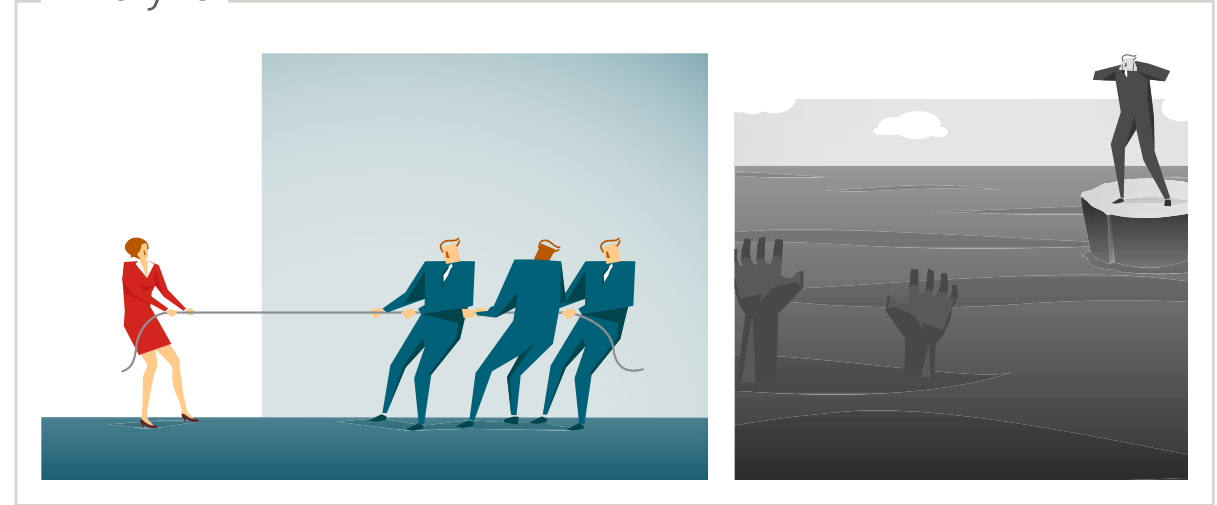


Project Management

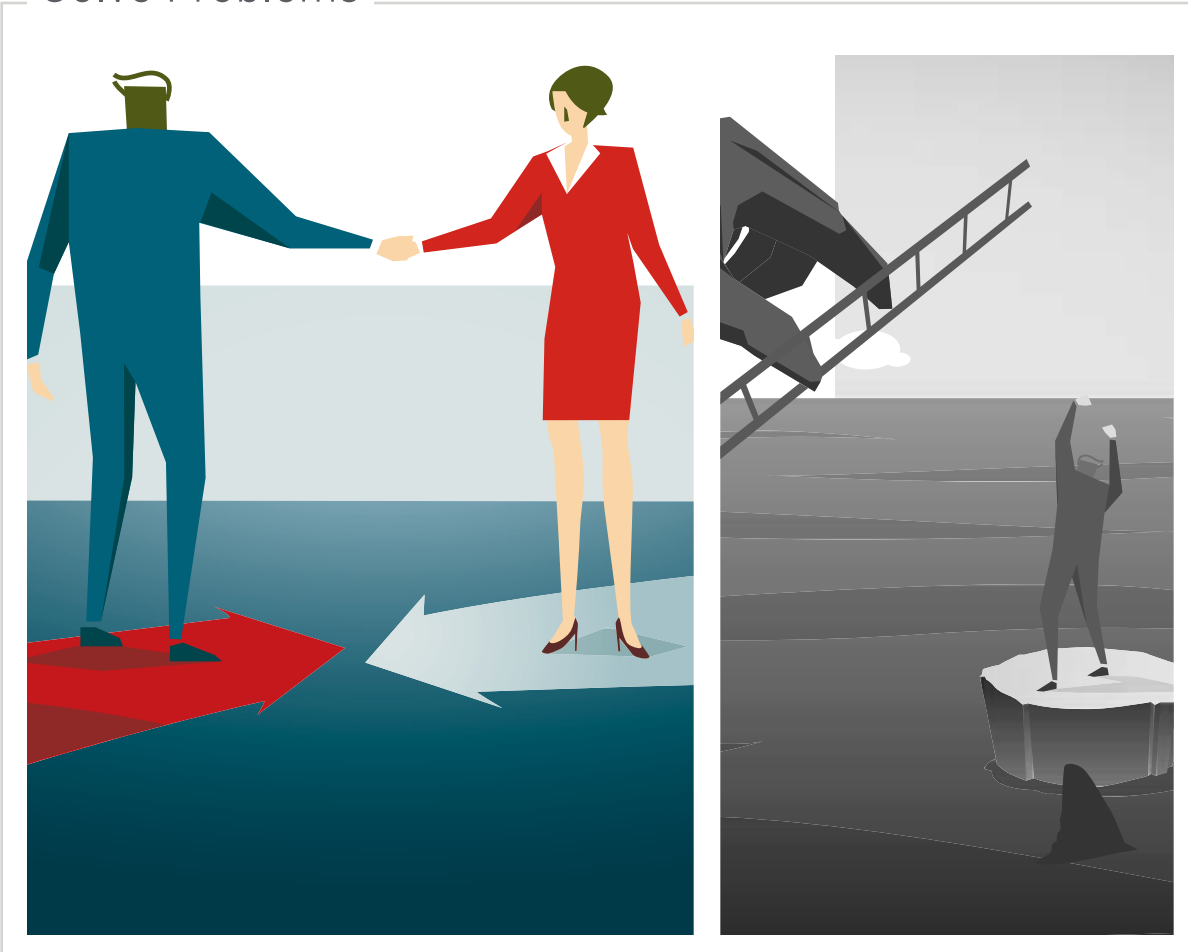
Inform



Analyze



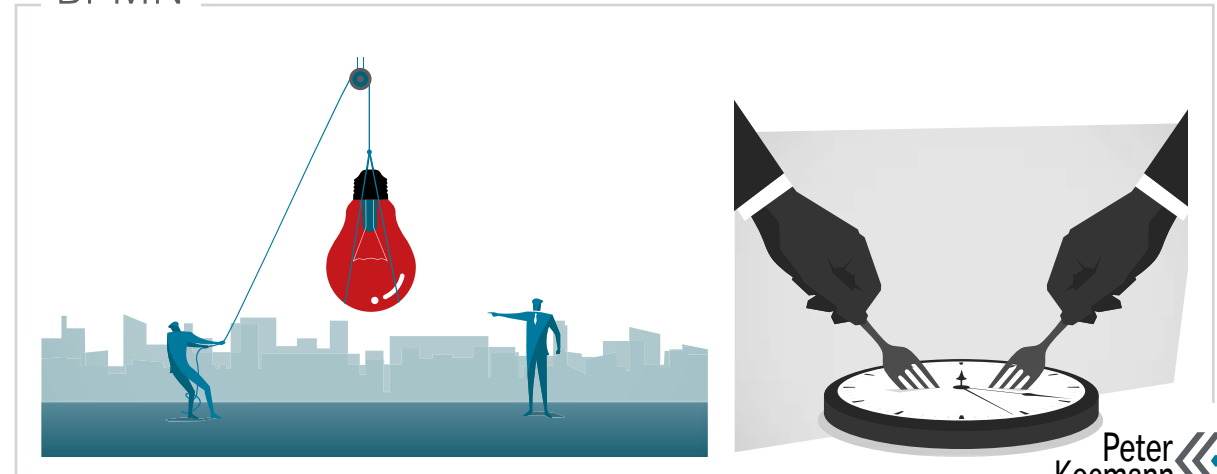
Solve Problems



Scrum



BPMN

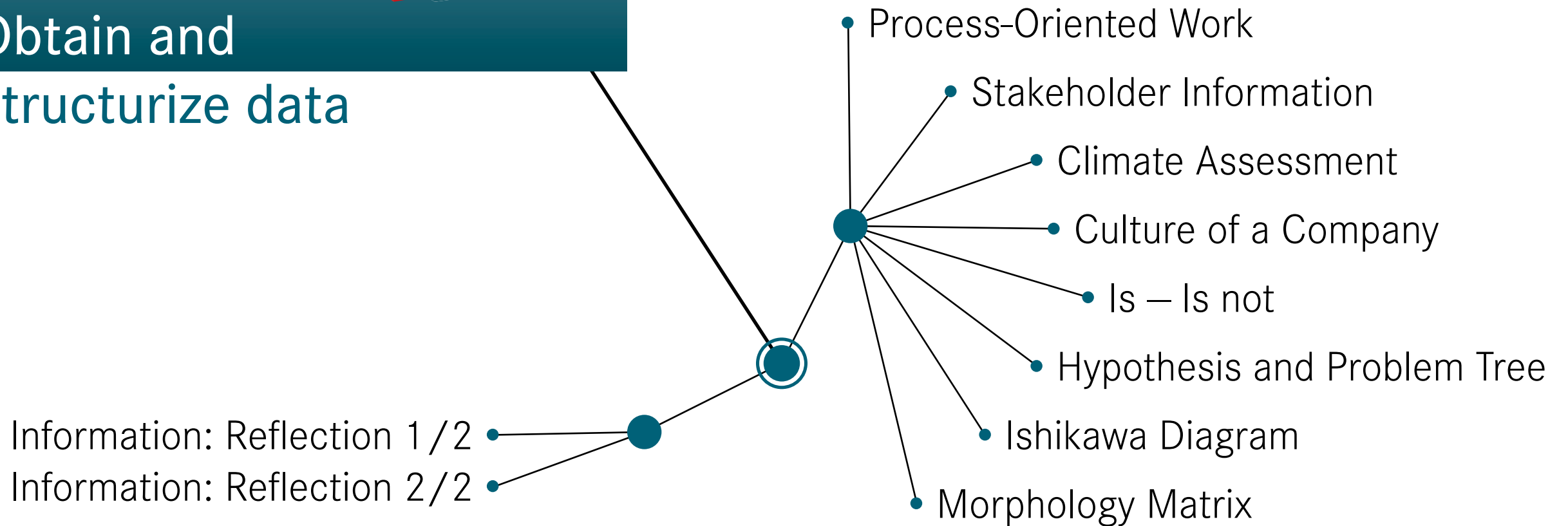


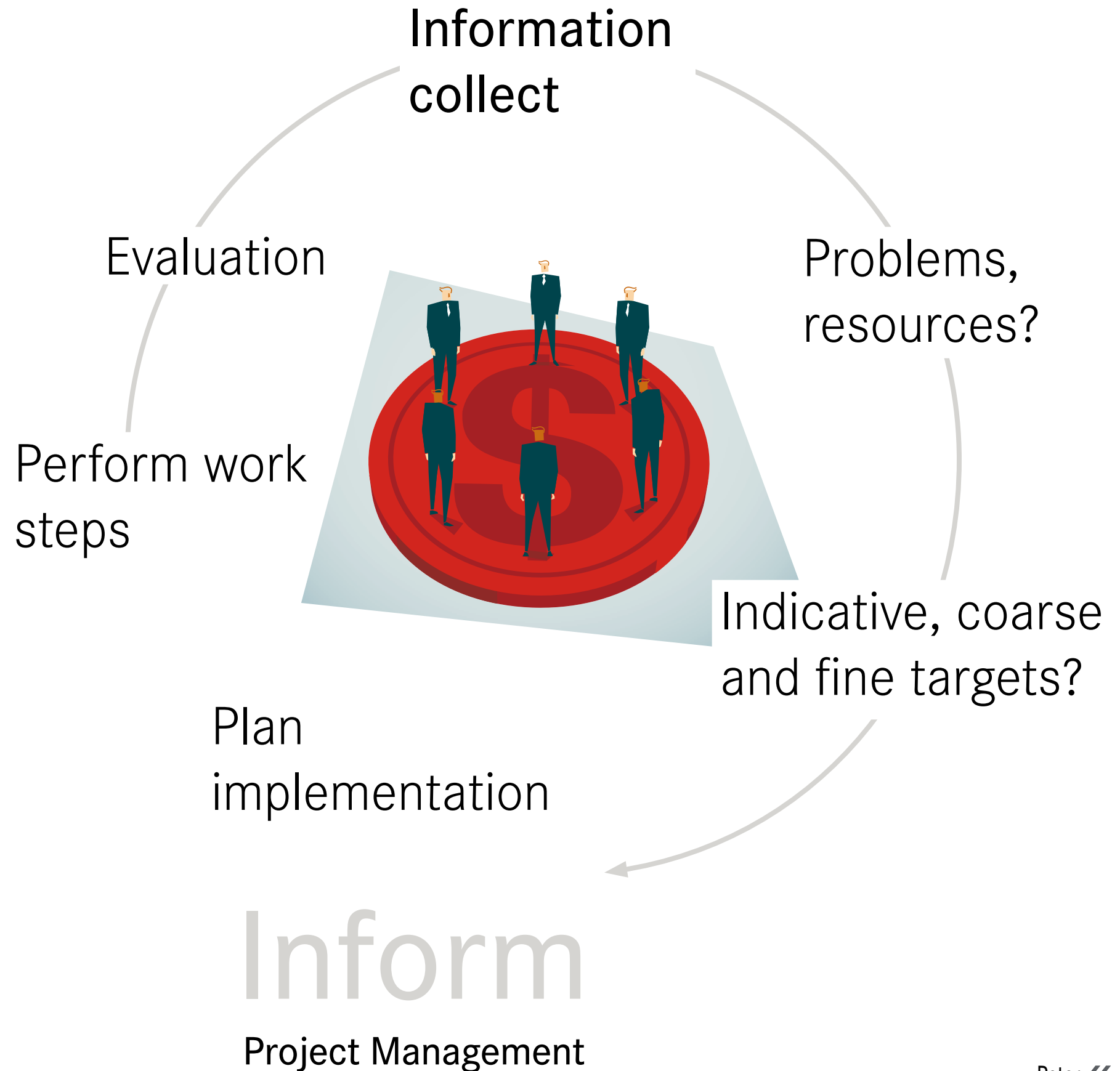


Inform

Project Management

Obtain and
structure data





Problem-solving process:

Circular and iterative

- Circular: The work scenarios follow a flow logic (process cycle)
- Iterative: The circulation is repeated several times during the realization phase

Analyze and design meticulously

Often, solutions are crafted for issues without fully grasping their intricacy. The outcome: During the implementation phase, significant adjustments are constantly needed. Making corrections during execution is substantially more challenging (by a factor of 8–10) than during the planning phase.

