



BOSTON  
CONSULTING  
GROUP

# Structured Problem Solving

2022





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# Learning objectives

After you have finished this training, you will be able to ...

- 1 Understand the importance of Problem solving skills
- 2 Be equipped with the BCG 4 step framework of structured problem solving



# Importance of Problem-Solving skills

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# "Thinking drives doing" is the main principle behind BCG's method for solving complex problems

## Traditional problem-solving methods

### Doing drives thinking

Mentality: hope to collect "enough" data  
Better do some customer interviews  
Let's wallow in and play with the data



Data death

- More work, more stress
- No idea where to go

## BCG's way of problem solving

### Thinking drives doing

Mentality: hope to collect the "right" data  
Be intentional and deliberate on how you approach the problem



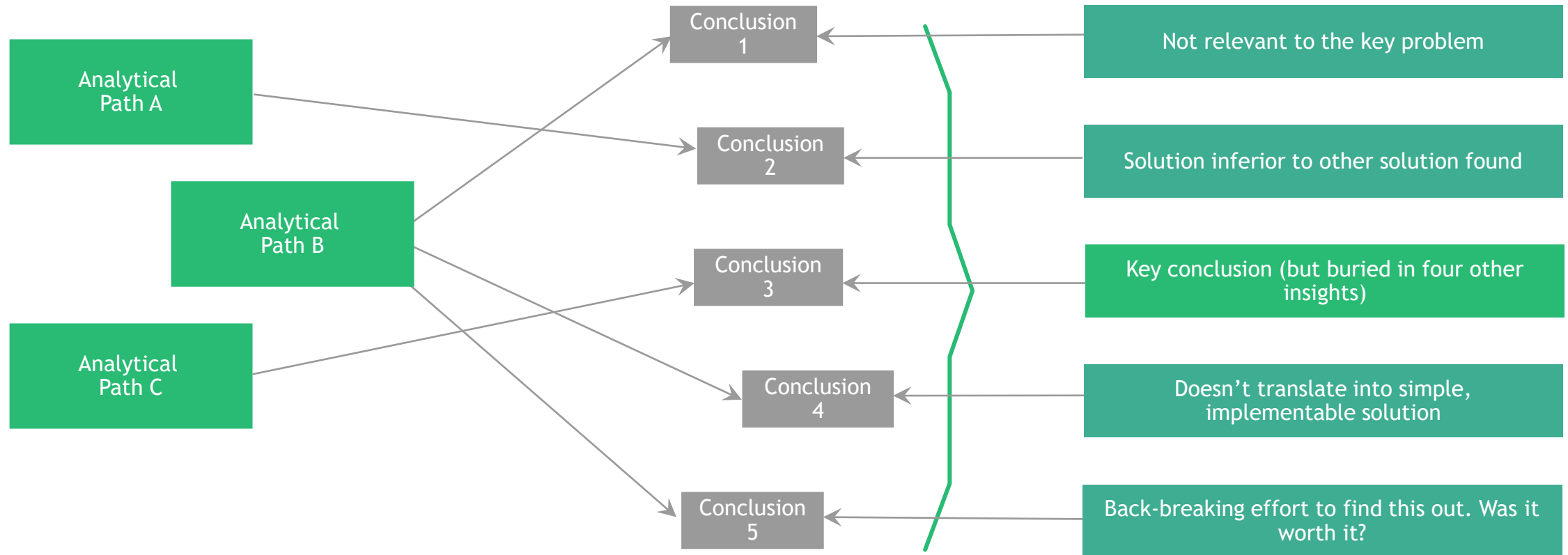
- Able to get where you're heading
- More effective work

# What could happen if you don't structure appropriately?

Started from three analyses

Found five conclusions

However...



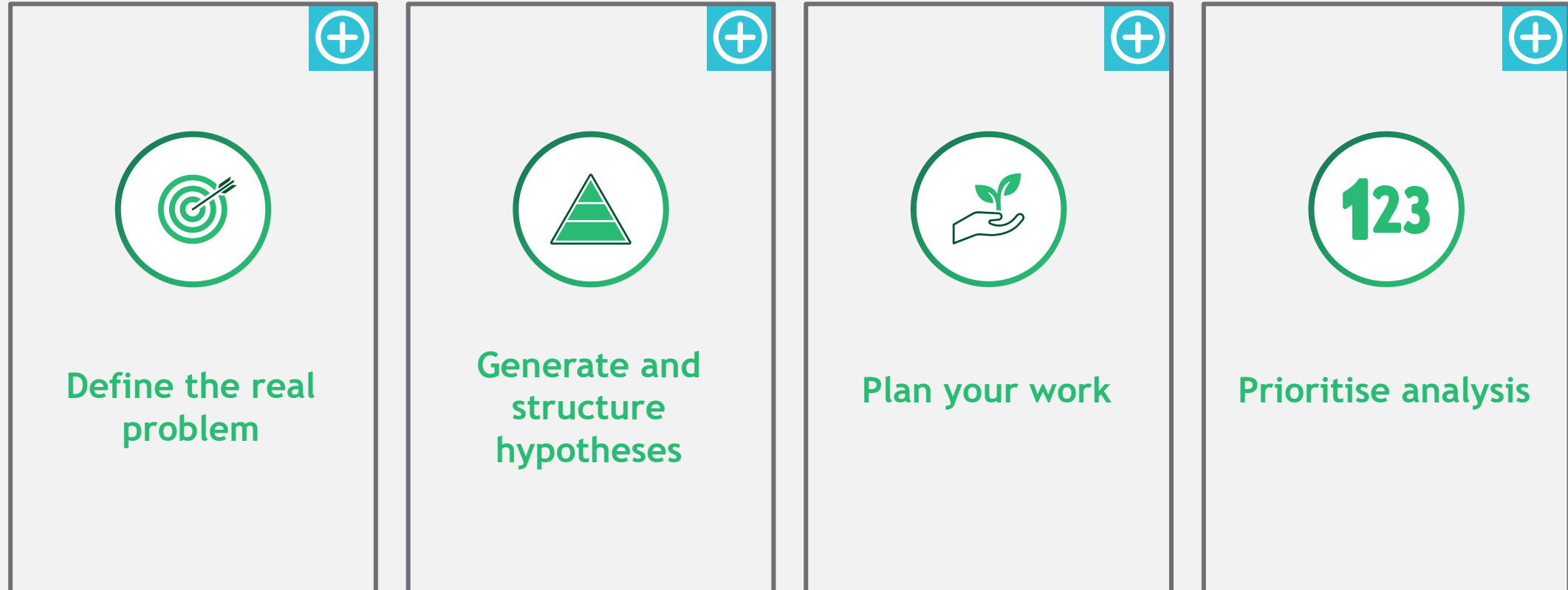


# BCG 4 Step Framework for Structured Problem Solving

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# The **BCG** Four step framework for Structured Problem Solving

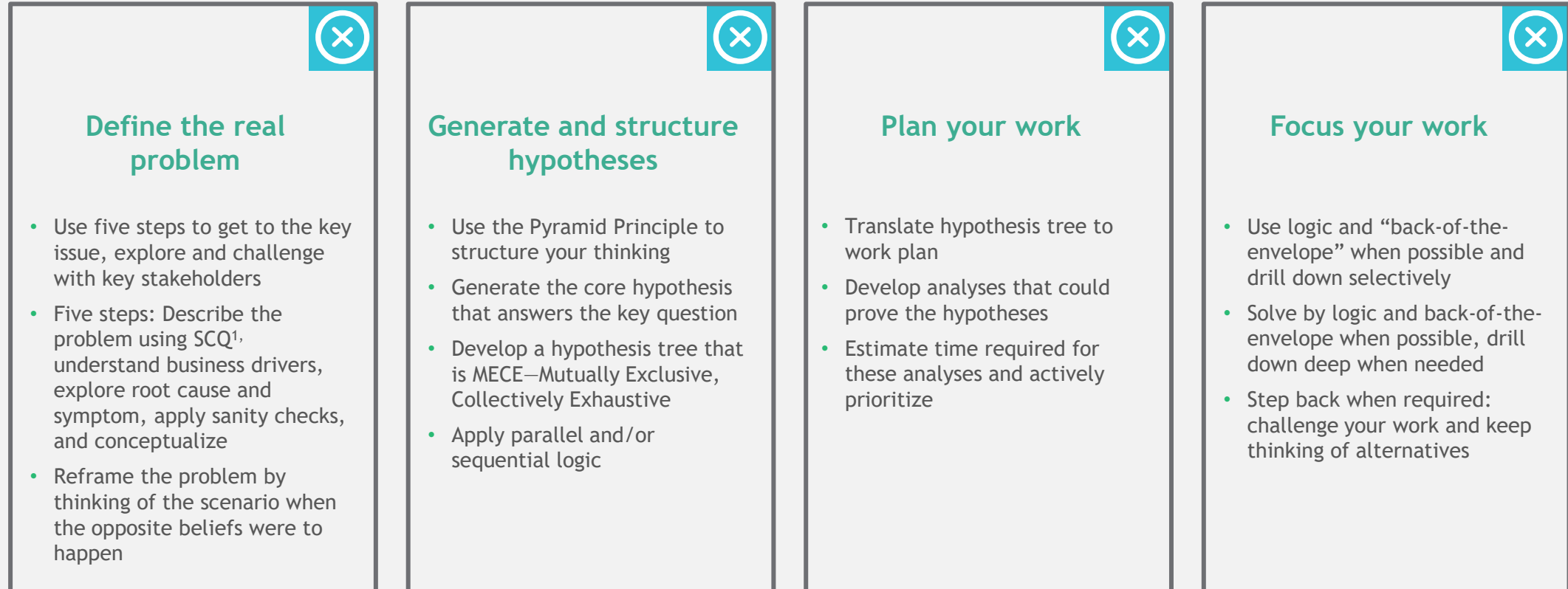
Click the plus signs to learn more





# The BCG Four step framework for Structured Problem Solving

Click the "x" signs to return to previous page



1. Situation, Complication, Question

Source: BCG experience and expertise. References to SCQ and Pyramid Principle: Barbara Minto, The Pyramid Principle

