

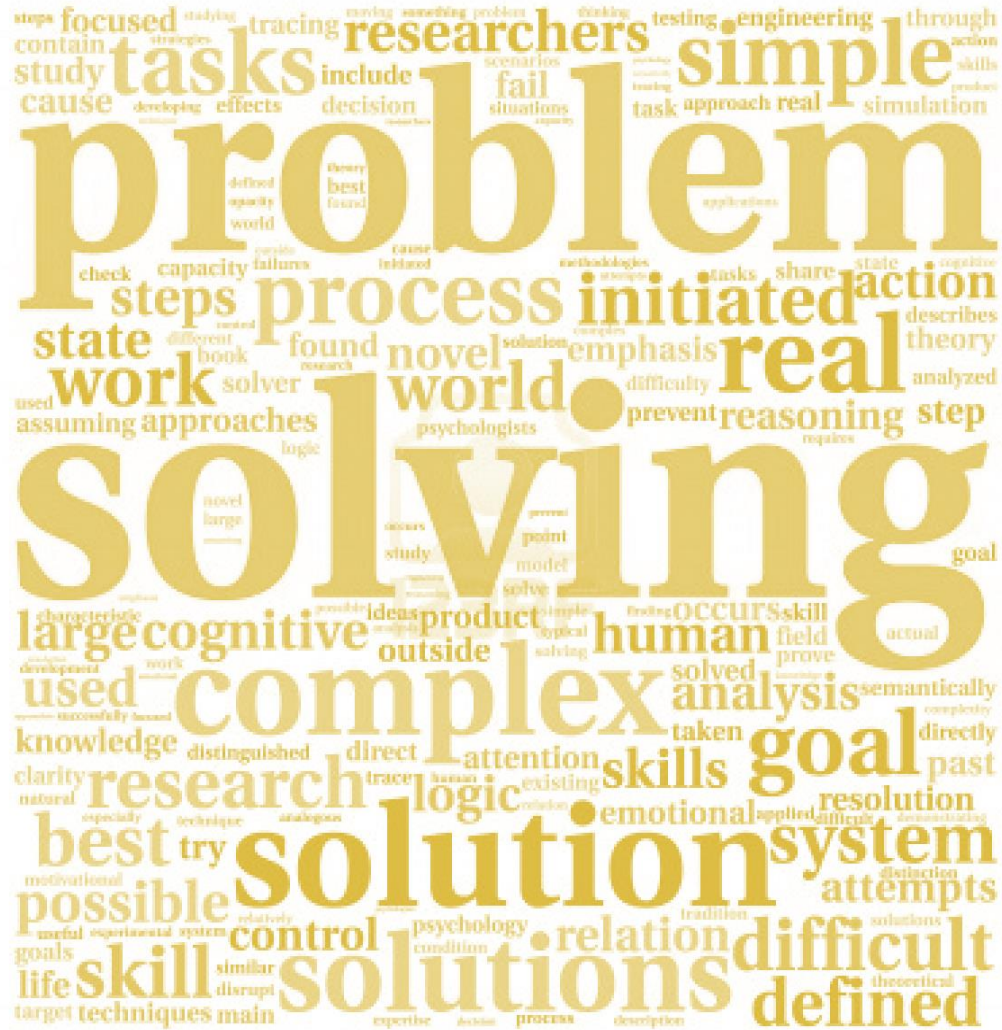
Houston, we have  
a PROBLEM!

**How to apply the 7 steps of Problem Solving**

July 2019



# What is problem solving?



A cognitive **process** directed at achieving a **goal** when no **solution** method is obvious

- Mayer & Wittrock, 1996

## Key characteristics of problem solving

- Impact-driven
- Focused
- Fact-based



# Typical reaction to problems is to treat symptoms instead of uncovering root causes

Observed problem

Temporary solution

Root cause

Countermeasure



## Fix the roof!

### Typical reasons for treating symptoms

Short-term focus on achieving operational targets

Inconsistent role modeling from top management

Inconsistent performance management culture and discipline

Cultural issues –  
Fire fighters repeatedly asked to fix fires rather than find root cause

**What is the practical approach to effective problem solving**



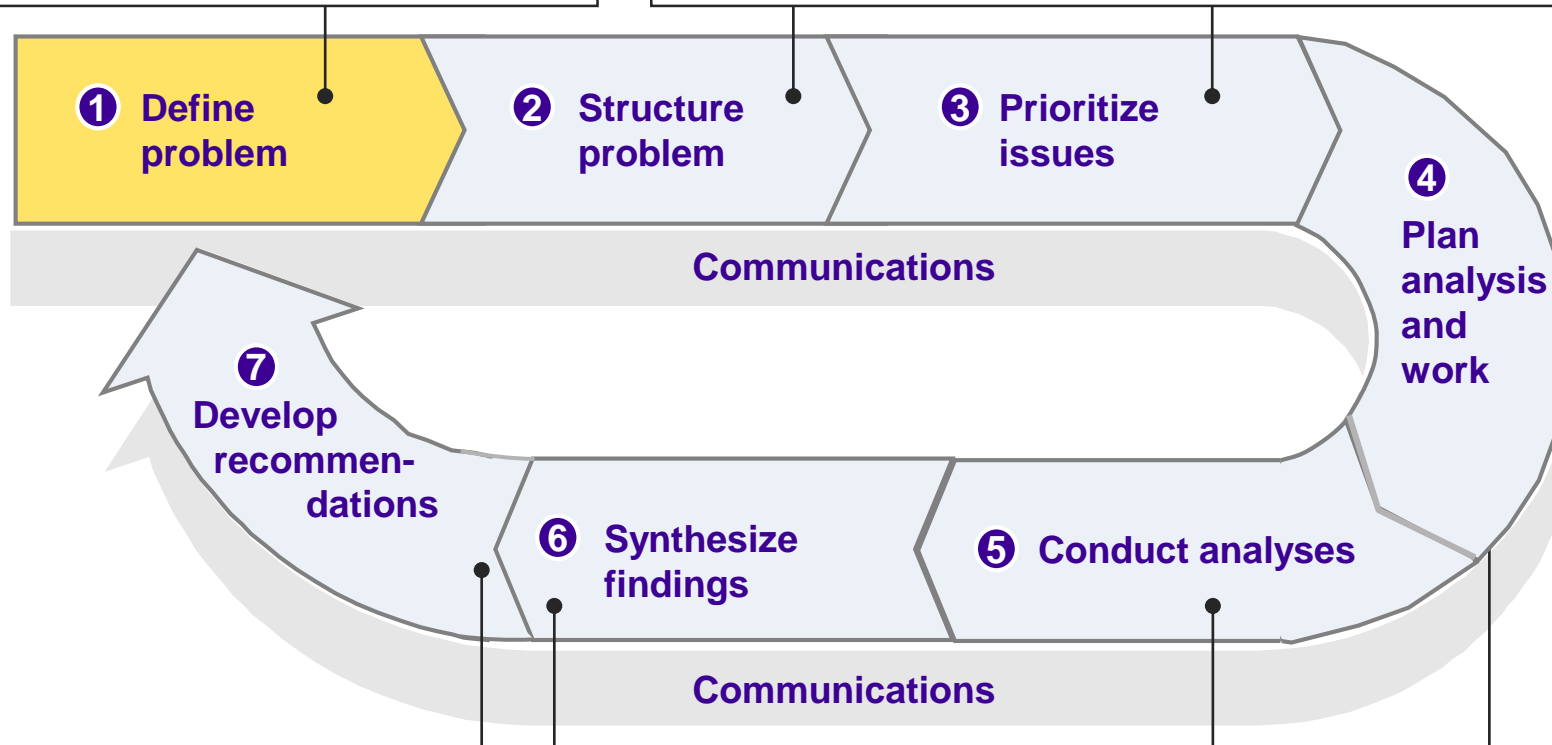
# 7-step process is a powerful framework to solve any problem

## Define

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- **Why:** Team is aligned around problem and methodology

