

# SELECTED METHODS OF INNOVATION MANAGEMENT

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# Methods and techniques applicable in innovation management

- Methods of creative thinking
- Methods and techniques for identifying customer needs
- Methods and techniques for finding the causes of problems
- Methods and techniques for evaluating themes and understanding the problem



# **METHODS OF CREATIVE THINKING**

# Methods of creative thinking

- The goal is to bring as many creative ideas and thoughts as possible in the shortest possible time
- Especially in the idea generation phase
- Can also be applied when identifying potential risks and opportunities, looking for impacts of possible actions, etc.

# Analogy

- A comparison of two things that are essentially different, but we can find commonalities in them
- E.g. similarities between phenomena in nature and technical solutions

Procedure:

1. Specification of the problem to be solved and definition of the goal of the solution
2. Shifting the problem to a different level (meaning and content), i.e. describing everything that resembles the desired goal state – meta problem
3. This similarity leads to analogies, which are further described and analysed
4. Solving meta problems
5. Looking for how it could be transferred to a real problem

# Brainstorming

- Individual members post anything that comes to mind related to the topic
- The role of facilitator is important (manages the meeting and takes notes)
- In the first phase, ideas are not evaluated or critiqued - this only happens in the next phase

# Morphological analysis

- It is based on the principle of systematic identification of all solution options by the emergence of a combination of all elements and factors of the problem
- Procedure:
  1. Identification and analysis of the problem to be solved, its division into sub-problems (decomposition)
  2. Identification of all parameters (factors) that characterize the problem
  3. Determination of mono values of each parameter
  4. Creation of a morphological matrix for better visualization - combination of parameters and their values
  5. Systematic generation of possible variants as a combination of all possible values of the given parameters
  6. Reduction of potential solutions by eliminating nonsensical/impermissible combinations



# **METHODS AND TECHNIQUES FOR IDENTIFYING CUSTOMER NEEDS**



# Methods and techniques for identifying customer needs

- Used for mapping, better specification of customer needs related to a specific product or product group


# Empathy Map

- Aims to understand the real needs and behaviour of the customer for whom the new product is intended
- In the first phase, the innovation team identifies customer representatives (personas) - a custom map is created for each type of customer
- Interview records, photographs, video recordings, observation records, etc. are used as sources of information.
- For each representative (persona), sectors of the empathy map are filled in in relation to the problem/product

# Activity

- Create a persona of a customer of your organisation (choose one example)
- Imagine you are supposed to create new product
- Create an empathy map