# BCG 4 step framework for Structured Problem Solving



**Frame and define the real problem**  
Get to the key issue



**Generate ideas and structure hypotheses**  
Use the Pyramid Principle to structure thinking



**Plan your work**  
Translate hypothesis tree to work plan

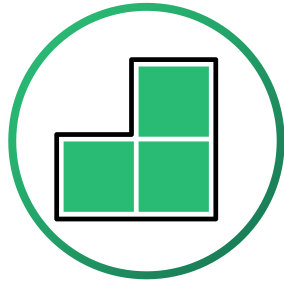


**Prioritise analysis**  
Use logic and "back-of-the-envelope" when possible

# Two Tools to describe the problem

1

## Situation-Complication-Question (SCQ)



Laying out all three components, we can see clearer on what the real question is - otherwise we may get lost during the process

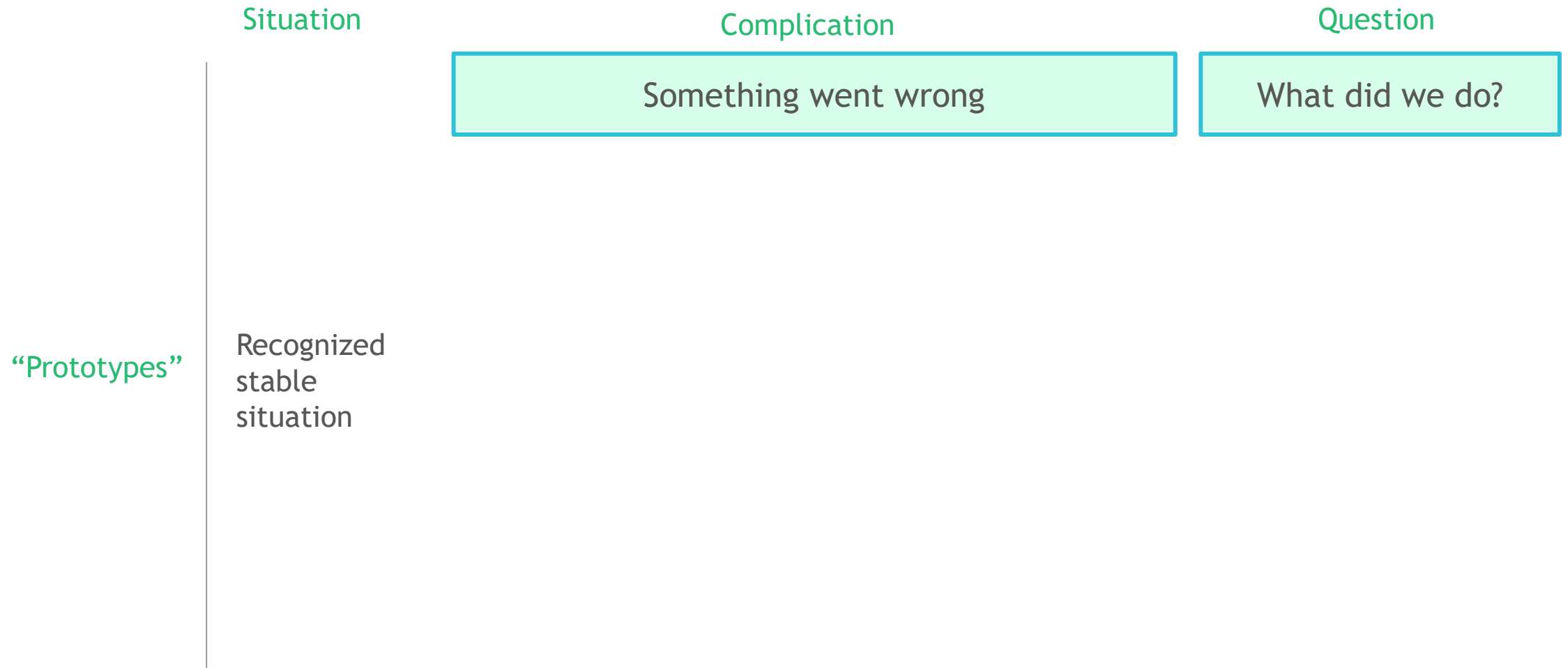
2

## Reframe



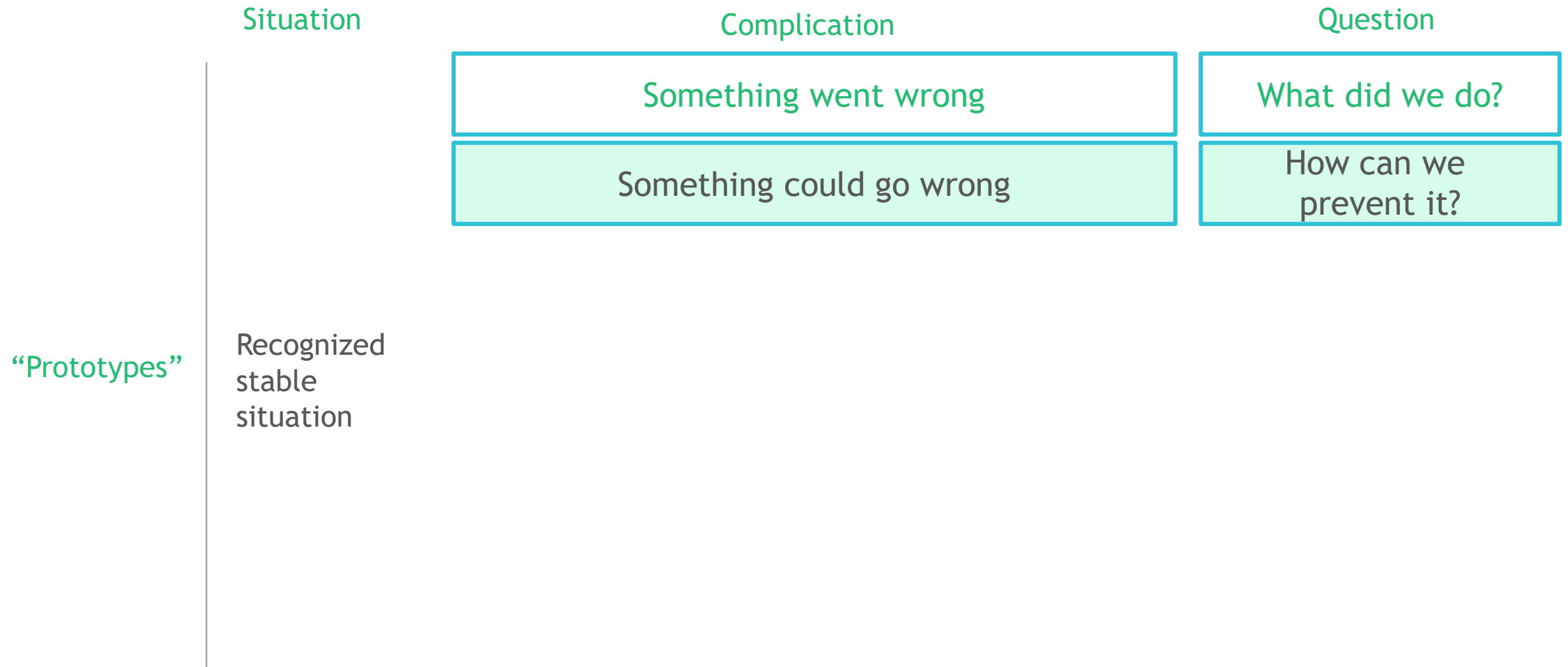
Thinking the problem under scenarios when the opposite beliefs were to happen

# Make your problem SCQ: Situation—Complication—Question





# Make your problem SCQ: Situation—Complication—Question



# Make your problem SCQ: Situation—Complication—Question

“Prototypes”	Situation	Complication	Question
	Recognized stable situation	Something went wrong	What did we do?
		Something could go wrong	How can we prevent it?
		Something changed	What should we do?

# Make your problem SCQ: Situation—Complication—Question

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		Something could change	How should we react?

# Make your problem SCQ: Situation—Complication—Question

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			Something could change	How should we react?
			Here’s what you might expect to find	Do we find it?



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			There’s someone with a different point of view	Who is right?

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			Something could change	How should we react?
			Here’s what you might expect to find	Do we find it?
			There’s someone with a different point of view	Who is right?
			In this situation we have three alternatives	Which one should we take?

## Exercise 1: How would you formulate Situation, Complication, and Question?

### Scenario

Milkease is in the dairy industry and manufactures low-cost cheeses targeted at the mass market (e.g., American cheese, shredded parmesan). The company has been facing declining profitability over the past 2 years which they attribute to increasing sales and delivery costs. Under the current operating model, the delivery driver is responsible for selling, merchandising and delivery.

A driver is expected to actively canvas smaller mom-and-pop grocery stores and roadside shops to generate more sales for the firm. They are also responsible for maintaining their own portfolio of customer relationships and deploying a customised promotion strategy. Lastly, the drivers must also coordinate cheese supply and deliver goods for their territory.

