

SPR/FPR A21 – Lesson 4

The Analyse Phase



Problem analysis

Background - Purpose -Problem:

Background: Setting the stage

Purpose:

Why something needs to be solved

Problem:

What to solve

Use the purpose as guidance for validating the value of your solution to the problem throughout execution of the project!

Purpose Vs Problem

The Alpha Romeo Case



Project	Purpose	Problem
A.	Contribute in making Alpha Romeo a "Green" brand	How to design an electrical A.R. SUV with a range of YY km/charge maintaining the characteristic A.R. experience within a product cost of ZZ.000€?
B.	Contribute in making Alpha Romeo a "Full range provider of personal transportation for the wealthiest 30%"	Design and develop a two seated truck aimed for leisure and nature maintaining the characteristic A.R. driving experience within a product cost of YY.000€?

Analysing – Getting the project off to a good start by ensuring you have relevant and valid data

- What is behind the problem
- What is the reason for...
- Which consequences could it have for...
- Why have no one made...
- Where can we find...
-

What happens
inside a washing
machine?



What is the Analyse phase?...

- In the problem analysis phase, an investigation of issues relevant for the project is made including the necessary collection of data to back this up, e.g. identification of the overall problem, establishment of causes and effects, identification of stakeholders, etc.

(Source: VIA Engineering Guidelines: Project Description Appendix 1)

What is the analyse phase.. continued?

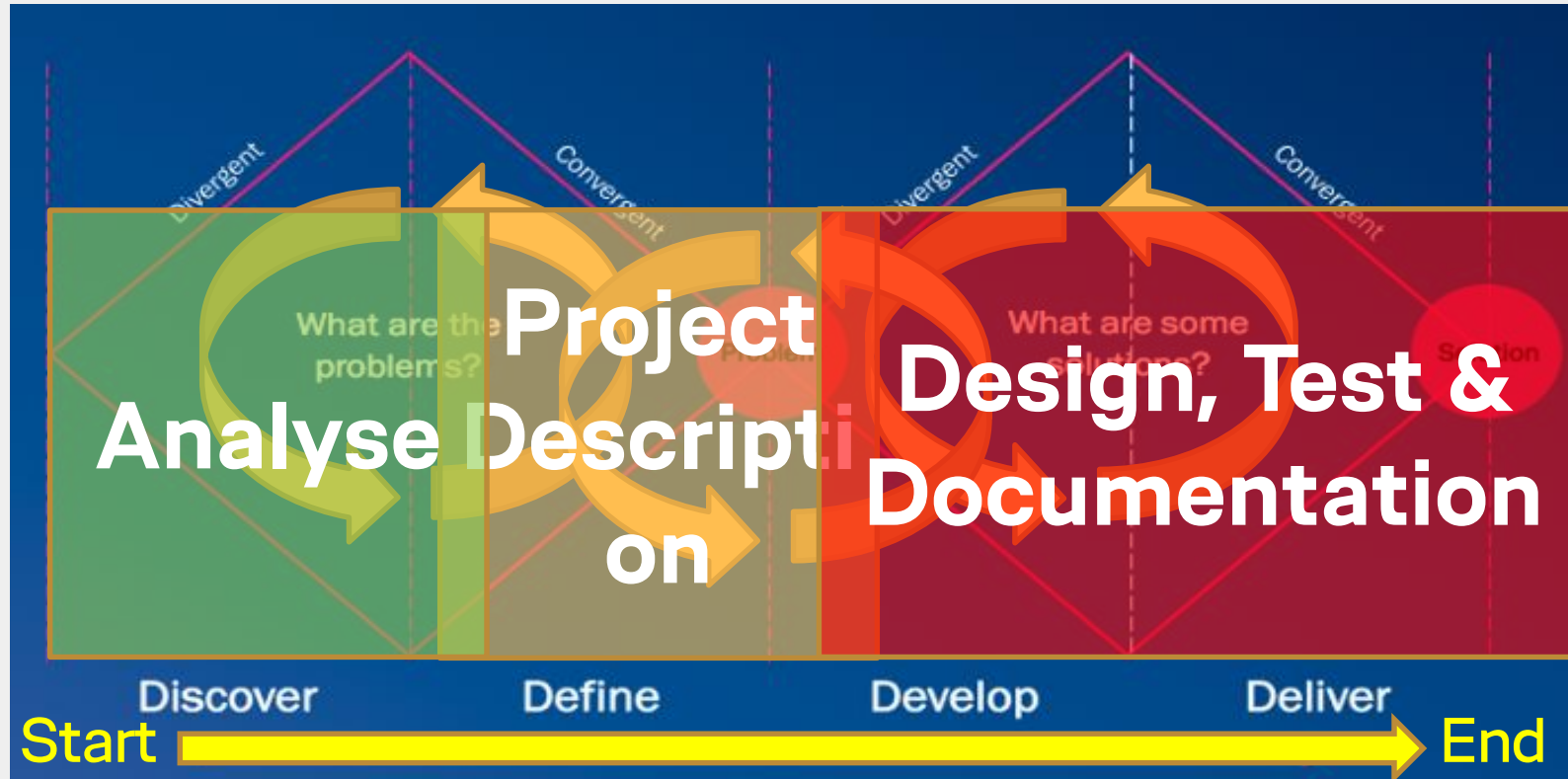
Problem/Subject analysis

- **Before** commencing the **actual project work**, you should carry out a **problem analysis**. Depending on the scope of the project, this process may be more or less comprehensive.
- In this process the **differing interpretations** as well as the project group's suggestions to the assignment text should be investigated and **discussed**
- The analysis **helps you to broaden your understanding of the subject including related issues** all together enabling you **to do a better job** in the problem formulation.
- The **problem analysis itself is not part of the actual project description**, but **forms the basis** of the description. The **problem analysis** needs to be enclosed as an appendix of the project description!

Double Diamond Model

The Overall Project Process at VIA Engineering

Four Phases: Discover – Define – Develop – Deliver
shifting from Divergent to Convergent



REMEMBER: The analyses phase is:
NOT about Defining solutions



BUT

**Identifying and gathering information
relevant when defining a solution**

Why Analyse.

NEW! From the creators of 2600
The Hacker Quarterly comes...