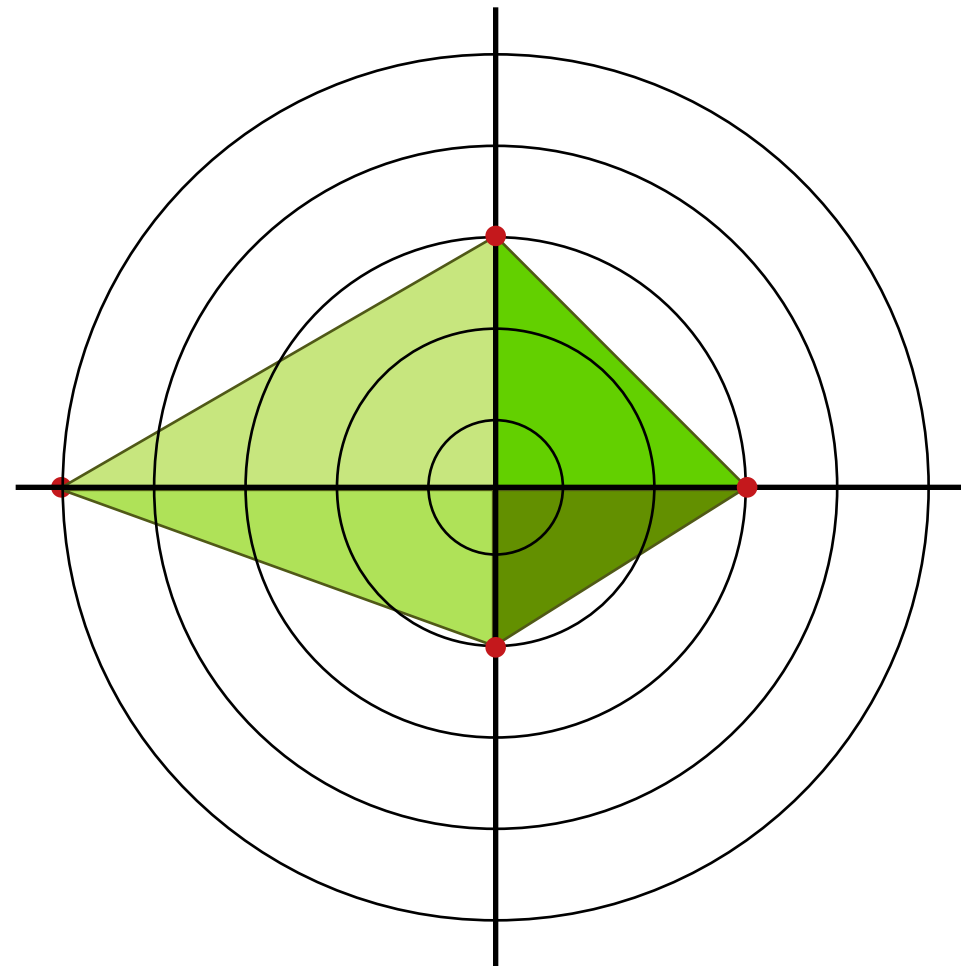
3–4 discuss alternatives, then decide

- Every realization of a problem solving binds resources
- A repetition is not possible

Stakeholder Value
Goals /motivation / claim
Influence
Meaning for project
Role in project
Strengths of the stakeholder
Weaknesses of the stakeholder

Influence of the stakeholder

Impact of his actions



Interest of the stakeholder

Level of stakeholder support

Stakeholder Radar

The stakeholder radar's scale extends from the center outward. At the center, it scores 0 points (indicating poor performance), while the outermost level scores 5 points (indicating excellent performance).

In the given instance, the stakeholder's influence is notably high, yet their support is comparatively low.

Their interest in the project seems to be moderate at best.

Inform
Project Management

Exactly

Does not apply
in any way

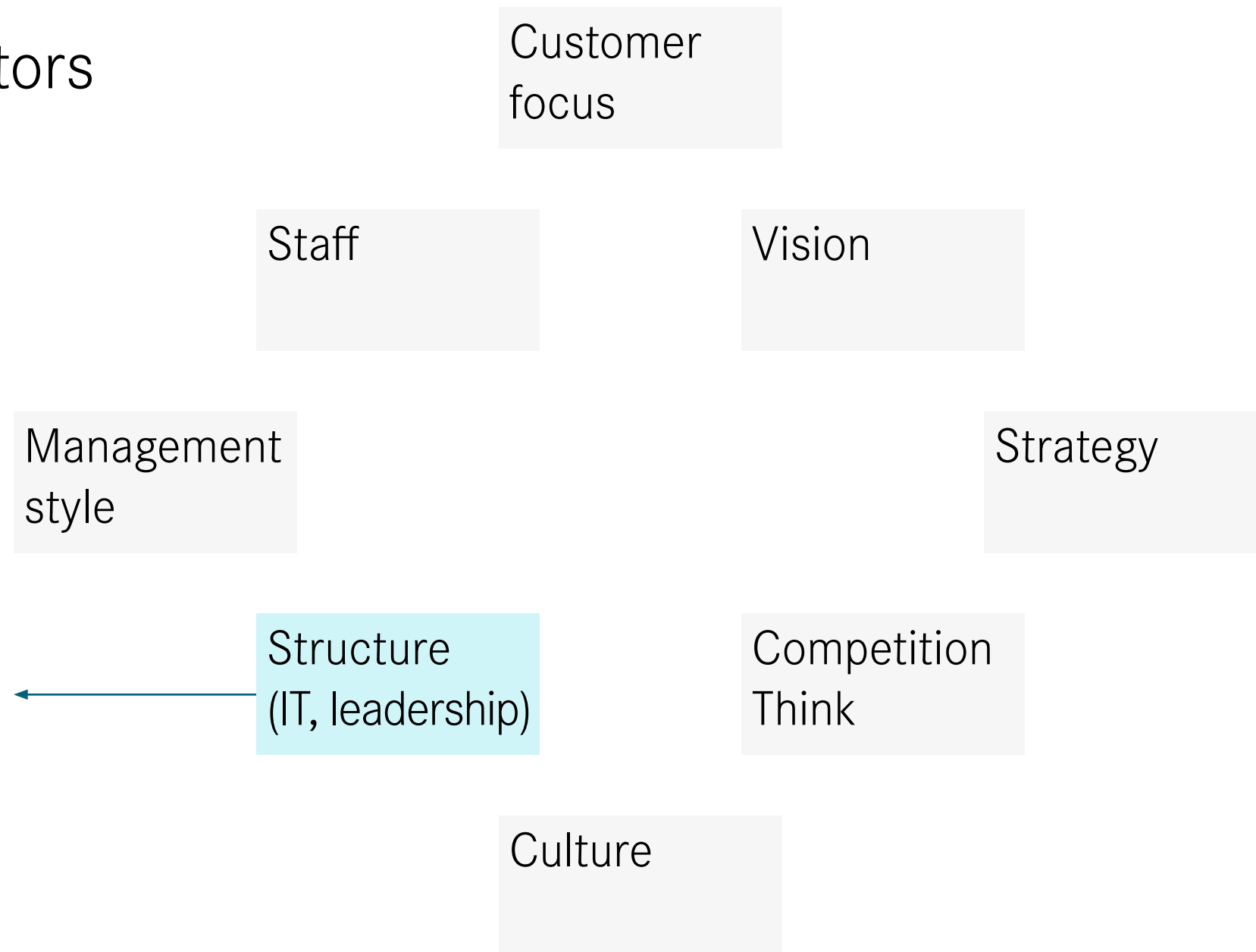


- Identifikation
 - Dealing with me is fair
 - I am satisfied with the ethical-moral tenor
- Basic Needs
 - The working environment is friendly and pleasant
 - I can regularly educate myself on exciting topics
- Intrinsic Motivation
 - I feel inspired to do the best
 - I work beyond the necessary level
- Fitness
 - I proudly tell others where I work
 - My skills and the requirements for me are consistent
- Cohesion
 - The work is cooperative and appreciative
 - I stand behind the good work of my colleagues
- Engagement
 - My work is useful
 - My services are recognized

Inform

Project Management

Eight key factors



IT: «We have a well-functioning database. The folder system, however, is relatively poorly structured. The standard hardware is on average 3–5 years old, the network technology is completely new.

The hierarchy levels are flat. Our executives are 80% responsive at all times. »

Inform
Project Management

Is – Is Not



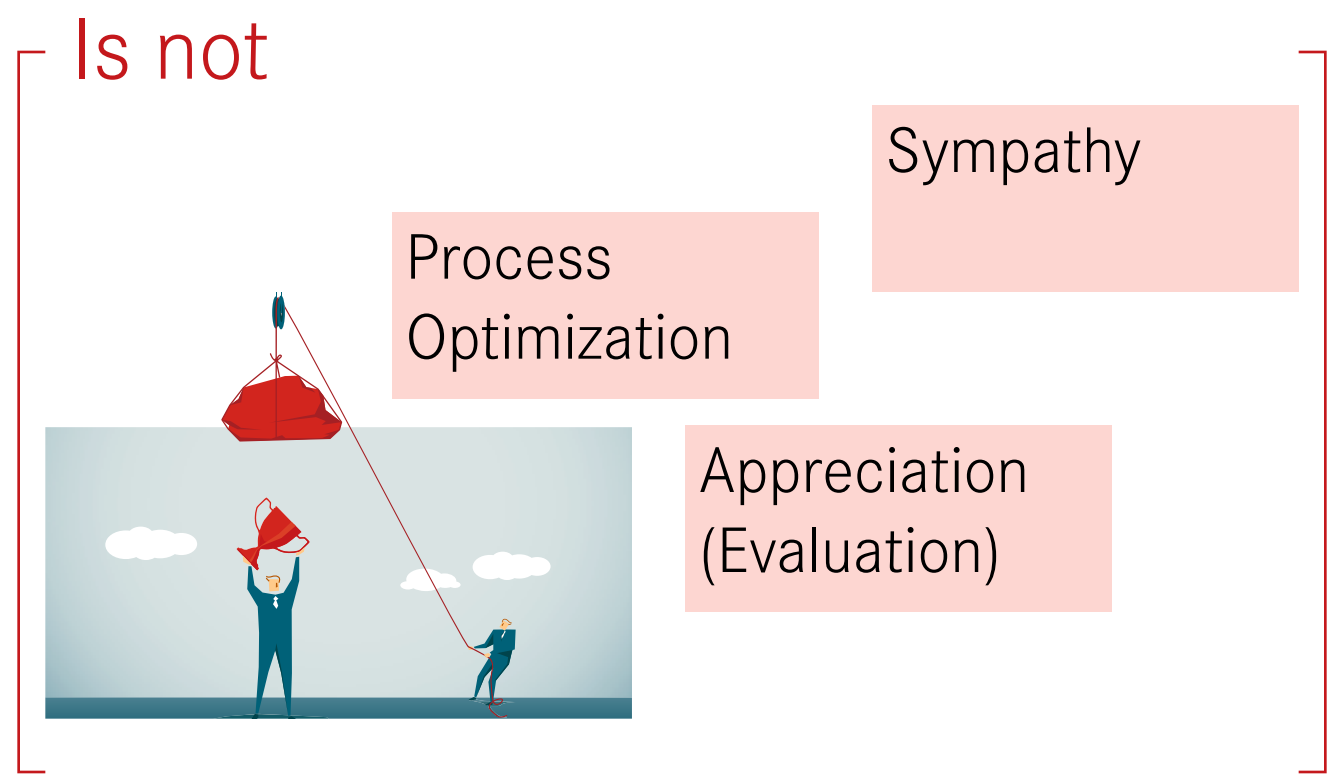
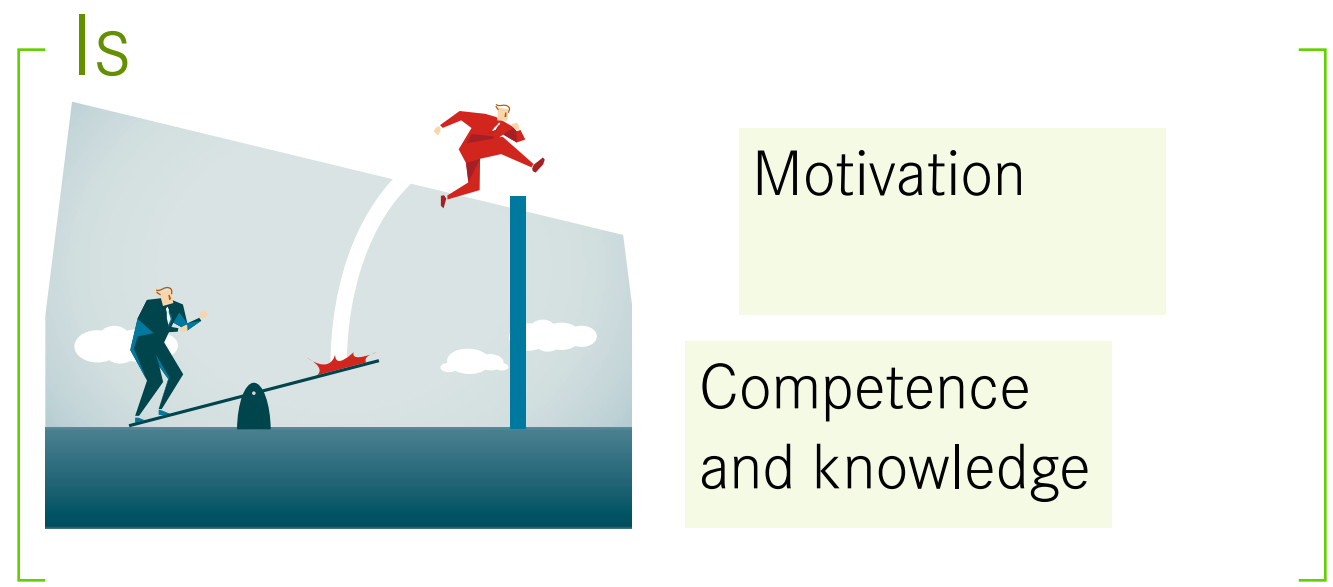
Simple description of the problem to get started

Implementation

- Analogue: on flipchart, pin board, whiteboard... collecting cards, clusters
- Digital: collect keywords using mapping software, cluster them

Question

- Which people and processes are involved – and which are not?
- When does the problem occur – and when / where / how not?