## LEAN PERSONA TEMPLATE

PHOTO	DEMOGRAPHIC INFORMATION	BEHAVIORS AND BELIEFS	
			
CHARACTERISTICS		GOALS, NEEDS, OBSTACLES	

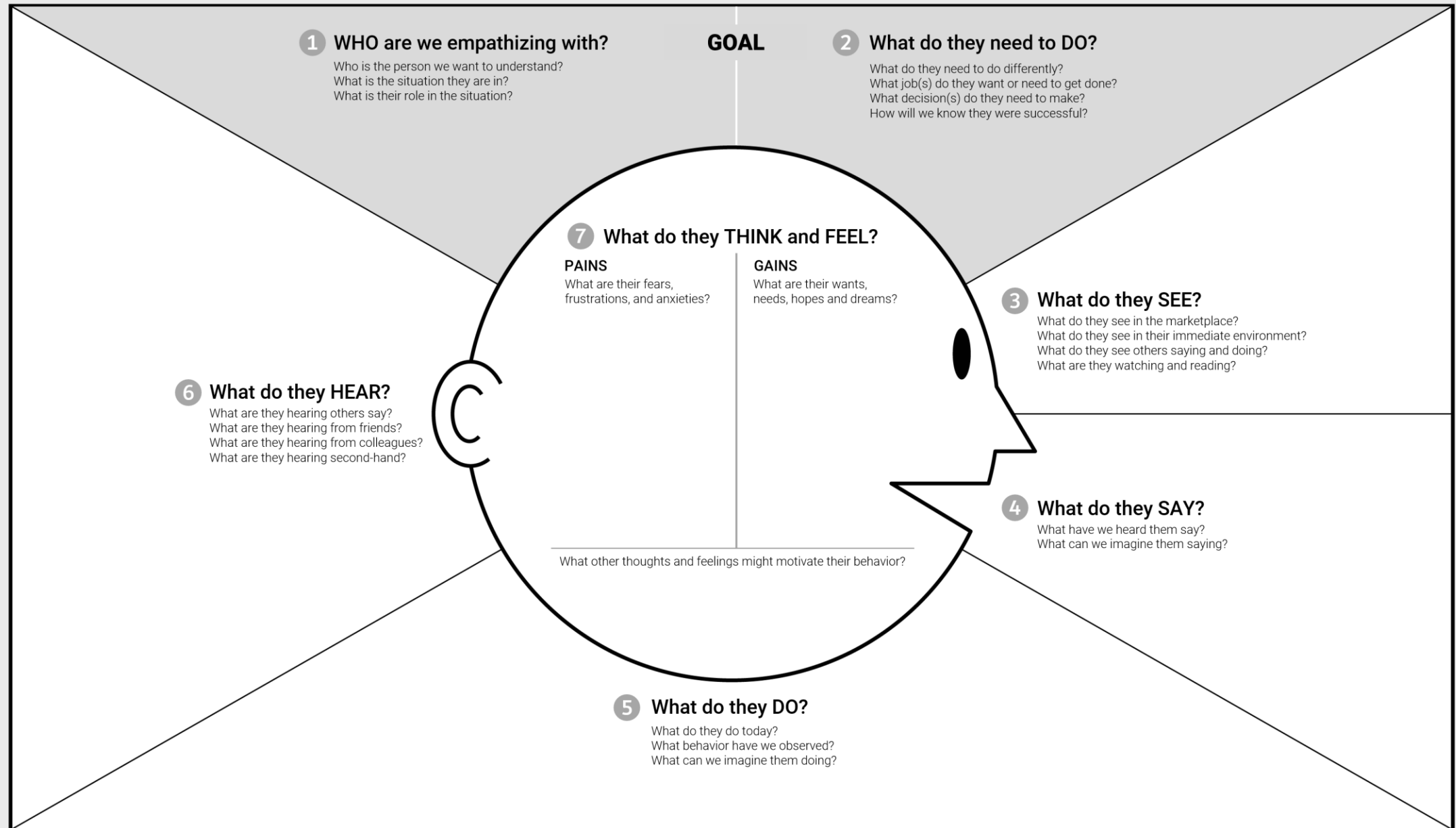
# Empathy Map Canvas

Designed for:

Designed by:

Date:

Version:



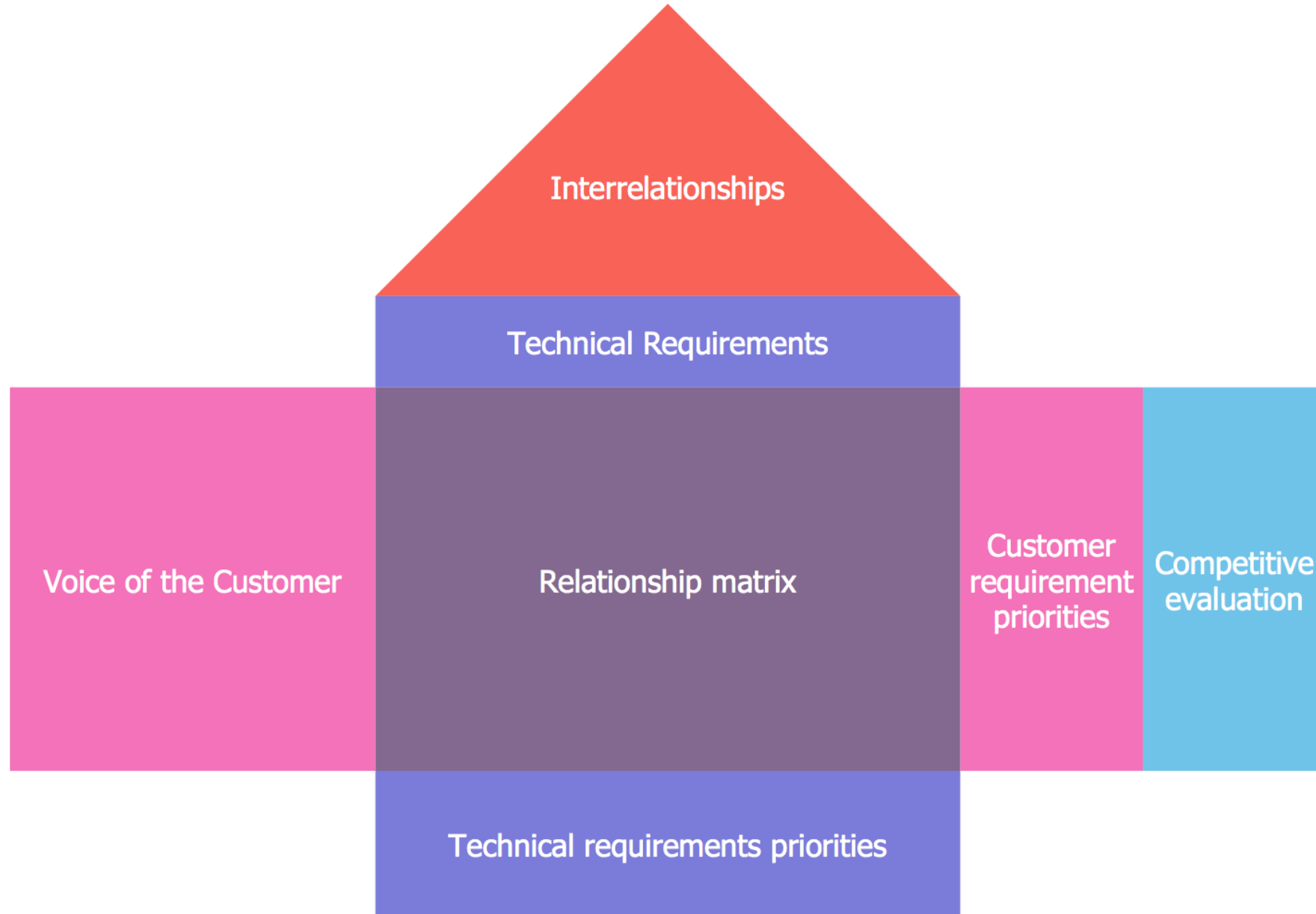
# Innovation Games

- Tools based on the principle of involving customers in the innovation process by playing games
- Based on the fact that playing games is more enjoyable than filling out questionnaires or giving interviews
- Games are often based on teamwork, which leads to the possibility of better understanding of the problem to be solved
- They help to better uncover the hidden wants and needs of customers
- The facilitator plays a key role in running the game. explains the rules, manages the pace of the game, monitors the levels of play and manages the overall game time

# QFD (Quality Function Deployment)

- The method was developed in Japan by combining elements of quality management and value engineering tools
- It finds its wide application especially in the automotive industry
- The aim is to integrate customer requirements and needs into the design process of new products and improvements to existing ones
- The method uses a so-called quality house, which is a visual representation of the relationship between customer requirements and their transformation into technical product parameters
- The method thus allows the often verbal product requirements to be translated into technical parameters, and the parameters of competing products to be projected into a single diagram and the form of the product that best meets the customer requirements to be found

