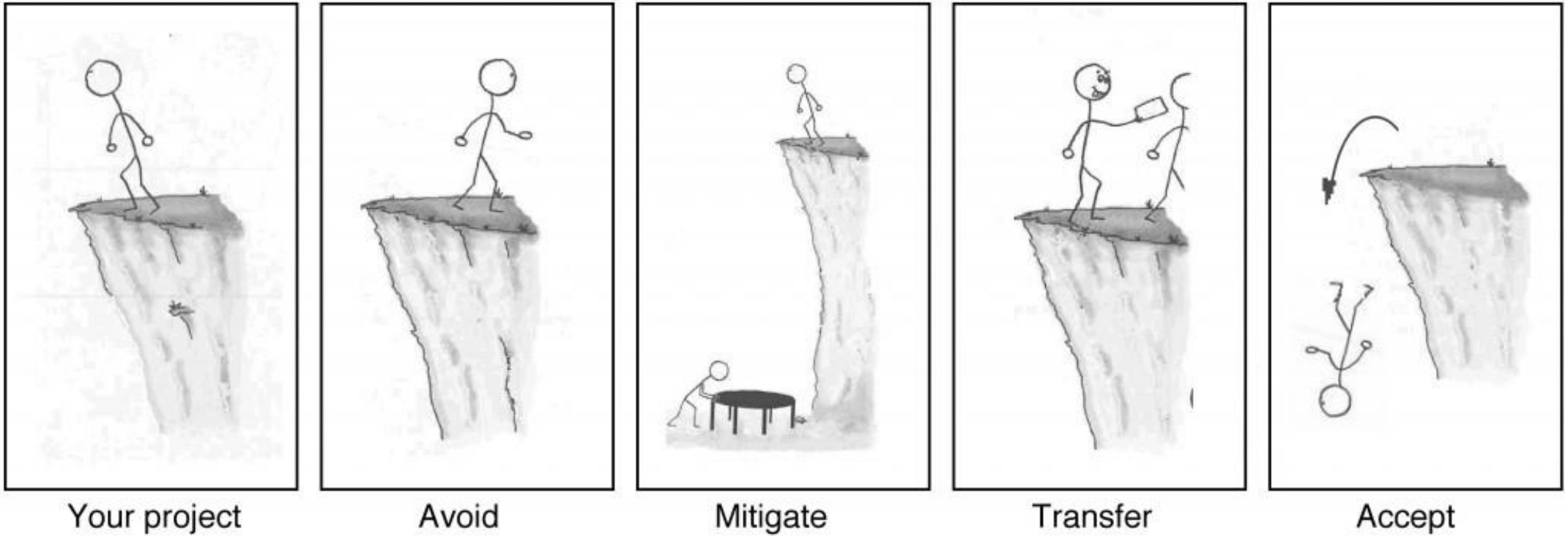
- If a project changes in such a way that the specified product scope is not delivered or some constraints are not respected, but all of the objectives are met, is the project still a success?
- If the answer to this can ever be “no,” the definition would have to be expanded to read:
- “Risk consists of an uncertain situation, the likelihood of the situation, and the impacts (which can be positive or negative) that the occurrence of the situation would have on a defined set of objectives or on the specified product scope or compliance with constraint.”