Eric Corley
1-Wire DVD Rewinder

Use the rewinder to rotate a DVD while
watching and protect your DVD player

Full Manufacturer's Warranty
LED indicator
Automatic start/stop
No AC adapter required
Fully UL listed



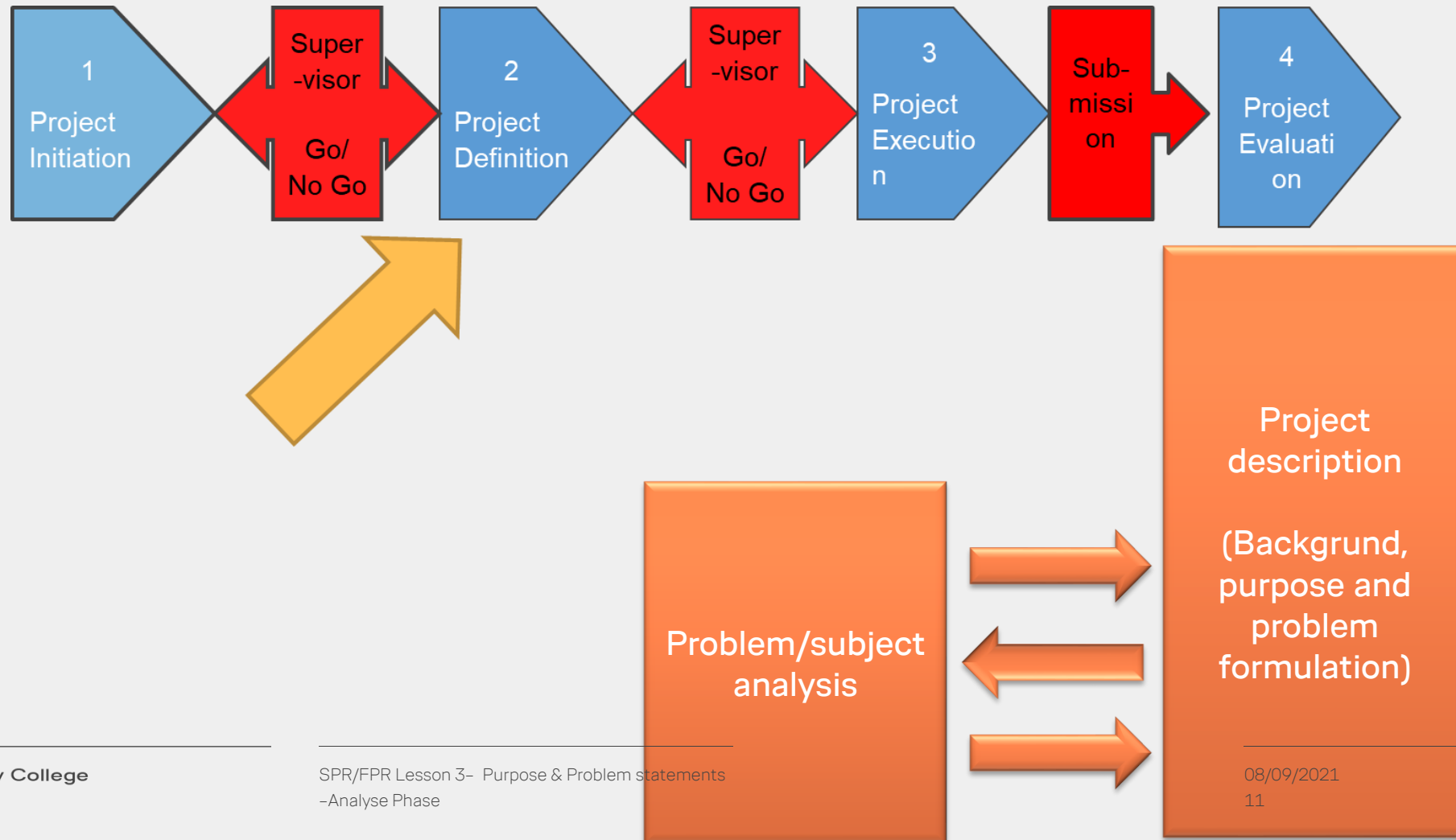
Your Cost: \$99.99

2600 Enterprises, Inc



Problem analysis

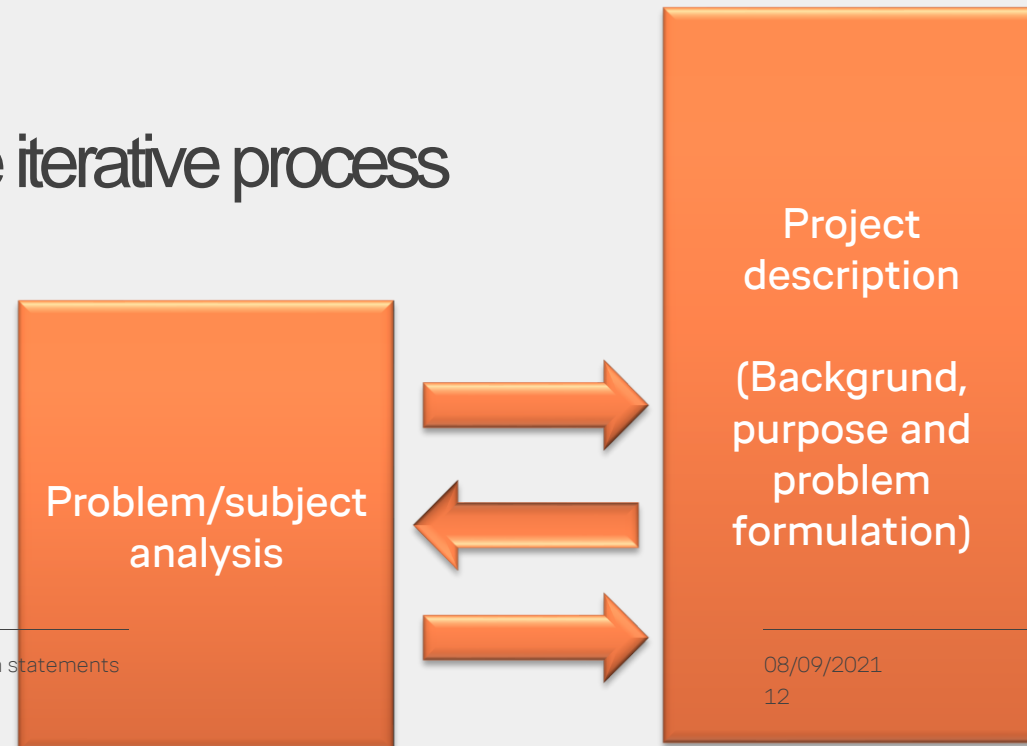
Two documents, one iterative process



Remember: Analysing never stops!

