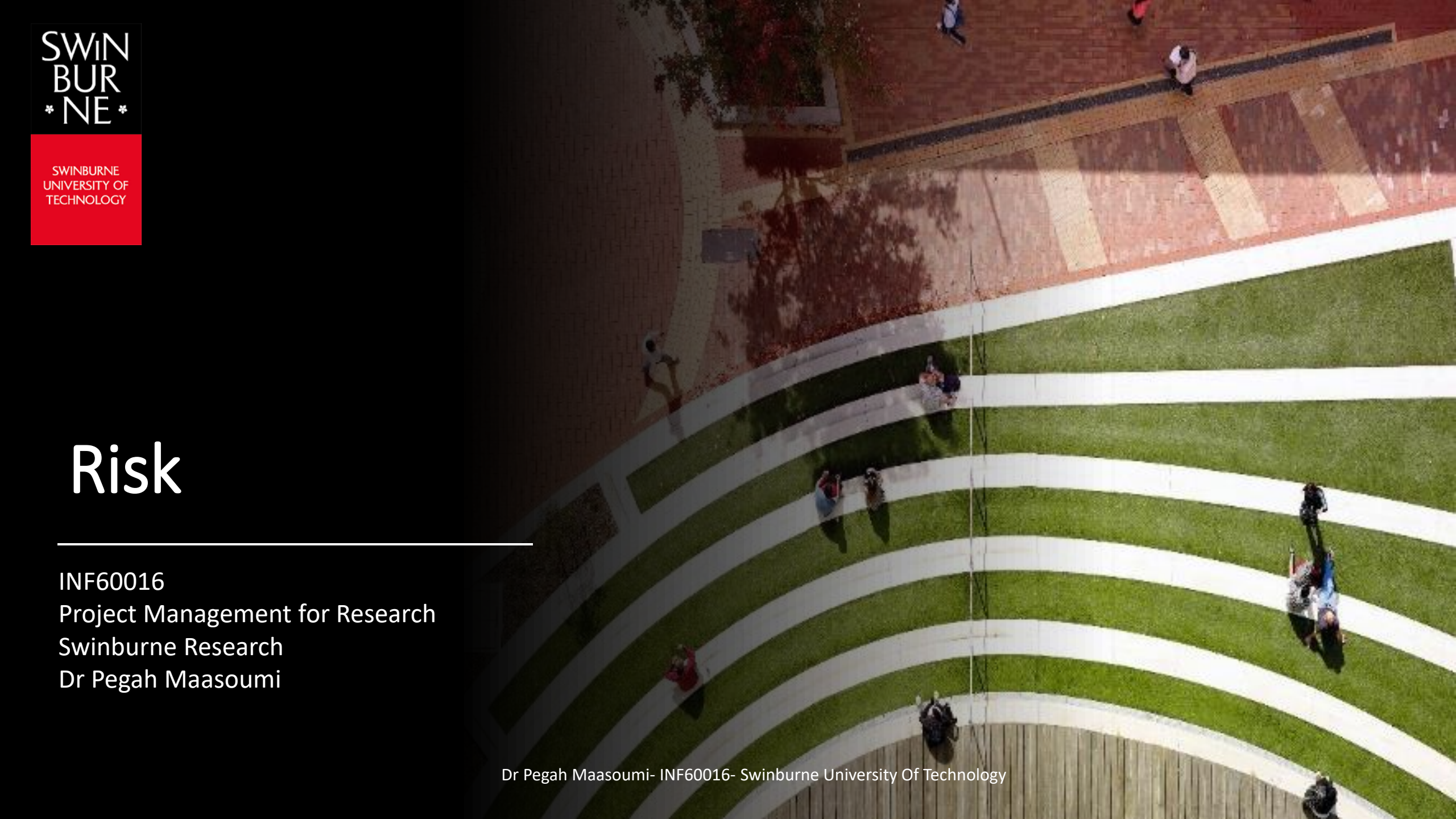
SWINBURNE UNIVERSITY OF TECHNOLOGY

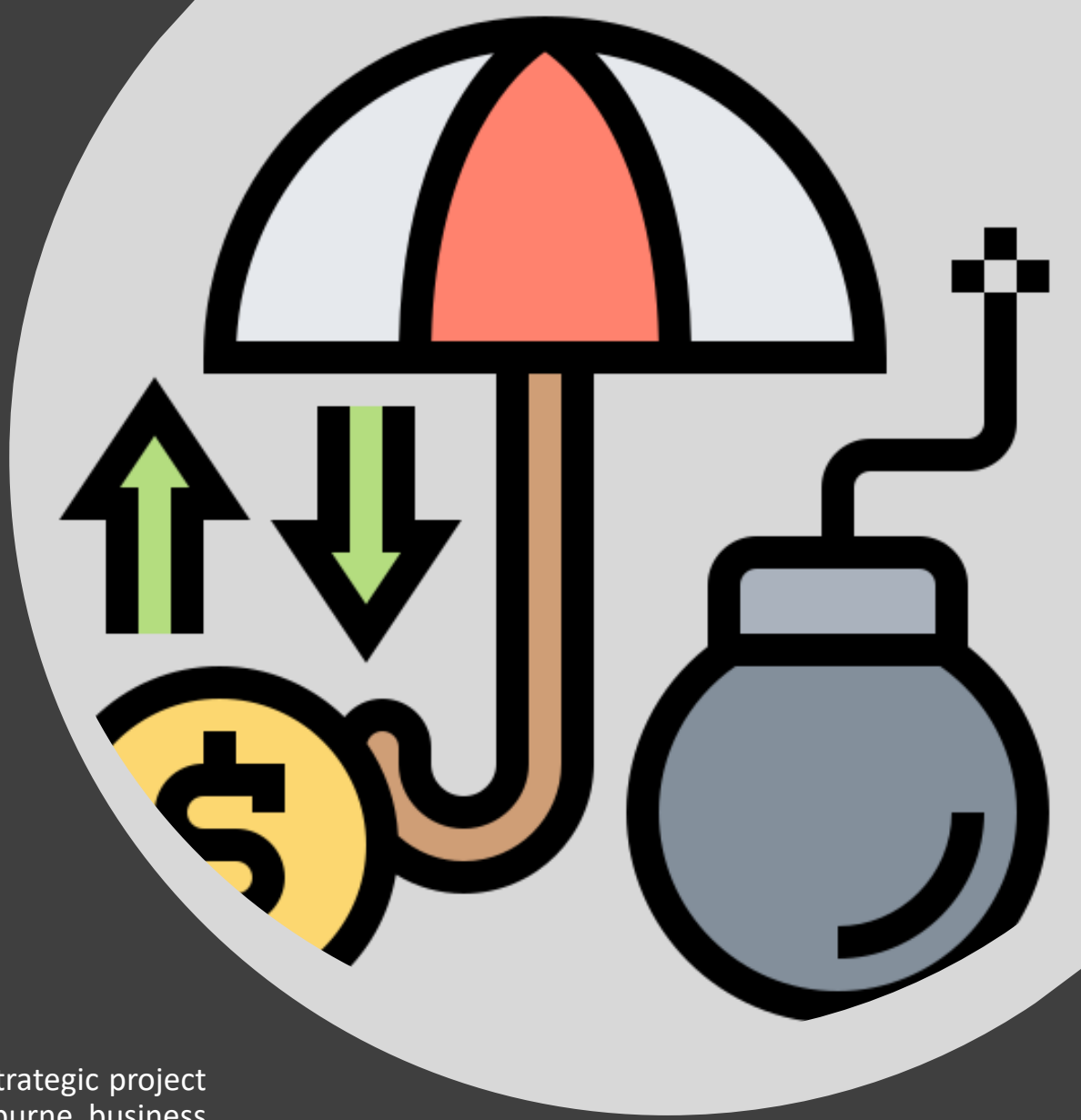
Risk

INF60016
Project Management for Research
Swinburne Research
Dr Pegah Maasoumi



Learning Outcomes

- Defining uncertainty and risk management in research;
- Identifying risks using the Fishbone diagram;
- Developing risk breakdown structure for complex risks;
- Evaluating risks and preparing risk response;
- Developing project risk register;
- Defining agile risk management in research.