# How would you formulate Situation, Complication, and Question?

Drag and drop the potential answers on the right to the correct scenario on the left, then click Submit

Situation		There has been declining profitability due to increasing delivery and selling costs
Complication		Can we change the current operational model to make operations more effective and cost efficient?
Question		Company is a manufacturer of low-cost cheeses for the mass market

SUBMIT



# How would you formulate Situation, Complication, and Question?

Drag and drop the potential answers on the right to the correct scenario on the left, then click Submit

Situation

Complication

Question

been declining  
y due to high delivery  
costs

ge the current operational  
ce operations more  
cost efficient?

s a manufacturer of  
eeses for the mass

CORRECT

Congratulations! Your answers are correct

CONTINUE

SUBMIT

# How would you formulate Situation, Complication, and Question?

Drag and drop the potential answers on the right to the correct scenario on the left, then click Submit

Situation

Complication

Question

INCORRECT

Sorry! Your answers are incorrect

RETRYVIEW SOLUTION

been declining  
y due to high delivery  
costs

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ce operations more  
cost efficient?

s a manufacturer of  
eeses for the mass

SUBMIT

# How would you formulate Situation, Complication, and Question?

## Solution

**Situation:** Company is a manufacturer of low-cost cheeses for the mass market

**Complication:** There has been declining profitability due to high delivery and selling costs

**Question:** Can we change the current operational model to make operations more effective and cost efficient?

CONTINUE

Instead of using SCQ, we could also describe the problem by reframing using either of these methodologies

1

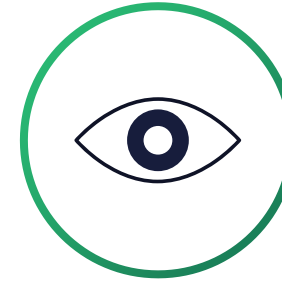
## De-constrain



Rethinking the inherent beliefs, assumptions and constraints to generate new insights into looking at the problem differently

2

## Perspectives



Shifting your perspective to another person's and asking for inputs from a variety of people helps widen your frame of reference



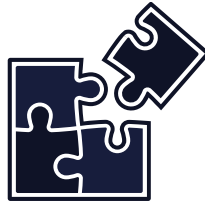
# De-constrain: Challenge your current mental model to identify new ways of looking at the problem

Specify your  
current problem



Clearly articulate the  
current problem or  
situation at hand

Identify your  
inherent beliefs



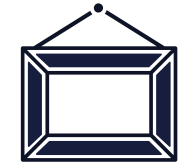
List out the inherent  
beliefs (assumptions,  
constraints, biases) with  
the current framing of  
the problem or situation

Challenge  
these beliefs



Articulate opposites for  
each of the beliefs;  
make them interesting  
and extreme

Reframe  
your problem



Reframe the problem by  
thinking of the scenario  
when the opposite  
beliefs were to happen



# Example: How would Starbucks have reframed?



Specify your  
current problem



Can we price our coffee  
higher than  
competition?



Identify your  
inherent beliefs

Coffee is just an  
everyday utilitarian drink

Customers may not be  
willing to pay higher for  
coffee



Challenge  
these beliefs

Coffee is associated  
with important  
activities in the day  
e.g. concentrating at  
work, meeting friends

Customers will pay  
more if they 'perceive  
added benefits'



Reframe  
your problem



What is the price that  
customers will be willing  
to pay for an 'experience'  
(along with the coffee)?

# Perspective: Taking another person's perspective allows you to tailor your solutions

**Situation:** High accident rate on travelators

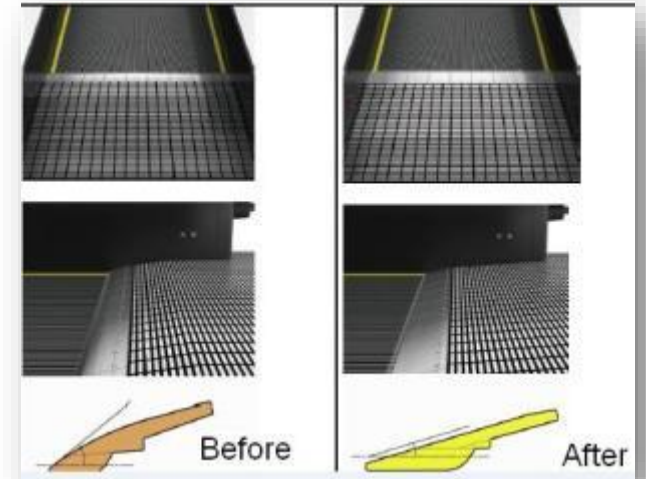


**Perspective:** Why do elderly have higher accident rates?

What difficulties does she face when using the travelators in our airport?



**Solution:** Modify the angle of the comb



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Use logic and "back-of-the-envelope" when possible

# The hypothesis helps to focus the project

Click each reason for further elaboration

1

Attempts to formulate the possible result of the project

2

Generating hypotheses will help user to be specific and focused

3

Hypotheses are allowed to be wrong

4

Hypothesis will be adapted to the findings during the project

# The hypothesis helps to focus the project

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Attempts to formulate the possible result of the project

- Helps identify the main reason of the problem and puts user on an investigative path
- Prevents 'boiling the ocean', doing unnecessary work

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- Forces you to be explicit about what you expect to achieve in the project
- More telling than a set of open questions

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- Their use is to structure and focus the project
- No preclusion of the results

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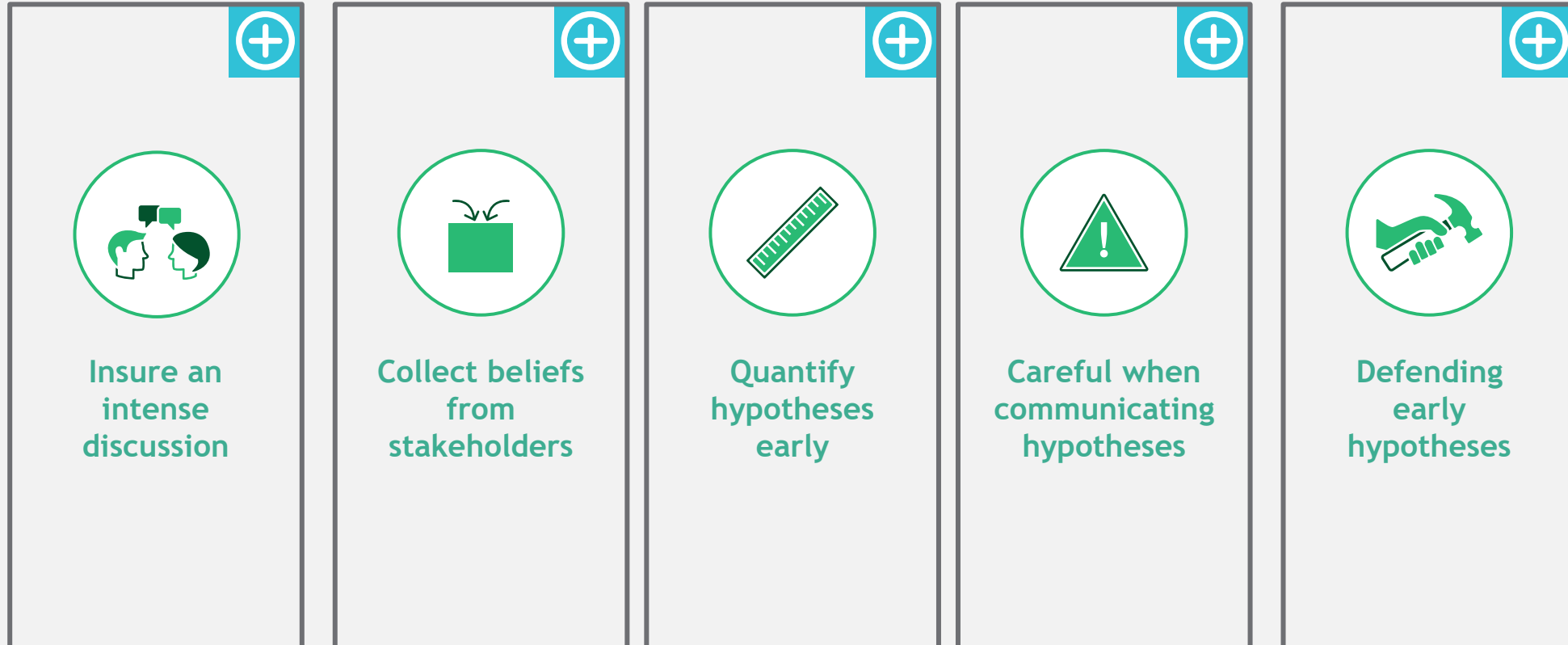
4

Hypothesis will be adapted to the findings during the project

- Hypothesis becomes more and more specific during the project
- Hypothesis change as the evidence evolves


# Best practices to establish and sharpen hypotheses

Click the plus signs to learn more




# Best practices to establish and sharpen hypotheses

Click the "x" signs to return to previous page




## Insure an intense discussion

- On possible hypotheses in your project team
- Encourage all members to bring forward hypotheses




## Collect beliefs from stakeholders

- In the hypothesis-forming phase
- Take care to cover the different perspectives on the issue
- Include people “in the heat of the business”—sales reps, shop floor managers, etc.