# House of Quality





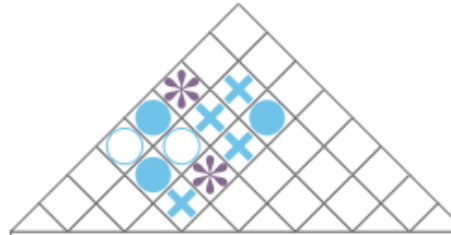
# Absolute Weights of Technical Requirements

Interrelationship between technical requirements (correlation matrix) HOWs vs. HOWs

●	Strong positive	+9
○	Positive	+3
×	Weak positive	+1
⊗	Weak negative	-1
✳	Strong negative	-9

Relationship between customer requirements and technical descriptors WHAT vs. HOWs

●	Strong	+9
○	Medium	+3
△	Weak	+1



		Technical Requirements (HOWs)													
		Material Selection			Manufacturing Process										
Primary	Secondary	Steel	Aluminum	Titanium	Welding	Die casting	Sand casting	Forging	Powder metallurgy						
	Customer requirements (WHATs)	Aesthetics	Affordable cost	●	●	△	●	○	●	○	△	3	4	2	8
Aerodynamic look				△	△	△	●	○	○	●	4	5	3	5	4
Proper finish			○	●	●	△	●	△	○	●	4	5	3	5	4
Corrosion resistant			△	●		△	○	○	○	○	4	4	2	2	4
Performance		Lightweight	△	○	●					△	3	4	2	7	4
		Strength	●	○	●	△	○	○	●	△	3	3	4	5	3
		Durability	●	○	○	△	●	○	●	○	3	3	4	3	3
Technical competitive assessment	Our product									Our product	A's product	B's product	Importance to customer	Target value	
	A's product														
	B's product														
Target Value										Customer Competitive assessment					
Absolute Weight															
Prioritized Technical Descriptors															