## Structure and prioritize

- Identify the best problem-solving approach
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## Synthesize and recommend

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# Definition of the task or problem should be SMART, which is the key to the right solution

Criteria of a SMART problem	Description
<b>S</b> pecific <b>I</b> mple	<ul style="list-style-type: none"><li>▪ Is it specific for the business?</li><li>▪ Is it clear and simply defined?</li></ul>
<b>M</b> easurable	<ul style="list-style-type: none"><li>▪ Is it easy to determine (easy to get data, no complex calculations required)?</li><li>▪ Is the measurement simple to define?</li></ul>
<b>A</b> ctionable	<ul style="list-style-type: none"><li>▪ Can the team influence the outcome?</li><li>▪ Do we understand the drivers behind the problem?</li><li>▪ Can we lessen the impact of the drivers that we cannot influence?</li></ul>
<b>R</b> elevant	<ul style="list-style-type: none"><li>▪ Is it relevant for the business as a whole?</li><li>▪ Does it support the top-down objectives?</li><li>▪ Is it in agreement with the business strategy and goals?</li></ul>
<b>T</b> imely	<ul style="list-style-type: none"><li>▪ Can it be promptly determined for a useful period?</li><li>▪ Does it have a specific deadline / timeframe?</li></ul>



## Today's case study: selecting a ski resort for a vacation trip with friends



- You are thinking to go to a ski resort with six other friends for the January holidays
- Your group consists of people of different affluence, but it would be better to find an option which all of them could afford
- All participants agree that an optimal duration of the trip would be 5–7 days
- One of the participants has had a vacation in Italy a few times, so this year, he would like to go elsewhere.
- Selection of a right resort to go to is important for all group members except Alex who is ready to go anywhere for company's sake
- The group includes a young couple with a child, and they would like to have a good selection of slopes suitable for entry-level skiers and families with children.
- The choice has to be made within the next 2 weeks, otherwise Serge, Chris, and Kate will change their minds and will go to Bali, which will cancel the entire trip.

**1** Exercise. Select the best wording

**Problem definition**

**Where could we go for vacation?**

**Where can we go skiing in January?**

**My friends and I plan to go skiing together and need to organize the trip**

**Which ski resort to select for a 5–7 days vacation trip during the January holidays based on the requirements of six friends out of seven?**



1 Exercise. Select the best wording

**Problem definition**

Where could we go for vacation?

**Comments**

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Too general

---

Where can we go skiing in January?

Simple, but not measurable

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My friends and I plan to go skiing together and need to organize the trip

Statement of fact

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Which ski resort to select for a 5–7 days vacation trip during the January holidays based on the requirements of six friends out of seven?

**Good wording**

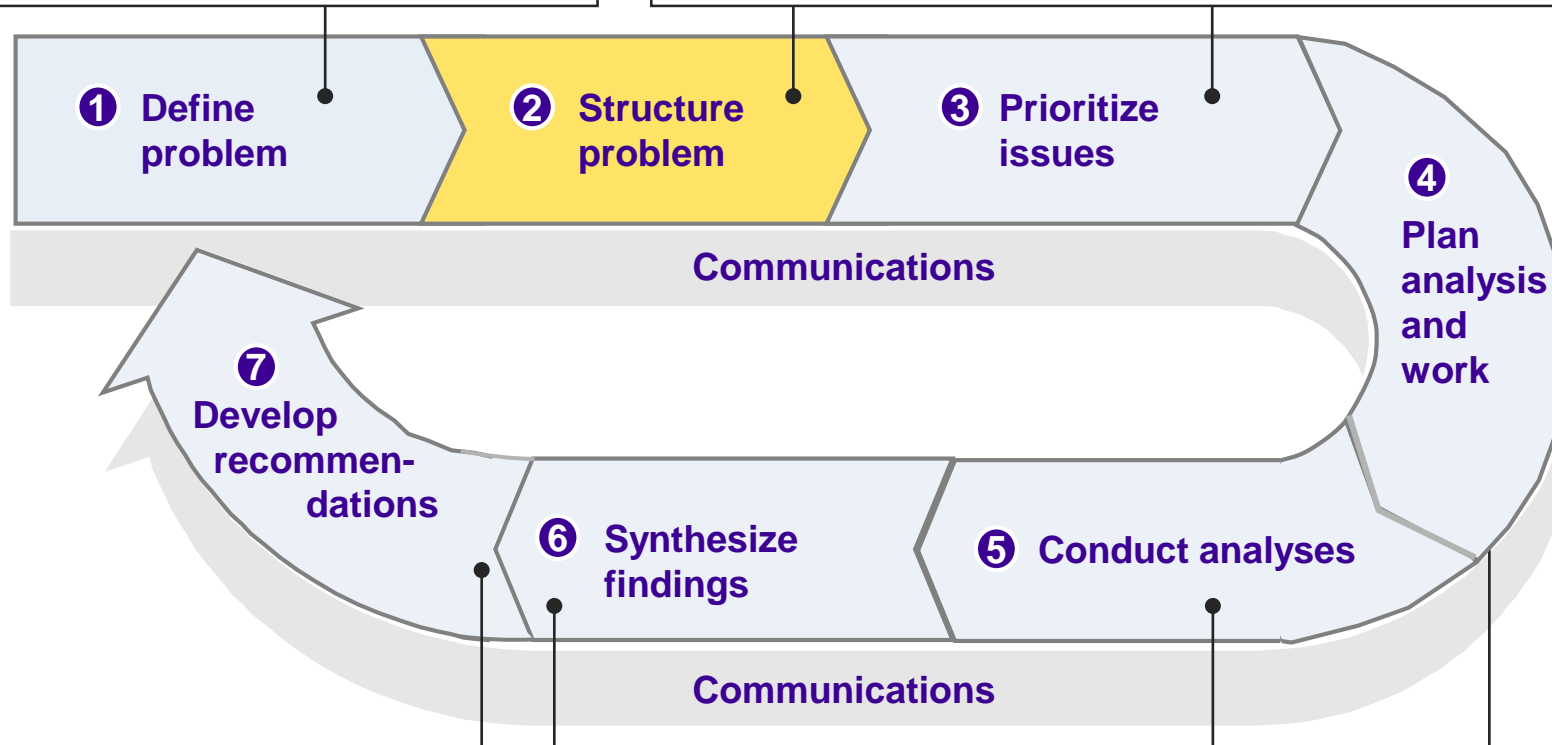
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2 It is easy to build the correct structure by using a special method – the MECE principle



The MECE principle helps to

- better understand the task
- break it down into components
- avoid leaving out essential things



As a result, we get a lean and logical structure which comprises all required components without any “frills”

**MECE**

**Mutually Exclusive, Collectively Exhaustive**



2 Meeting the MECE principle assures complete coverage of the subject matter without duplicating its elements

**Mutually exclusive elements:  
the structure must have no repetitions**



**Collectively exhaustive elements:  
no element must be left out**

## 2 Some MECE-based structuring methods

### Examples

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#### Mathematical formula

- Profit = income items – expense items
  - Profit = market volume x market share x profitability
  - Profit = profit from region 1 + profit from region 2 + ...
  - Profit = profit from product 1 + profit from product 2 + ...
- 