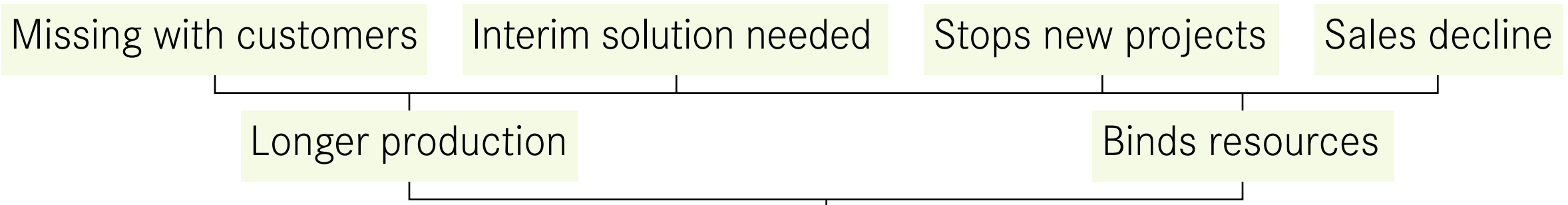


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Hypothesis and Problem Tree (Issue Tree)

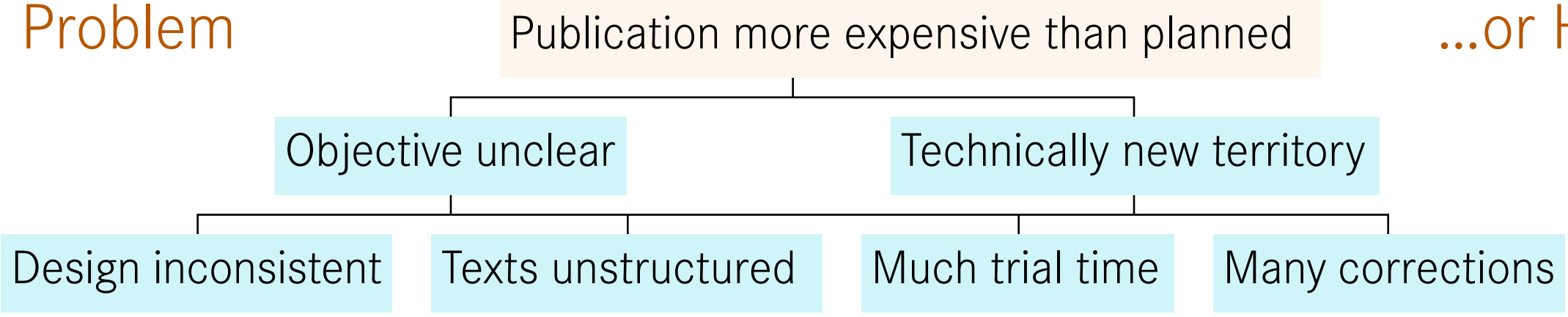


Consequences



Problem

...or Hypothesis



Cause

Hierarchical structure

- Starting from a trunk the contents are differentiated more and more (Mind mapping principle)
- Pay attention to linear dependency when changing levels. Otherwise, logic breaks threaten

Hypothesis instead of problem testing

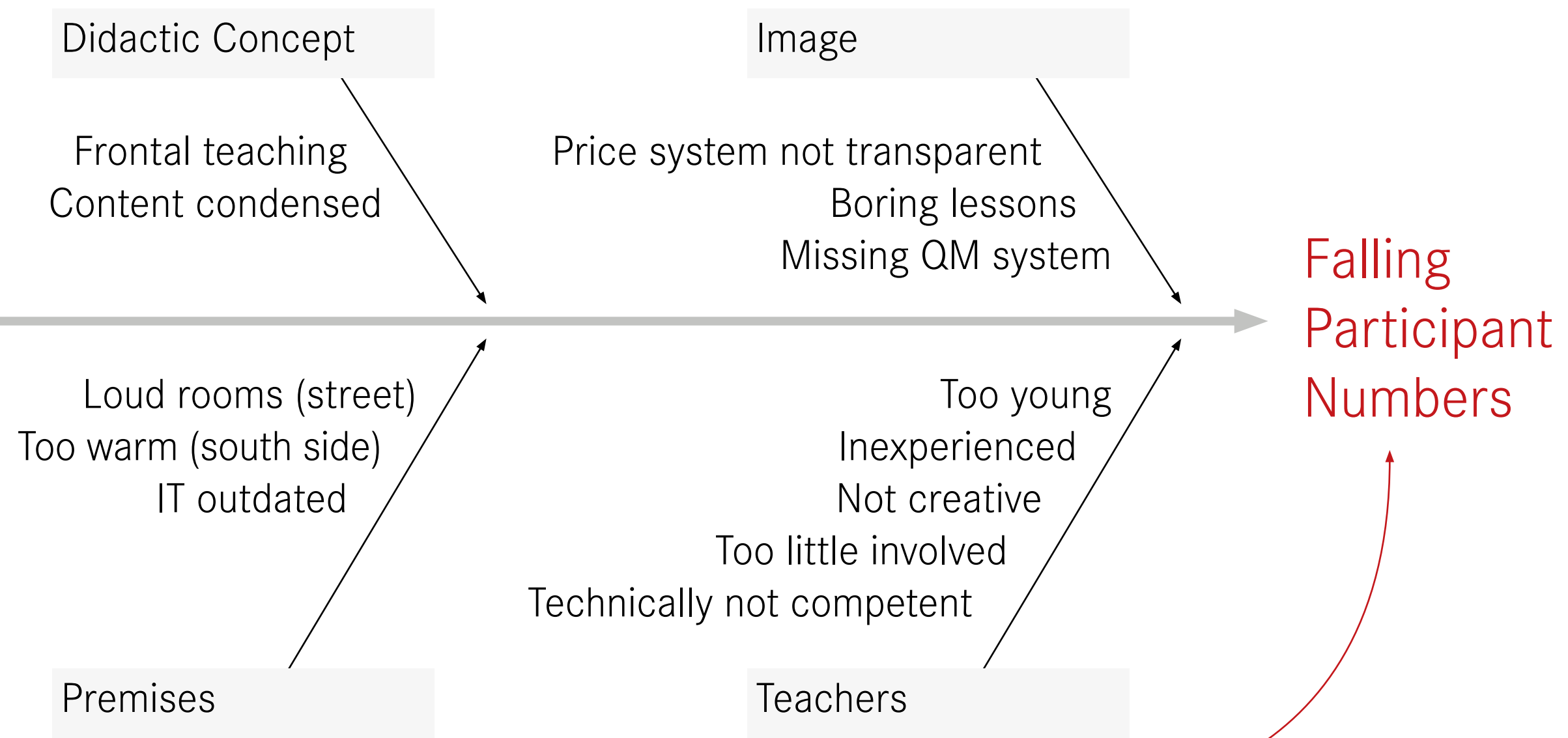
- In this case, no examination of the sequence takes place
- The upper green half is omitted
- Only the cause / logical reason is determined
- Goal: Identify relevant arguments

Formulate problem or hypothesis

Action-oriented

Inform
Project Management

Ishikawa Diagram («Why is sth happening?») ⏪ ⏩



Inform
Project Management



Morphology Matrix



Goal: Inform the employees about topic xyz

Work Step *Conceivable characteristics of the work step*

Research Literature research **Online** Survey, interviews

Results Word document Mental Link Collection **Knowledge-Mapping**

Evaluation Alone **Alone, with coach** Team Team with coach

Presentation Blog Essay **Lecture** Wiki Film/Podcast Poster

Color coded (red)
Selected characteristics
of the work step



Inform
Project Management

Information: Reflection 1/2



Exactly

Does not apply in any way

Have you clarified the general conditions of the project?

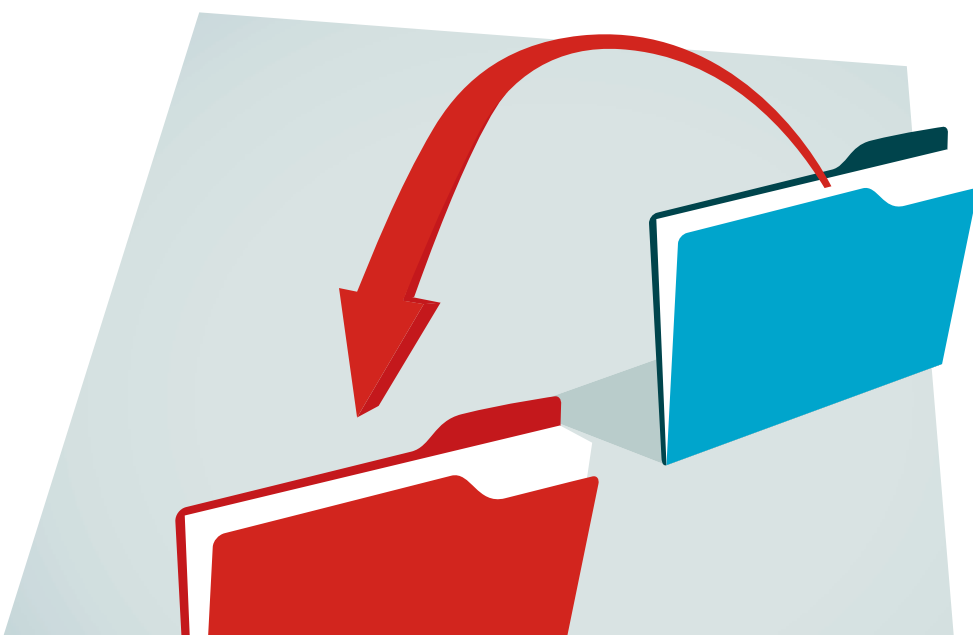
Do you know the stakeholders and their influence on the project?

Is there clarity about how the goals are measured?

Do you have enough skills to solve the problem?

Do you know who is affected by the problem?

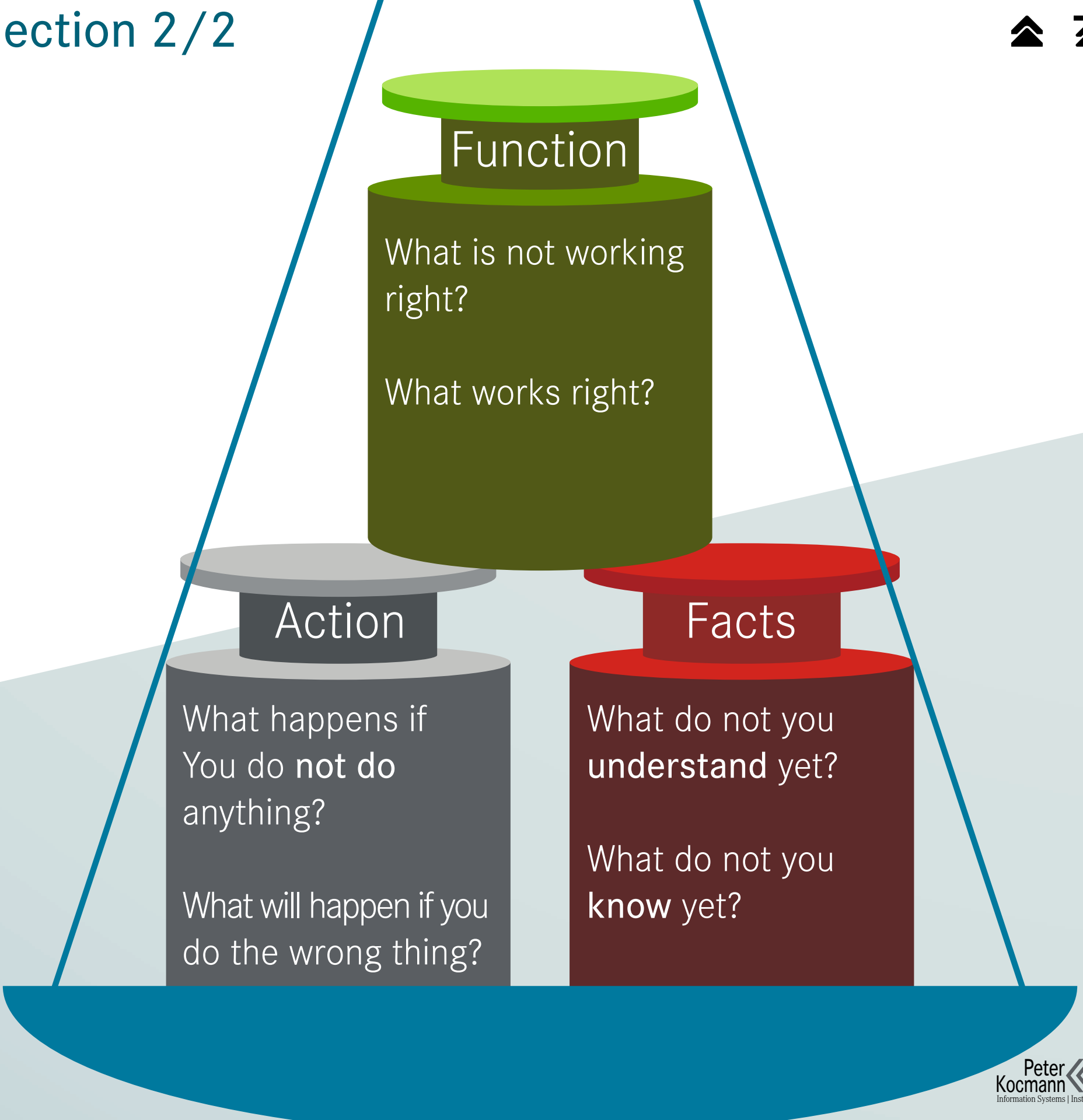
Do you know what resources you can use for the project?