# **METHODS AND TECHNIQUES FOR FINDING THE CAUSES OF PROBLEMS**

# 5 Whys

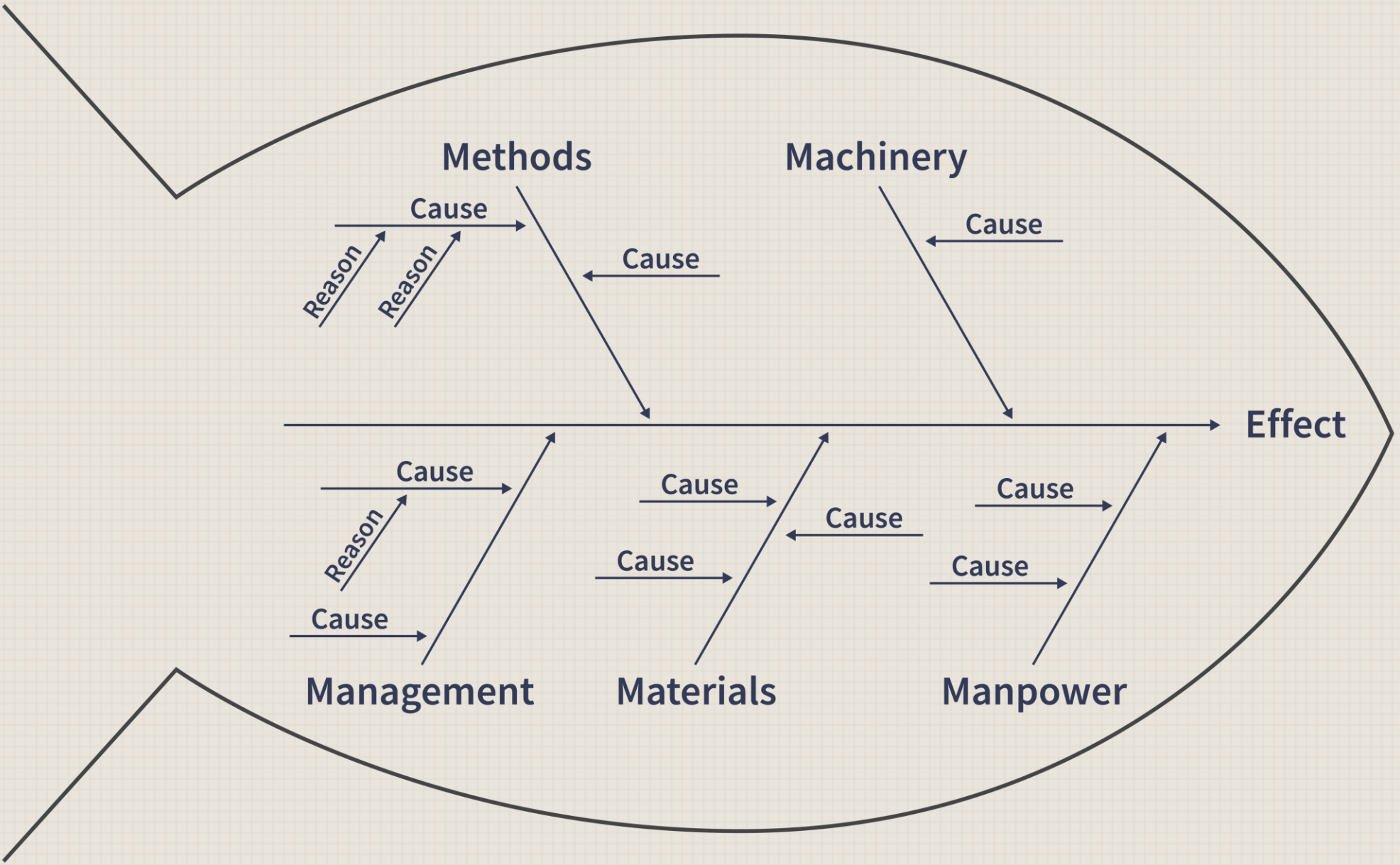
- It is mainly used to find the root causes of the problem
- E.g. finding the needs of customers for whom innovation (internal and external) is being created or dysfunctional processes in the organization
- Sorting the Why questions (the number five is not necessarily a given)
- Risk of getting stuck or diverted from the original brief
- Common mistakes
  - Tendency to end questioning before getting to the root cause (questioning ends when symptoms are discovered)
  - Inability to go beyond current knowledge
  - Tendency to look for only one root cause when there are usually several

# Fishbone method (Ishikawa's diagram)

- A simple analytical method of finding the causes of a problem
- 5x M (Man, Methods, Machines, Materials, Measurements)
  1. These areas are analyzed to find partial causes
  2. For a given problem, all logical causes are defined and displayed
  3. The individual causes are then assigned points depending on the probability of their effect on the resulting problem
  4. Those causes that score the most points can be considered the most likely and are subject to further, more detailed investigation