https://www.henricodolfing.com/2017/04/the-reverse-triple-constraint-of.html

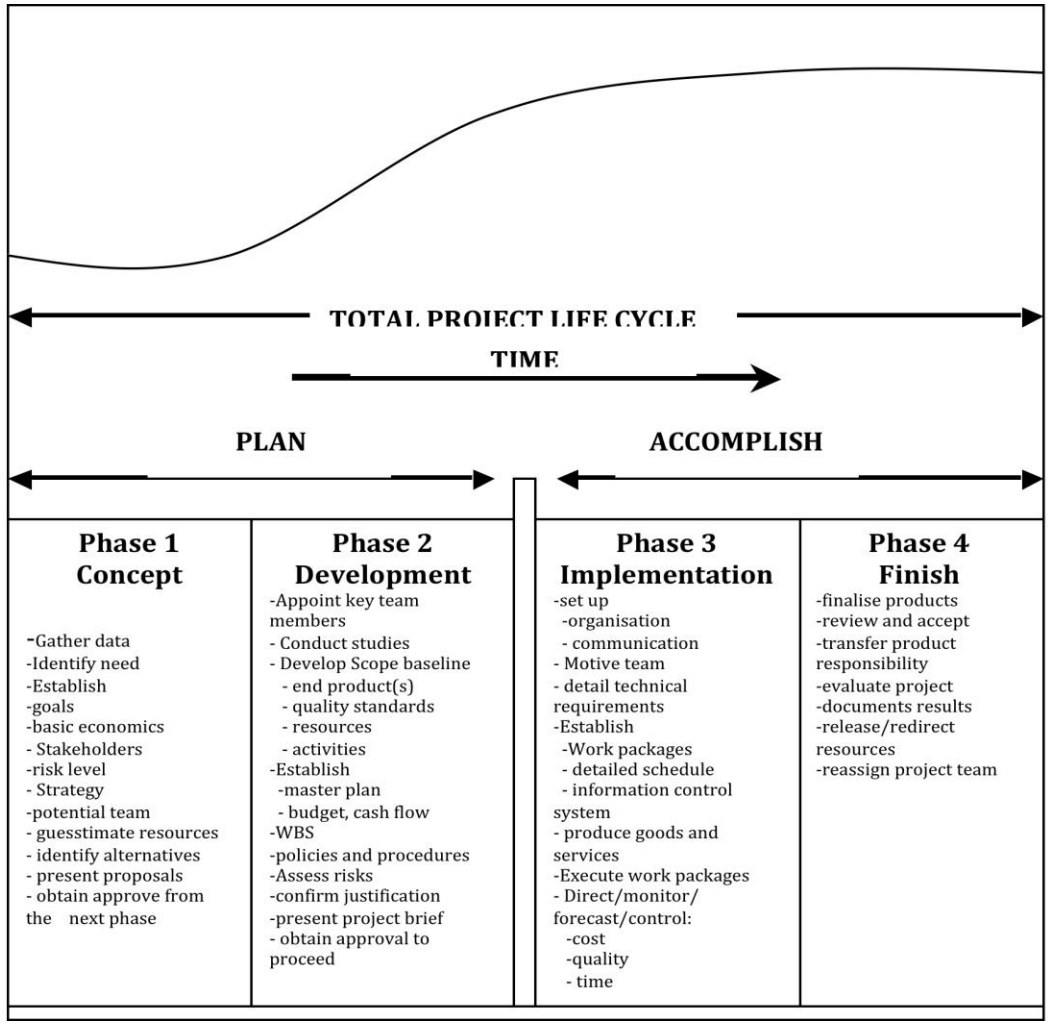
Risk management process

There are different risk management strategies



https://opentextbc.ca/projectmanagement/chapter/chapter-16-risk-management-planning-project-management/

Risk management life cycle



Burke (2006, p.32) fig.3.3 “project life cycle Components”

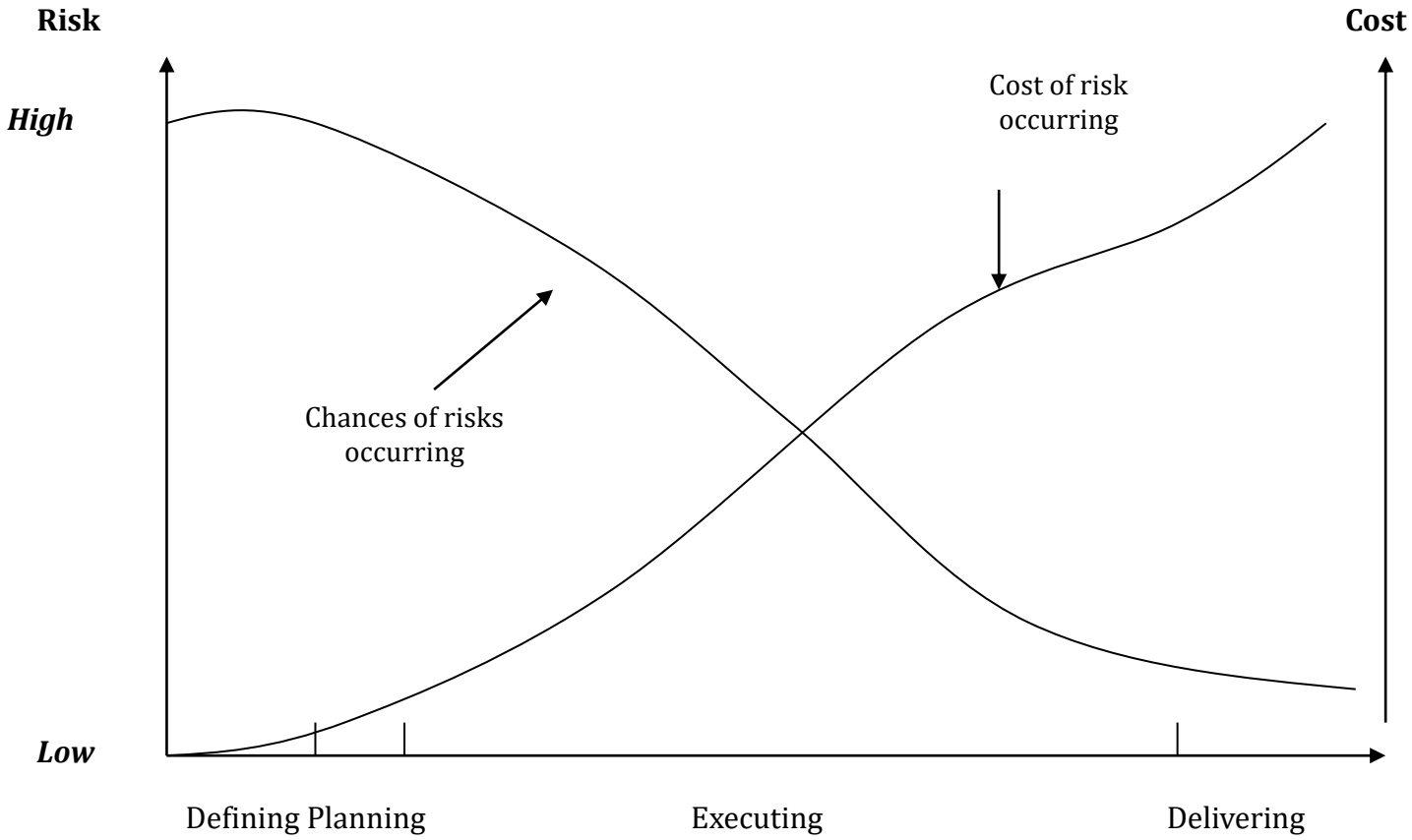
Risk Management in the Project Lifecycle