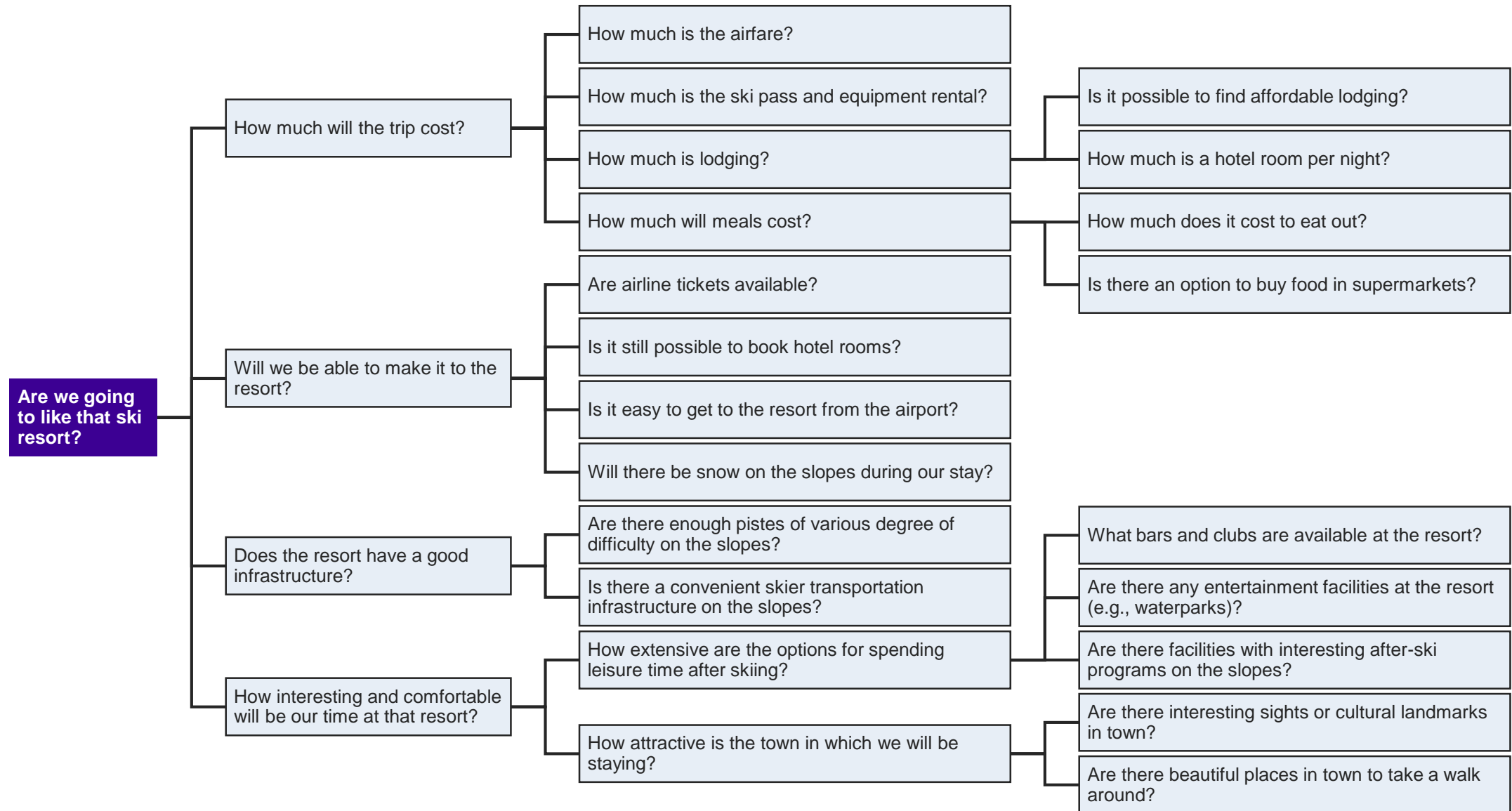
#### Generally accepted structure

- Profit and loss statement
  - Organizational structure of a company
  - Budget of an organization
  - Product mix
- 

#### Logical statement

- Efficiency of an employee depends on whether he or she has requisite knowledge and skills, on degree of his or her motivation, and on the incentives system implemented by the organization
- Personal tasks need to be prioritized based on their importance and urgency