# Activity

- Choose a problem from your work experience and apply Fishbone method





# **METHODS AND TECHNIQUES FOR EVALUATING THEMES AND UNDERSTANDING THE PROBLEM**

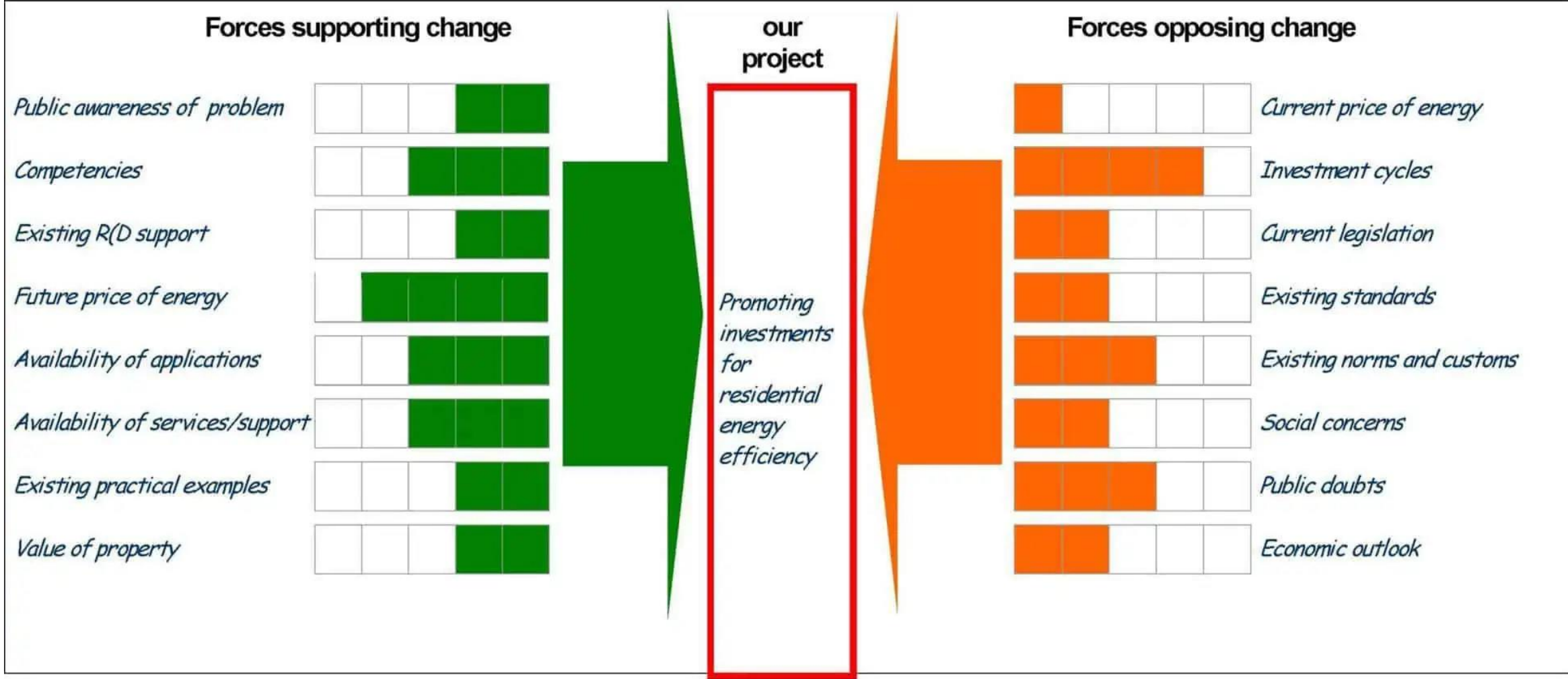
# Force-Field Analysis

- The method is suitable for the phase of evaluating themes, i.e. when making decisions or implementing changes that will be triggered by innovations
- Helps in the decision-making process when it is necessary to include forces that will support the change/innovation and forces that will hinder or impede it
- Analysis process:
  1. Identification of the current problem
  2. Description of the future situation, i.e. what the situation will look like when the problem is solved
  3. Identification of the forces and influences that will support moving to the target state (driving forces) and identification of the forces and influences that will hinder moving to the target state (hindering forces)
  4. Highlighting the most significant forces
  5. Identification of actions/measures that will strengthen the driving forces and weaken the restraining forces
  6. Identification of actions/actions to be implemented and establishment of a solution plan



# Activity

- Imagine you want to implement a change in your organisation. Use Force-Field Analysis to identify what will influence the process.