* Acknowledgment- the lecture content is partially inspired by materials on strategic project management and project management for business development by Swinburne business school.

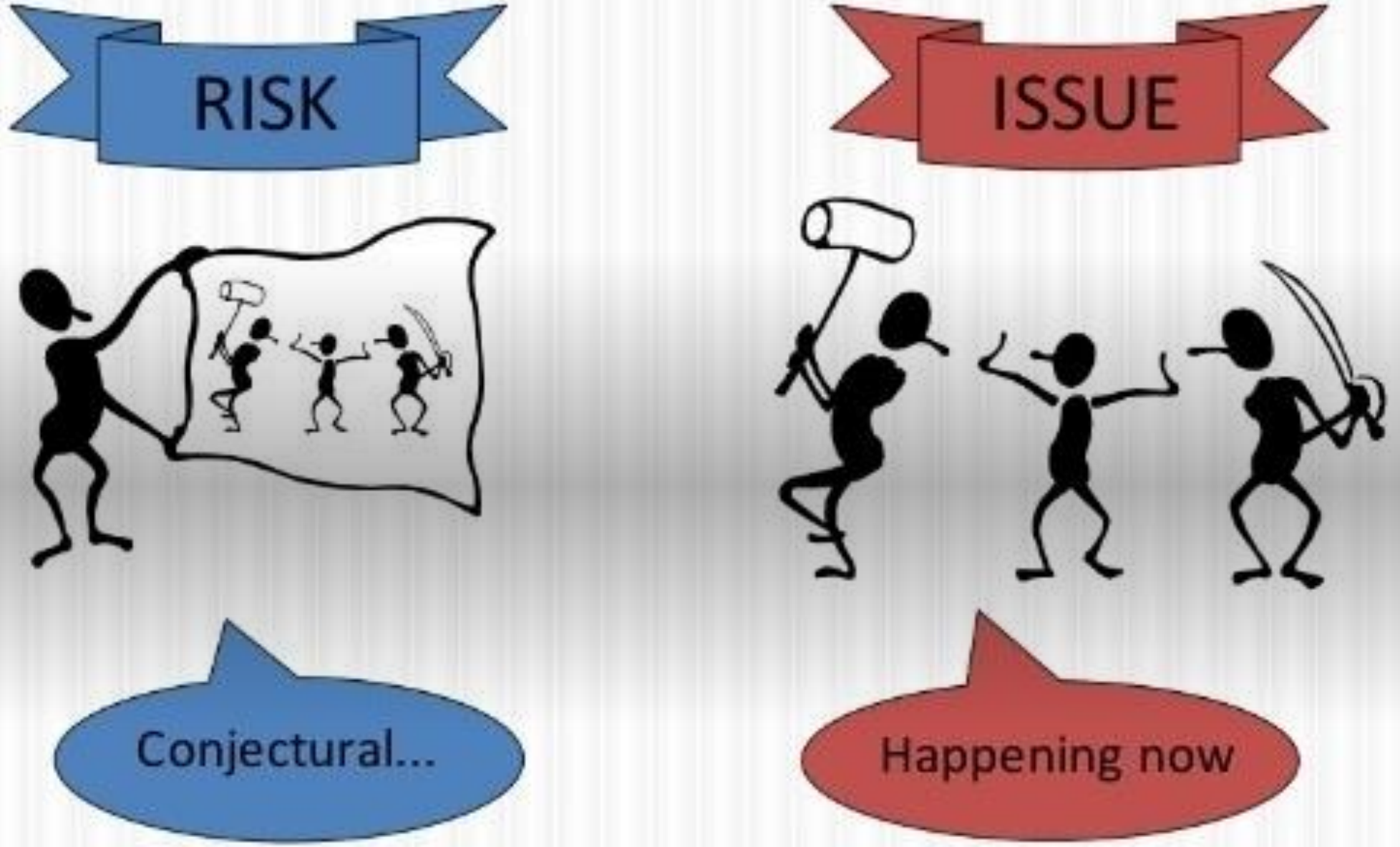
Certainty consists of events and decisions known to the project manager;

Uncertainty is an unknown future to project manager, therefore the consequences remain unknown;

Risk is an unknown future which can be analyzed and planned for, Risk is recognizing what is unknown.

Risk…

Is any uncertainty with the potential to have a significant impact on achieving the project objective.