## 2 Decision tree example – is it MECE?





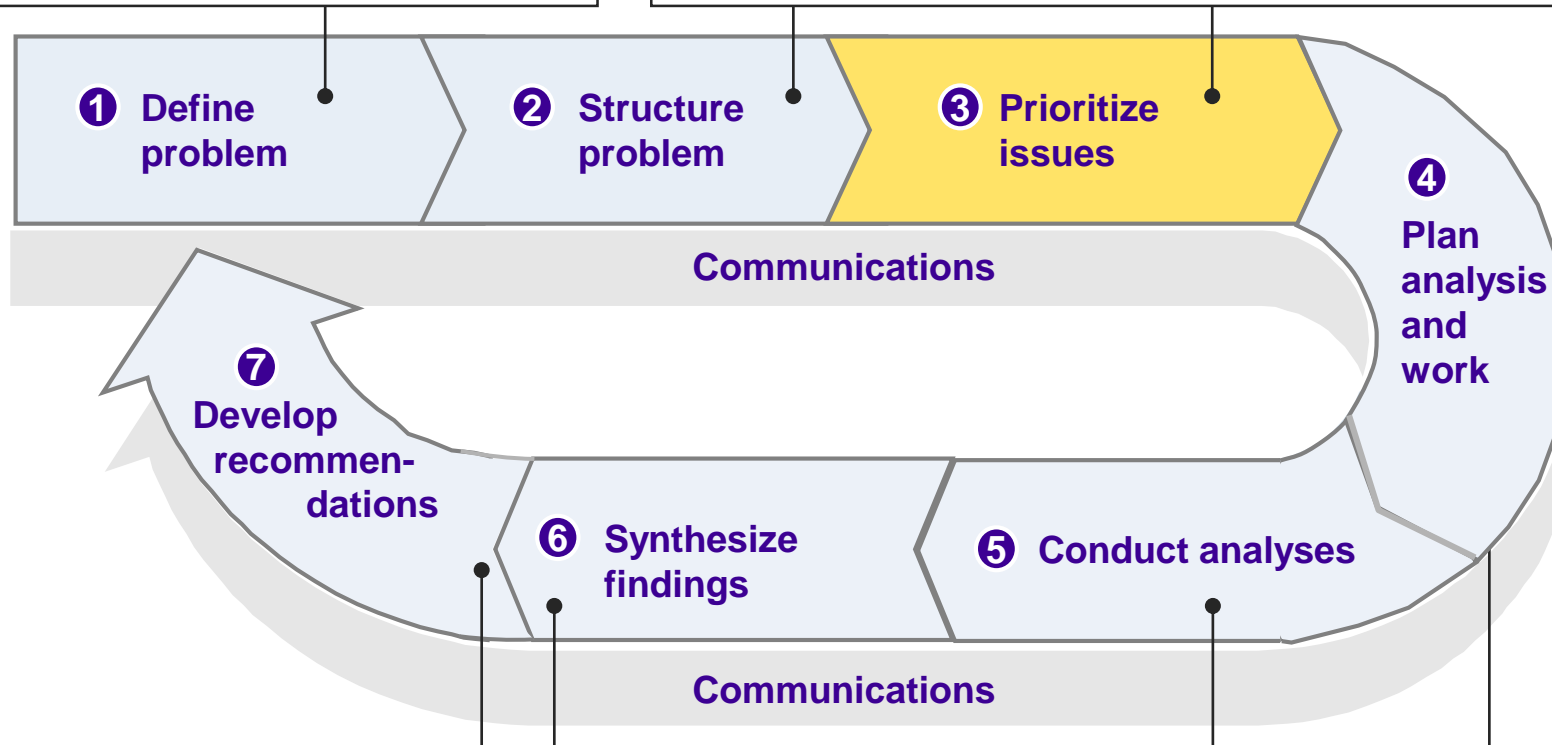
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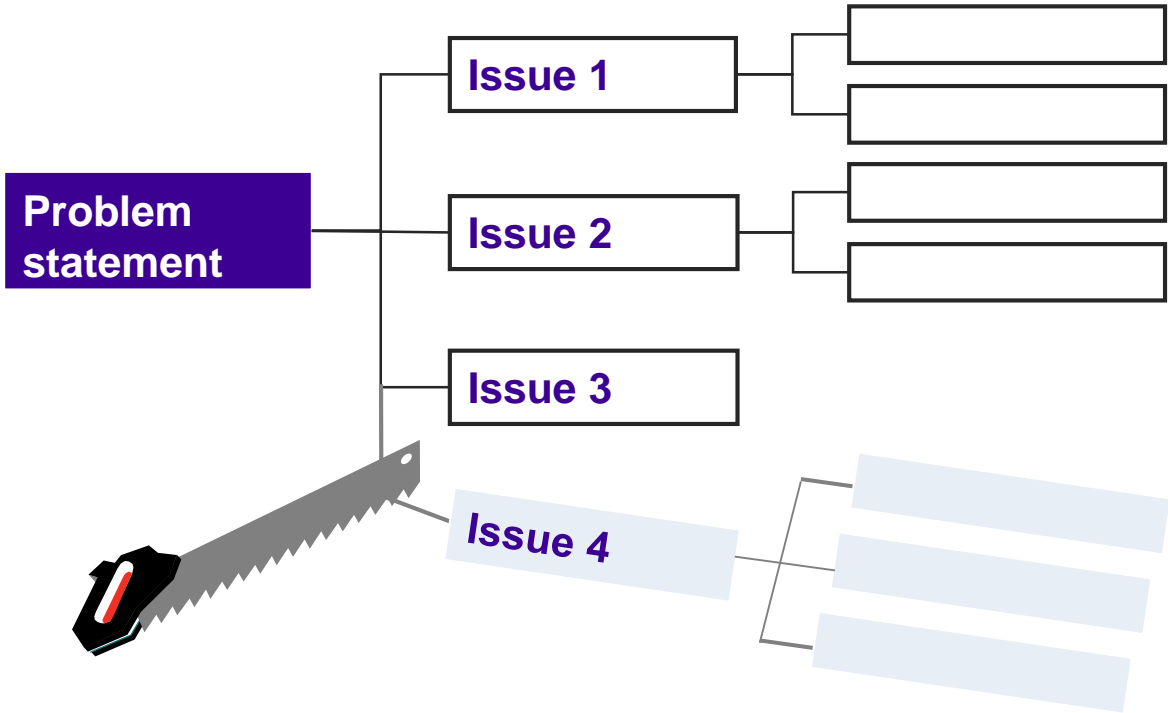
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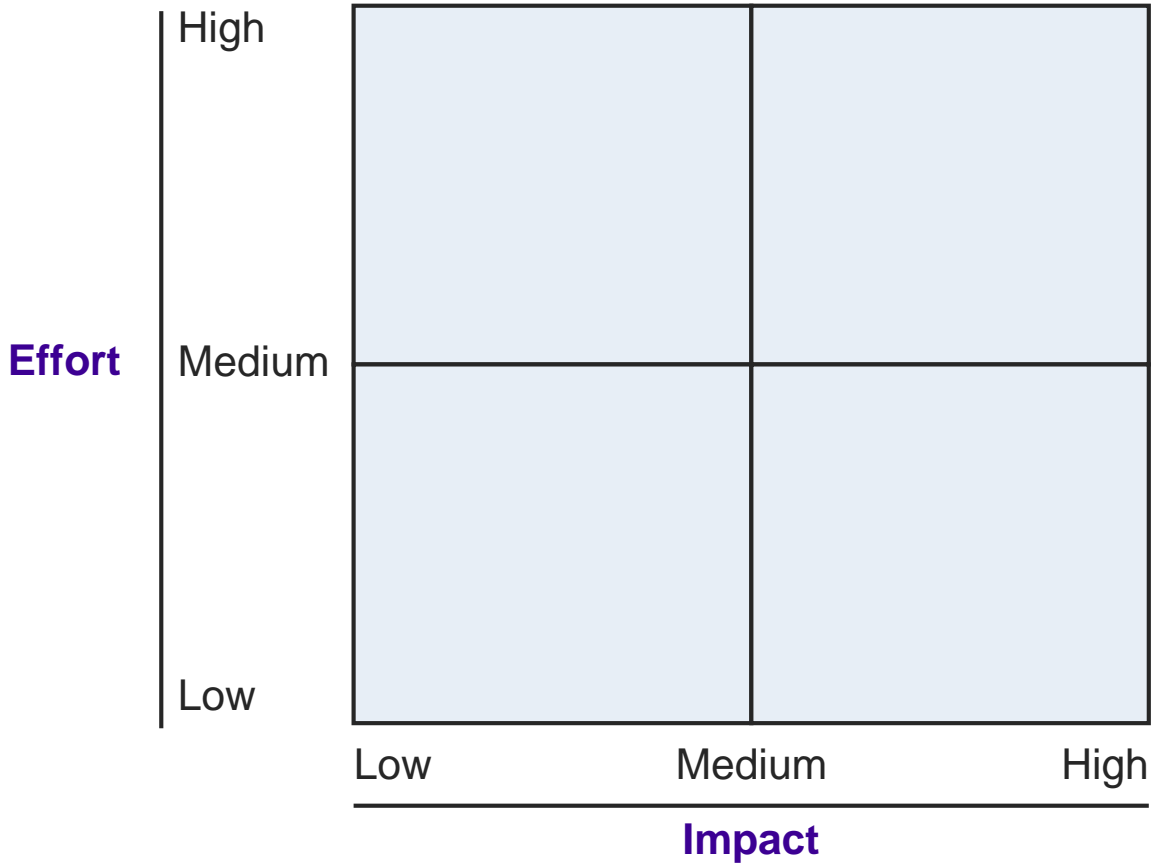
### 3 Prioritize issues: Which issues are most important?

Start pruning your issue tree...



- Use judgment/intuition and be practicable
- Do back-of-the-envelope calculations
- Take risks
- Don't 'boil the ocean'