- **"Defining"** stage: identify all of the potential costs associated with delivering the project in order to be able to assess its financial viability
- **"Planning"** stage: the risks need to be taken into account when the schedule is being constructed.
- **"Execution"** stage: risk status must be regularly reviewed to monitor the risk treatment activities, identify emergent risks and prioritise their treatment and sanction contingency activities and the release of the associated contingency funds as and when risks occur.
- **"Delivering"** stage: the lessons learned need to be captured, analysed and then used to improve the project management process and the quality of decision-making for future projects

https://www.henricodolfing.com/2017/04/the-reverse-triple-constraint-of.html

Risk and cost relationship

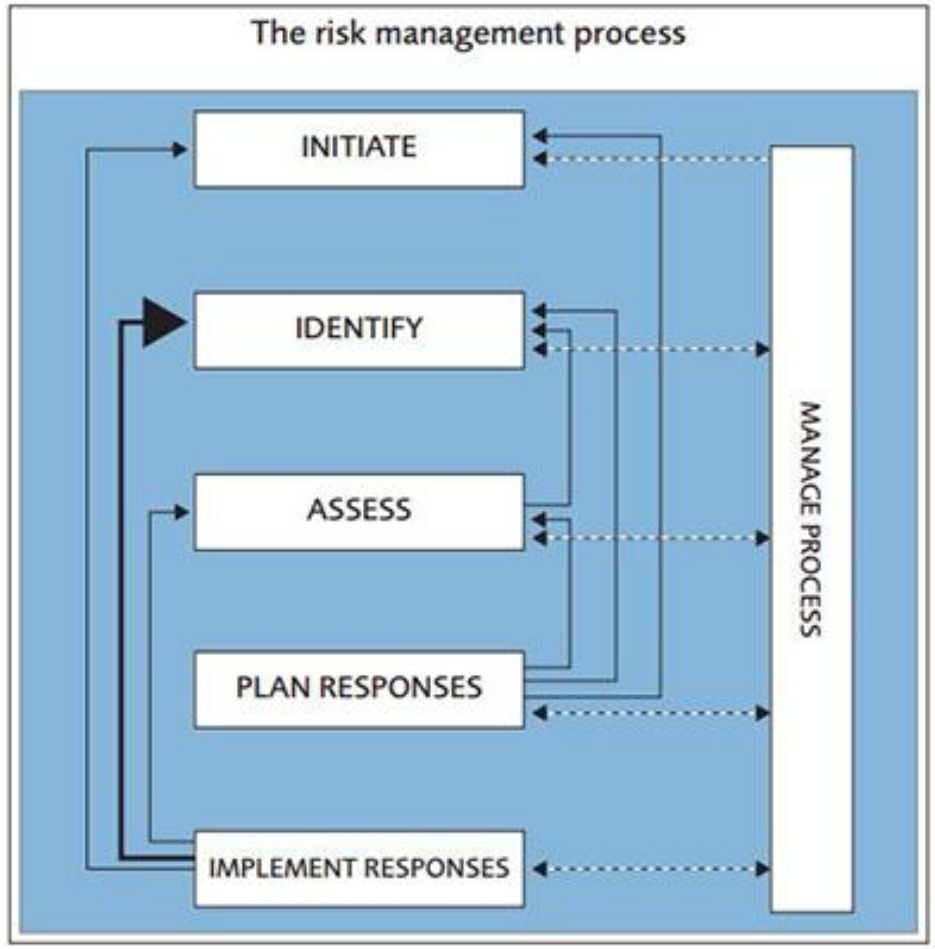
Gray and Larson (2007) suggest that identifying project risks and deciding a response before the project begins is a more prudent approach than not attempting to manage risk.