## Quantify hypotheses early

- Quickly check hypotheses against readily available data and run easy-to-do estimates



## Careful when communicating hypotheses

- Be careful when communicating hypotheses outside the core project team
- Make clear it is a possible solution, not THE solution
- Avoid distributing hypotheses in emails or other written form



## Defending early hypotheses

- Ensure you do not get locked into defending early hypotheses!
- Regularly review the hypothesis against the facts and data you collected in the project
- Pay special attention to analysis that will potentially disprove the hypothesis

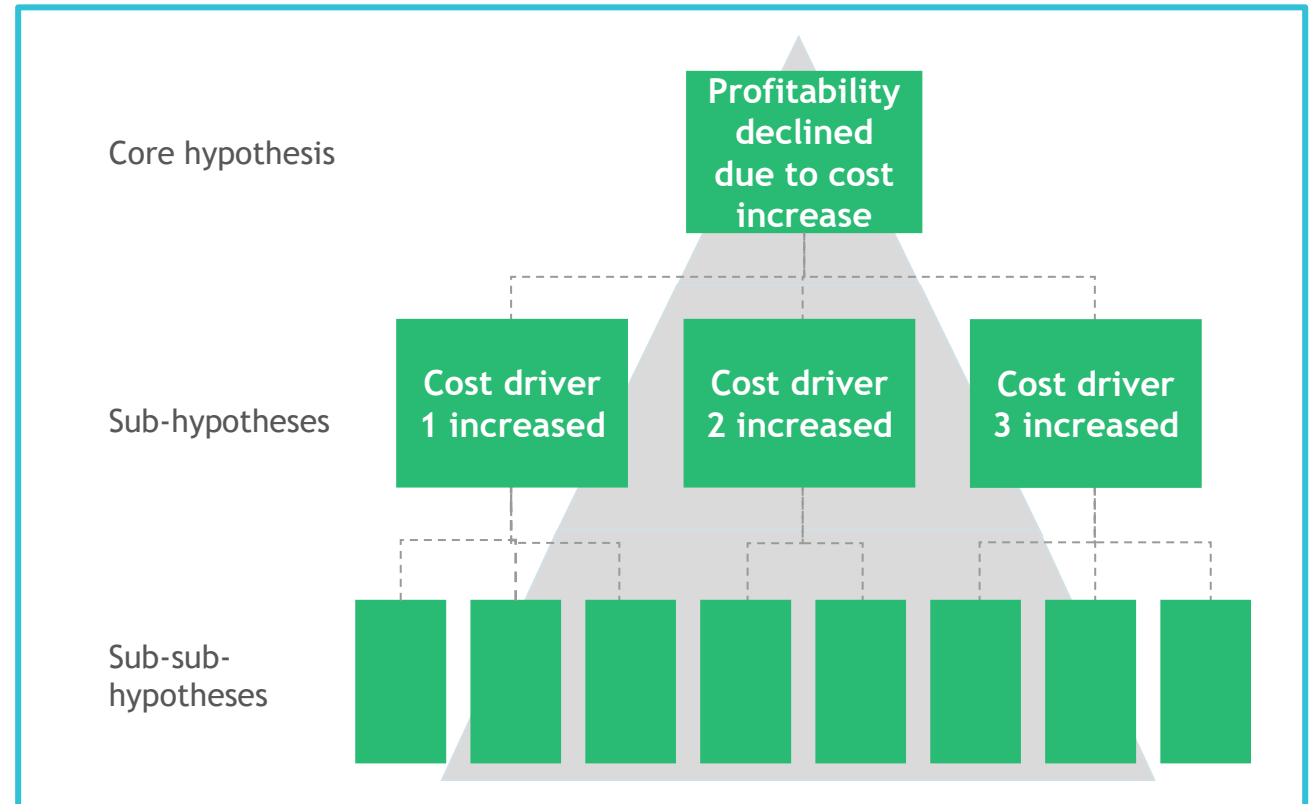
# Structuring hypotheses: Apply the Pyramid Principle

**The Pyramid Principle states that ideas are easier to grasp if they**

- Are organized as a pyramid under a single point
- Are directed toward answering a question existing in your audience's minds
- Obey a limited number of logical rules

**This structure results in a clear, concise message**

- Grasped quickly by the audience
- Developed with minimum hassle by the creator
- Leading to action where required
- Saving time at all levels of a project team

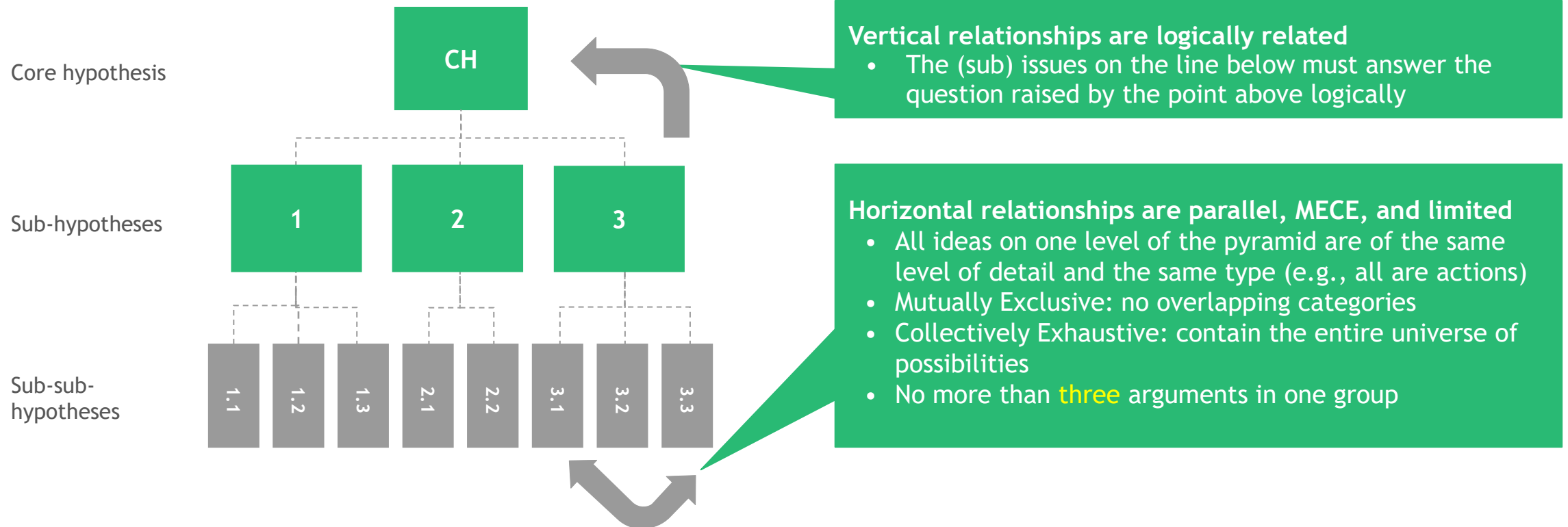


# MECE stands for Mutually Exclusive, Collectively Exhaustive

The hypothesis tree structures hypotheses and sub-hypotheses in layers...

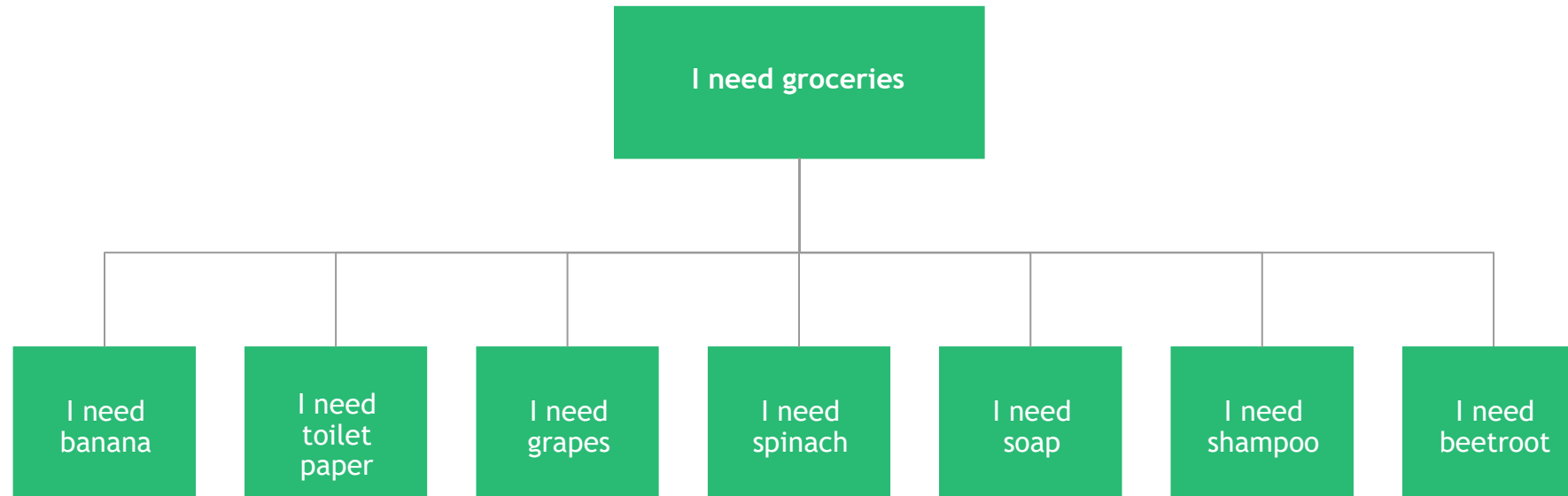
...following important specific rules about vertical and horizontal relationships

Describes the top-down sequencing and flow of key issues to be analyzed or communicated





Exercise: What is wrong with this hypothesis tree and how could we improve?



# What is wrong with this hypothesis tree and how could we improve?

Select the correct answer, then click Submit

- ☐ Too many items. Cluster them into groups that have the same starting letter.
- ☐ Too many items. Cluster them into groups that have the same colour.
- ☐ Too many items. Cluster them into groups that are in the same category.
- ☐ Nothing is wrong.

SUBMIT

# What is wrong with this hypothesis tree and how could we improve?

Select the correct answer

- ☐ Too many categories
- ☐ Too many items per category
- ☐ Too many levels
- ☐ Nothing is wrong

CORRECT

Congratulations! You have selected the correct answer

Explanation:

Clustering the items into groups that are in the same category using the MECE principle.

Clustering the items into groups with the same starting letter and colour are possible but are not the most effective way.