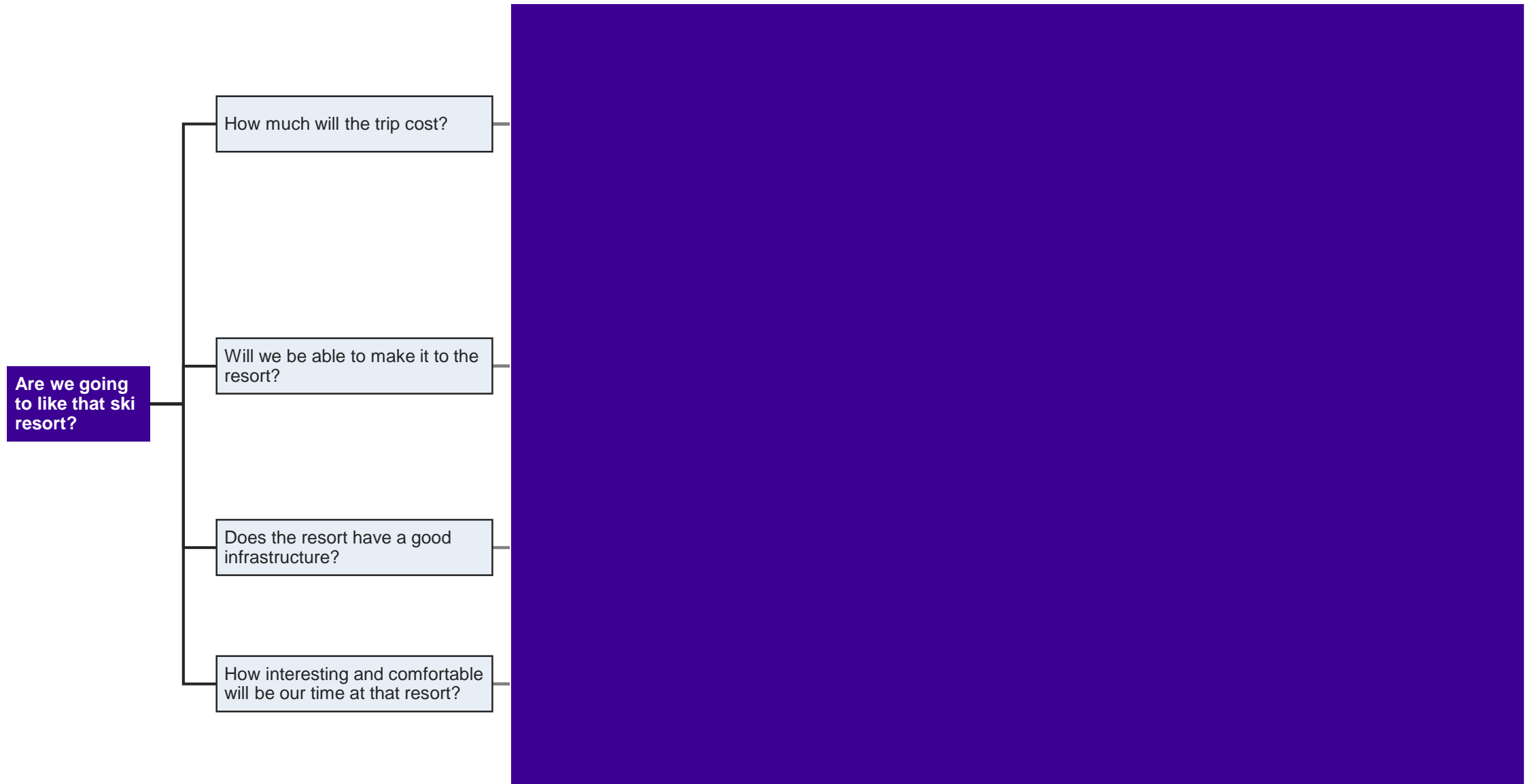
... and prioritize by effort and impact



80% of the problem can often be addressed by 20% of the issue tree

### 3 Prioritization of focus areas for the analysis

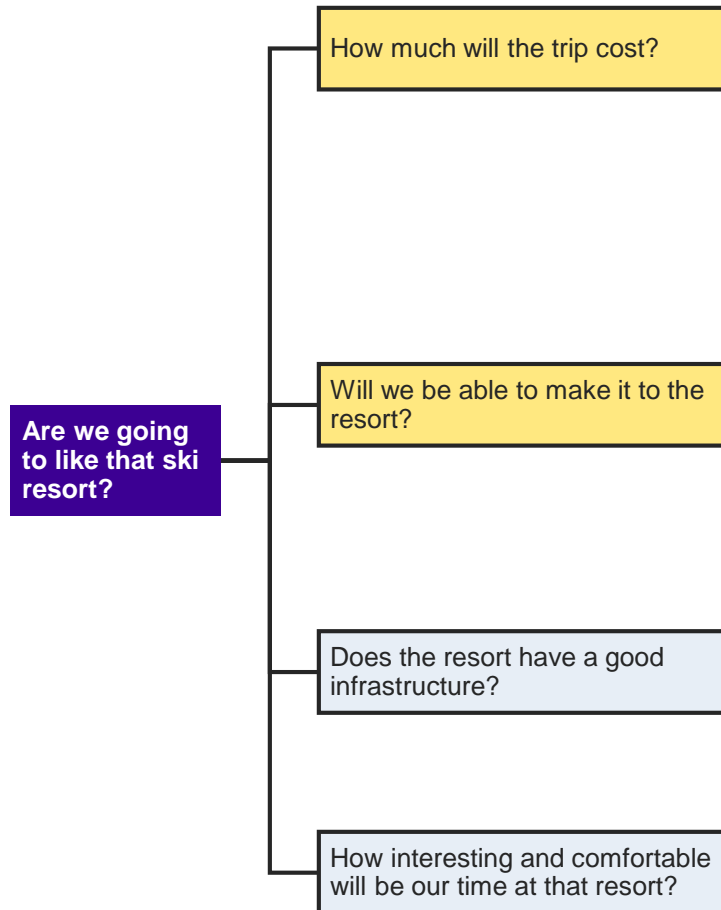
Priority area





### 3 Prioritization of focus areas for the analysis

Priority area



#### Why:

- The ability to make it to the resort is the decisive factor, and if it is not secured, then the rest of the questions are irrelevant
- The cost of the trip is important for your friends

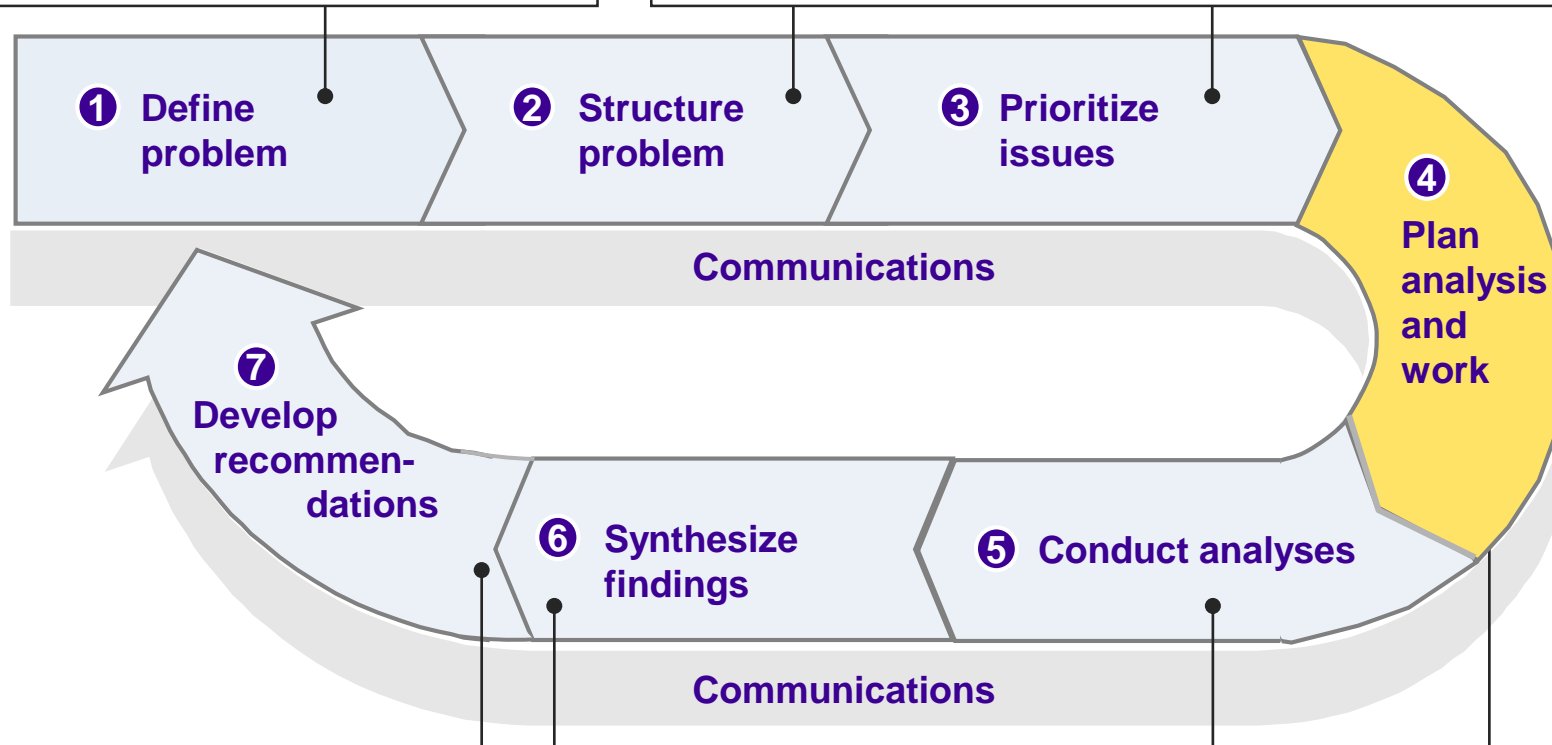
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#### 4 Plan analyses and work: Where and how should the team spend its time?