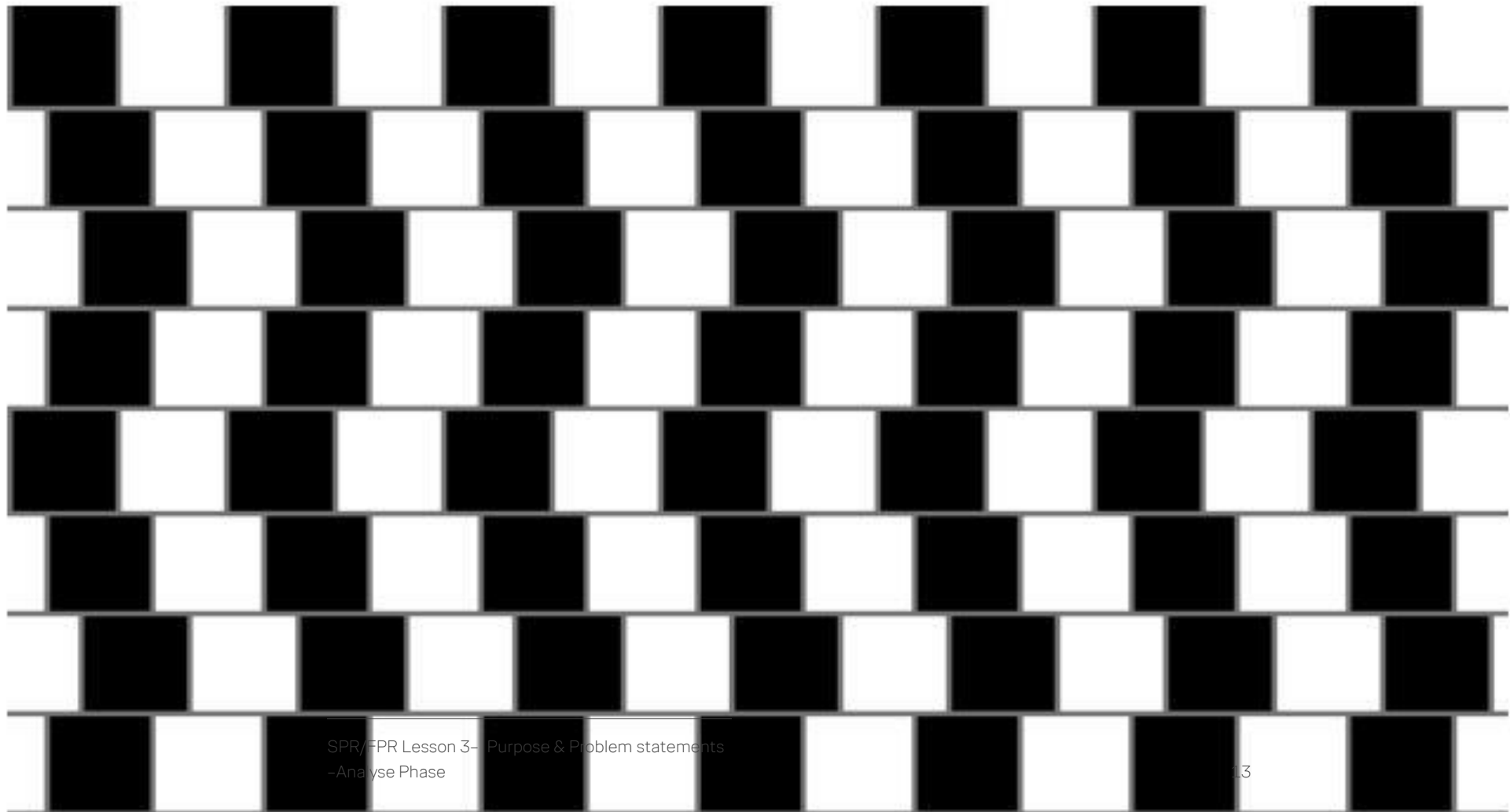
However qualifying what you are to do before you do it will minimize risk and redoing work

Problem analysis
Two documents, one iterative process



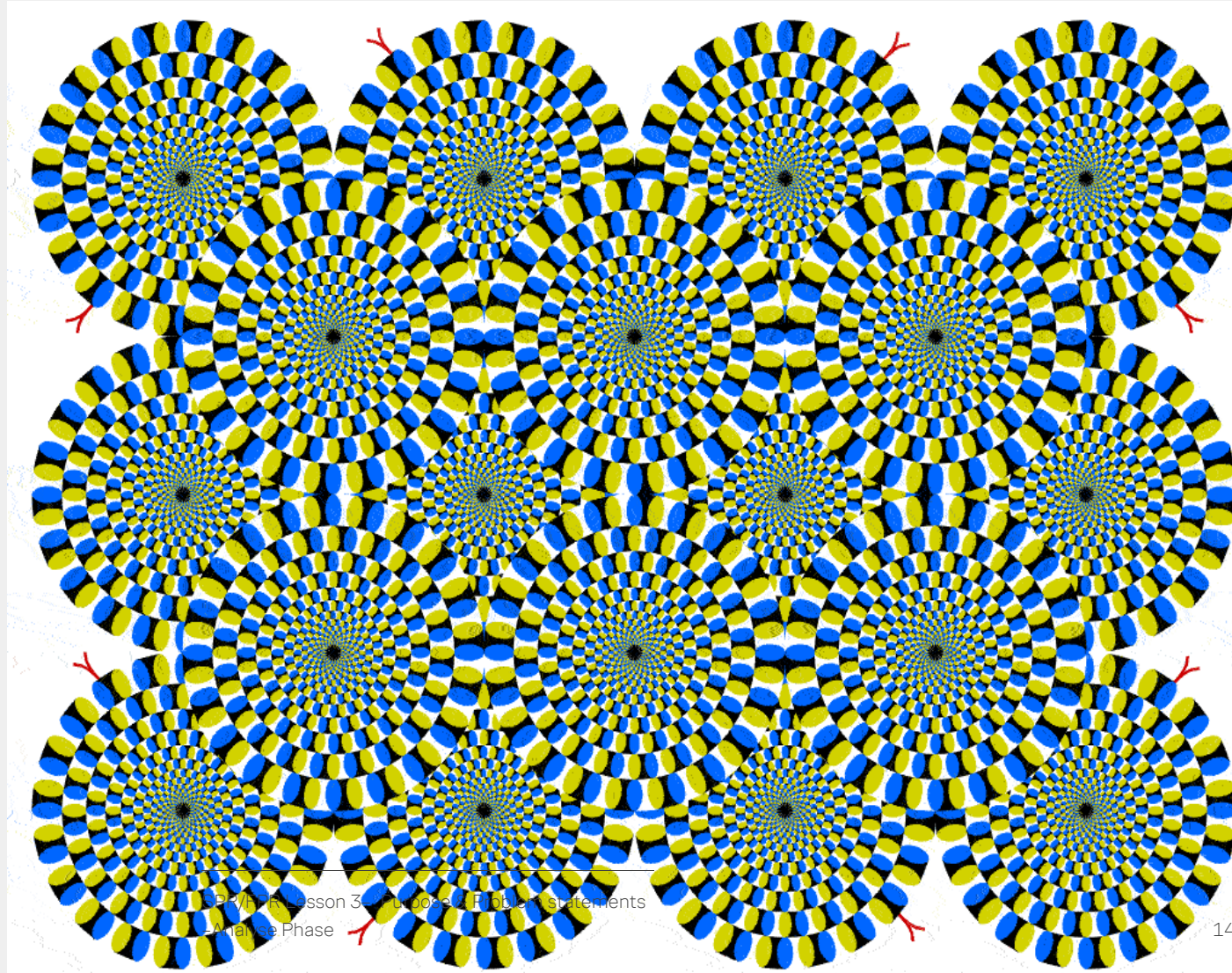
Problem analysis

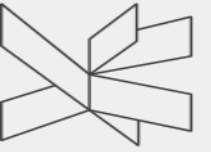
Why analyze?