Source Gray Larson (2007, p197) fig.71 “risk event graph”

The PRAM guide

Risk Management process



(Illustration from Body of Knowledge 6th edition)

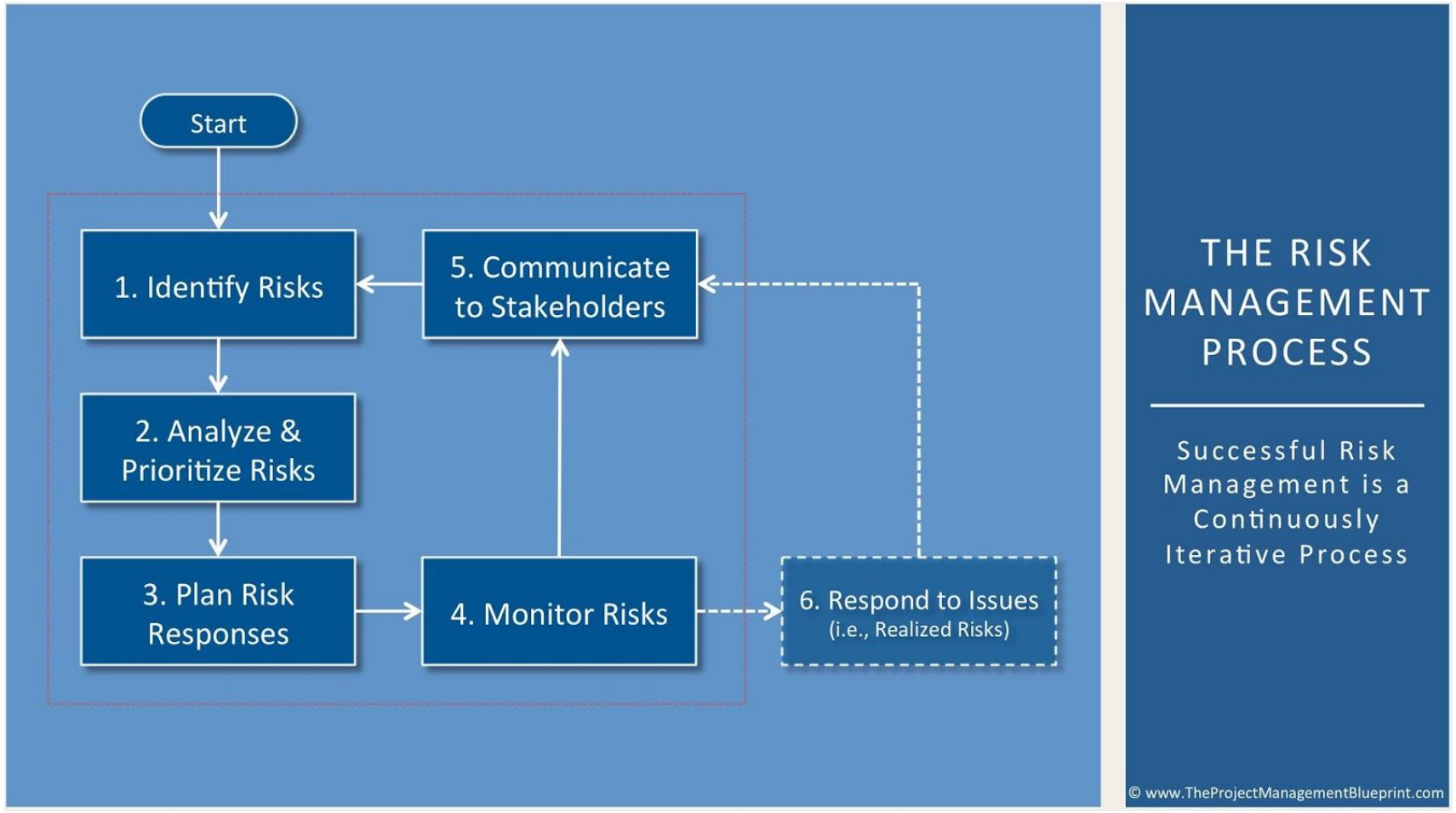
Risk management process

- Risks are threats or opportunities (PRAM Guide)
- Risk planning is an integral part of project planning
- *Project Risk = (Probability of Event)(Consequences of Event) = (Probability)(Effect)*
- Example Risk of Strike = 1% * $10.000.000