Inform
Project Management

Inform

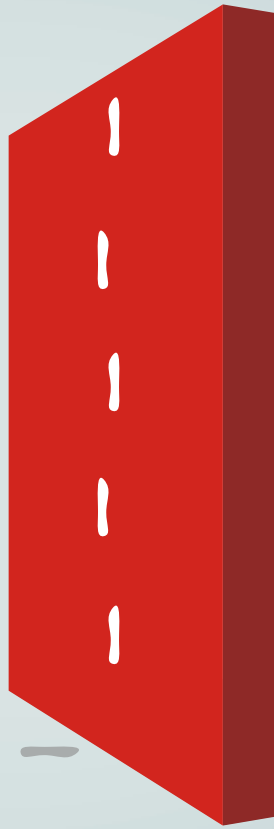
Project Management





Analyze

Project Management

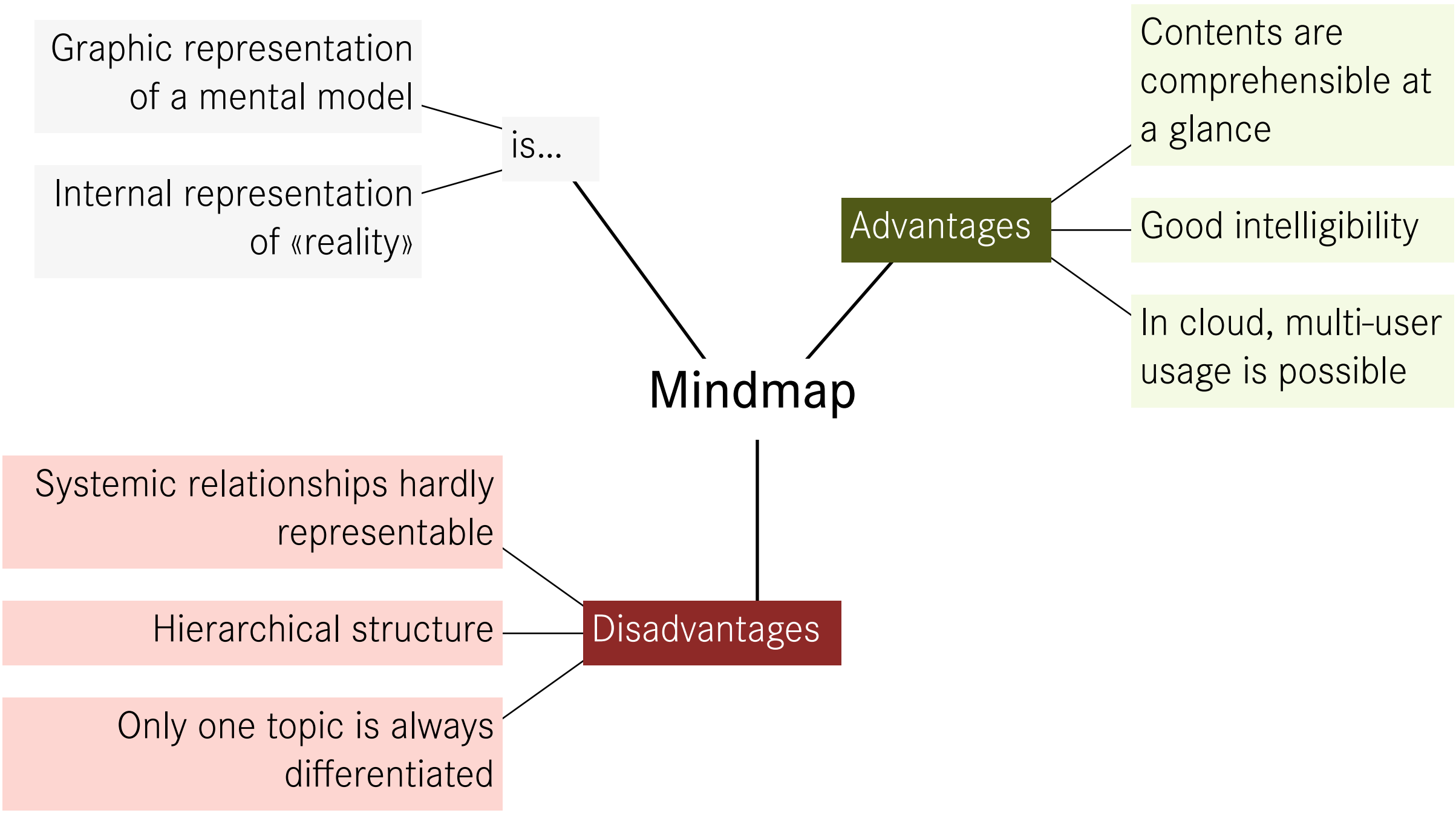


What is the Problem?

Analyze: Reflection 1 / 2

Analyze: Reflection 2 / 2

- Mindmap
- Feedback Mechanism Diagram
- SWOT Analysis:
Today and Future View
- SWOT / ABC Chart:
Strategy Development
- Influencing Factors Analysis (Table)
- Influencing Factors Analysis (Chart)
- Sociogram
- Relational Data Model



Analyze

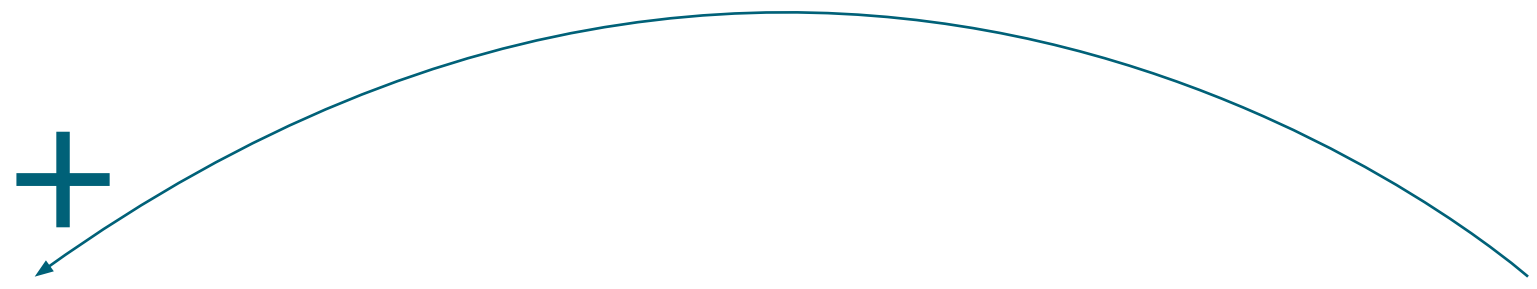
Project Management

Feedback Mechanism Diagram



Limited growth

Described is a mutually dependent fox-mouse population on an island with limited free space. The populations become alternating both types of animals increase and decrease.



Escalating growth

«Minus» exists in an even number

Growth

Population



Graphical representation of complex relationships

Graphic instead of text

The prevalent text-based depiction of systems is often seen as less optimal.

Why? Texts typically offer only linear-hierarchical organization, which might lead to confusion, blending the inherent logic of the described knowledge with its textual representation. The significant issue: The intertwining of the content isn't evident. This challenge persists across various knowledge domains and is fundamentally rooted.

Moreover, texts can't be grasped «in an instant.» In contrast, visual representations offer a holistic view, making connections and dependencies more discernible.



Stabilizing feedback

«Minus» exists in an odd number

Free space



Analyze

Project Management

SWOT Analysis: Today and Future View



Internal View

Strengths

- What are you good at? How so?
- What do customers appreciate about you?
- What can you do, what others can not? Why?

Weaknesses

- Which competences are missing you?
- What failures did you have?
- Which clients do you criticize? Why?

Strength



Weaknesses



External View

Opportunities

- Are there / will there be market changes in your favor? Which?
- Which clients can you acquire? Why?

Threats

- Which circumstances threaten the company? Why?
- What do your competitors do?

Opportunities

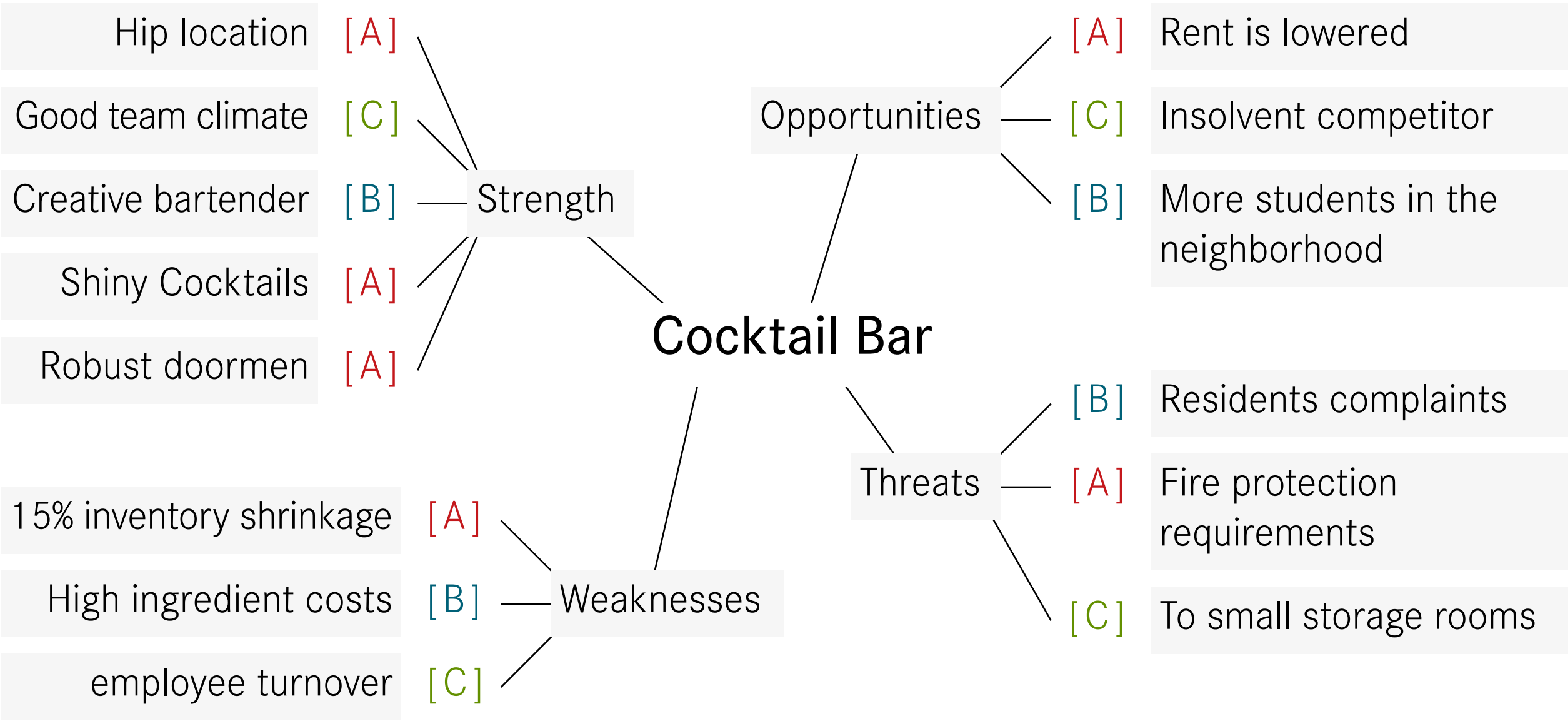


Threats



Analyze
Project Management

SWOT / ABC Chart: Today and Future View

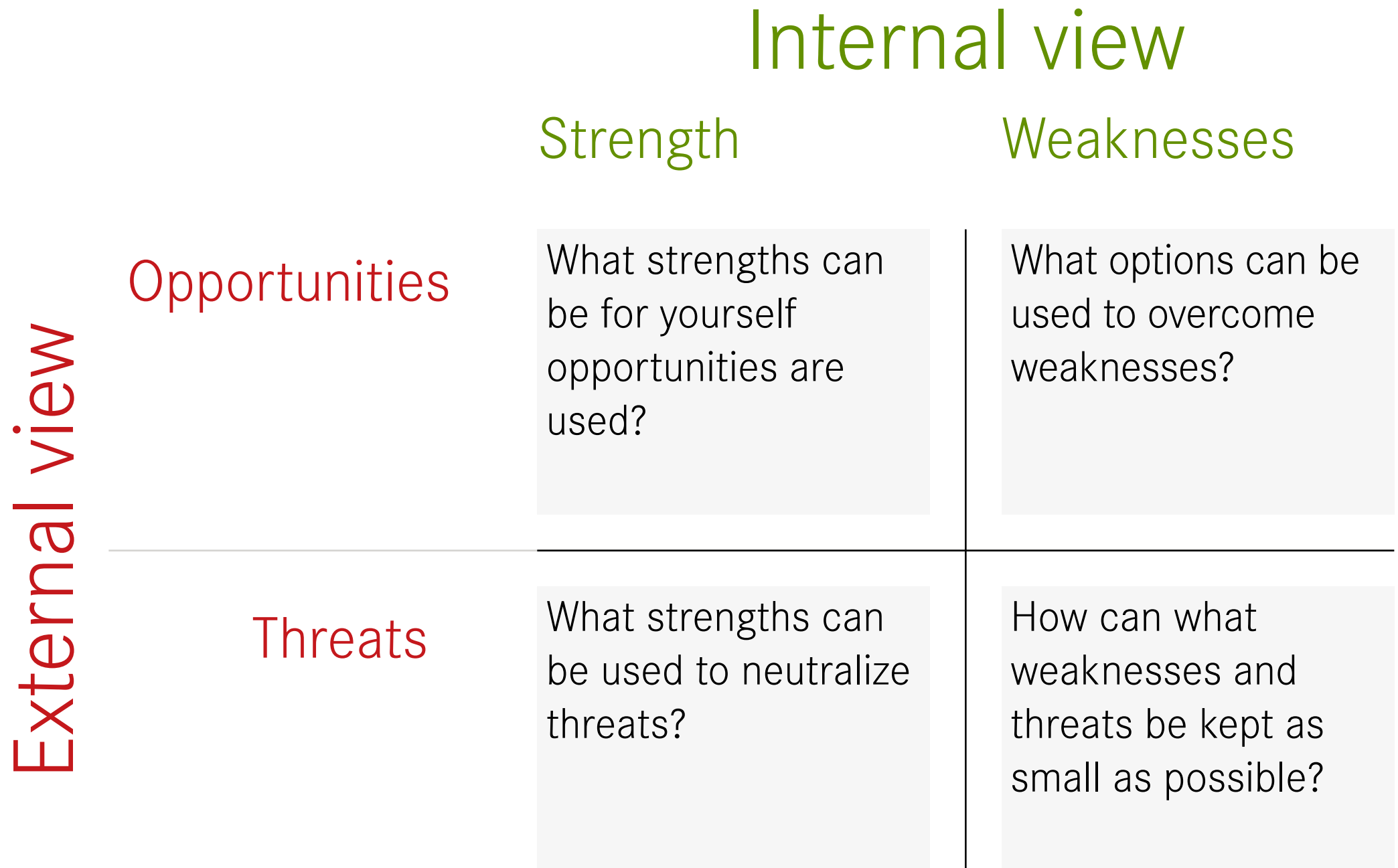


[A] Very important

[B] Important

[C] Unimportant

Analyze
Project Management



Analyze
Project Management

Strategy Development

- The findings from the strategy mind map are summarized in a four-field matrix
- The graphic demonstrates the possible questions per quadrant

Influencing Factors Analysis (Table)



What success is the **concept of web communication** if the information **needs of the customer** are known?