CONTINUE

SUBMIT

## What is wrong with this hypothesis tree and how could we improve?

Select the correct answer

- ☐ Too many branches
- ☐ Too many nodes
- ☐ Too many levels
- ☐ Nothing is wrong

**INCORRECT**

The answer you selected is incorrect

RETRY

VIEW SOLUTION

SUBMIT

## What is wrong with this hypothesis tree and how could we improve?

Select the correct answer

☐ Too many categories

☐ Too many items

☐ Too many levels

☐ Nothing is wrong

### SOLUTION

The answer is:

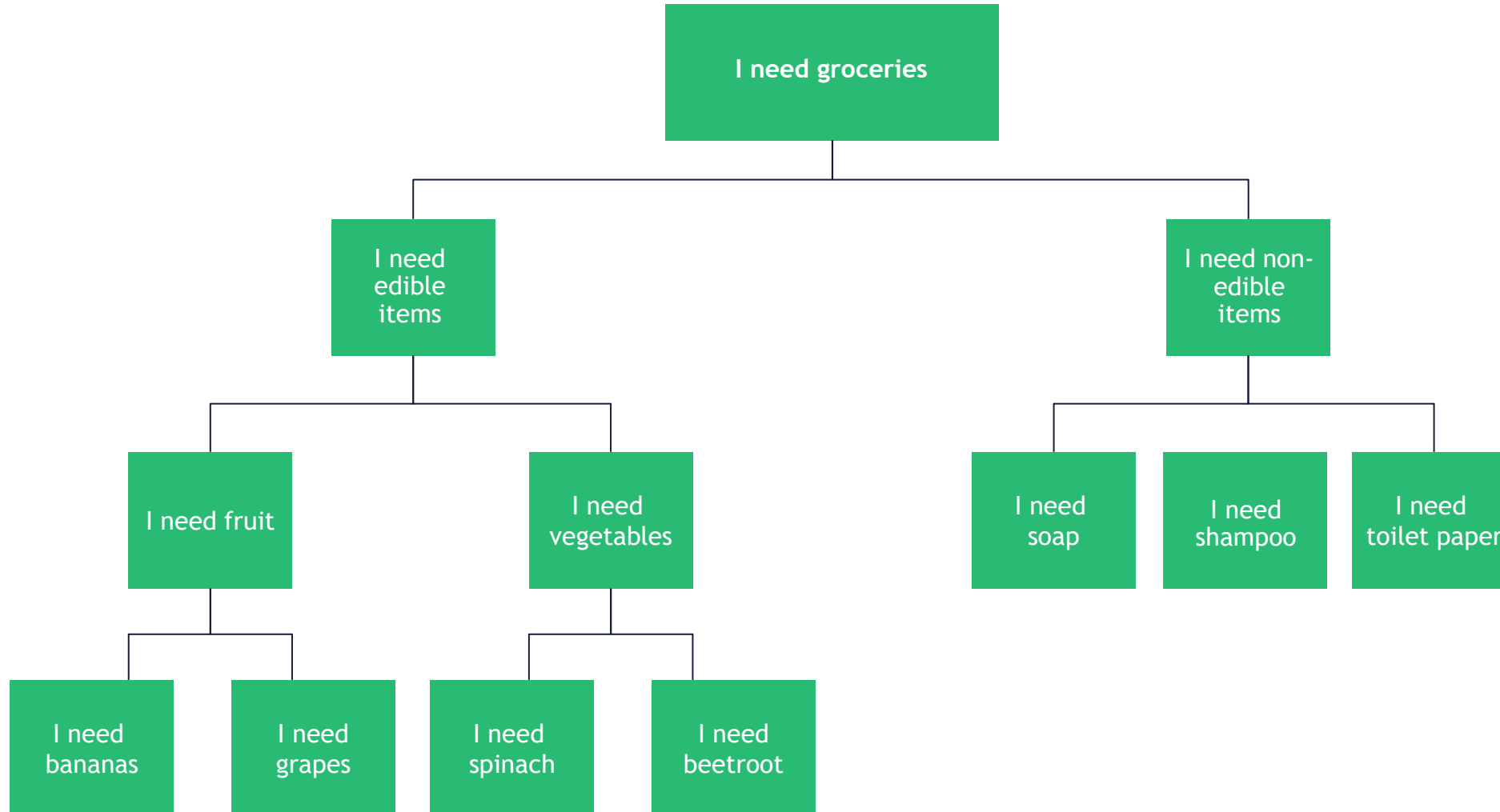
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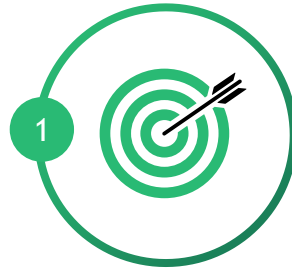
CONTINUE

SUBMIT

Here is a possible solution for a better hypothesis tree



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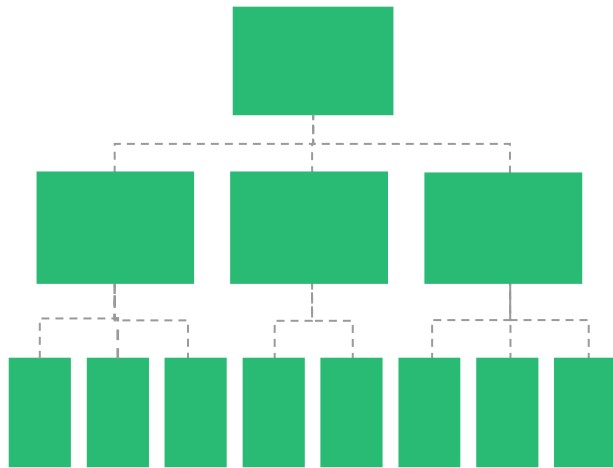
Prioritise analysis  
Use logic and "back-of-the-envelope" when possible



# Make a work plan based on your hypotheses

## Hypothesis tree

What are your hypotheses to solve the problem?



Ask the right questions

## Tasks

What do you need to do to validate or falsify these?

Determine for each hypothesis what needs to be done to validate it (or change it)

- Data collection
- Interviews
- External research
- Analysis

Get to the right answers

## Project Plan

What resources do you need to do this?

Who is in charge?  
Who needs to be involved?

- Expertise
- Interviews
- Data access

Expenses?  
Duration?  
Due date?

Manage the analysis

# Create a high-level work plan for a (hypothetical) project before you start

## Situation:

Company is a manufacturer of low-cost cheeses for the mass market

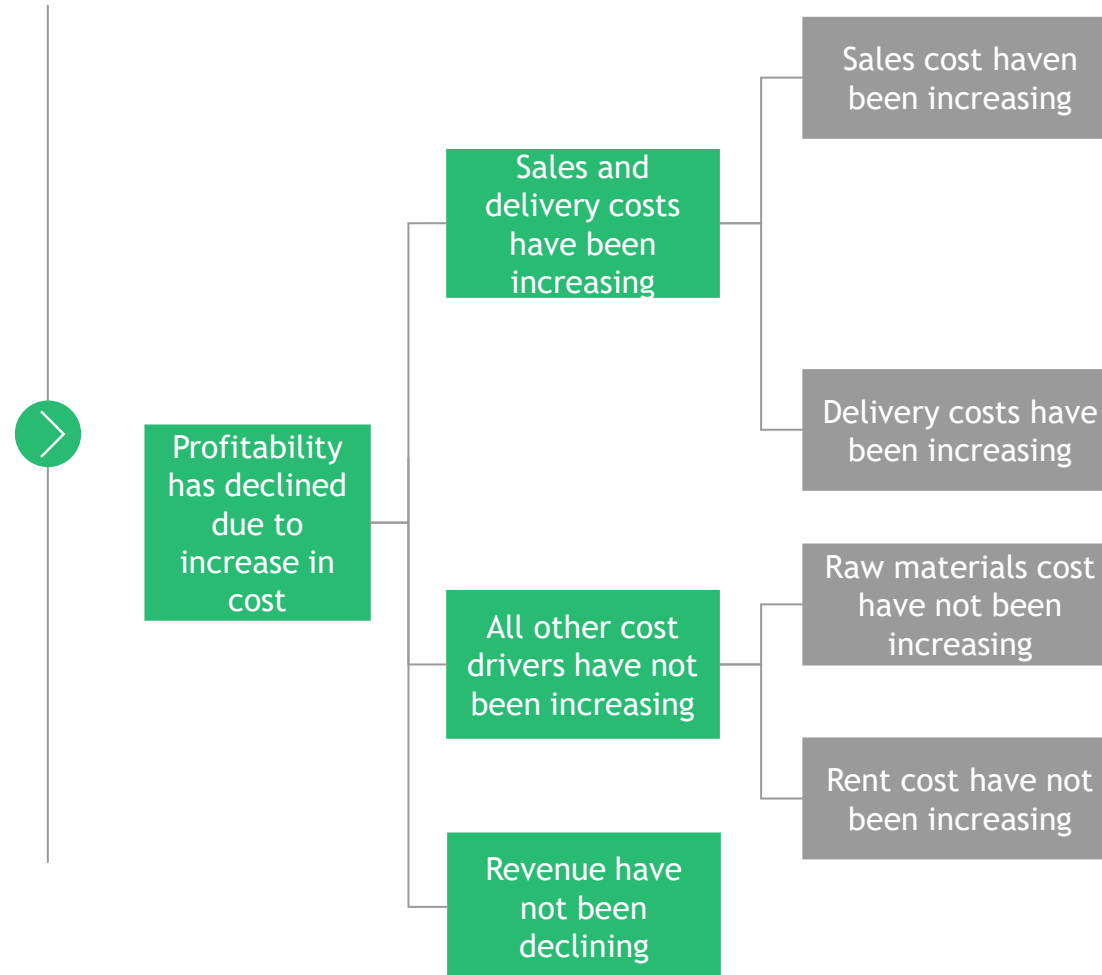
## Complication:

There has been a decline in profitability due to increasing delivery and selling costs

## Question:

Can we change the current operational model to make operations more effective and cost efficient?