Source: *PMBOK® Guide*, p. 273

(Illustration from Body of Knowledge 6th edition)

Risk management process



https://www.engineeringmanagement.info/2018/12/what-are-five-steps-in-risk-management.html

Identify risk

The importance of risk identification

- The basis for all that follows
- Some argue the most important phase
- Can be time consuming

Risks change during operations life

- Because of operation phases – feasibility, development, etc…
- Because of development of operation – e.g. specification certainty
- Because of external conditions – political, legal etc

Identify risk – risk sources

Operation related risks

- Errors, omissions, complexity, innovation etc

Sources:

- External data (financial data, …)
- Internal data (company's data, company's standards, …)
- Project Team
- Experts
- ..

External environment

- Political, legal, regulatory (safety, planning etc), economic (interest rate, inflation etc), weather, labour disputes, material supplies etc, etc…

Identify risk – types

- Technology risks.
- People risks.
- Organisational risks.
- Requirements risks.
- Estimation risks
- Environmental risks (natural disasters earthquake, floating, volcano eruption, wild fire, etc)

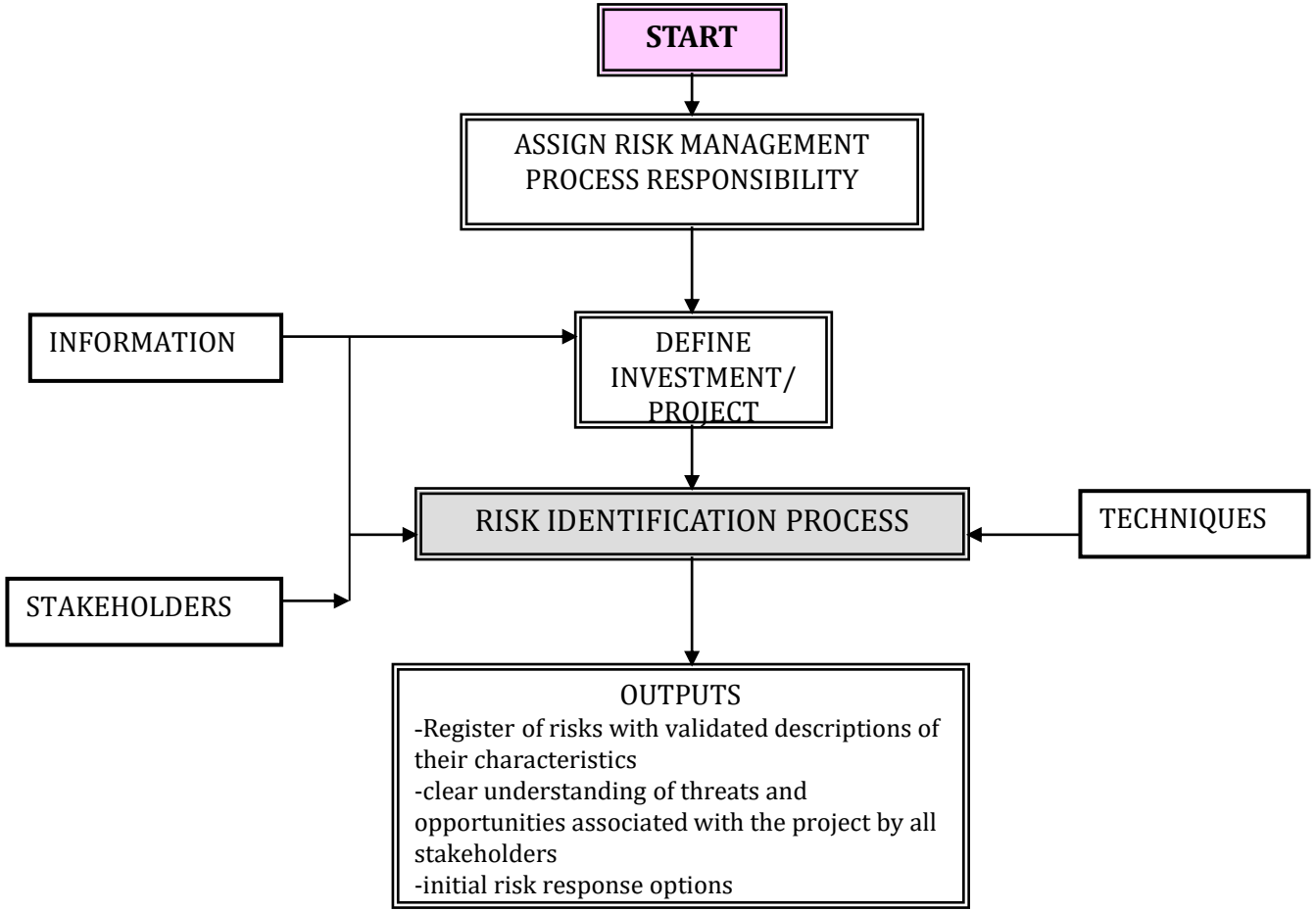
Identify risk – example

Risk type	Possible risks
Technology	The database used in the system cannot process as many transactions per second as expected. Software components that should be reused contain defects that limit their functionality.
People	It is impossible to recruit staff with the skills required. Key staff are ill and unavailable at critical times. Required training for staff is not available.
Organisational	The organisation is restructured so that different management are responsible for the project. Organisational financial problems force reductions in the project budget.
Tools	The code generated by CASE tools is inefficient. CASE tools cannot be integrated.
Requirements	Changes to requirements that require major design rework are proposed. Customers fail to understand the impact of requirements changes.
Estimation	The time required to develop the software is underestimated. The rate of defect repair is underestimated. The size of the software is underestimated.