[0] No success | [1] Small success | [2] Lot of success | [3] Outstanding success

y Axis
▼

	Know the customer's information needs	Design web communication	Use project methods	Σy
Know the customer's information needs	0 	1	1	2
Design web communication	← 3	0	1	4
Use project methods	2	0	0	2
Σx	5	2	2	

- X axis
- Is cause and works on...
 - Has active role, is independent
- y-axis
- Is effect and is influenced by...
 - Has passive role, is dependent on x-axis value

Analyze
Project Management

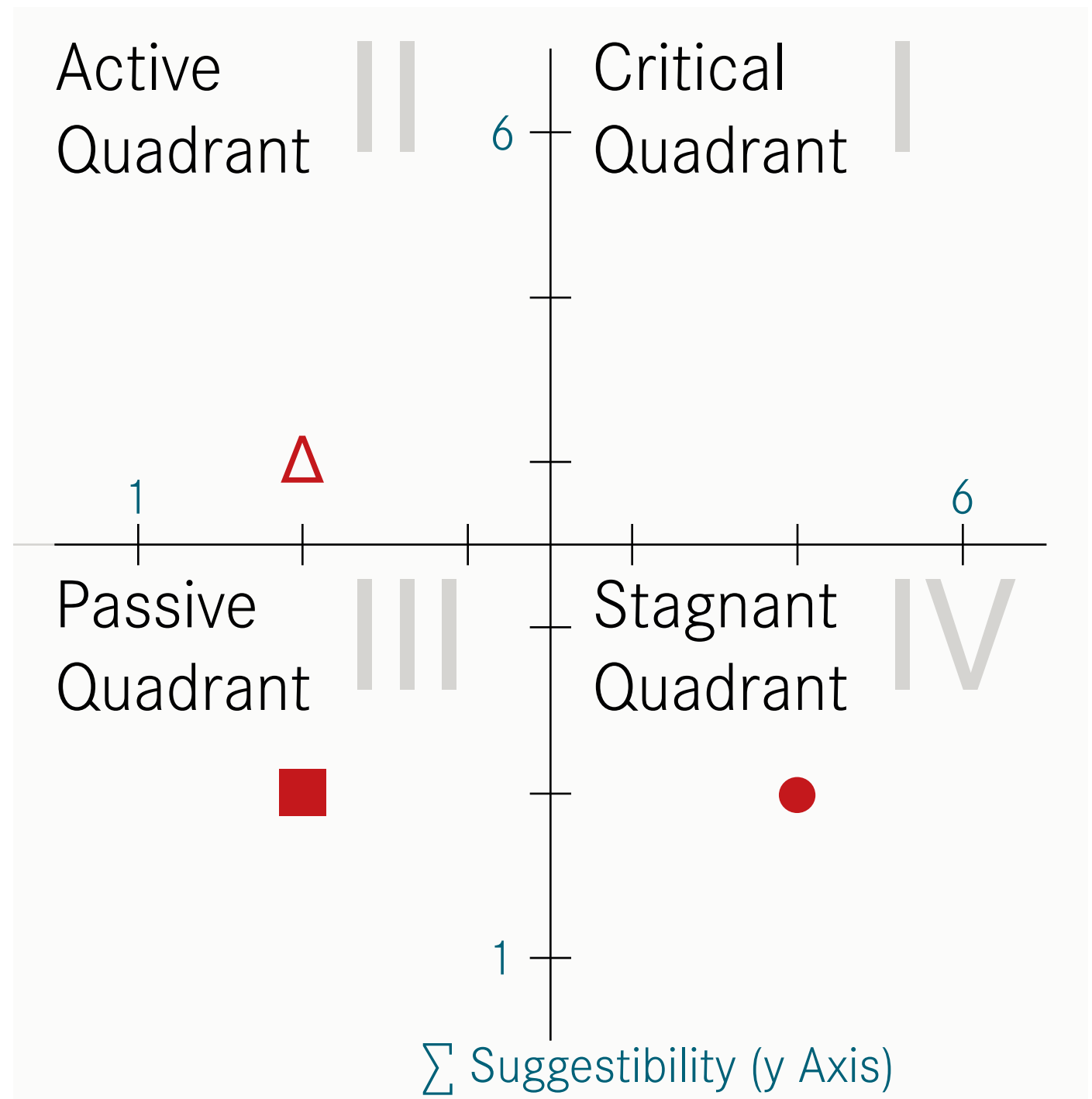
Influencing Factors Analysis (Chart)



Quadrant Evaluation

- Items in the critical and active quadrant should be examined intensively
- Items in the stagnant quadrant can be considered subordinate
- Items in the passive quadrant can be neglected

∑ The option of influencing (x Axis)



Analyze
Project Management

Influencing factors of the system

	∑ x Axis	∑ y Axis
● Know the customer's information needs	5	2
△ Design web communication	2	4
■ Use project methods	2	2

Sociogram



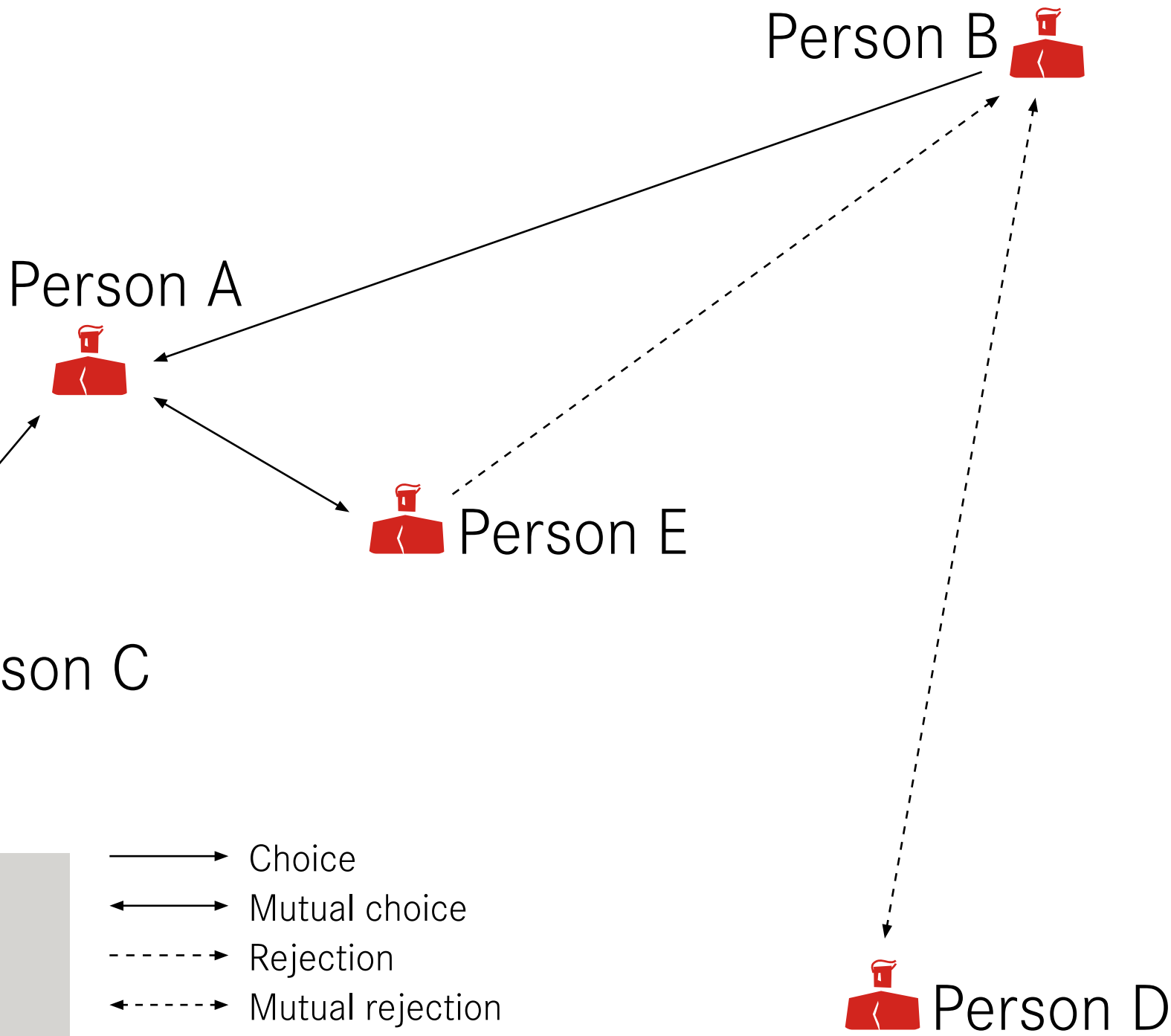
Visualization of social relationships

Using a sociogram, the social relationships within a group are examined.

There are two visualization elements:

- The lines describe the quality of the relationship
- The sketched relative proximity / distance of a person to the other persons describes the emotional proximity / distance of the group members to each other

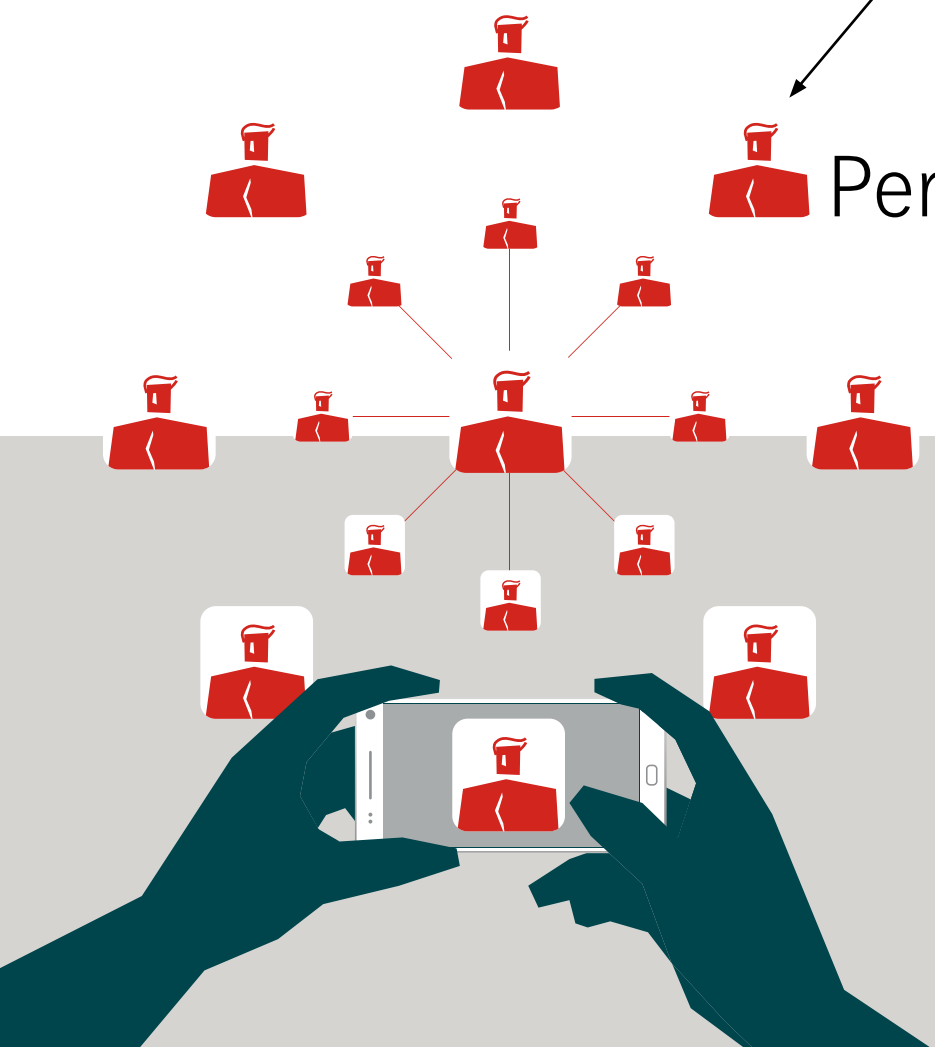
A sociogram should **not** be made available to the group. Undesirable group dynamic processes, e.g. the commitment of group members to specific roles.



- > Choice
- >< Mutual choice
- - - -> Rejection
- - - ->< Mutual rejection

Analyze

Project Management



Relational Data Model



Backstage Data Storage

Within limits possible with Excel.
Better: MS-SQL server!
Benefit of the server: Data integrity is significantly better protectable than in Excel.

- Also:
- Free
 - Basics easy to learn
 - Robust
 - Harmonizes well with Excel
 - Data access rights finely granulated



Frontstage Data Analysis

- Excel
- R, SQL Server (free)

fact_Student_Study

ID	Study_fi	Student_fi
1	1	522
2	3	371
3	3	657

dim_Student

Matrikel	First Name	Last Name
522	Lena	Archer
371	Alex	Browne
657	Fabi	McCane

dim_Study

ID	Study
1	Physics
2	Math
3	Biology

tbl_Student_Study

Matrikel	First Name	Last Name	Study
522	Lena	Archer	Physics
371	Alex	Browne	Biology
657	Fabi	McCane	Biology

Analyze
Project Management

Exactly

Does not apply in any way

Did you remove your ego from the field during analysis?

Did you use statistical tools for your analysis?

Have you used knowledge maps for analysis?

Has the analysis been carried out profoundly and multilayered by you?

Were the analysis results clearly documented by you?

Did you fully document the analysis results?



Analyze

Project Management

What exactly is the problem – and what does it not consist of?

Structures / factors

- Which relationships and structures characterize the situation / problem?
- Which problem factors influence the problematic situation to be solved?

Components

- Which social component has the problem?
- Which technical component has the problem?



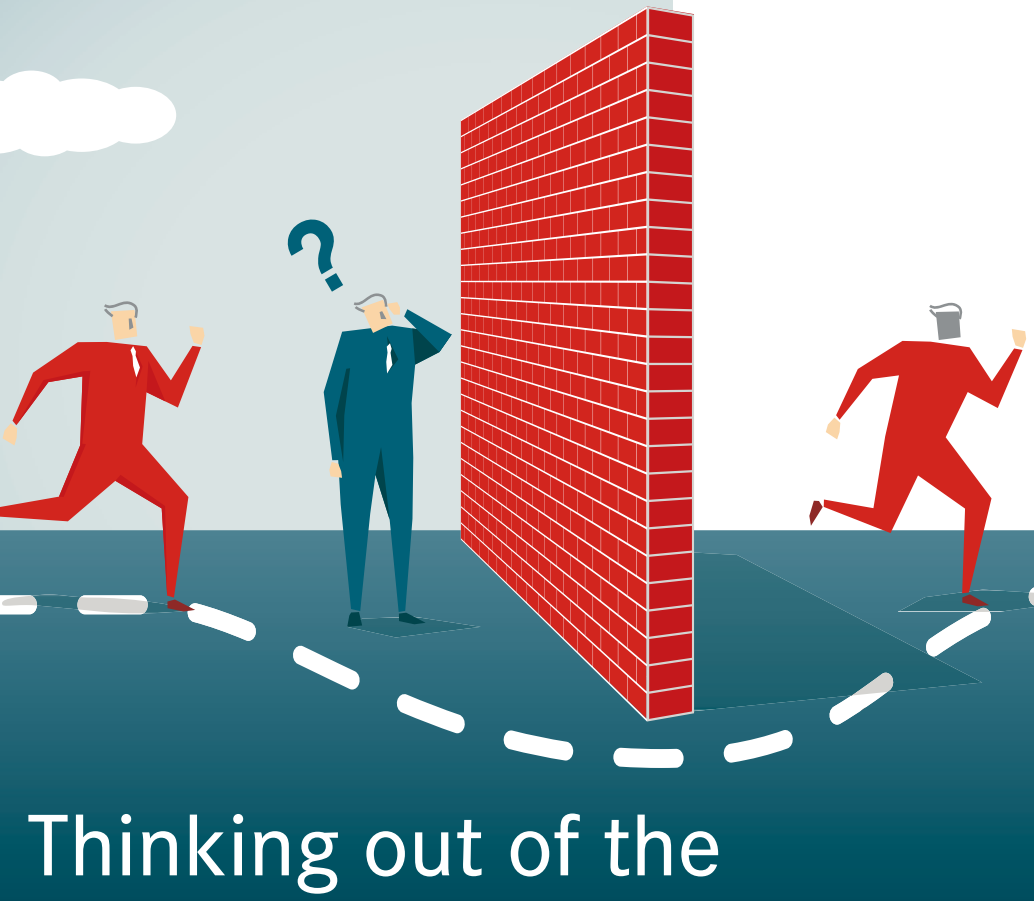
Analyse

Project Management



Solve Problems

Project Management



Thinking out of the
Box

- SMART Goals
- Brainstorming
- 6–3–5 Tool
- Clust Cards
- Six Thinking Hats (DeBono)
- Merlin Technology
- Ideas Check
- Program Flow Chart