RISK
ISSUE
Conjectural...
Happening now

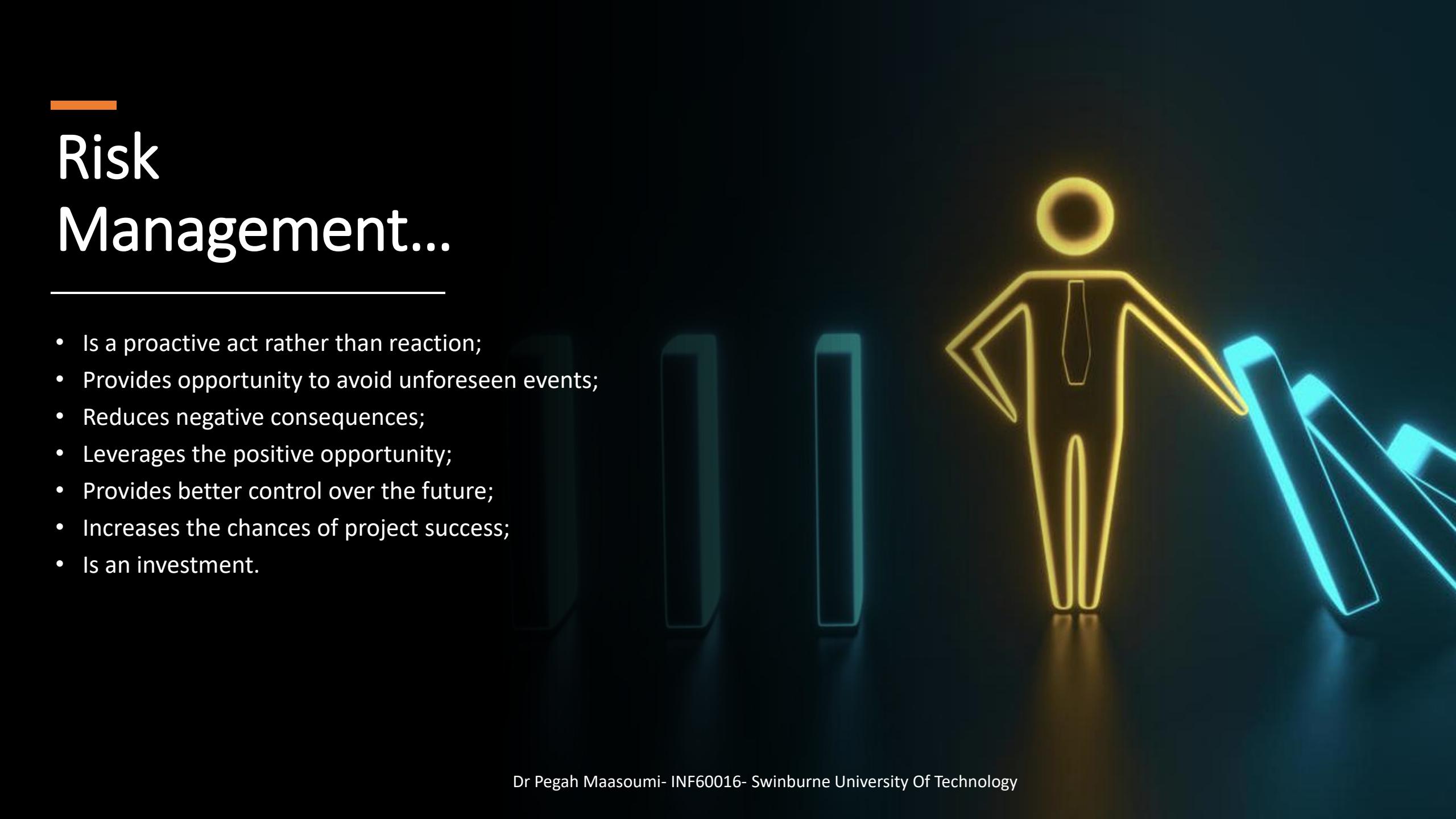
Risk Management

Despite good planning, things can go wrong!

However using the art and science of ***Risk Management,*** you can anticipate and mitigate to avoid a risk, minimize its impact or turn it to a positive opportunity.

Risk Management…

- Is a proactive act rather than reaction;
- Provides opportunity to avoid unforeseen events;
- Reduces negative consequences;
- Leverages the positive opportunity;
- Provides better control over the future;
- Increases the chances of project success;
- Is an investment.



Risk Management Process consists of...

1. Defining **objectives** and deliverables;
2. **Identifying** risks which are likely to affect each objective;
3. **Assessing** the likelihood and level of impact of each risk on achieving the objective;
4. Preparing suitable **responses** to avoid the risk, minimize the negative impact and perhaps utilize a positive opportunity;
5. **Communicating** the risk management plan and status with the relevant stakeholders;
6. **Monitoring** the risk status, the effectiveness of response and if necessary make adjustment to the plan.

1-Context and Objectives

The first questions to recall are :

- What are the objectives?
- What are the key deliverables?

2-Risk Identification

The process of determining what events are likely to affect each of the deliverables and documenting its characteristics.

Tools and techniques to use for this purpose are:

- Brainstorming;
- Interviewing;
- Checklists;
- Assumption analysis;
- Expert consultation;
- Diagraming (Fishbone , Flowchart, etc).

Risk Anatomy

Consists of three parts as below:

Causes

How and why can the event happen?