Problem analysis

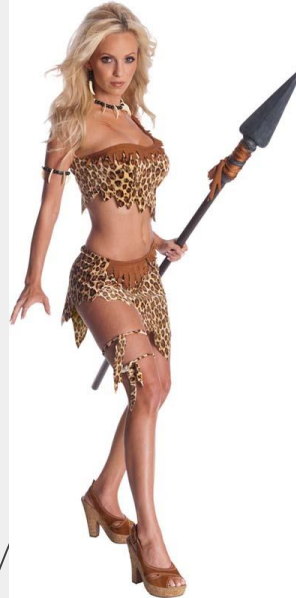
Why analyze?





Problem analysis

Why analyze?



Water

What should Tarzan do in order to get to Jane?

SPR/FPR Lesson 3- Purpose & Problem statements
-Analyse Phase

08/09/2021
15

The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>



Problem: One of the monuments in Washington D.C. is deteriorating.



Purpose: Confirm the USA as a role model for democracy and freedom?

The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>



Problem: One of the monuments in Washington D.C. is deteriorating.

Why #1 – Why is the monument deteriorating?

Because harsh chemicals are frequently used to clean the monument.

Source: <https://www.theatlantic.com/photo/2016/02/historic-photos-of-the-lincoln-memorial/462990/>

And:

https://www.google.dk/search?q=pigeon&sa=X&rlz=1C1GGRV_e_nDK751DK751&tbm=isch&tbo=u&source=univ&ved=0ahUKEwiH_z6GHyKDZAhWJCSwKHx0qCKMQsAQIjg&biw=1680&bih=919#imgrc=wuZ1oPrgu7L3FM:



The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>



Problem: One of the monuments in Washington D.C. is deteriorating.

Why #2 – Why are harsh chemicals needed?

To clean off the large number of bird droppings on the monument.



Source: <https://www.theatlantic.com/photo/2016/02/historic-photos-of-the-lincoln-memorial/462990/>

And:

https://www.google.dk/search?q=pigeon&sa=X&rlz=1C1GGRV_e_nDK751DK751&tbm=isch&tbo=u&source=univ&ved=0ahUKEwiH_z6GHyKDZAhWJCSwKHx0qCKMQsAQIlg&biw=1680&bih=919#imgrc=wuZ1oPrgu7L3FM:



The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>

Problem: One of the monuments in Washington D.C. is deteriorating.

Why #3 – Why are there a large number of bird droppings on the monument?

Because the large population of spiders in and around the monument are a food source to the local birds



<https://www.rentokil.tt/spiders/species/>

The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>

Problem: One of the monuments in Washington D.C. is deteriorating.

Why #4 – Why is there a large population of spiders in and around the monument?

Because vast swarms of insects, on which the spiders feed, are drawn to the monument at dusk.



<https://www.rentokil.tt/spiders/species/>



The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>

Why #5 – Why are swarms of insects drawn to the monument at dusk?

Because the lighting of the monument in the evening attracts the local insects.

Solution: Change how the monument is illuminated in the evening to prevent attraction of swarming insects.



The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>



The Lincoln Memorial Mystery

See: <https://wallbuilder.wordpress.com/2013/05/29/the-lincoln-memorial-and-the-5-whys/>



Problem: One of the monuments in Washington D.C. is deteriorating.

Why #1 – Why is the monument deteriorating?

Because harsh chemicals are frequently used to clean the monument.

Why #2 – Why are harsh chemicals needed?

To clean off the large number of bird droppings on the monument.

Why #3 – Why are there a large number of bird droppings on the monument?

Because the large population of spiders in and around the monument are a food source to the local birds

Why #4 – Why is there a large population of spiders in and around the monument?

Because vast swarms of insects, on which the spiders feed, are drawn to the monument at dusk.

Why #5 – Why are swarms of insects drawn to the monument at dusk?

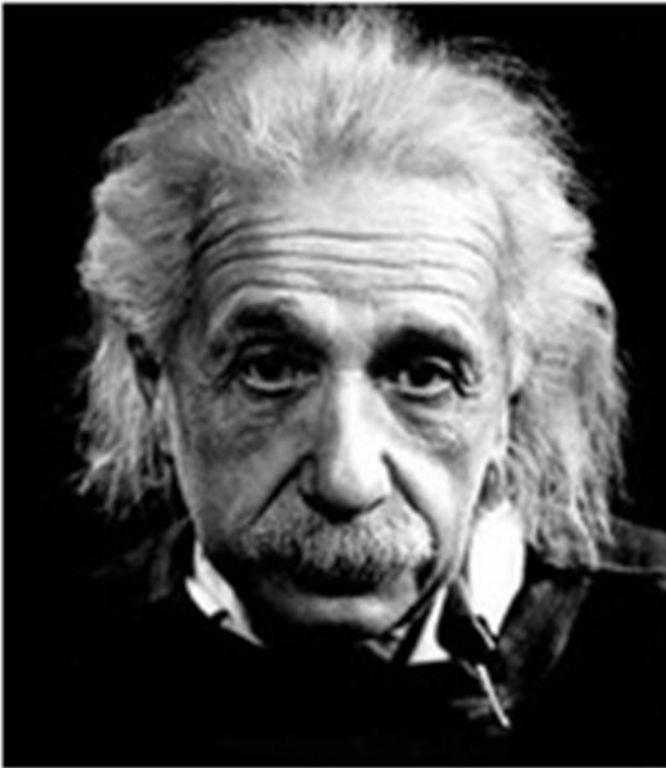
Because the lighting of the monument in the evening attracts the local insects.

Solution: Change how the monument is illuminated in the evening to prevent attraction of swarming insects.



Doing Problem Based Projects

Albert Einstein



“If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.”

– Albert Einstein

tags: problem-solving

Source: <https://www.goodreads.com/quotes/60780-if-i-had-an-hour-to-solve-a-problem-i-d>

REMEMBER:

The Analyse phase is the fundament for
the Background Description....

Purpose.....

Problem

&

Therefore the Project (Report)

Assignment.. In the Tonale Groups 30 minutes

Define topics that needs to be analysed if doing one of the two Alpha Romeo Projects.