Solve Problems: Reflection 1 / 2
Solve Problems: Reflection 2 / 2

«Learn statistics as fast as possible»

«Edit two lessons per week»

All participants agree

The destination is accessible

«Done on 15/11/2019»

Specific

Measurable

Accepted

Realistic

Terminated



Solve Problems

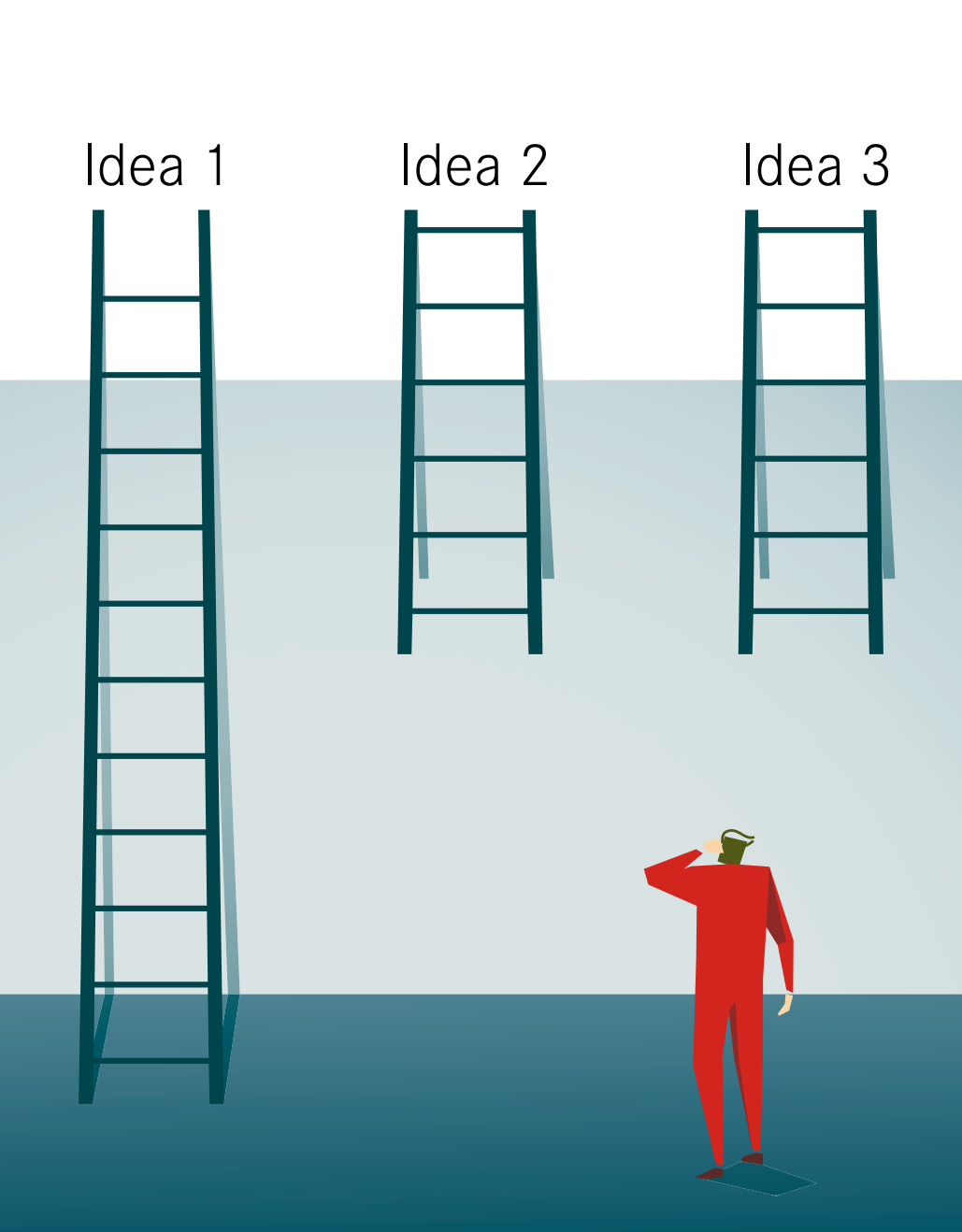
Project Management

Brainstorming



Collect Ideas

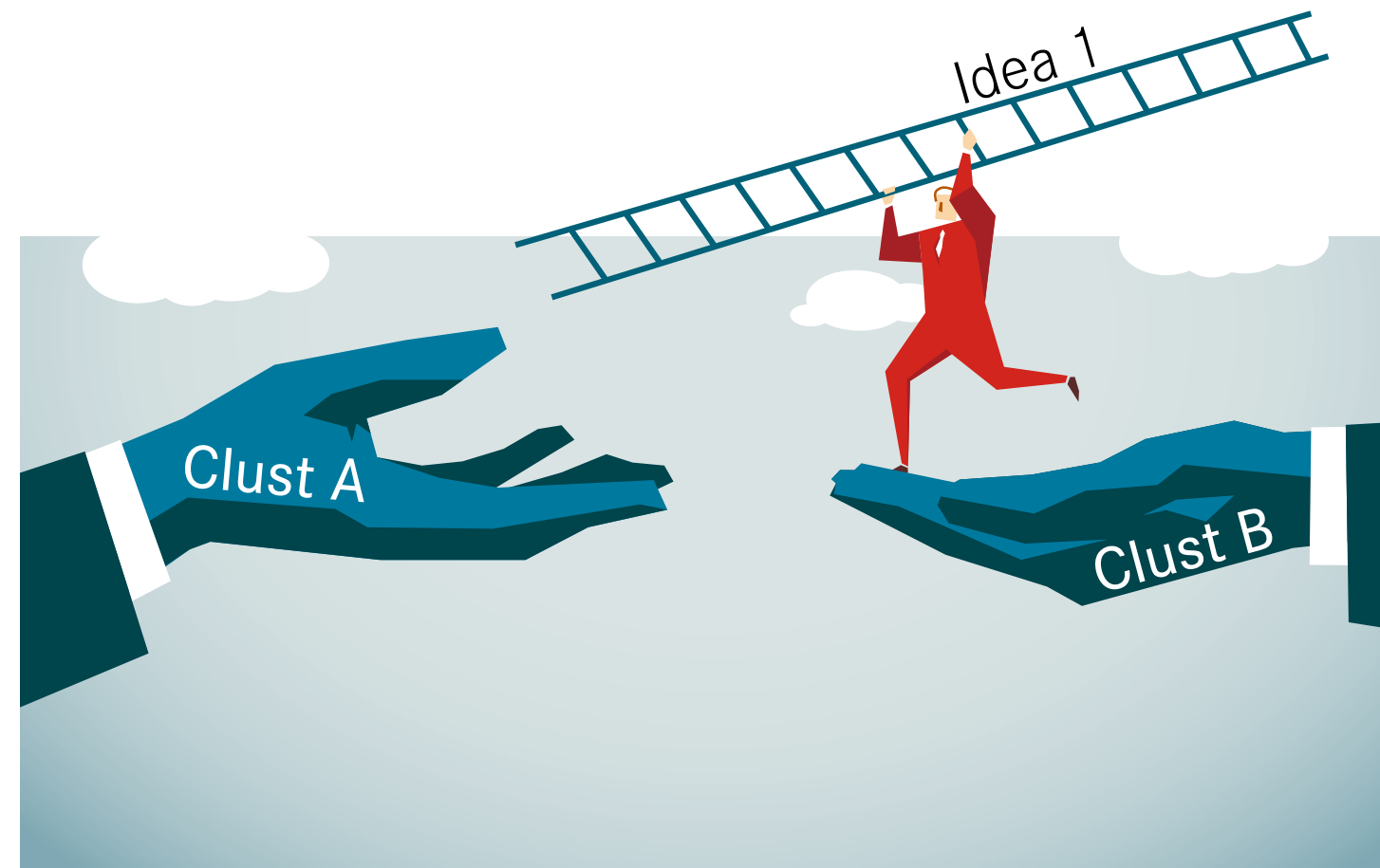
Important: Do not evaluate the ideas!
It depends on the amount of ideas, not on their quality. All ideas should serve as inhibitors for ever new ideas.



Structure and Evaluate Ideas

Conceivable working techniques

- Clust cards
- Mind mapping



Solve Problems

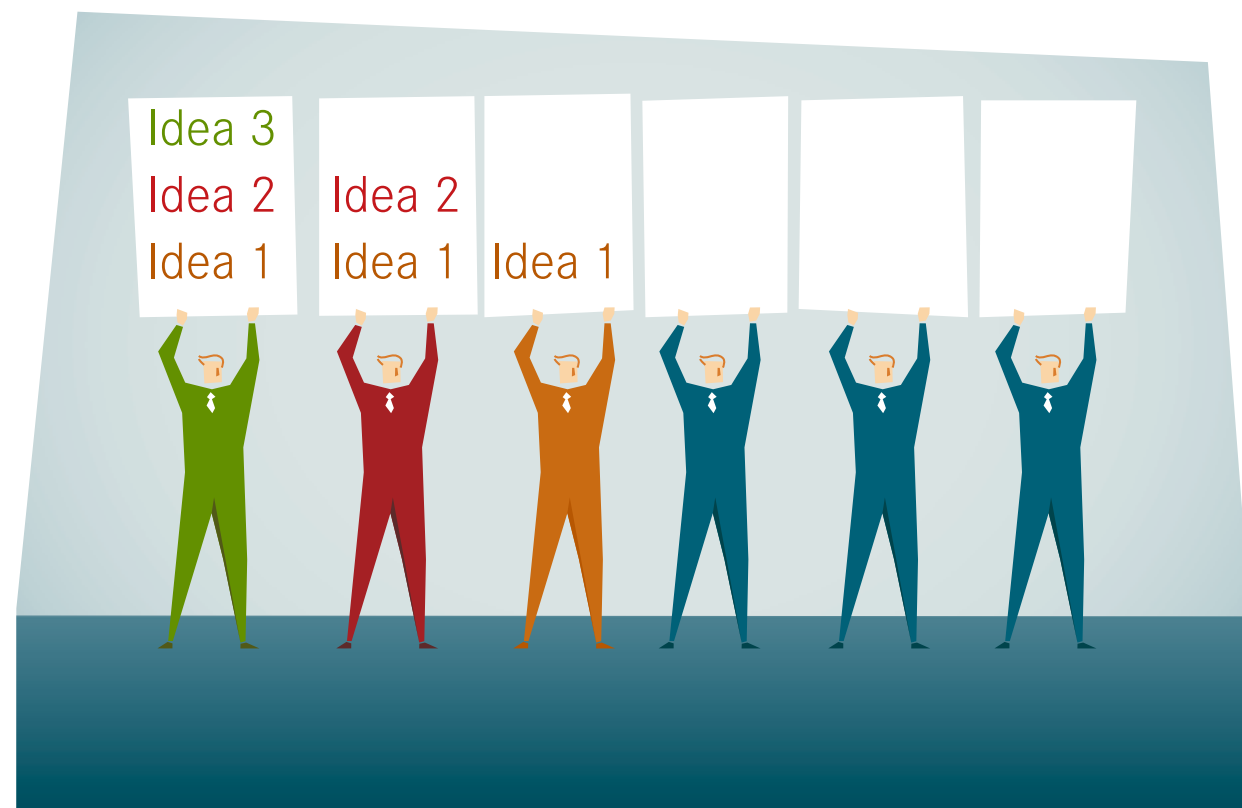
Project Management

The Silent Variant of a Brainstorm

- 6 people write
- 3 ideas within
- 5 minutes on every three cards
- Then the three cards described are passed on
- The card receiver is inspired by previous entries

Advantage Over Classic Brainstorm

Silent participants are going through loud participants hardly affected in brainstorming



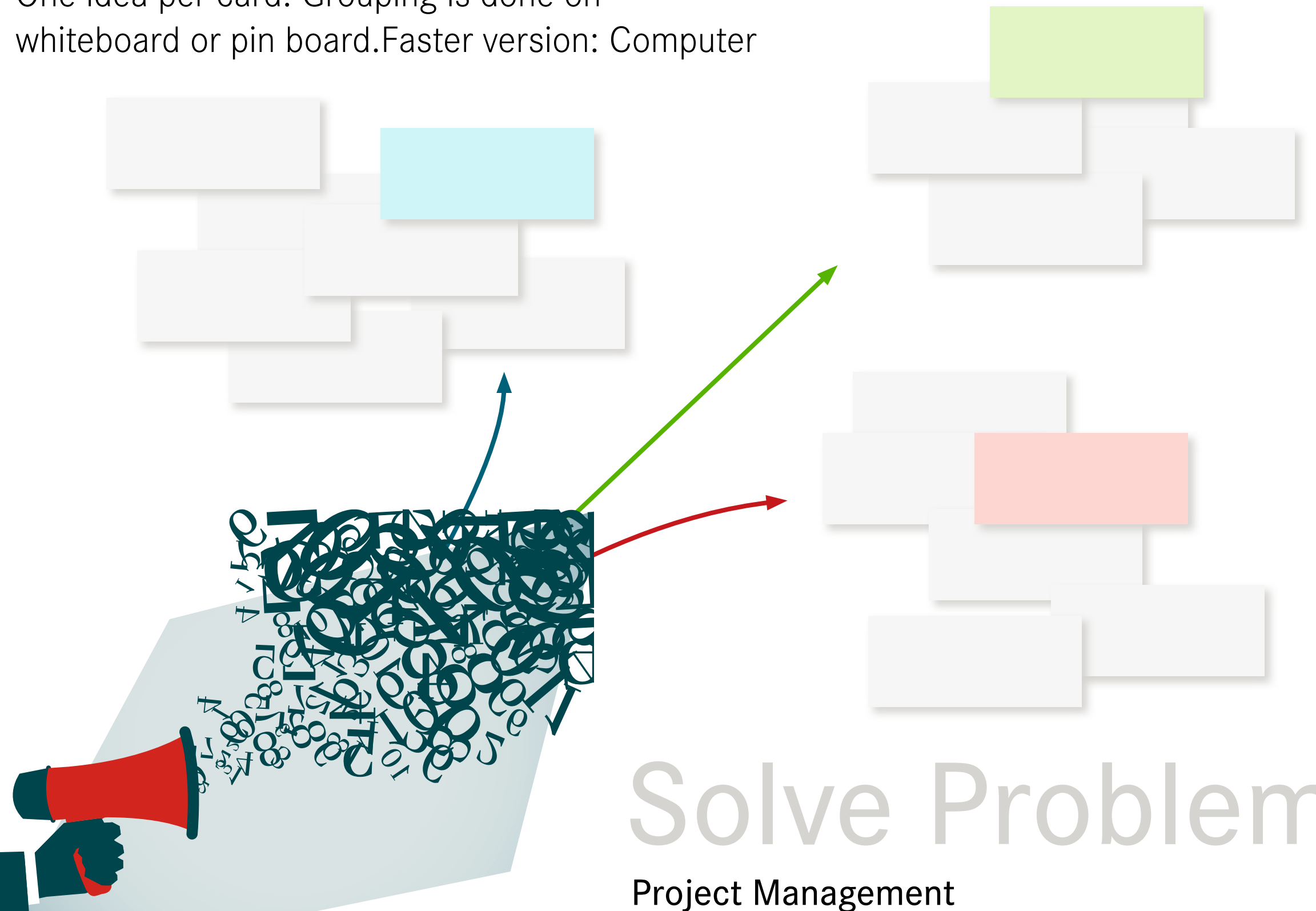
Solve Problems

Project Management

Clust Cards



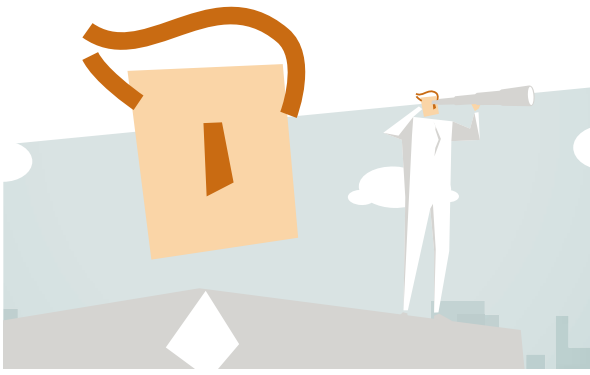
One idea per card. Grouping is done on whiteboard or pin board. Faster version: Computer