Event

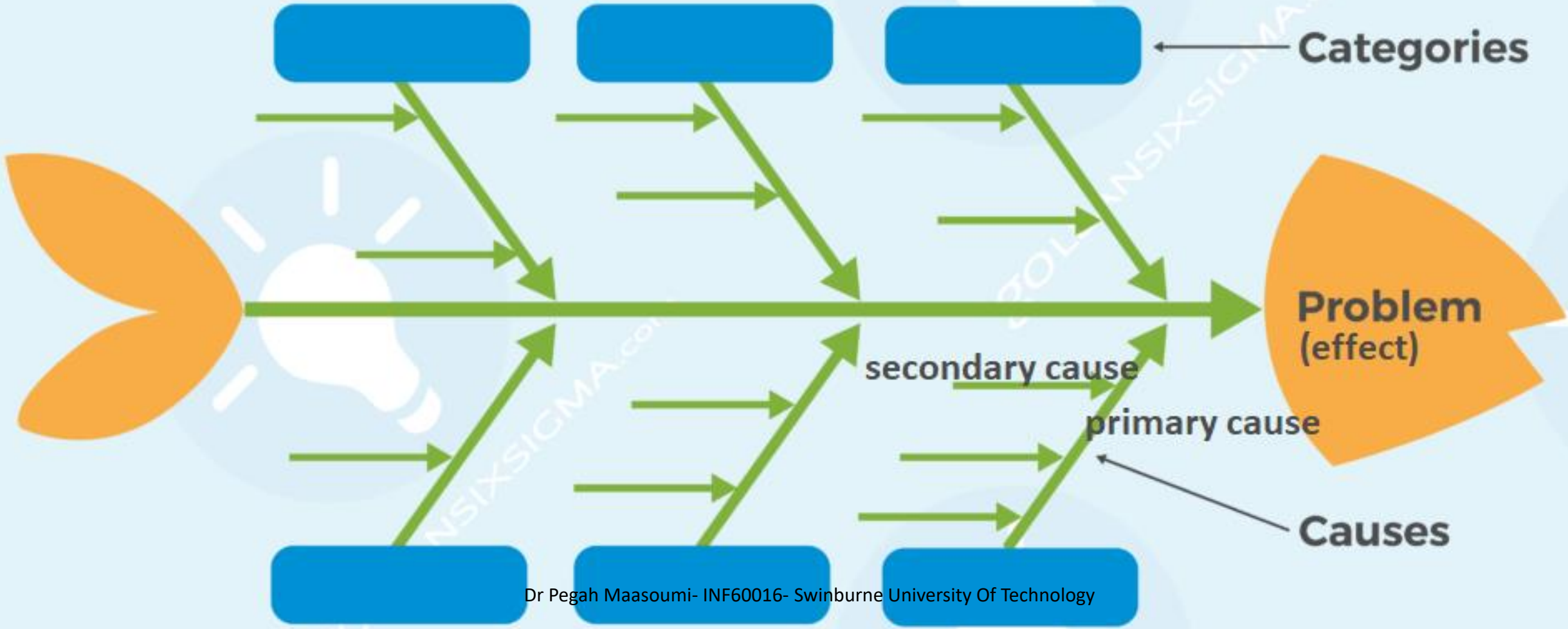
What can go wrong? What are the symptoms of occurring?

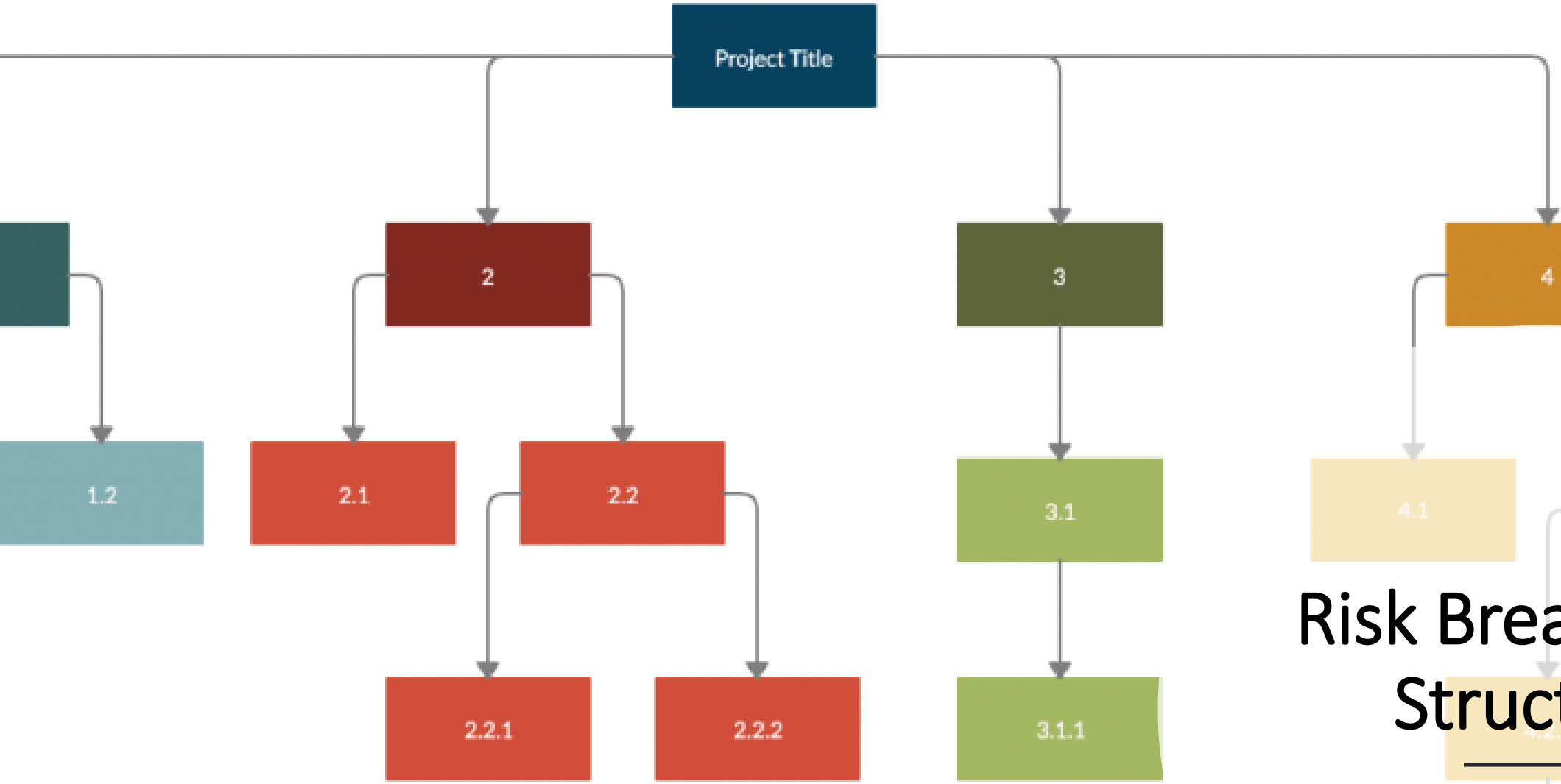
Effects

What is the consequences?