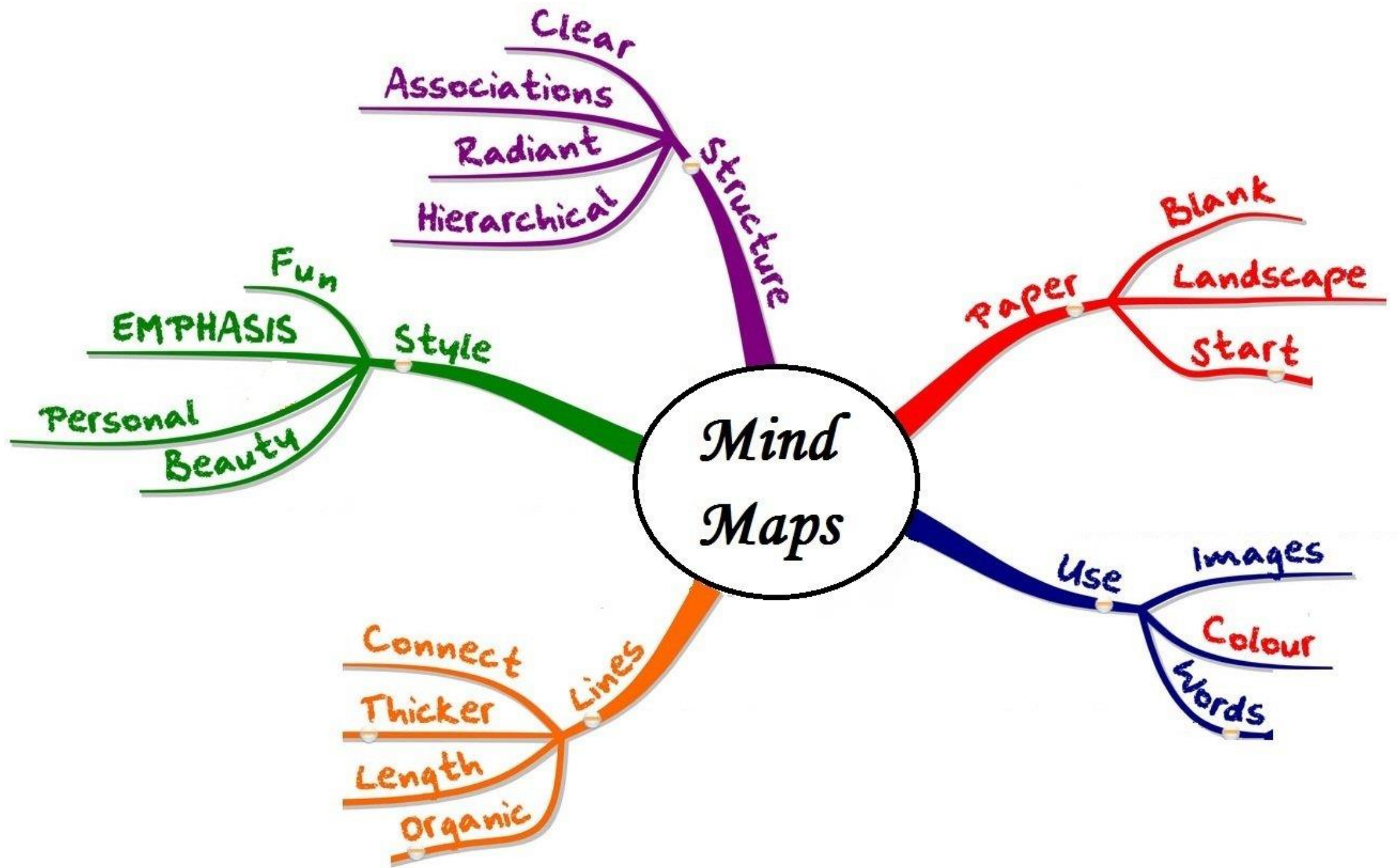


# Delphi method

- Suitable for both the topic phase and for assessing their feasibility
- Multi-stage method of interviewing experts, with the results processed and shared with the other members of the expert team after each stage.
- Experts do not communicate directly with each other.
- The aim is to arrive at a unified opinion of the expert group

# Mind Maps

- A general tool for displaying the problem to be solved and its context
- Used not only in innovation management, but also in problem analysis, action planning, learning and decision making
- The central node symbolizes the problem to be solved
- Main branches extend from the central node and branch off to sub-branches
- Thinking maps can be written, but illustrations can also be used



# Summary

- What have you learned today?



# Thank you for your attention

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