Consider
Business Related
User Related
Technical
Sustainability & Ethics

Name minimum 10 for each subject

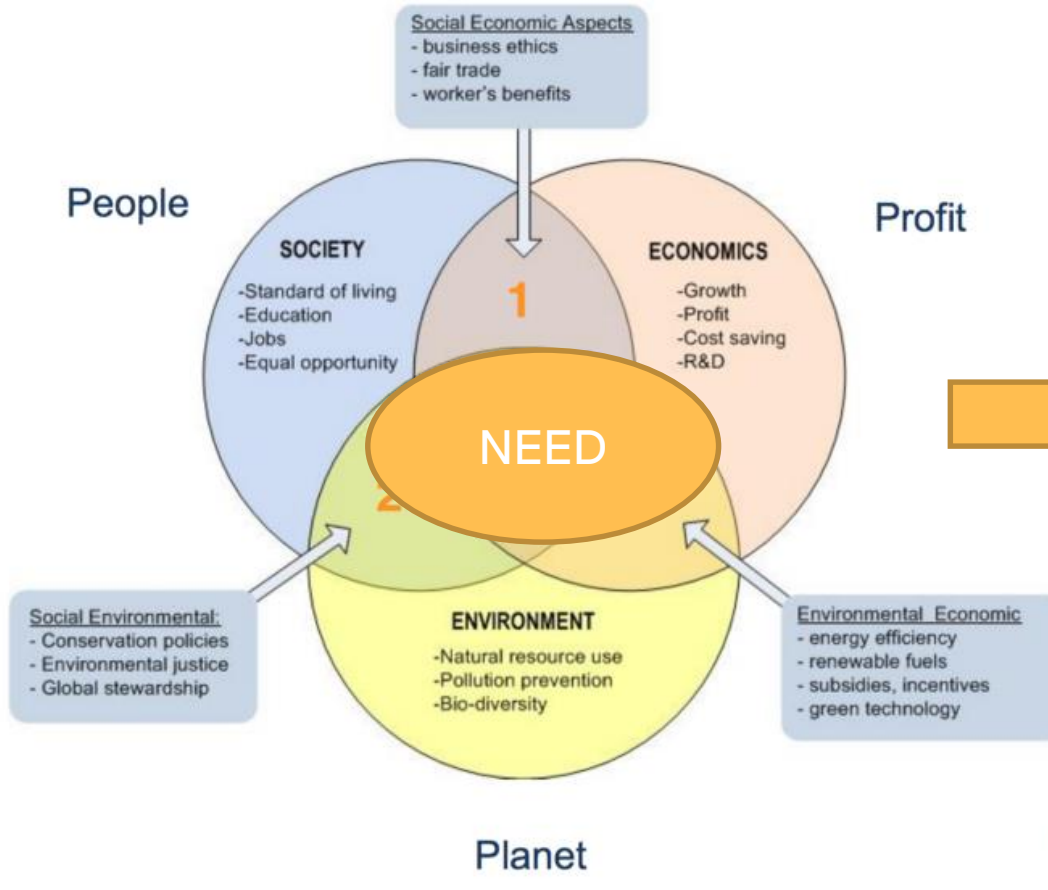
Purpose Vs Problem
The
Alpha Romeo Case



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VIA University College SPR/FPR Lesson 3- Purpose & Problem statements -Analyse Phase 08/09/2021

Analysing



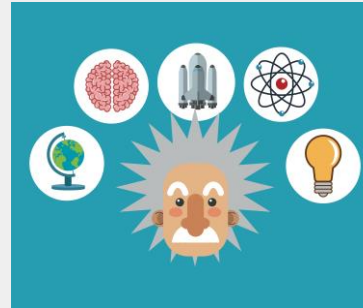
As MINIMUM ensure tat you have investigated within all three topics!!

Functionality

Sustainability
& Ethics

Business

How Analyse... Start asking



- What is behind the problem
- What is the reason for...
- Which consequences could it have for...
- Why have no one made...
- Where can we find...
-



Start analyzing via a Mind Map



You have successfully analysed when you can describe with arguments to a relevant out stander

- What your project is about
- What is the need
- Why it is relevant
- + Other relevant considerations regarding the project

In other words: Are able to do a project Description



How analyse

Issues always to consider:

Who are the users and what is their need?

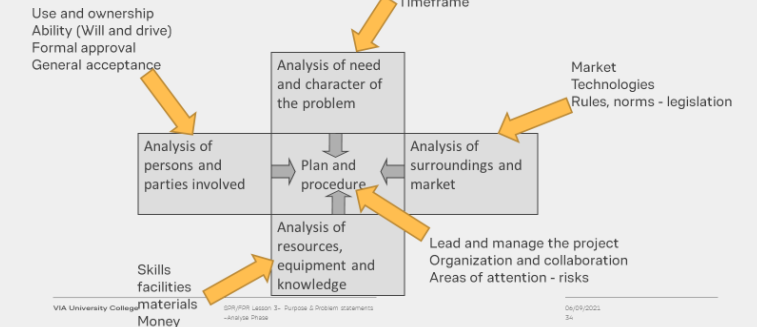
What are the existing solutions to the need?

Focus of other interested parties?

How big is the market and for how long?

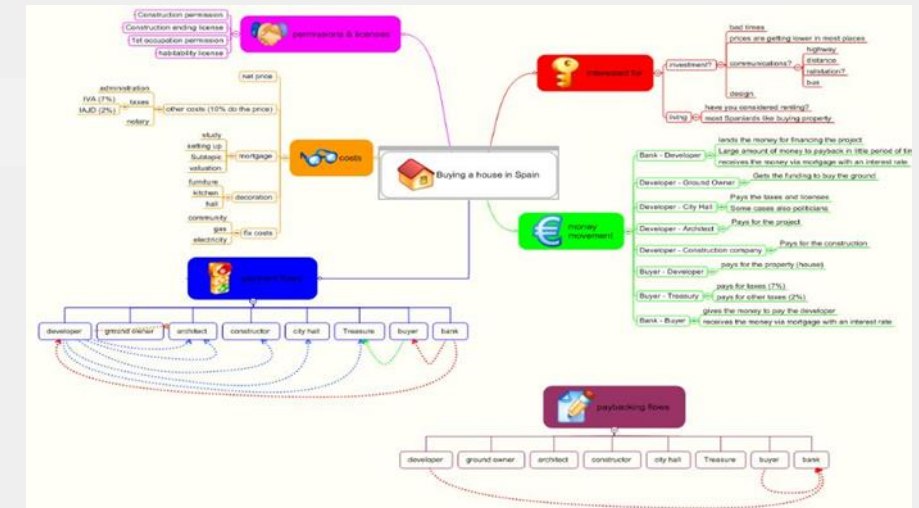
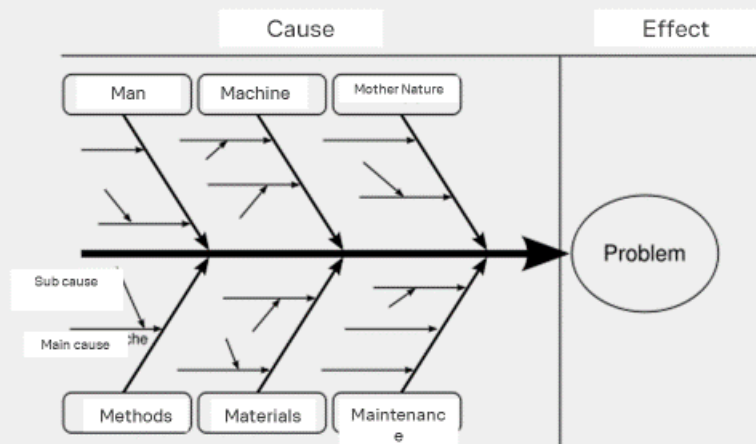
Do we have the necessary skills and knowledge to succeed solving the task?