Fishbone Diagram

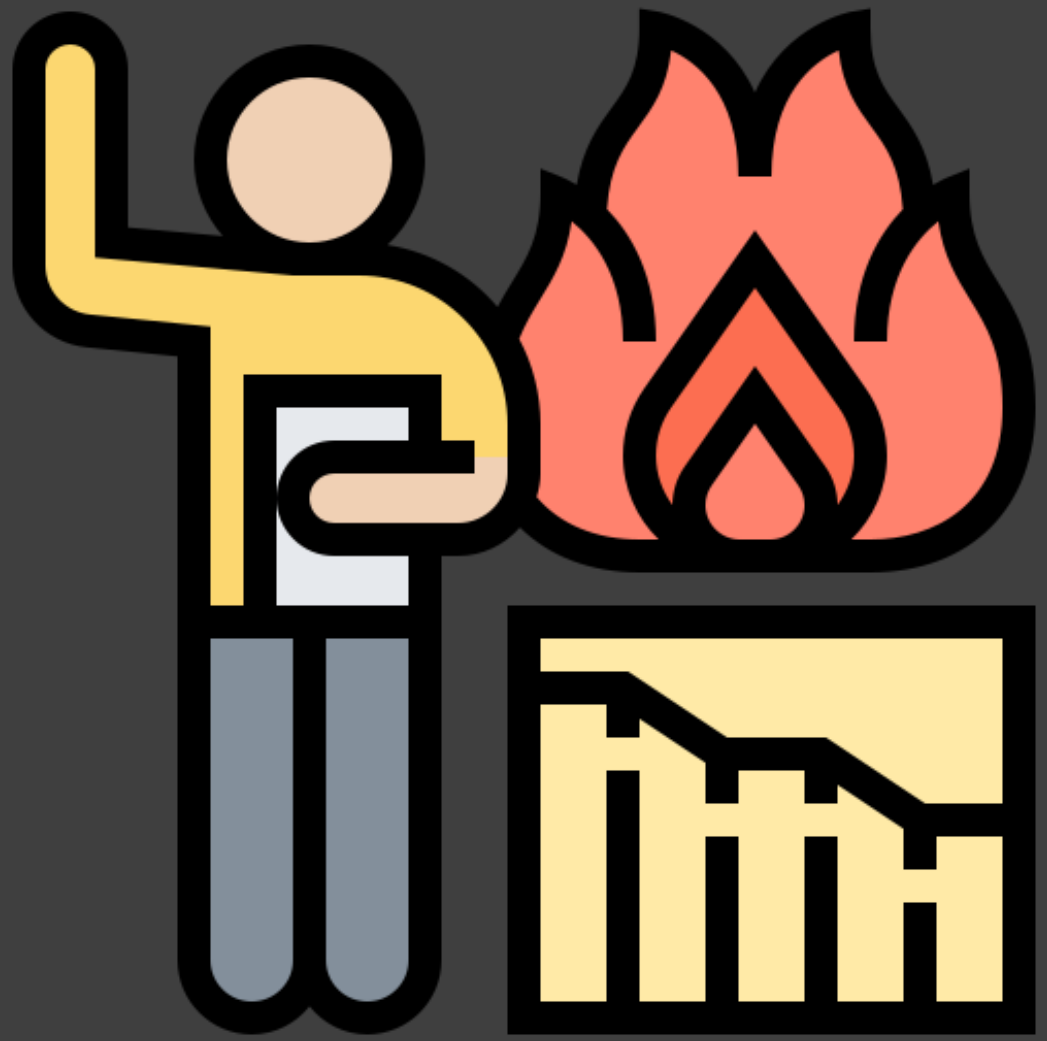
A Fishbone Diagram is a structured brainstorming tool using categories to explore root causes for an undesirable effect.





Risk Breakdown Structure

Risk breakdown structure is a hierarchy of smaller risks which can lead to a more complex risk and a bigger effect on achieving an objective.



3-Risk Assessment

Is the process of assessing the likelihood and impact of identified risks to determine their magnitude and priorities on achieving the objectives. This process can be performed using quantitative or qualitative risk analysis.

In this course only the qualitative risk analysis will be introduced using the probability and impact matrix tool.