Solve Problems

Project Management

Six Thinking Hats (DeBono)



The Analyst

«Blank page»

Lens focused.
Facts, numbers, goals, solutions are his world.



The Moderator

«Open, free sky»

Surveys all processes. His strength is to transform chaos into structure and order.



The Doubter

«Paint it Black»

Critical troubleshooting. News is evaluated skeptically and reserved.



The Optimist

«Sunshine»

Speculated positive and expectant about the future.



The Emotional

«Fire and heat»

Pay attention to opinions and feelings. Acts subjectively and emotionally.



The Creative

«Growth»

It is easy for him to think in an associative way.
He develops new inspiring ideas.

Idea: Temporarily taking on one of the roles in a conversation. Supposedly «weird» positions represent the role, not the role owner.

Solve Problems

Project Management

Use Differently

For what and in which contexts can the idea still be used?

Enlarge

How can you enlarge it... with more power, length, strength, height, frequency, benefits... ?

Set Up

Which structures can be rearranged?

Adjust

Are there similar ideas?
Where? Are there analogies in nature? Is a grouping possible?

Decrease

How can you make it smaller or softer... thinner, cut something out, easier... ?

Turning Back

What needs to be done so that the problem can not be solved?

Redefine

Can the meaning of color, shape, sound, smell, size... be changed?

Replace

Who or what instead?
Other content, processes, materials, places, times... ?

Combine

Can the solution be broken down into modules?
Can units be combined?



Solve Problems

Project Management

Exactly

Does not apply in any way

Have you realized all the benefits of problem solving?

Have you covered all the risks of your problem solving?

Have you developed a new concept (no adaptation)?

Have you considered the rejection of your problem solution?



Have you considered and worked out an alternative idea?

Is your problem solving easy to implement?

Are you really solving a real problem?

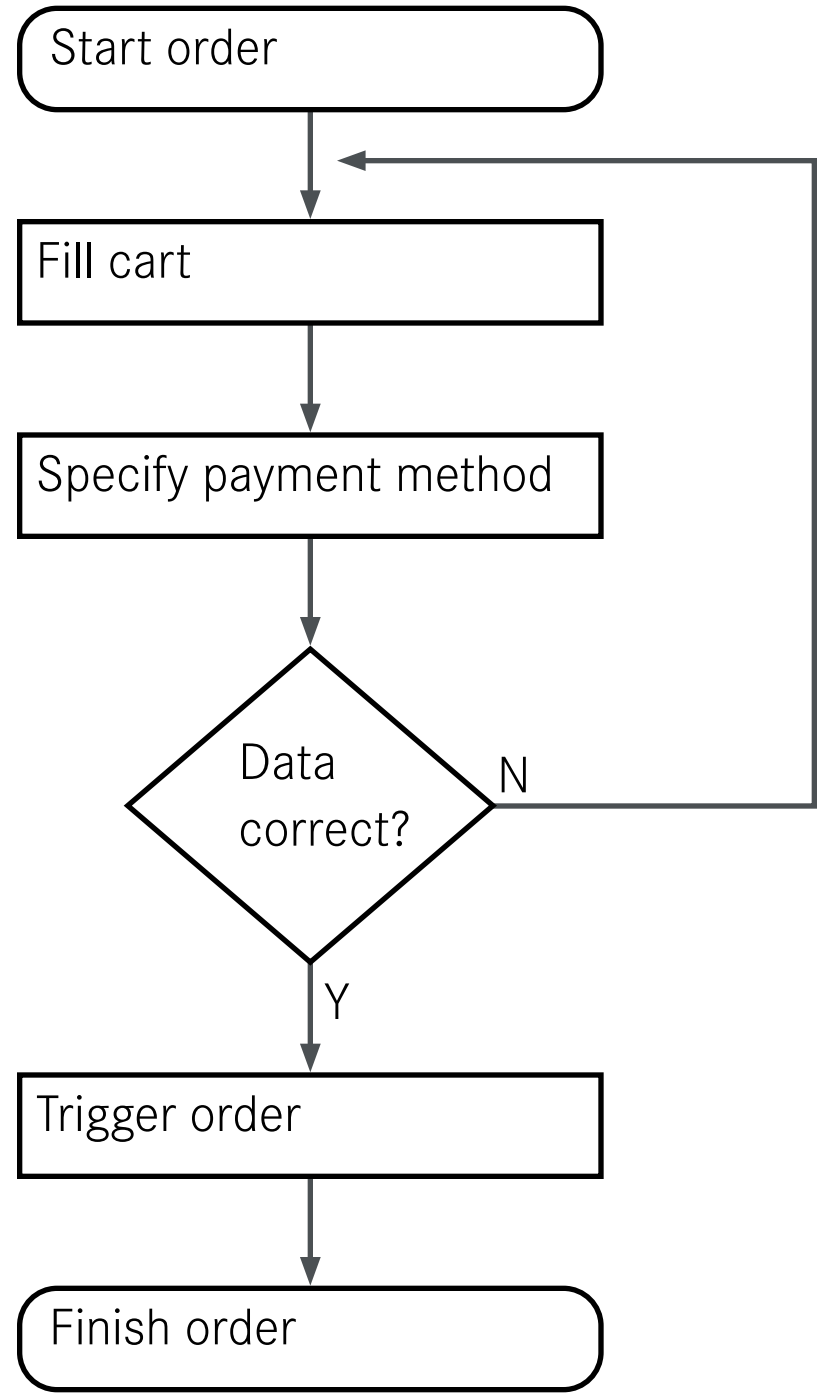
Did you troubleshoot your problem solution?

What long-term successes do you expect? What does the competition at the site offer?

Solve Problems

Project Management

Program Flow Chart

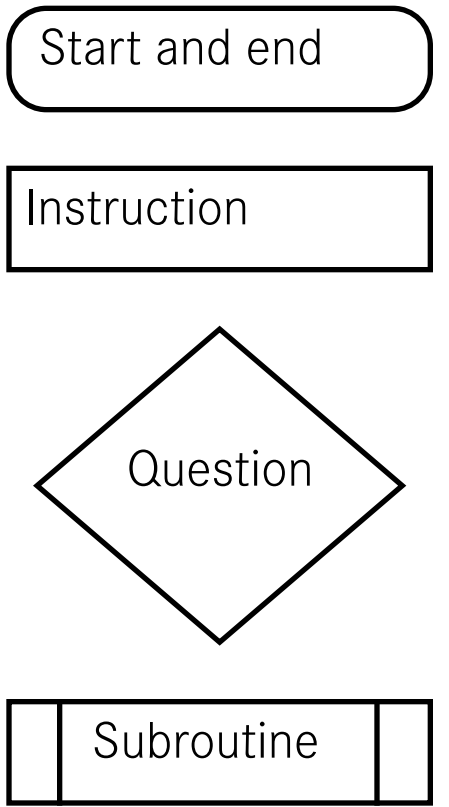
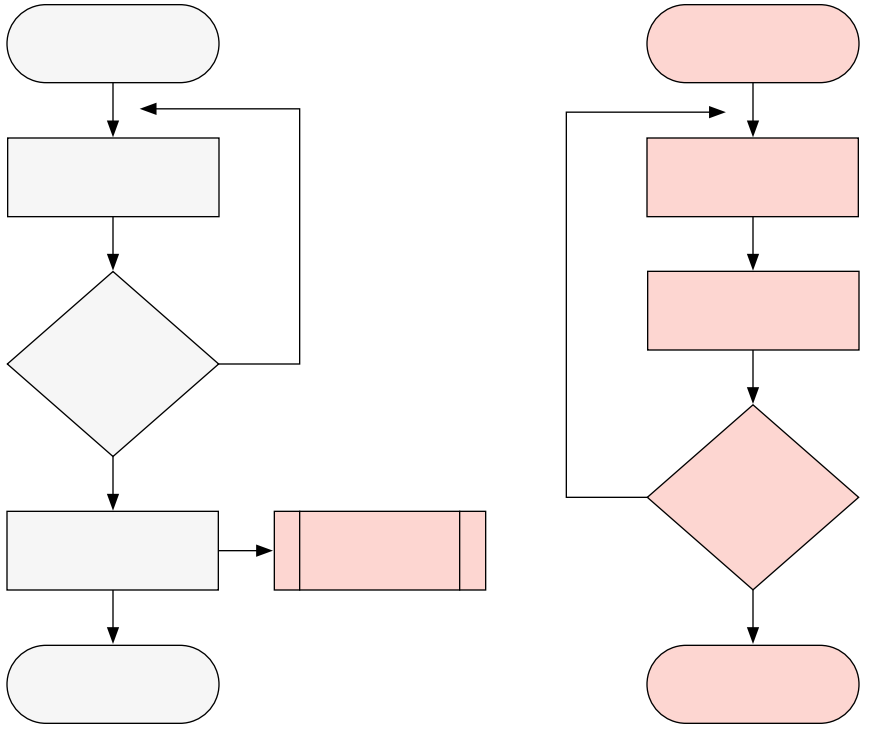


DIN 66001

Simple process icons

- Program logic of software
- Process description of a data evaluation

Process transfer to red subroutine (multiple worksheets)



Solve Problems

Project Management

Exactly

Does not apply in any way

Are all stakeholders in agreement on the goals?

Is there a complete concept for your problem solving?

Have you thought through all the advantages and disadvantages of your solution?

Have you reflected on variants of your problem solution?

Do you know, (1) **Who** (2) **When** (3) **Which** results?

Do you know the risks of your problem solving?



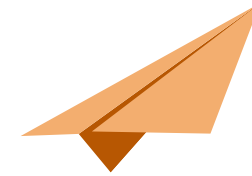
Solve Problems

Project Management

What advantages / disadvantages does your problem solution have?

Processing

- What can not you do, though it would be important for problem solving?
- Who claims that you can not do certain things when solving a problem? Why?



Achievements and Plan B

- What could go wrong?
- What is your plan B if your solution does not work?



Solve Problems

Project Management



BPMN

Business Process Model Notation

Visualize Process Flows

Symbols



Job Posting:
Choreography—Chart



Errorhandling in TSQL
Coding: Multiple Instances



Mail Order Business: Multiple
Use of Sub—Processes



Events



Pools and Message Flows



Solution of a Project Task
Inclusion Subprocess




Errorhandling:
Clients' Contacts



Job Posting:
Collaboration Chart

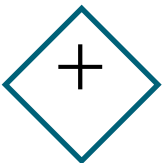
Example

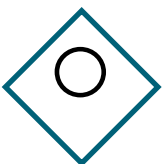
BPMN: Business Process Model Notation Symbols

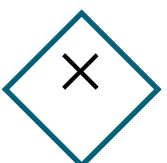
Artifacts  
 Notes, Free Symbols,
 Connectors With Flow
 Objects

Gateways

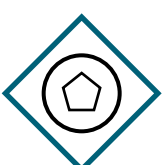
- Split-Gateways: Token divide
- Joined-Gateways: Token merge


 **AND Branching**
 All edges are activated at the same time

 **OR Branching**
 At least one of «N» edges is activated

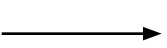
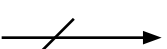
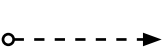
 **XOR Branching**
 Exactly one of «N» edges is activated

Gateways: Event Based


 **Exclusive Instance**
 Process starts when one of the events occurs

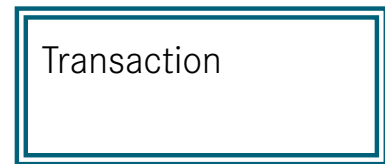
 **Parallel Instance**
 Process starts when all of the events occur

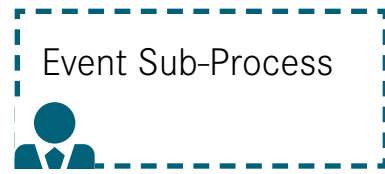
Process & Information Flows

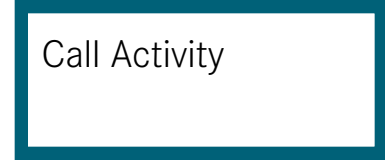
-  **Sequence Flow**
-  **Standard Sequence Flow**
-  **Message Flow**

Activities

 **Work Package (WP)**
 The execution behavior of an activity can be marked optionally.
 ⊕ = Sub-Process reference



 **Transaction**
 A transaction contains a number of work packages.
 A transaction can be undone.

 **Event Sub-Process**
 Integration of an event sub-process into other event sub-process.
 Each activity can be characterized.