##### Best-practice work planning

<b>Early</b>	Do not wait for data, critical mass, or anything else
<b>Often</b>	Revise, update, and improve the hypotheses as you work through the data
<b>Specific</b>	Be specific on analysis and sources
<b>Syndicate</b>	Test with team members, try alternative hypotheses
<b>Milestones</b>	Be disciplined – deliver on time using 80/20
<b>Simple</b>	Push detailed workplans out only 2-4 weeks ahead. Don't write an encyclopedia. Keep it simple. Take it piece by piece
<b>Realistic</b>	Make it manageable and realistic, otherwise it will not be used



## 4 Analyses list example

	<u>Key analyses</u>	<u>Owner</u>	<u>Deadline</u>
How much will the trip cost?	▪ Check the cost of airline tickets for the selected dates	You	13:00
	▪ Check the cost of lodging at a hotel or a rental property for the selected dates	You	13:00
	▪ Check the cost of equipment rental on websites of large rental companies (e.g., Intersport)	You	15:00
	▪ Check the ski pass cost on the resort's official website	You	15:00
	▪ Look through travelers' reviews to understand the cost of meals (e.g., at Tripadvisor.com)	You	15:00
Will we be able to make it to the resort?	▪ Review historical precipitation data, by the month	You	17:00
	▪ Check availability of hotel rooms on booking websites (e.g., booking.com) for the selected dates	You	17:00
	▪ Check availability of airline tickets for the selected dates	You	18:00
	▪ Research options and schedules for transfers from the airport to the selected resort and back	You	18:00

The analyses have to be run for every resort that meets the group's criteria



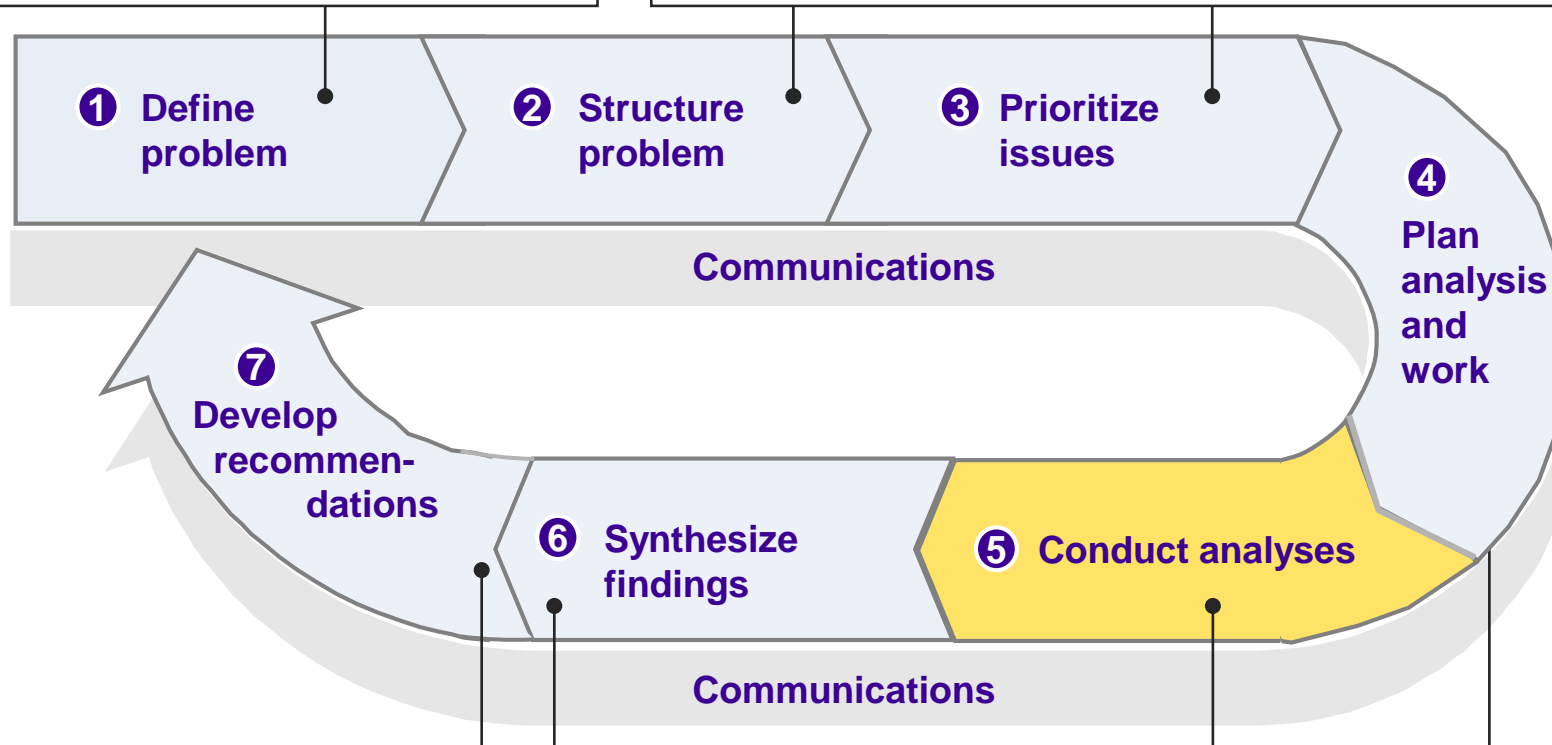
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5 During deep dive, learn to come up for air and remember the big picture

Big picture / hypothesis



Details / data









**When conducting deep dive, remember to:**

Step back occasionally to check that your answers are meaningful to the problem trying to be solved

Transition frequently between your hypotheses and data







## 5 Exercise: analyze data and select an optimal resort

● High  
● Low

	Hotel rooms availability	Airline tickets availability	Airline tickets costs, return trip, thousand rubles	Average price level at the resort	Slopes operation in January over the last 3 years	Transfer from airport
<b>Japan (Okudaisen)</b>	Yes	Yes, connecting flights only	60–80		1 out of 3	Railroad, more than 3 times a day
<b>Austria (Sölden)</b>	Yes	Yes, non-stop flight	30–40		2 out of 3	Railroad, more than 3 times a day
<b>France (Les Trois Vallées)</b>	Only expensive options	Yes, non-stop flight	30–40		3 out of 3	Railroad, more than 3 times a day
<b>Italy (Canazei)</b>	Yes	Yes, non-stop flight	20–30		3 out of 3	Bus, once every 2 days
<b>Switzerland (Gstaad)</b>	Yes	Yes, non-stop flight	30–40		2 out of 3	Railroad, more than 3 times a day
<b>USA (Aspen)</b>	Yes	Yes, connecting flights only	60–80		2 out of 3	Railroad, more than 3 times a day