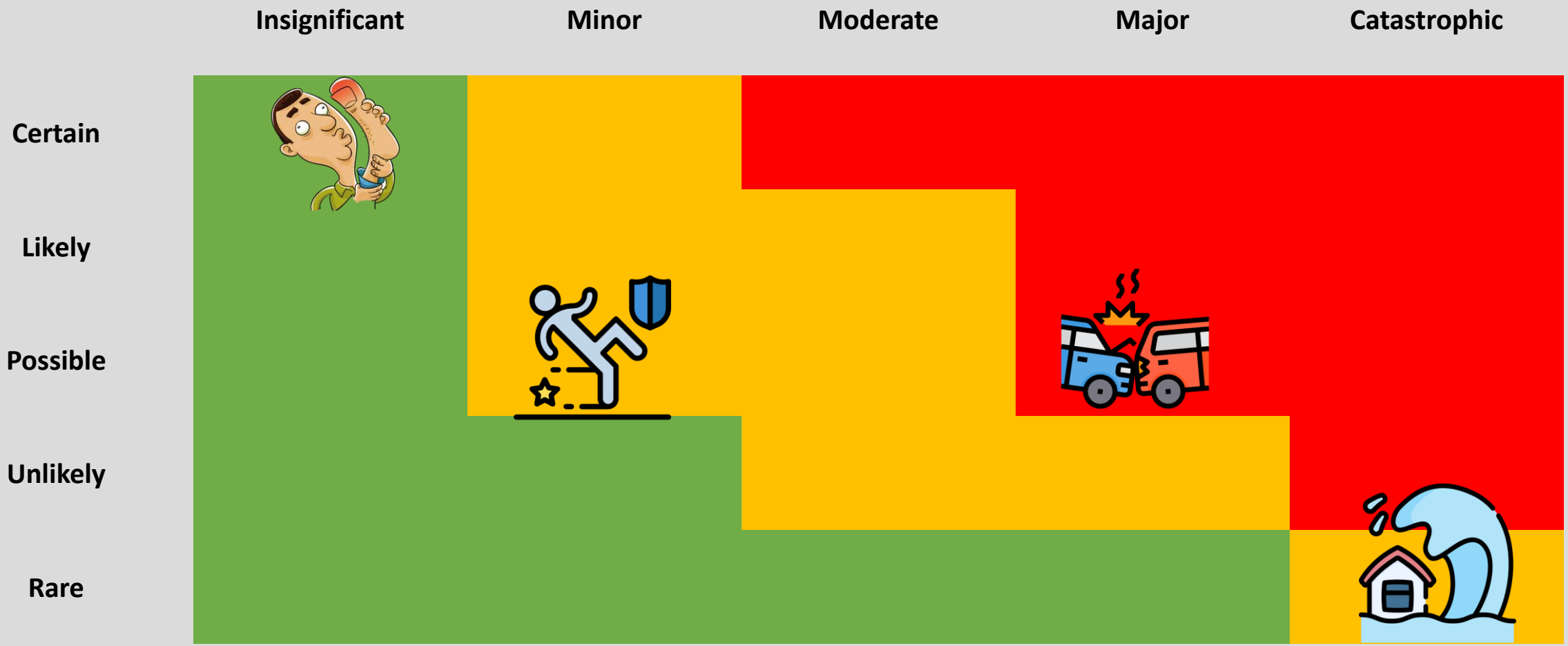
Probability and Impact Matrix

Risk Score = Probability * Impact

Risk Thresholds		
< 0.05	0.05-0.15	>0.15
Low Risk	Moderate Risk	High Risk
Monitor	Regular Review	Urgent Attention

Probability	Impact →	Insignificant	Minor	Moderate	Major	Catastrophic
		0.05	0.1	0.2	0.4	0.8
Certain	0.9	0.045	0.09	0.18	0.36	0.72
Likely	0.7	0.035	0.07	0.14	0.28	0.56
Possible	0.5	0.025	0.05	0.1	0.2	0.4
Unlikely	0.3	0.015	0.03	0.06	0.12	0.24
Rare	0.1	0.005	0.01	0.02	0.04	0.08

Risk Assessment Matrix Examples



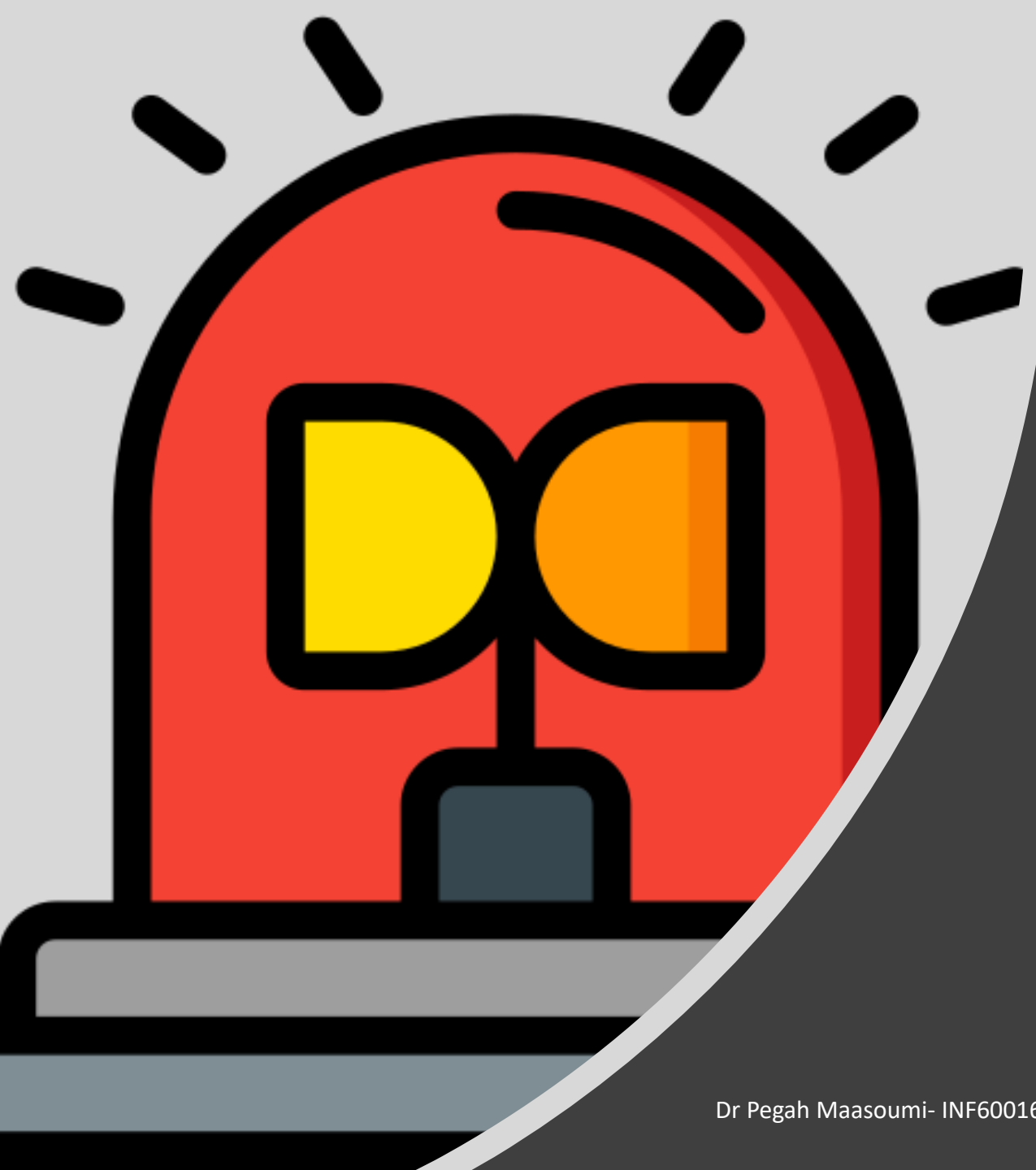
Risk could impact different elements of a project such as:

- Time;
- Cost;
- Health and safety;
- Performance;
- Quality;
- Relations;
- Data;
- Administrative;
- Support;
- etc.