Problem analysis 5 X 5 model?



Problem analysis

Cause effect diagram (Ishikawa)



08/09/2021
30

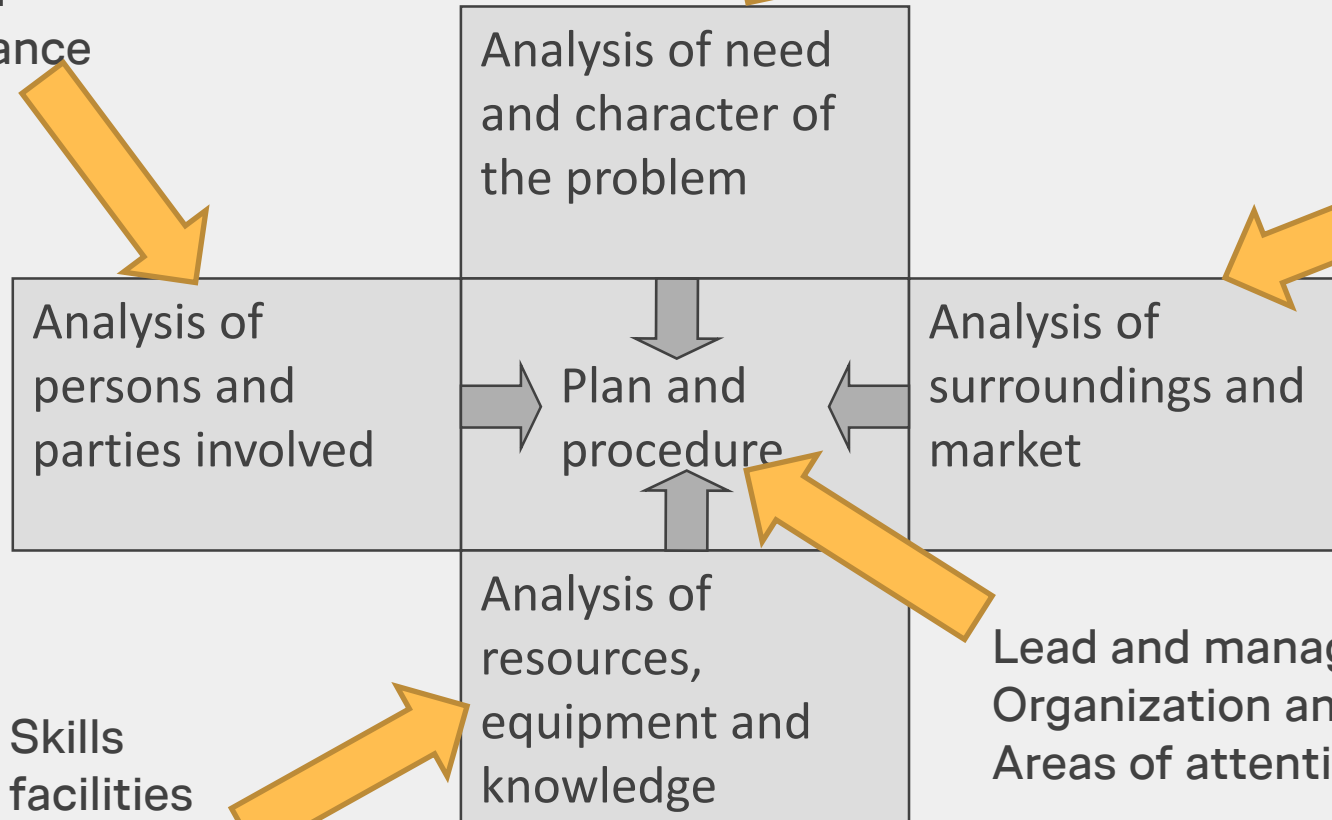
Problem analysis

5 X 5 model?

Use and ownership
Ability (Will and drive)
Formal approval
General acceptance

Needs and objectives
Scope and content - idea base
Objectives and products of the project
Timeframe

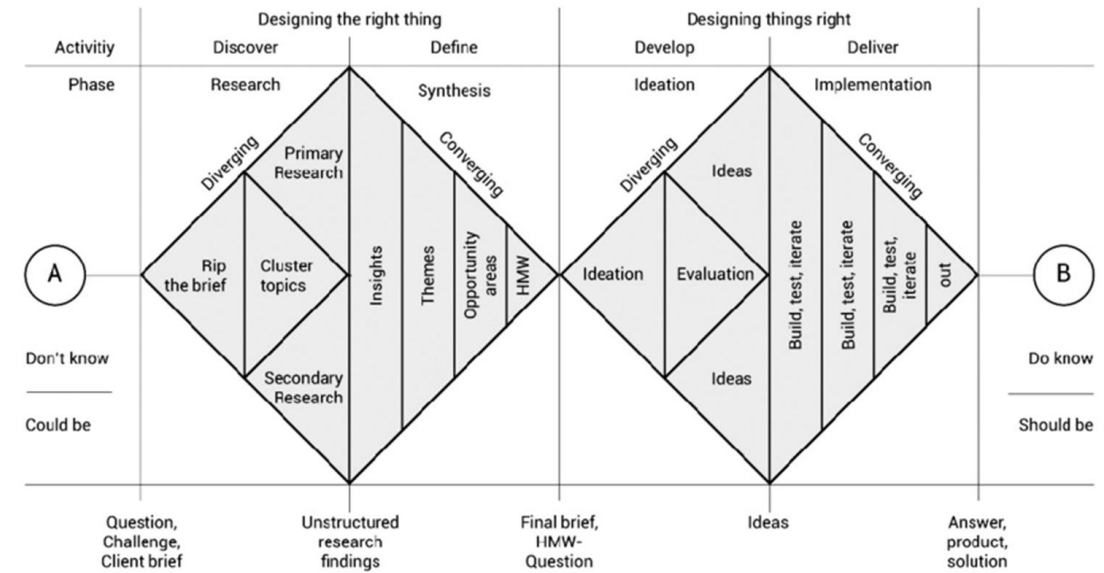
Market
Technologies
Rules, norms - legislation



Lead and manage the project
Organization and collaboration
Areas of attention - risks