## Hypothesis tree



## Analysis

1. What constitutes sales cost?
2. Have sales cost been increasing over the past 2 years? Why?

1. What constitutes delivery cost?
2. Have delivery cost been increasing over the past 2 years? Why?

1. Have revenue been declining over the past 2 years?

2

3

1

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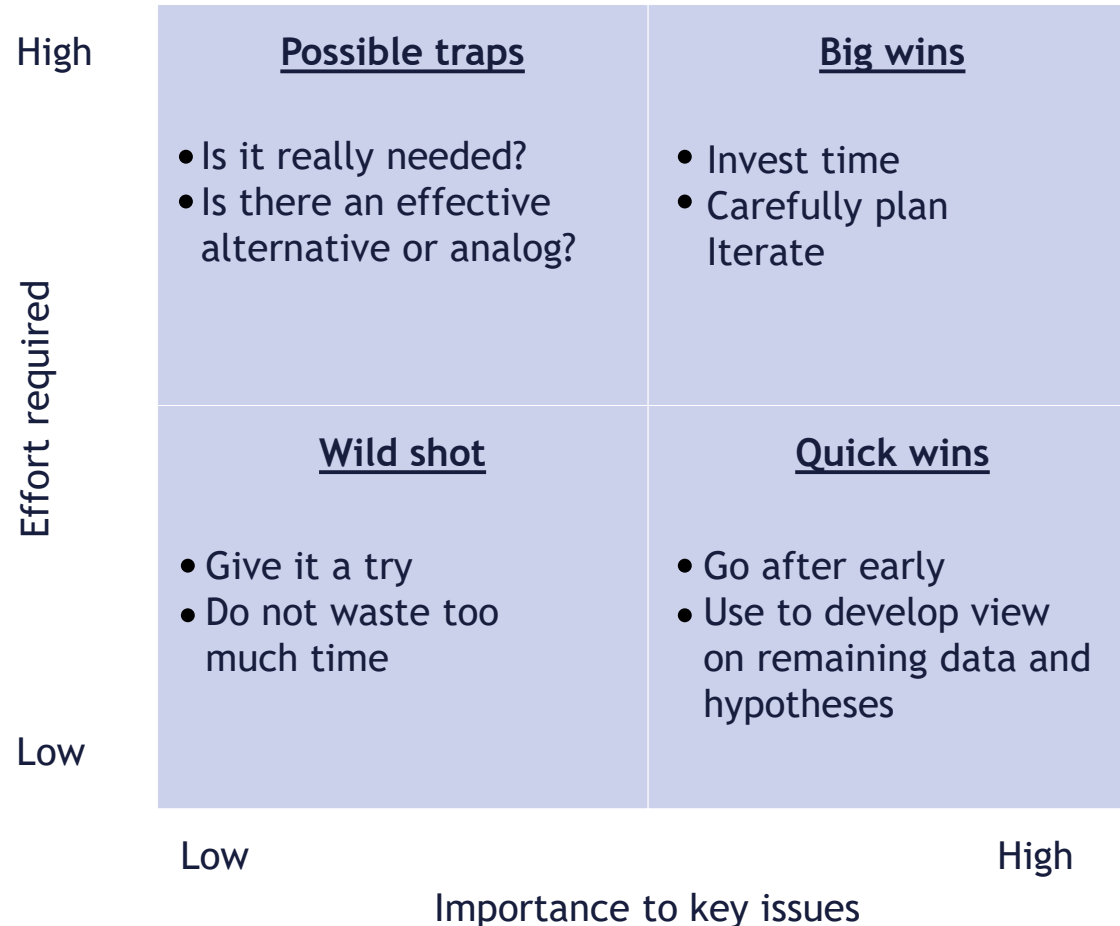


Plan your work  
Translate hypothesis tree to work plan



Prioritise analysis  
Use logic and "back-of-the-envelope" when possible

# When determining the time needed for your analyses, prioritise your analyses based on effort and importance



Use the 80/20 rule

# Four reasons why back-of-the-envelope is such an important and powerful tool

Click each reason for further elaboration

1



Avoids unnecessary fine tuning,  
freeing up time for more relevant  
analyses

2



Breaks down logic for analyses and  
shows on which specific parts to focus

3



Can fill gaps when no data is  
available

4



Provides input for analysis  
“sanity checks”

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If back-of-the-envelope suggests option A's pay off is 100-110, and option B's is 5-10, we do not need detailed data analysis to see if X is 105, 106, etc. A is clearly better

2



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Breaks down logic for analyses and shows on which specific parts to focus

Back-of-the-envelope to estimate X consists of 5 steps. Maybe 3 of these steps are pretty sure, but 1 or 2 we really need to check in more detail

3



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Back-of-the-envelope to estimate X consists of 5 steps. Maybe 3 of these steps are pretty sure, but 1 or 2 we really need to check in more detail

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Can fill gaps when no data is available

Answer will explicitly be uncertain, but it is better to have an indication than no answer

4



Provides input for analysis “sanity checks”



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Can fill gaps when no data is available

Answer will explicitly be uncertain, but it is better to have an indication than no answer

4



Provides input for analysis “sanity checks”

If back-of-the-envelope shows X is 100-110, and analysis shows it is 58, something needs to be fixed either in the logic or in the model

## Question

What is the online dating app market in Singapore?

## Back-of-the-envelope

## Assumptions

### Step 1

What is the population in Singapore?

Population in Singapore assumed to be 6 million.

### Step 2

### Step 3

### Step 4

### Step 5

### Step 6

## Question

What is the online dating app market in Singapore?

## Back-of-the-envelope

## Assumptions

Step 1

What is the population in Singapore?

Population in Singapore assumed to be 6 million.

Step 2

How many people belong in the 'dating age'?

Only people in the 'dating age' will be using the online dating app.

Step 3

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Only people in the 'dating age' will be using the online dating app.

Step 3

Of these people in the 'dating age', what is the proportion who are single?

Only singles will be using the online dating app.

Step 4

Step 5

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Step 2

How many people belong in the 'dating age'?

Only people in the 'dating age' will be using the online dating app.

Step 3

Of these people in the 'dating age', what is the proportion who are single?

Only singles will be using the online dating app.

Step 4

Of these singles, what is the proportion that are looking to get attached?

Only people looking to get attached will be using the online dating app.

Step 5

Step 6

## Question

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Only singles will be using the online dating app.

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Of these singles, what is the proportion that are looking to get attached?

Only people looking to get attached will be using the online dating app.

Step 5

Of the singles looking to get attached, what is the proportion that is receptive to the idea of online dating?

Not everyone is receptive to using online dating apps.

Step 6

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Of the singles looking to get attached, what is the proportion that is receptive to the idea of online dating?

Not everyone is receptive to using online dating apps.

#### Step 6

How much is each user willing to spend on the online dating app annually?

Not everyone is willing to spend on online dating apps.



## Context

### Apple

Founded on April 1st, 1976 by Steve Jobs, Steve Wozniak and Ronald Wayne in a tiny household garage, Apple is now the largest technology company in the world by revenue. Apple has undoubtedly become a household name with its range of ubiquitous devices such as the iPhone and MacBook.

Looking back, there have been several pivotal moments in Apple's journey. In 2001, Steve Jobs presented his “digital hub” strategy in which he envisioned an entire Apple device and software ecosystem. This shift was initiated by the debut of the iPod in 2001, followed by the iPhone in 2007, then the iPad in 2010.

Fast forward to 2020 and that vision has largely come to fruition. But Apple is highly dependent on the iPhone as its main revenue generator, even as it faces stiff competition from the likes of Samsung and Huawei. As a group, you have been tasked by Tim Cook (Apple's current CEO) to answer a very important question.

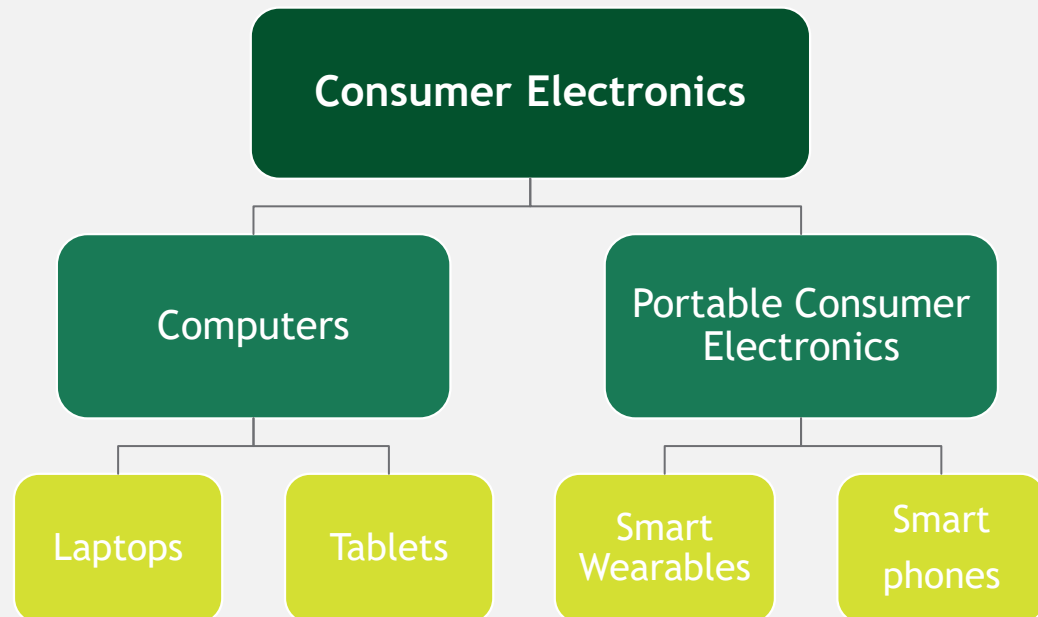
**What should Apple's strategy be for the future of its consumer electronics business?**



# Context

## Apple

For the purposes of this case, let's **only look at Apple's current consumer electronics products**, which we will simplify down to the following



Think carefully to understand not only which line of product, but also which geography may be the highest potential for Apple.

# How would you formulate Situation, Complication, and Question?

Write your answers, and click Submit

## Apple

Founded on April 1st, 1976 by Steve Jobs, Steve Wozniak and Ronald Wayne in a tiny household garage, Apple is now the largest technology company in the world by revenue. Apple has undoubtedly become a household name with its range of ubiquitous devices such as the iPhone and MacBook.