4-Risk Response

Risk response is the process of developing strategies and planned actions in order to avoid a risk, reduce probability of occurrence and/or reduce the severity of impact. The responses are categorized as:

- **Risk Avoidance -** Reduce the probability of occurrence to zero or eliminate the impact(s) or both. (Get rid of it!)
- **Risk Reduction -** Reduce the probability of occurrence or impact consequences, or both, to acceptable levels**.**
- **Safety Measures -** Provide barriers to the consequences of impact.
- **Warning Measures -** Incorporate warning protocols to identify increasing probability or indicators of impending occurrence.
- **Risk Transference -** Transfer responsibility for risk management to a third party (eg. insurance).



5-Communication

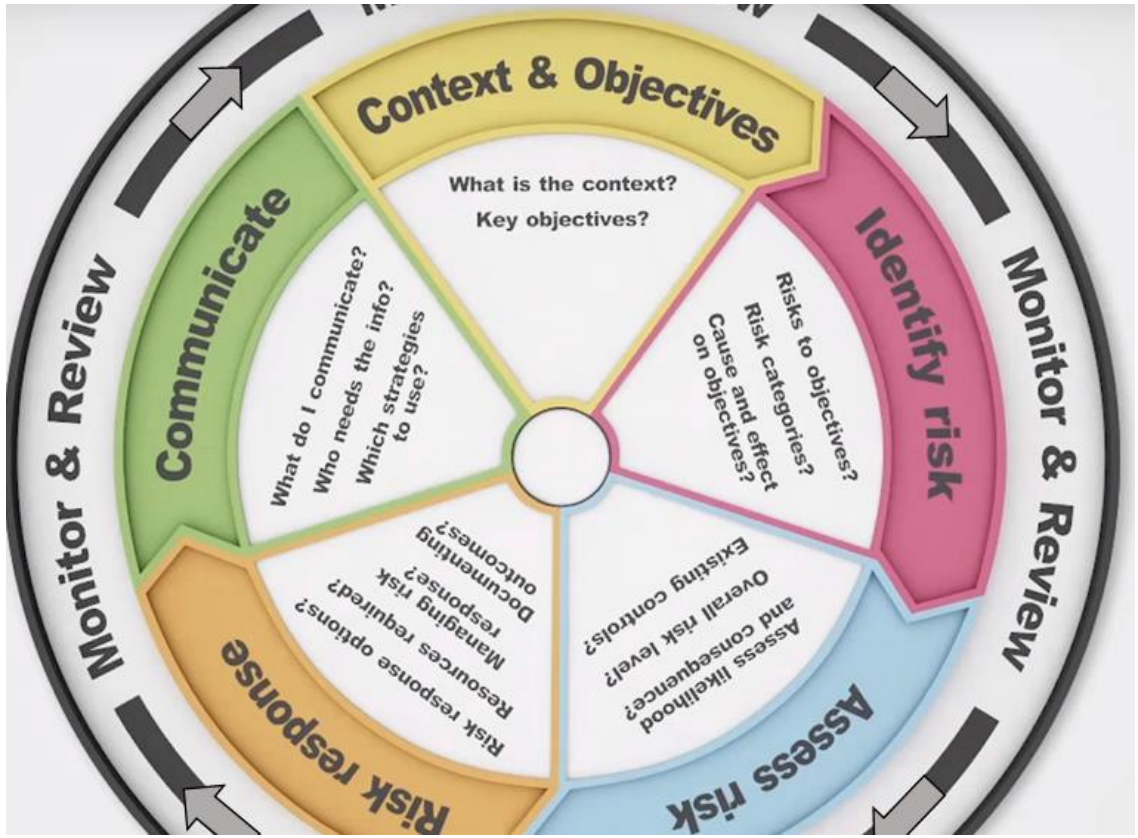
Communicating the identified risk and responses to the stakeholders, perhaps the most important step, underpins the success of the risk management process. Proper communication enables and encourages all stakeholders to be involved and offer input where necessary.

A useful tool to use in this part is **risk register.**

Risk Register

Risk register contains information on cause, assessment and response and is usually presented in a table format.

- Name: Unique Identification
- Description (What could happen)
- Category
- Potential root and contributory causes (Why it could happen)
- Likelihood and consequences pre-reduction
- Pre-Reduction risk score
- Likelihood and consequences post-reduction
- Post-Reduction risk score
- Indications or symptoms of impending occurrence
- Actual or proposed mitigation methods
- Post-Mitigation consequences, if any
- Etc.



6-Monitor And Control

This step will be discussed in next module.

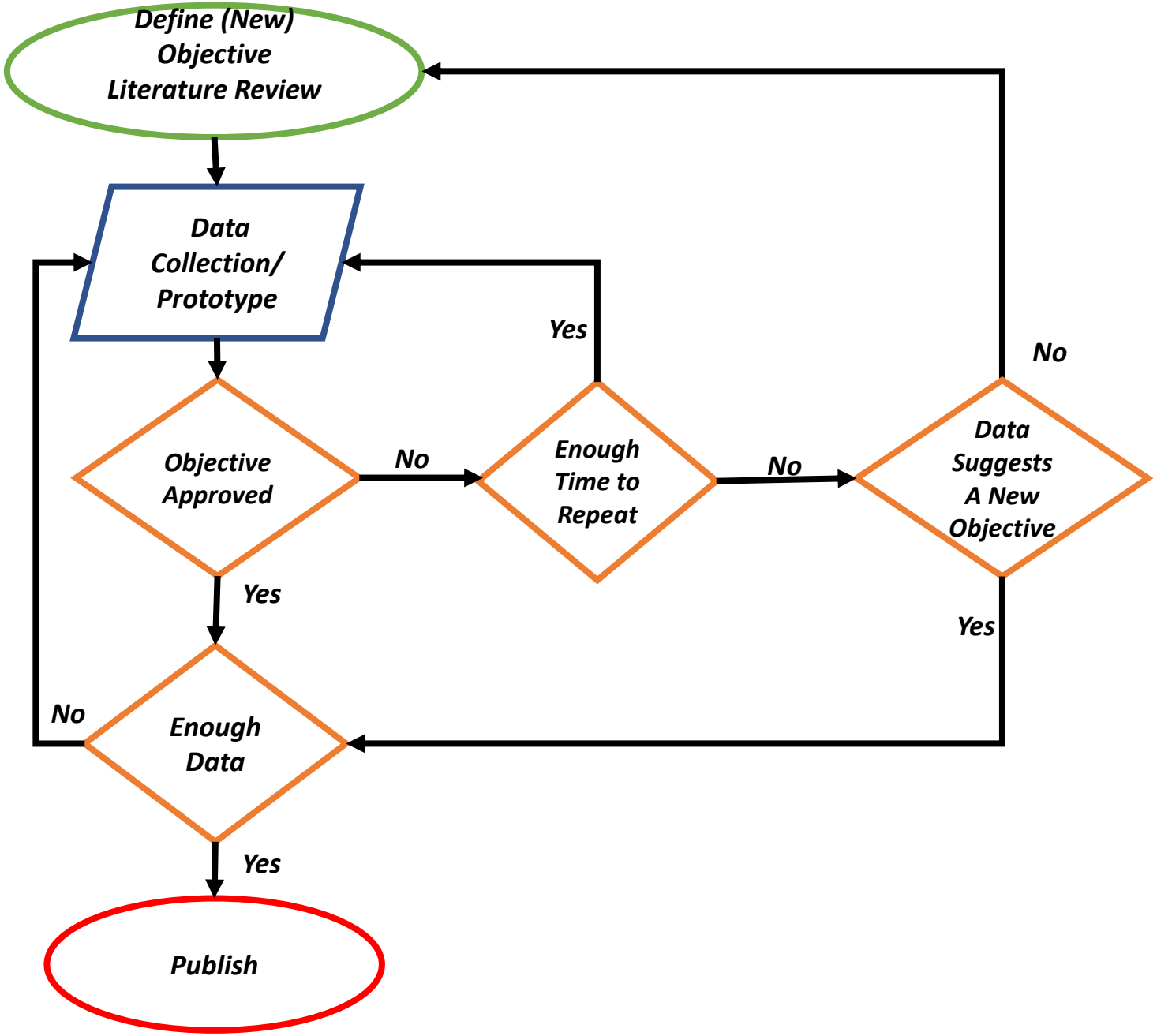
Agile Management Of Uncertainty In Research