Risk identification stage

- ***Initial risk identification:*** which refers to new organizations which were not previously identified its risk in a structural way or organisation which a launch a new project or activity.
- ***Continuous risk identification:*** is referring to the identification of new risks which did not previously arise and changes in the existing risks.

Risk identification stage



Risk tools and techniques

Thus, risk identification intends to minimize the amount of uncertainty (Smith, 2003).

There are three main techniques used for this phase:

- **Checklists** – used to make certain that risks that have been identified in earlier similar projects are not overlooked;
- **Brainstorming** – used to identify as many risks as possible;
- **Lessons learned** picked up from similar projects. (Smith, 2003) and **Knowledge management** databases

The main the output of this stage is a Risk Register with a list of risks.

Risk checklists

Risk Management Checklist

Schedule risks

	Yes, this could be	No, this isn't
The project is end-date driven	☐	☐
The timescale estimates were not provided by subject matter experts	☐	☐
The project schedule is ambitious	☐	☐
The project schedule makes several optimistic assumptions	☐	☐
The project schedule is incomplete	☐	☐
The project schedule assumes availability of resources that may not exist	☐	☐
The project needs to be completed in a limited time	☐	☐
The project has many external dependencies which are unmanaged	☐	☐
It is not clear whether the project can be done in the time available	☐	☐
The project plan is not based on tangible deliverables, but on tasks	☐	☐

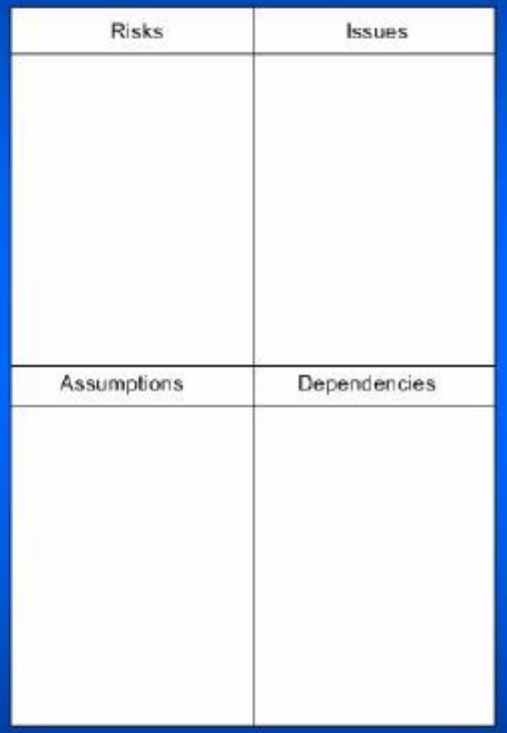
Brainstorming standard procedure

- Select one member of the group as the recorder
- Put the topic to be considered on a flip chart/white board. (It may help to underline the key words).
- Ask for possible solutions/ideas to be called out.
  - Record these, without allowing any opinion on value or relevance to be expressed at this stage.
- Continue until ideas cease.

- THEN evaluate the ideas, and refine the proposals.