Skills
facilities
materials
Money

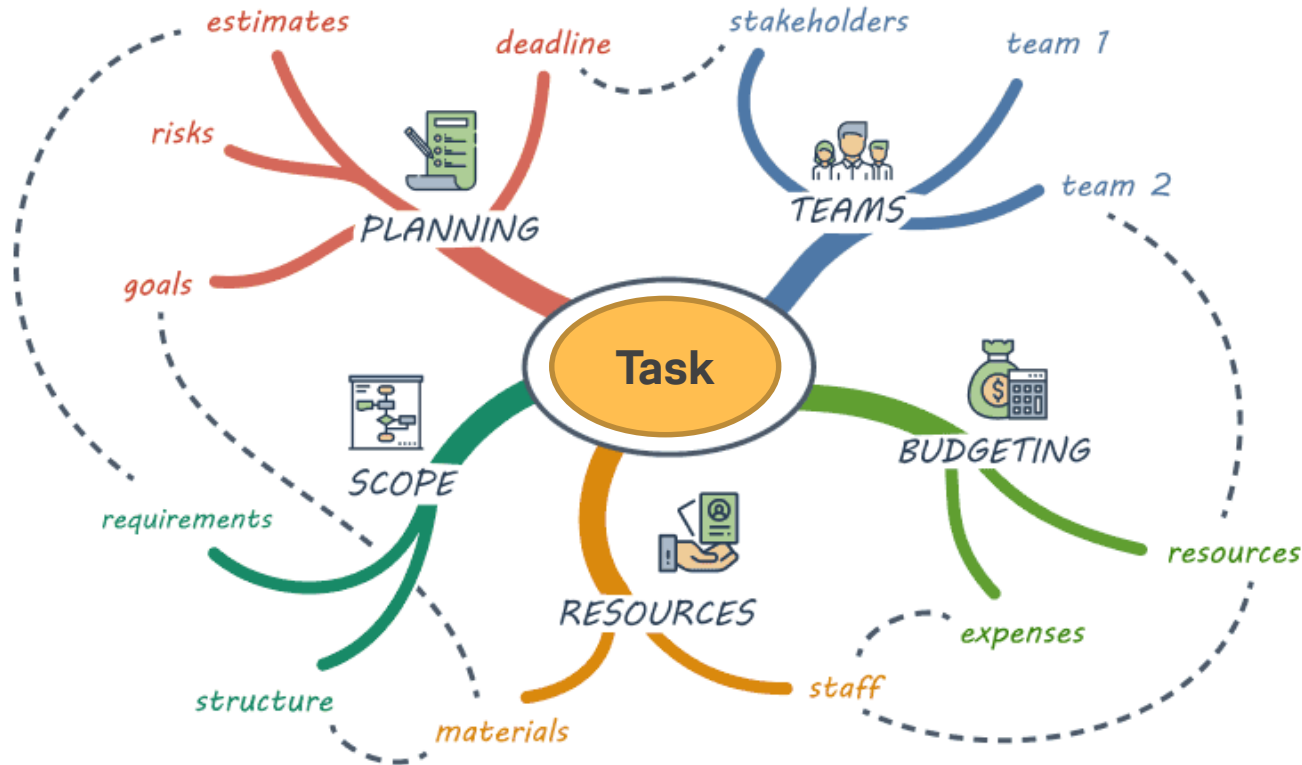
Setting up the Analyse phase



- Is there a market / how big – for how long time/ 3P's?
- Fulfilling a need: Competitors/ Patents/ Substitutes?
- What skills are needed to succeed– do we have them - can we achieve them?
- How is this a project?
- Etc.

A good way to start is doing a Mind Map

A Mindmap – a good place to start
Create all issues that may be relevant



Characteristics:

Graphical
Hierarchical or tree branch.
Allows for creativity
Combines words & visual representations
Not linear

Download e.g. the application
Freemind

Or:

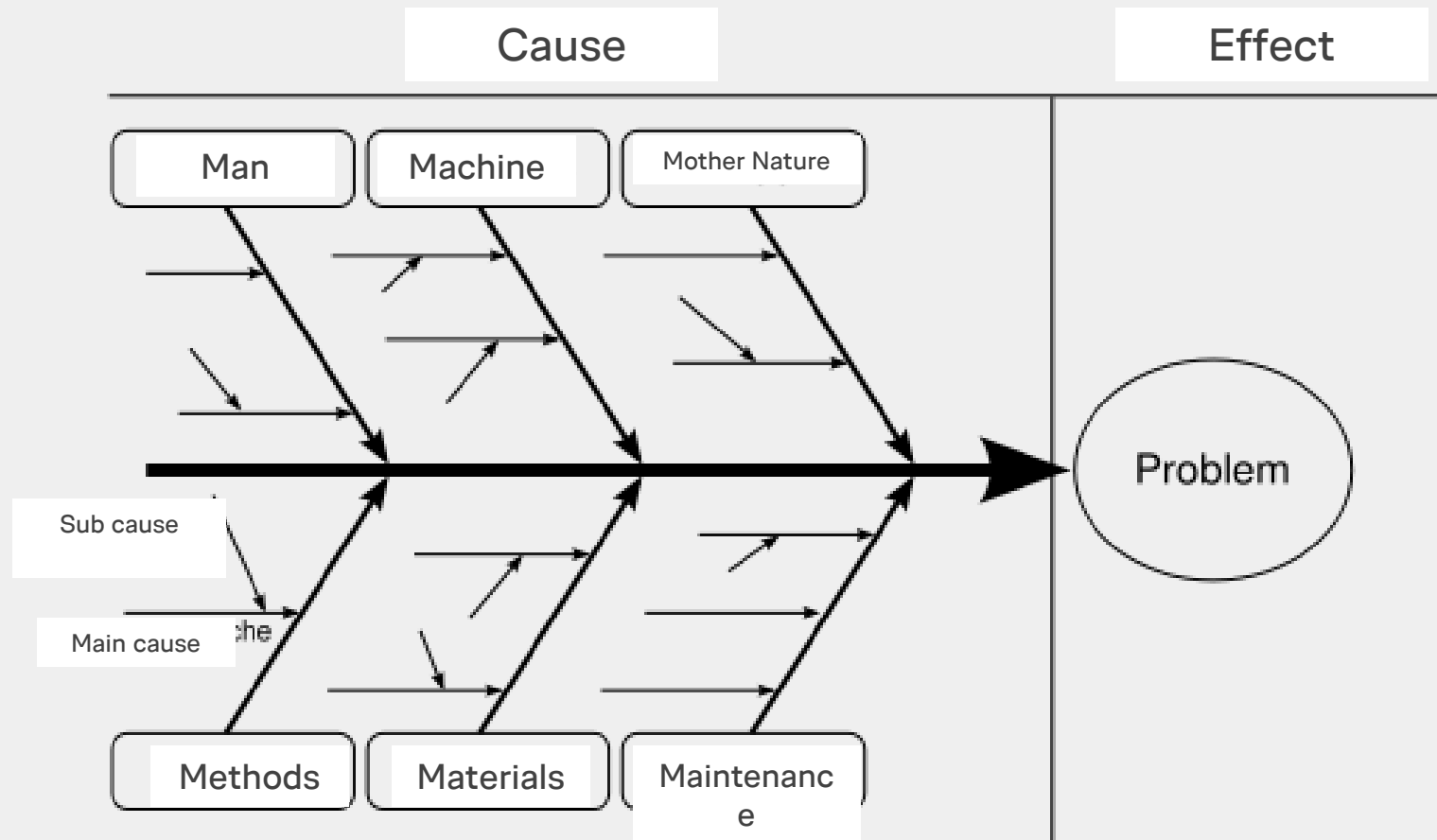
http://www.jcu.edu.au/tldinfo/learning_skills/mindmap/
http://www.nlpmind.com/mind_mapping.htm

A mind map is a diagram technique used to represent words, ideas and tasks linked to a central key word or idea.