Research is defined as going somewhere that no one been before, therefore it deals with a high level of uncertainty and even ambiguity in results and deliverables.

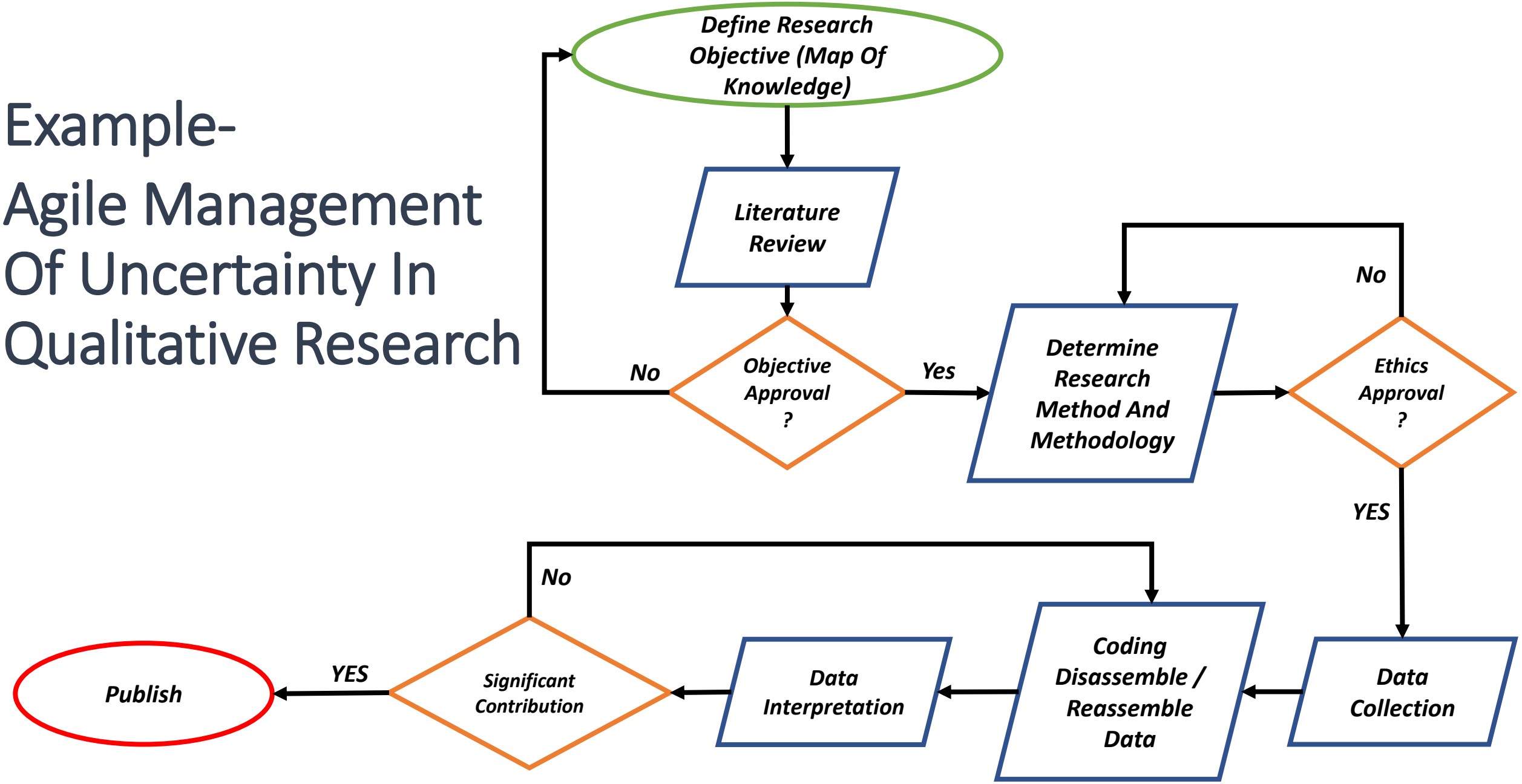
Although any research start with a specific question and direction, the direction can deviate or even turn toward opposite.

Research project is dynamic and many details emerge as the project unfold. Therefore managing research uncertainty requires to be agile.

Example-
Agile Management Of Uncertainty In Quantitative Research



Example-
Agile Management Of Uncertainty In Qualitative Research



Ideally,
you should be able to:

- Identify, evaluate and assess the potential risks to your research project considering all different impacts;
- Develop a well thought and details risk register;