Continuous risk identification

- listen for new risks
- probe new issues
- identify new dependencies
- challenge assumptions



Risk identification

- A commonly used simple structured risk description has three essential components:
- cause,
- risk
- effect
- A cause is a certain event or set of circumstances that exists in the present, and that gives rise to one or more risks. A risk is an uncertain event or set of circumstances that might occur

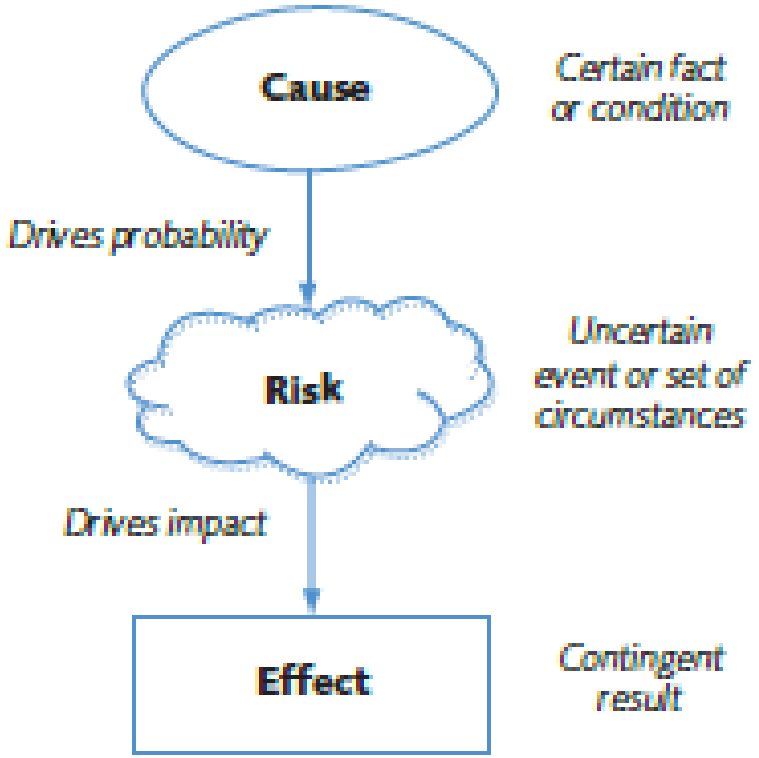
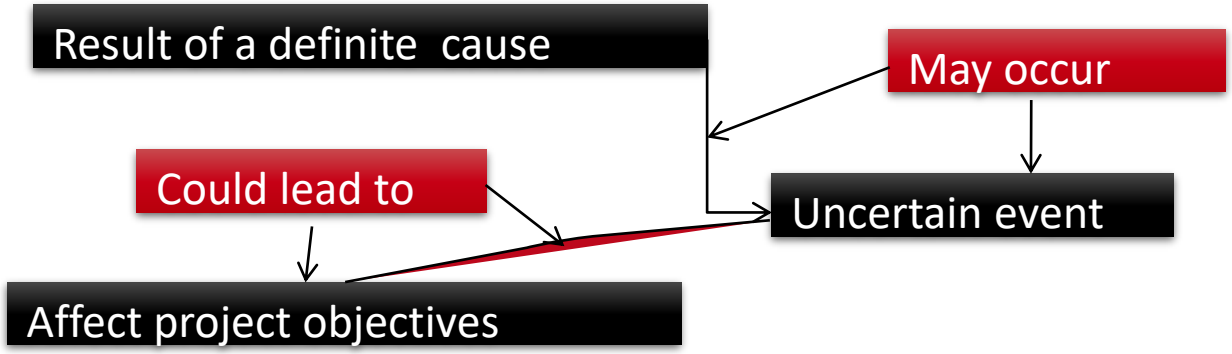


Figure 2.1 Simple cause–risk–effect model

Risk identification statement

- **Cause:** Definite event or set of circumstances that exists in the project and its environment and which give rise to uncertainty
- **Risks:** Uncertain event or set of circumstances that, if it occurs, would affect the project objectives
- **Effect:** Unplanned variations from project objectives, either positive or negative , which arises as a result of risk occurring
- **OR SIMPLY THINK IF …… THEN…….**



How to form a good risk statement

- ***IF*** *the interface from timekeeping to payroll is not completely tested prior to the beginning of payroll system testing,*

- ***THEN*** *payroll system testing will experience a day-for-day schedule slip.*

Risk statements

- A well-formed risk description contains this information:
- The **Risk Cause**: describes project decisions or conditions that may give rise to the Risk Event. This provides context information about the risk.
- The **Risk Event**: describes the possible future event or circumstance that affects your project and introduces uncertainty.
- The risk likelihood indicates the probability that the risk event will occur.
  - Typical quantitative measures are Very High, High, Medium and Low.
  - A quantitative measure would be a specific probability greater than 0% but lower than 100%.
- A **risk trigger** is an identified measure or indicator that signals to the project that the risk event has occurred.
- The **Risk Impact**: the anticipated effects on the project's ability to execute planned activities and successfully achieve its objectives.
- This risk impact describes a specific impact to the project's defined scope, schedule, cost and quality objectives.
- Initially, might be qualitative: Very High, High, Medium and Low
- Some risks may undergo further analysis and have quantitative impacts

Risk statements – Example 1

Example: Cause, Event, Impact

Cause

- Our project requires the development of smart contracts
- We decided to have an external vendor developing them;
- many subsequent project tasks are dependent upon deployment of the smart contacts.