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**What should Apple's strategy be for the future of its consumer electronics business?**

Your Answer

Situation:

.....

.....

.....

Complication:

.....

.....

.....

Question:

.....

.....

.....

SUBMIT

# Situation, Complication, and Question: Potential answer

## Apple

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**What should Apple's strategy be for the future of its consumer electronics business?**

### Potential Answer

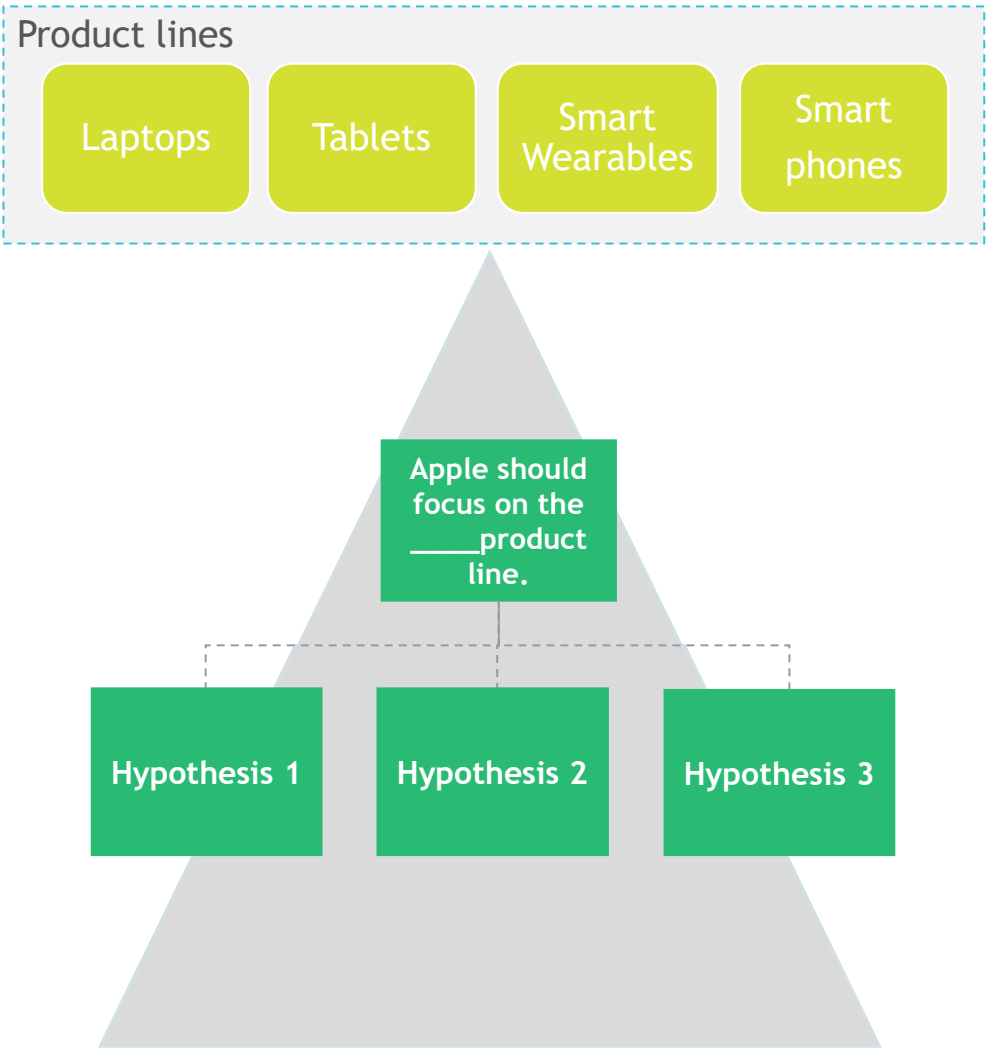
**Situation:** In 2001, Steve Jobs presented his "digital hub" strategy in which he envisioned an entire Apple device and software ecosystem. Fast forward to 2020 and that vision has largely come to fruition.

**Complication:** Apple is highly dependent on the iPhone as its main revenue generator, even as it faces stiff competition from the likes of Samsung and Huawei.

**Question:** What should Apple's strategy be for the future of its consumer electronics business?

# Generating a level 1 Hypothesis Tree: Exercise

Drag and drop one of the 4 boxes, write your answers, and click Submit



### Recommendation

Apple should focus on the  Product line.

### Main Hypotheses

Hypothesis 1: Chosen market is more attractive than others

Hypothesis 2: .....

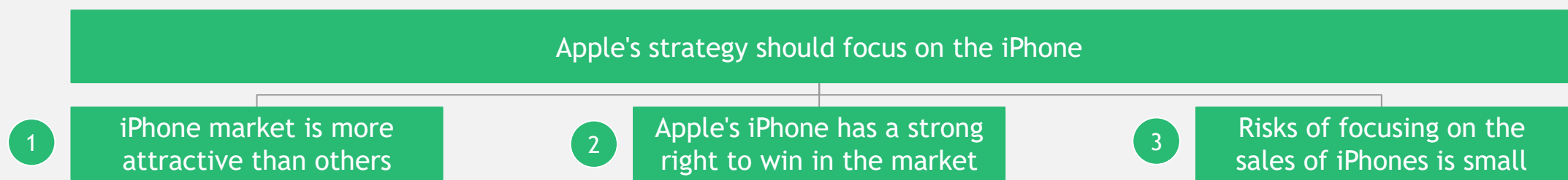
Hypothesis 3: .....

SUBMIT

# Generating a level 1 Hypothesis Tree: Potential framework

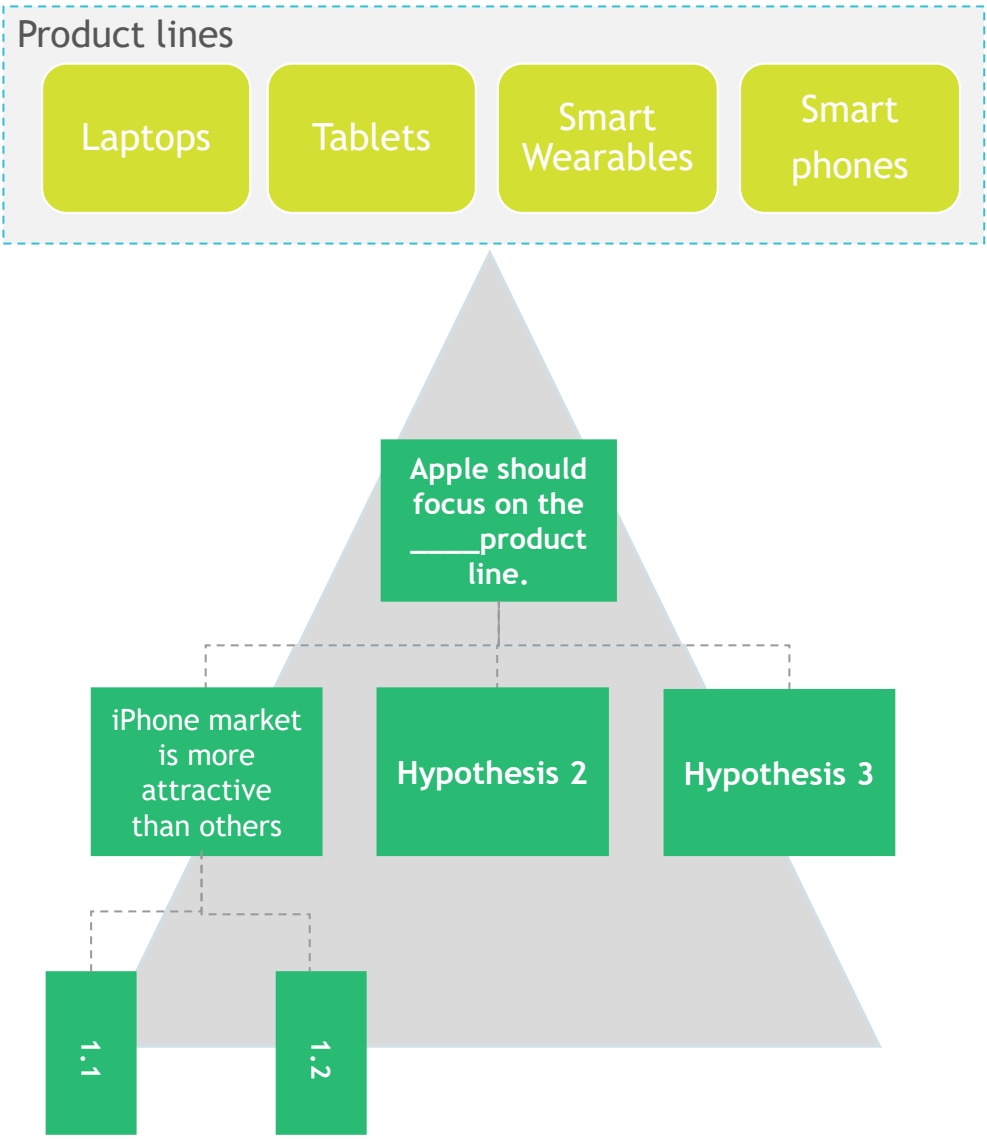
There are various ways in which you can structure your approach to this problem. One example below is if we took the stance and hypothesis that "Apple's strategy should still focus on the iPhone".

Potential framework



# Generating a level 2 Hypothesis Tree: Exercise

Write your answers, and click Submit



Recommendation

Apple should focus on the **Smart phones** Product line.

Sub Hypotheses

Hypothesis 1: iPhone market is more attractive than others

Sub Hypothesis 1.1: .....