## 5 Exercise: highlights of results

● High  
● Low

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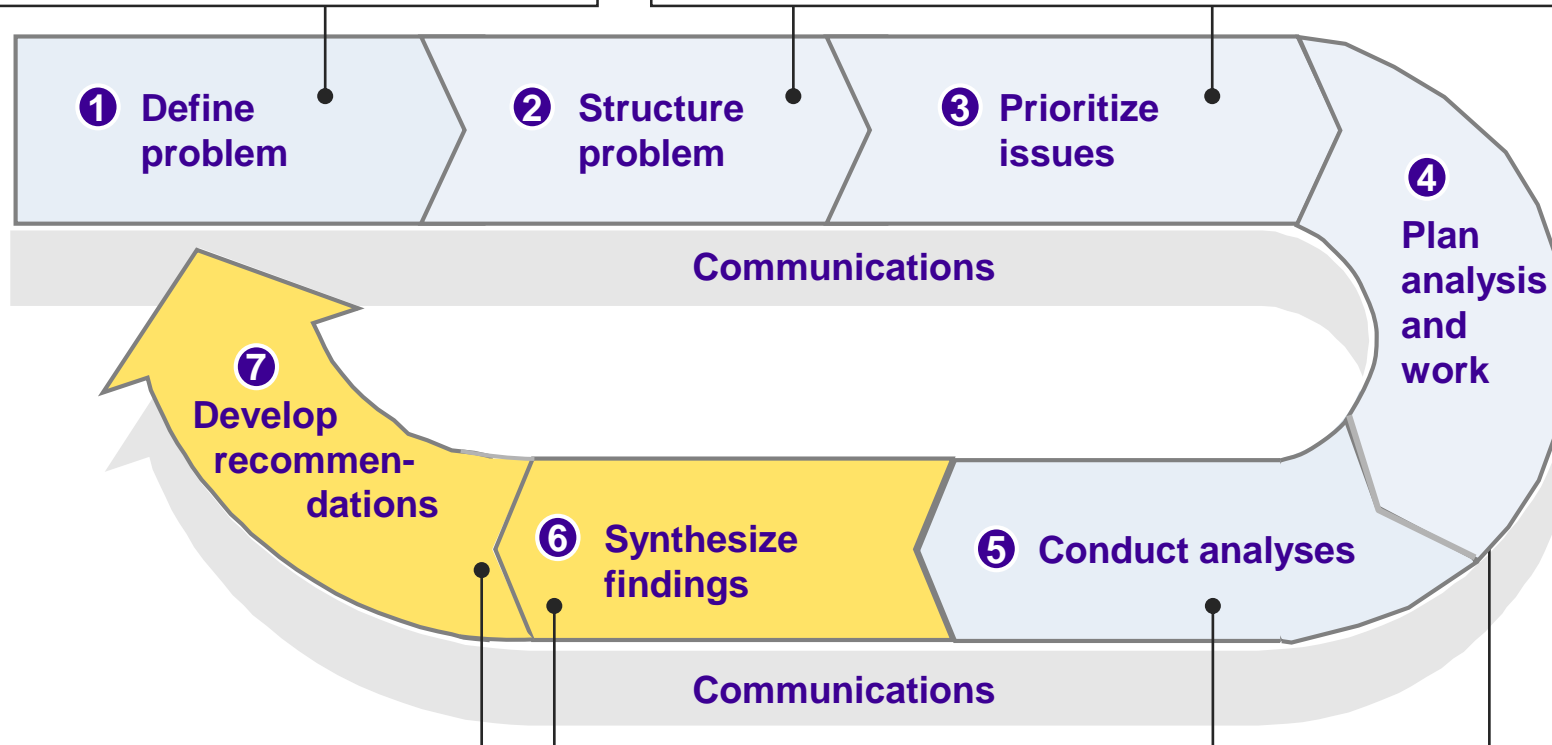
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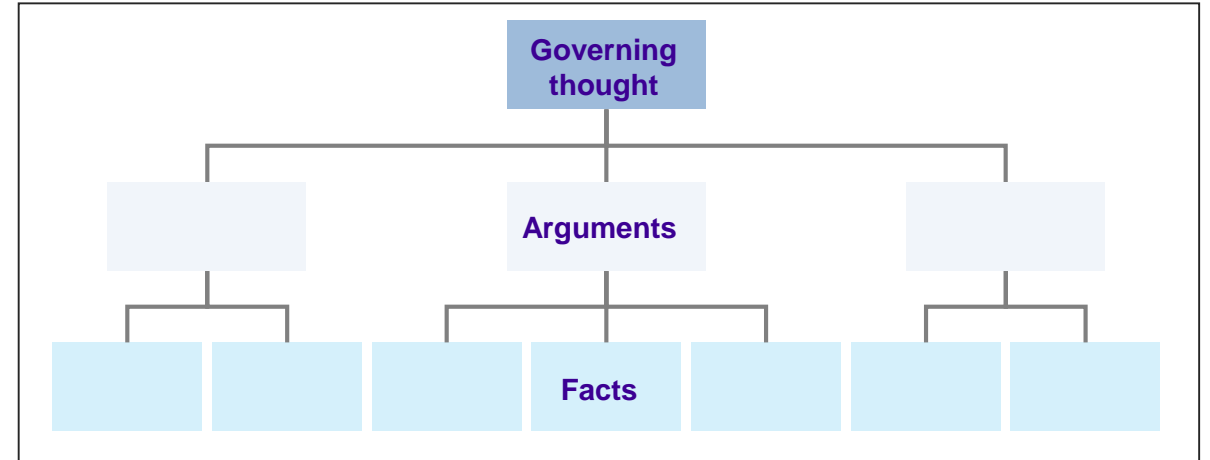
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## 7 The pyramid principle in business communications