Mind maps are used to generate, visualize, structure, and classify ideas.

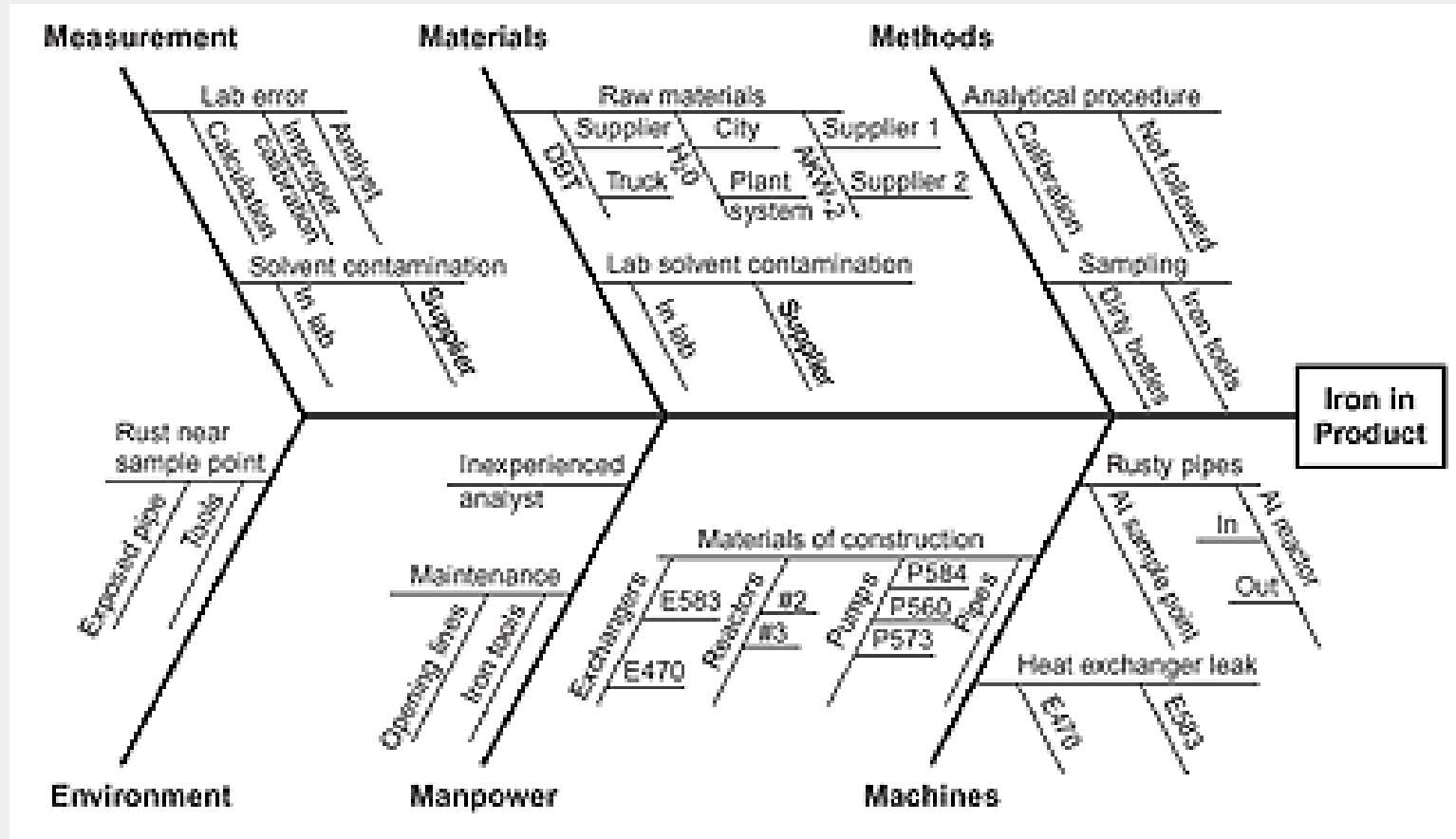
Problem analysis

Cause effect diagram (Ishikawa)



Isikawa cont.

(<http://asq.org/learn-about-quality/cause-analysis-tools/overview/fishbone.html>)



Next lesson: Monday September 13

Defining the groups & Project Topics

(Setting up requirements
Defining Sub problems
Defining – Delimitations)

Forming project groups...

- At least two nationalities must be present in each group.
- 4-5 students in each group for SPR
- 3-4 students in each group for FPR
- Maximum expected mark difference in the group: 4
- Groups can be formed with students from the same programme, but not the same home university
- For cross-programme groups, there must be a minimum of two students from each programme

*No mix between
SPR and FPR*

*Project Topic MUST
reflect the Students
study program*

Education	SPR/FPR	Project Topic
GBE	SPR	Machinery re setup at Chem-Tech Chem-Tech is expanding their production plant and needs to move an existing production line to a new buildt facility. The project is about optimizing the new position and planning the move.
ME	SPR	
ME	SPR	
GBE	SPR	

Education	SPR/FPR	Project Topic
Mechanical Engineering	SPR	Intelligent BeeHive How can bee hives be monitored easier than to day in order to optimize maintenance? IT + MECH + GBE
GBE	SPR	
ICT	SPR	
Mechanical Engineering	SPR	

Education	SPR/FPR	Project Topic
IT	SPR	
IT	SPR	
MEC	SPR	
GBE	SPR	
GBE	SPR	

Education	SPR/FPR	Project Topic
Mechanical Engineering	SPR	invent a rollator bag that is lifted by a mechanism to make it easier for the person to get the stuff out of the bag maybe use generative design to make the rollator more stable and lighter optional: design a desk which could be attached to the rollator if needed Problem: It is still hard for older people to be independent if they are using a rollator. How can we improve the
Mechanical Engineering	SPR	
GBE	SPR	
GBE	SPR	
GBE	SPR	

Education	SPR/FPR	Project Topic
MEC	SPR	... that can be used to transport belongings like shoping bags or lugagge across the street, being able to drive in every
MEC	SPR	
GBE	SPR	
IT+GBE	SPR	
GBE	SPR	

Education	SPR/FPR	Project Topic
GBE	SPR	Employee Management/ Kindergarden problem Branches with a majority of female employees (e.g. dentist) often can't find a kindergarden spot to work full time. Employers need to hire more workers to make up for these employees --> rise in personnel cost We want to find a solution that lets young mothers work full time again (find a kindergarden spot/ alternatives) which then also helps the company they work for.
GBE	SPR	
GBE	SPR	
IT + GBE	SPR	
GBE	SPR	
IT	SPR	
IT	SPR	