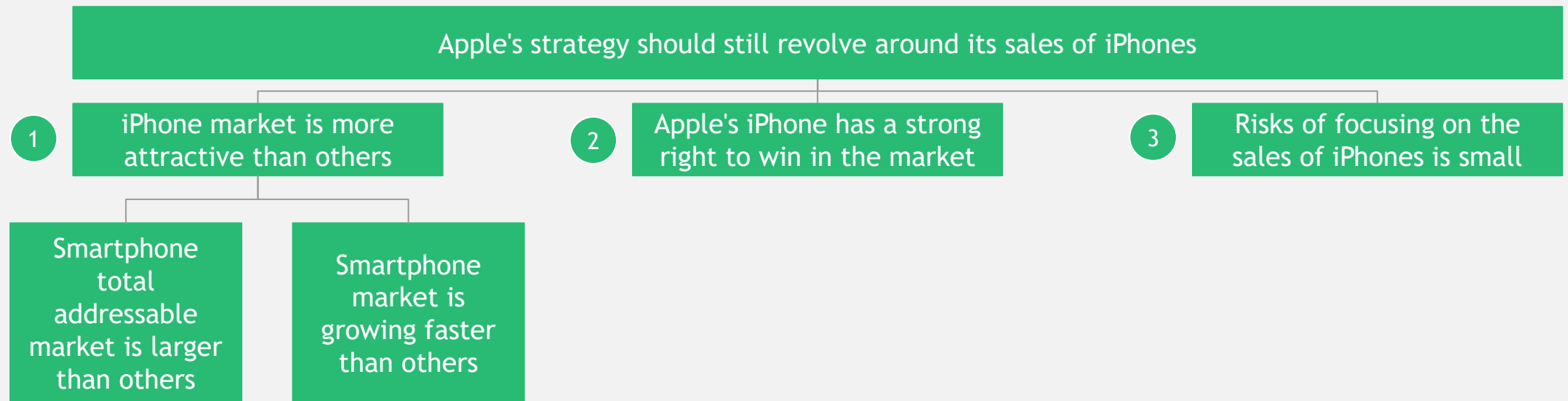
Sub Hypothesis 1.2: .....

SUBMIT

# Generating a level 2 Hypothesis Tree: Potential framework

There are various ways in which you can structure your approach to this problem. One example below is if we think of 'attractiveness' as size and growth rate.

Potential framework



# Data required for analysis: Exercise

Write your answers, and click Submit

Apple's strategy should still revolve around its sales of iPhones

iPhone market is more attractive than others

Smartphone total addressable market is larger than others

Smartphone market is growing faster than others

Type of analysis required

Size of market: What are the current sizes of the laptop, tablets, smart wearables and smartphone total addressable markets?

Growth of market: What is the current and projected growth rate of the 4 markets?

Key data required

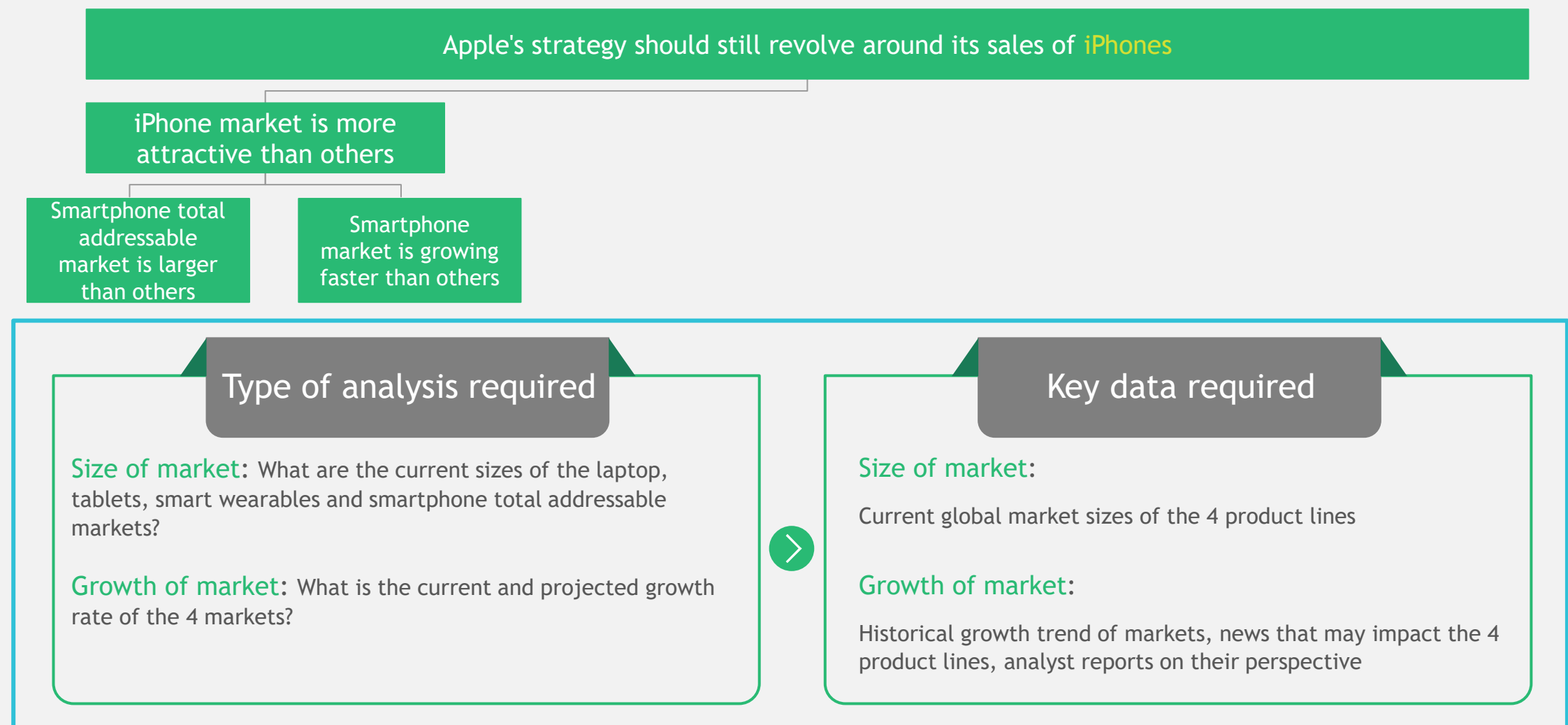
Size of market:

Growth of market:

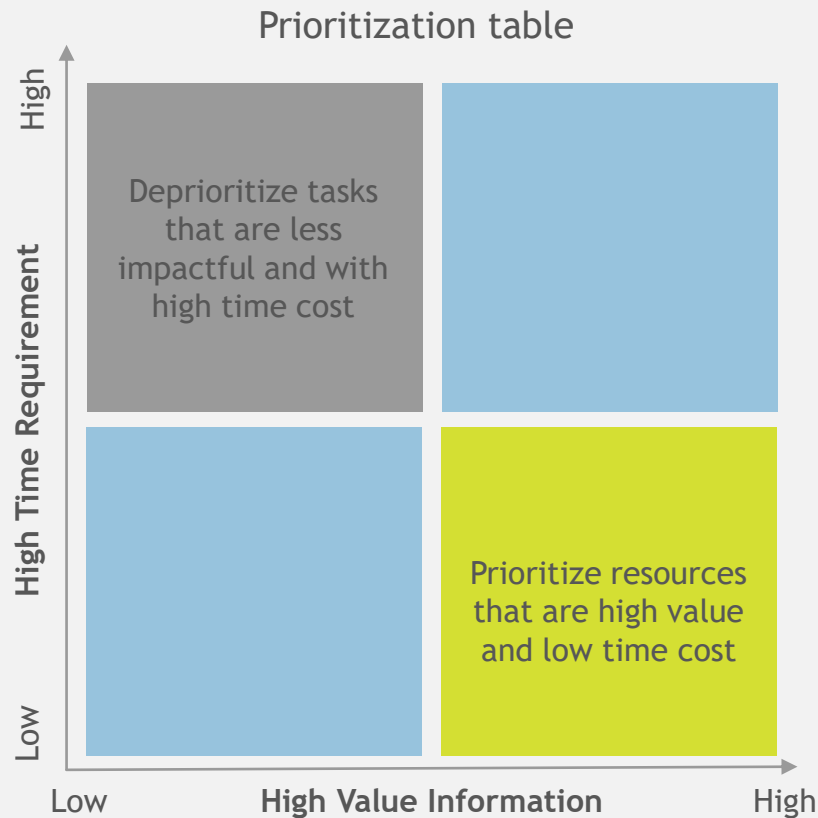
SUBMIT



# Data required for analysis: Potential answer



# Prioritising analysis: Potential framework



## Questions to consider

- What is the Project timeline?
- How accessible is the data?
- How relevant is the data?
- Who is in charge of the data?

## Prioritising analysis

**Priority 1:** Procure market size data from individual global product line managers. Alternatively, look at analyst reports.

**Priority 2:** To calculate growth rate of market, look at historical trend, make logical assumptions and project future growth rate. Validate with individual product line managers.

⋮

# The **BCG** Four step framework for Structured Problem Solving



**Define the real problem**—get to the key issue

- Describe the problem using SCQ<sup>1</sup>
- Reframe the problem by de-constraining or thinking from another perspective



**Generate and structure hypotheses**—use the Pyramid Principle to structure your thinking

- Generate the core hypothesis that answers the key question
- Develop a hypothesis tree that is MECE—Mutually Exclusive, Collectively Exhaustive



**Plan your work**—translate hypothesis tree to work plan

- Develop analyses that could prove the hypotheses
- Estimate time required for these analyses

**123**

**Prioritise analysis**—use logic and “back-of-the-envelope” where appropriate

- 80/20 rule
- Back-of-the-envelope



Click [here](#) to save this slide as a PDF

1. Situation, Complication, Question

Source: BCG experience and expertise. References to SCQ and Pyramid Principle: Barbara Minto, The Pyramid Principle 43



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