Pyramids in the deserts are built from stones

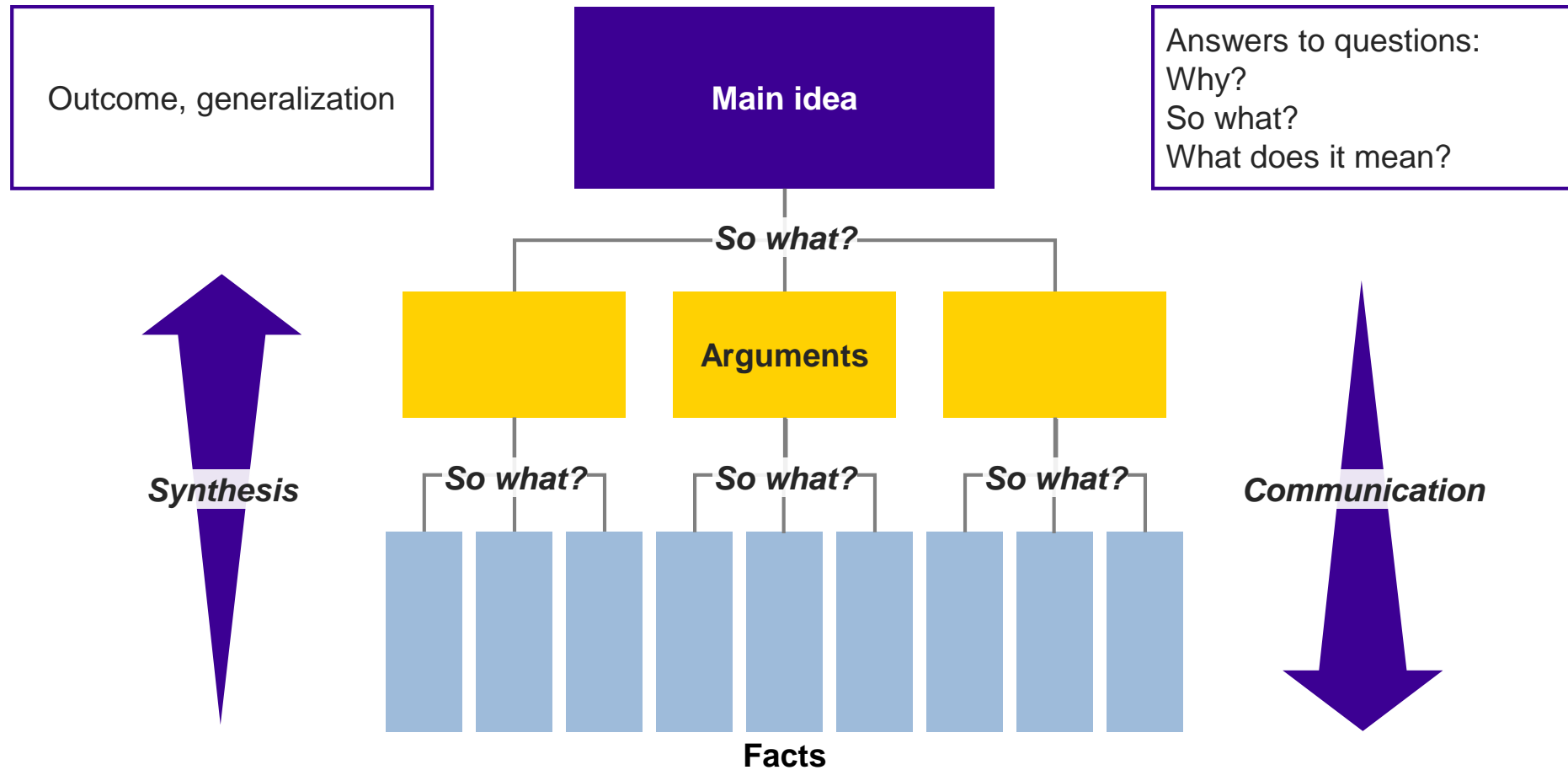


Pyramids in business communications are built from ideas

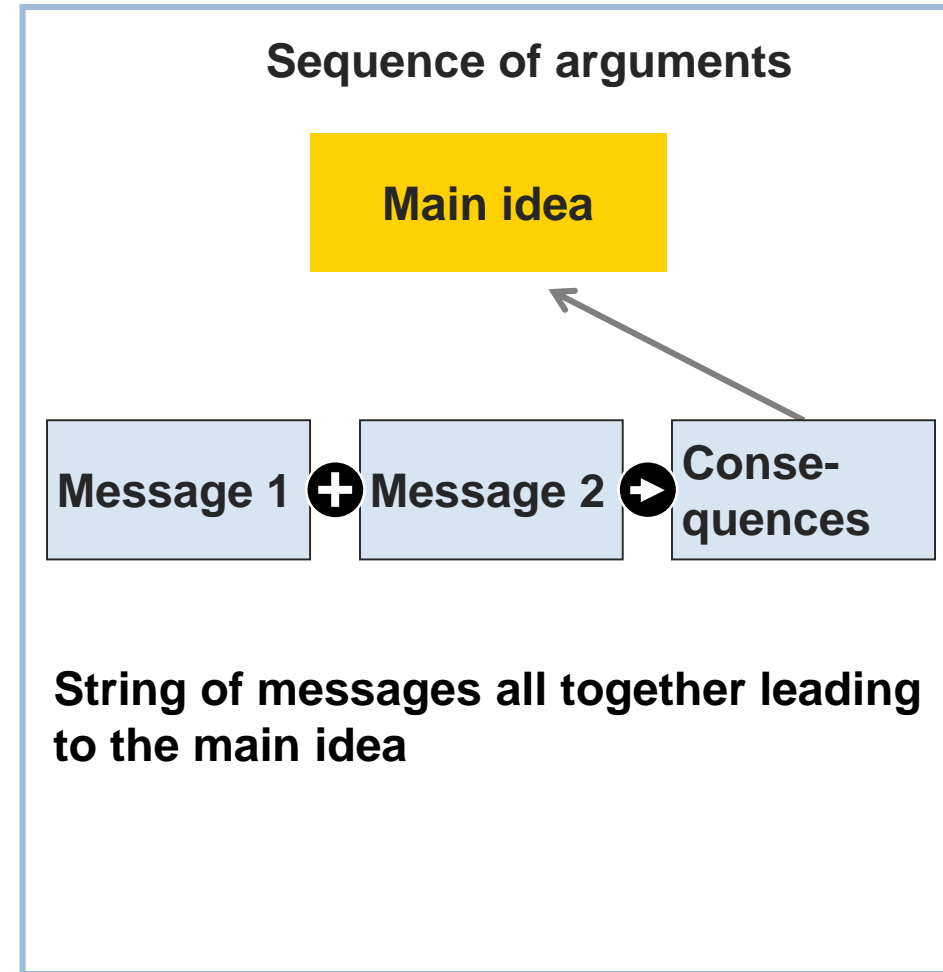
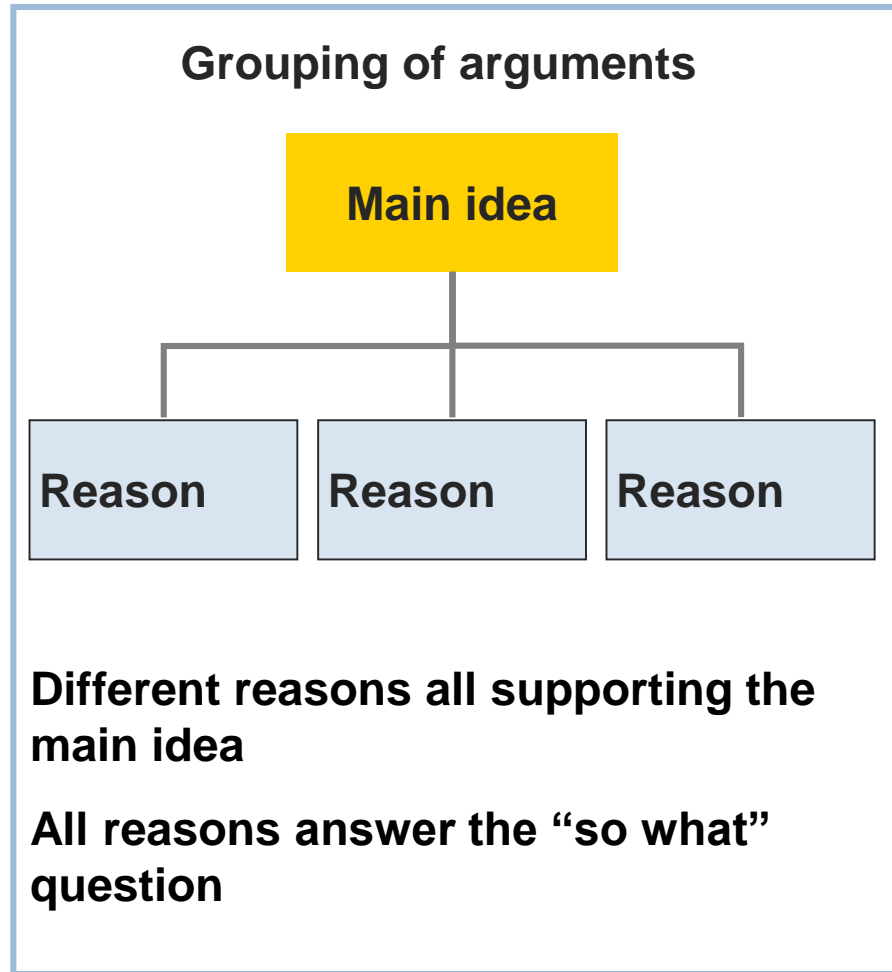


- There is only one stone at the top
- Each stone rests on three (minimum two) other stones
- Robust structure makes the pyramid stable

- 6 Following the pyramid principle helps synthesize the meaning of all discovered facts AND communicate them to the audience



6 Two types of communication: top-down and bottom-up





## 7 Preparing the presentation – the story you are trying to tell should drive the structure of your presentation, not the other way around

### Common approach

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- Putting all analyses done by team on slides
- Sorting all slides into sections / topics
- Fixing slide titles to fit the story



### Suggested approach

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- Developing a logical story based on outputs of key analyses
- Writing slide titles telling the story
- Selecting analyses that best support the story
- Developing simple and clear visuals / charts / graphs



**Presentations that are built on the pyramid principle are easier to follow**

- 7 It is good practice to make slide titles make sense as a story and support each title message with an output of an analysis

If the slide titles are done right, ...

...you can easily put the slides together as a logical sequence...

...according to the pyramid principle...

...and make the story easy to follow...

...even without...

...the need to read the content of every slide



If the **slide titles are telling a story**, you need to make sure the content of each slide **supports the titles**

6 An example of synthesis and message structure

7

**It's better to choose Sölden as ski resort for joint trip**

**The resort is easy to get to and operating**

- Non-stop flights are available
- Scheduled railroad transfer is available
- Two Januaries out of three the slopes at Sölden were open

**Prices at Sölden are affordable**

- Air tickets to the resort are at a medium level
- Groceries are available for sale at inexpensive supermarkets
- Affordable hotels under 150 euros per night are still available

**Ski resort has good infrastructure**

- Tracks for entry-level skiers and families with children are available
- There are number of bars & night clubs in city
- Aquapark in Sölden can be visited with children from 4 years

# CASE INTRODUCTION

## Case study

Your team has received a proposal to develop a design for a group of Russian investors who want to build **Hyperloop in Russia**.

We need to substantiate whether this project is feasible.

**HYPERLOOP**



### Requirements

- No more than 6 slides besides the title slide and team introduction
- All additional analytics and calculations can be backed up in the presentation
- You will have 10 min for presentation and 10 min for Q&A