Event

- There is a very low chance that the vendor will be late;
- Previous experience with this vendor has shown very good performance in completed their work as contracted.
- If the vendor is late by two weeks, then …

Impact

- then our delivery of new features will be four weeks later than committed
- Project costs will increase by about 10%.
- This will have an impact on project roadmap and future products delivery

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Risk statements – Example 2

Example: Cause, Event, Impact

Cause

- Our project requires a new technical designer.
- We've interviewed several candidates and just extended an offer of employment to our first choice for the position.

Event

- We know that the candidate is speaking with other prospective employers and don't know if the candidate favors our offer of employment.
- We would guess that we have a 50% chance that our offer will be accepted.
- If the candidate accepts/rejects our offer of employment and starts/delay work on the project within a month

Impact

- **Impact**: then our time to design the new features will decrease/increase by at least two full months.

http://www.pmnotebook.com/index.php/component/content/article?id=134:the

The Output: The Risk Register

- One of the most fundamental tools of project risk management is Risk Register. Risk Register is considered to be a database of risk information gathered through project lifecycle. Risk Register is a very important tool in decision making, its enables information from identified risks to be stored and saved into a risk database.

- This database provides the advantage of greater understanding of risks and information surround them. However, risk register contains information from all risk management process, it enables risk reduction, and risk mitigation plans to be documented.

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The Risk Register

- “Generally information gathered in risk register should contain a description of risk, its impact (likelihood), probability, reduction and mitigation (contingency) plans.” Patterson and Neailey (2002, p.367). In general Risk Register as Carter (1995, cited in Ahmed N. 2007 p.39) serves the following main purposes:
- Identification of risks and their likely impact;
- Records the findings of the risk assessment process and supporting discussions;
- Documents the proposed risk management action plans to be used in mitigation of risks;
- Provides a basis for the monitoring of risk management action plan.

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The Risk Register

Priority	Description	Probability	Impact	Owner	Key Dates	Current Action	Review Dates
1							
2							
3							
X^n							

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Description of risk register

- Risk identification: This shall include: risk ID if any, proper description of the risk involved.
- Basic cause and effect (on the project) of the risk.
- Primary objective for which the risk analysis is carried out (e.g., time, cost etc.).
- Consequence details such as likelihood of occurrence, severity, etc. to assess risk level or risk matrix (discussed in Chapter II in details).
- Mitigation and control action of the negative impacts from the risk. In case there is any positive impact, then control action may be incorporated in the register also (e.g., recruitment of marketing agent is a positive impact on marketing).
- Monitoring and control of risk response action

Risk registries

- According to Merna and Al-Thani (2005), there are four different categories of software:
- **Management data software packages:** large software systems based on databases, concerned predominantly with automating data administration.
- **Spreadsheet-based risk assessment software:** programmes used in the evaluation of risk in models that are designed to carry out analysis for specific analytical requirements. Generally adds-in programmes.
- **Project network-based risk assessment software:** used in the evaluation of risk models; designed to carry out analysis for specific analytical requirements. These may be adds in or standalone programmes.
- **Standalone project network-based risk assessment software:** intended to be self-contained in terms of the construction of risk models and the parameters and the variables that are input (e.g. CASPAR).

Risk registries

Risk #1				
Identify risk				
Risk name:				
Description:				
Category:				
Date identified:				
Responsible:				
Risk analysis				
Probability	**Consequence**	**Exposure**	**Priority**	**Updated on**
Total exposure:				
Risk management				
Monitoring index:				
Predecessor risk:				
Strategy:				
Updated on:				
(Optional)				
Precautionary measures:				
Correction measures:				
Contingency plan:				
Transition plan:				
Risk monitoring				
Monitor (e.g. 1 per month:				
Status:	(Open/Closed/Terminated)			
Date closed:				

2. Exercise

Class exercise

- Assuming that you are planning to launch an NFT marketplace.
- Identify potential risks and propose ways to address them
- Time = 10 minutes

6. Conclusions

Conclusions

- Risk is an uncertain event or set of circumstances that, should it occur, will have an effect on achievement of one or more project's objectives, with the clear understanding that risk can affect achievement of project objectives either positively or negatively"—APM (2006).
- Risks may have positive or negative effects on a business
- Risk management is critical for the success of any kind of project
- Risk management practices can be applied in Blockchain projects in the same fashion as in any other project

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Questions?

Contact Us:

Twitter: @Themistocleous6
Instructor's Email: themistocleous.m@unic.ac.cy
Course Support: digitalcurrency@unic.ac.cy
IT & live session support: dl.it@unic.ac.cy