 **Call Activity**

- Globally defined process or globally defined work package
- Advantage: Multiple use






Character

-  Shipping
-  Reception
-  User
-  Service
-  Manually
-  Script
-  Business Rule

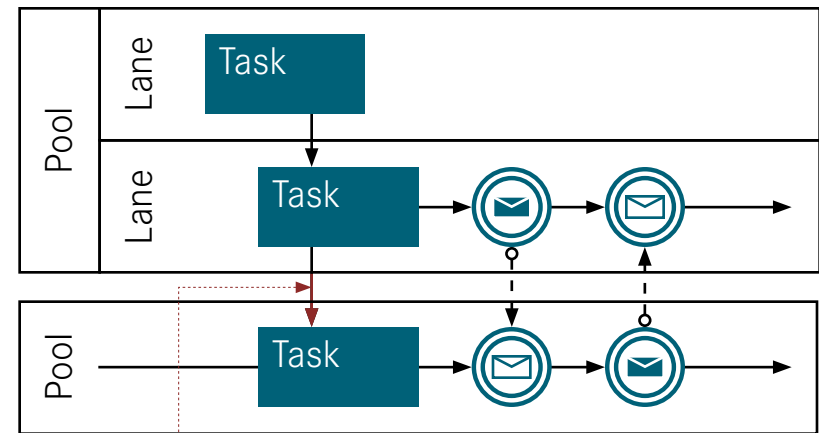
Execution Behavior

-  Loop
-  Ad hoc
-  Sequentially Multiple
-  Sub-Process
-  Compensation
-  Parallel Multiple

Data

-  **Data Storage**
 Exists regardless of process instance
-  **Data Object**
 Representation of information
-  **Data Output**
 Is generated by process instance
-  **Data Input**
 Added to the process instance
-  **List Data Object**
 Special information (order lists, etc.)

Participants: Role, Organization



No sequence flows between pools

BPMN

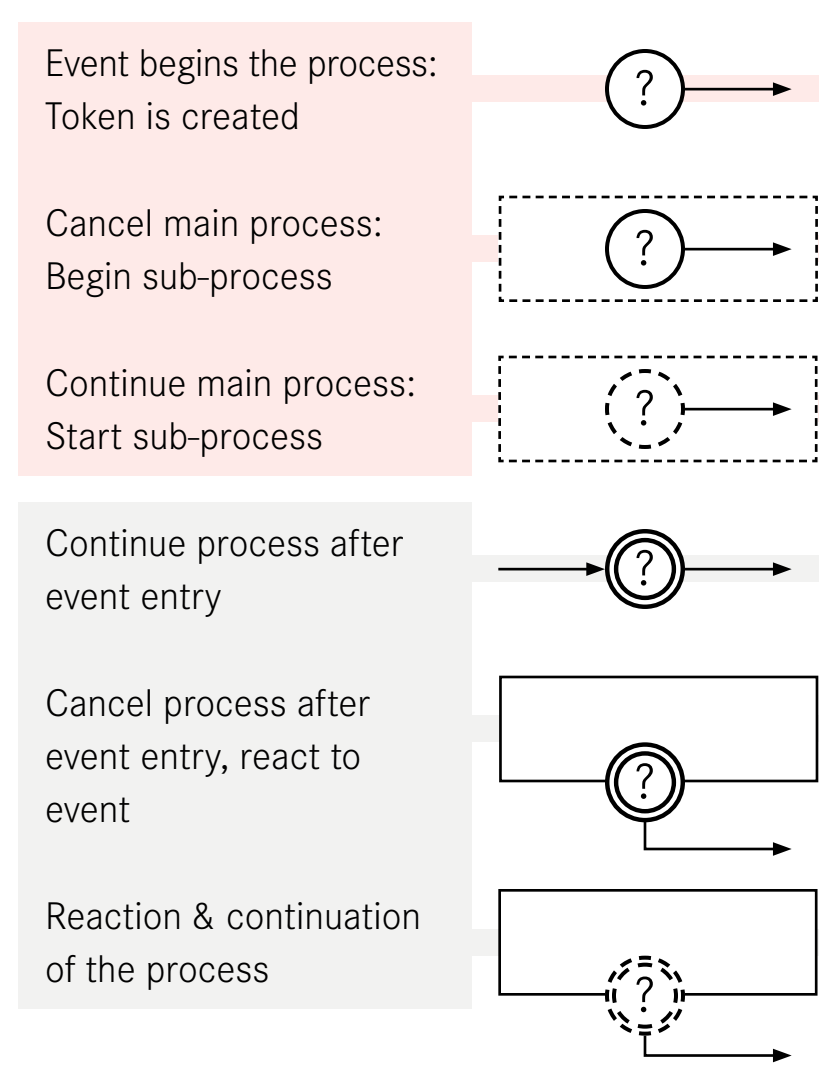
Symbols & Examples



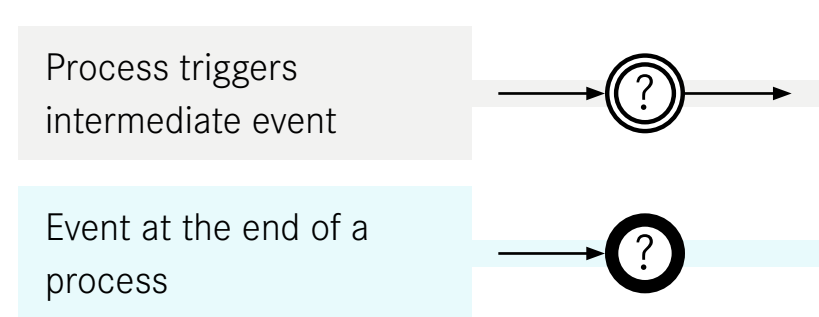
BPMN Events

	Start Events			Between Events				End
	A	B	C	D	E	F	G	H
Blank event, status change								
Message has a specific recipient								
Time (periodically)								
Conditions, business rules: Reaction								
Linking of sequence flows								
Message has no specific recipient								
Exceptional mistake								
Escalation: There is a change in hierarchy								
A termination process: Consumes all tokens								
Compensation: Trigger or react								
Abort transaction: Trigger or react								
One of «N» events occurs								
All «N» events occur								

The Event Was Realized Within the Process

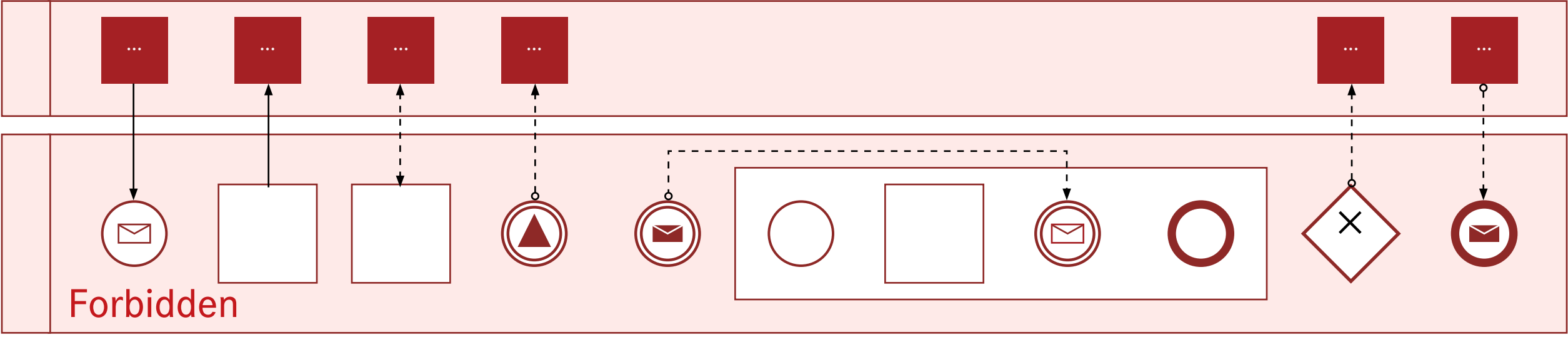
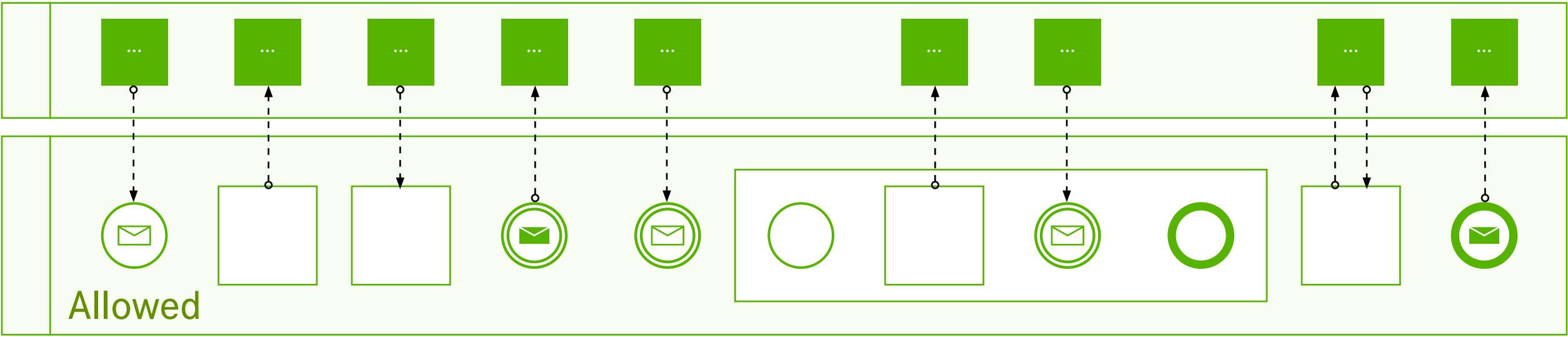


The Event Realized by External Stakeholders



BPMN: Pools and Message Flows

Do's and don'ts



Jakob Freund et al.: Praxishandbuch BPMN 2.0, S.99 (2014)

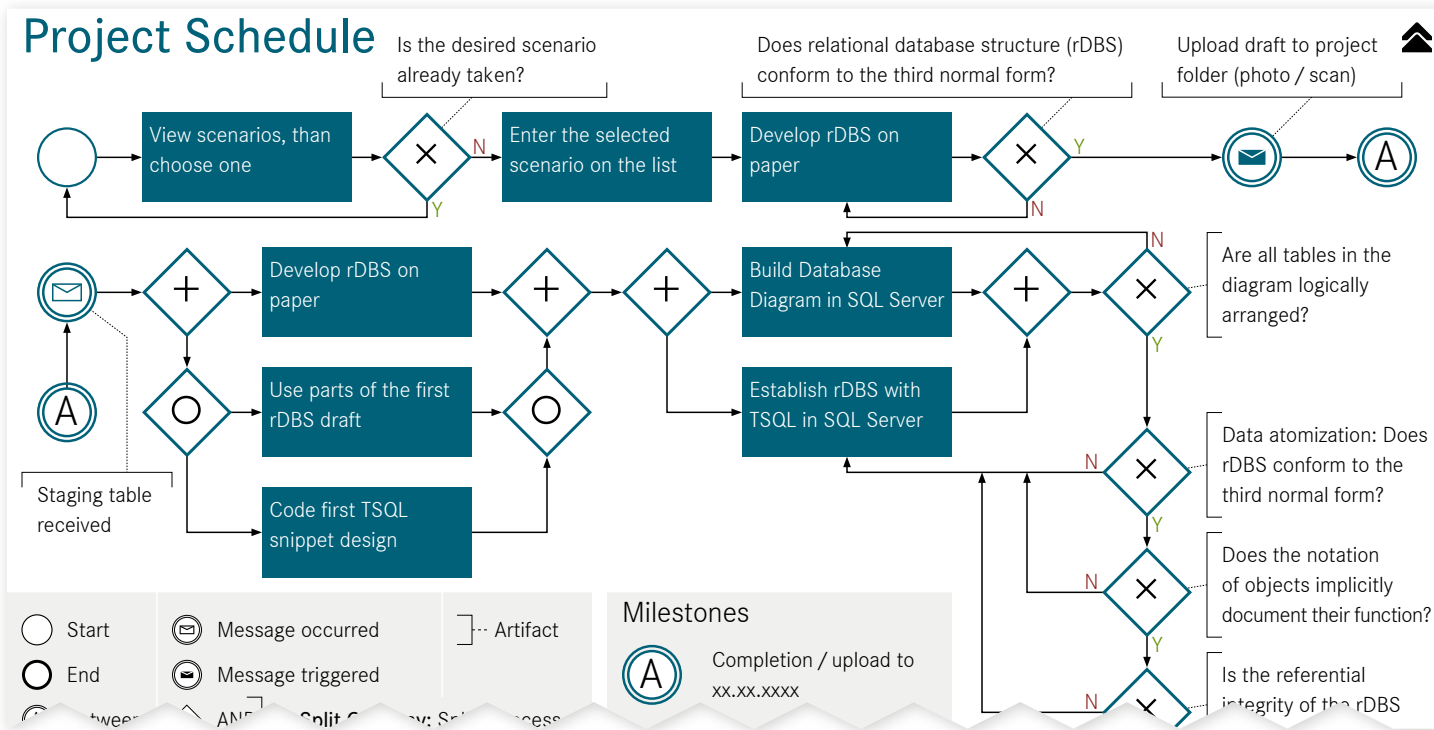
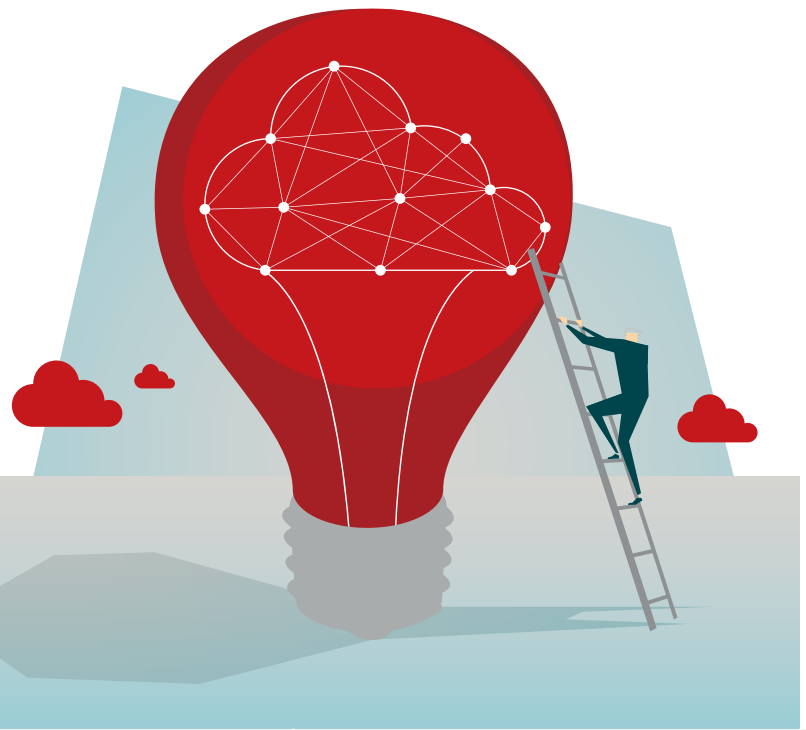
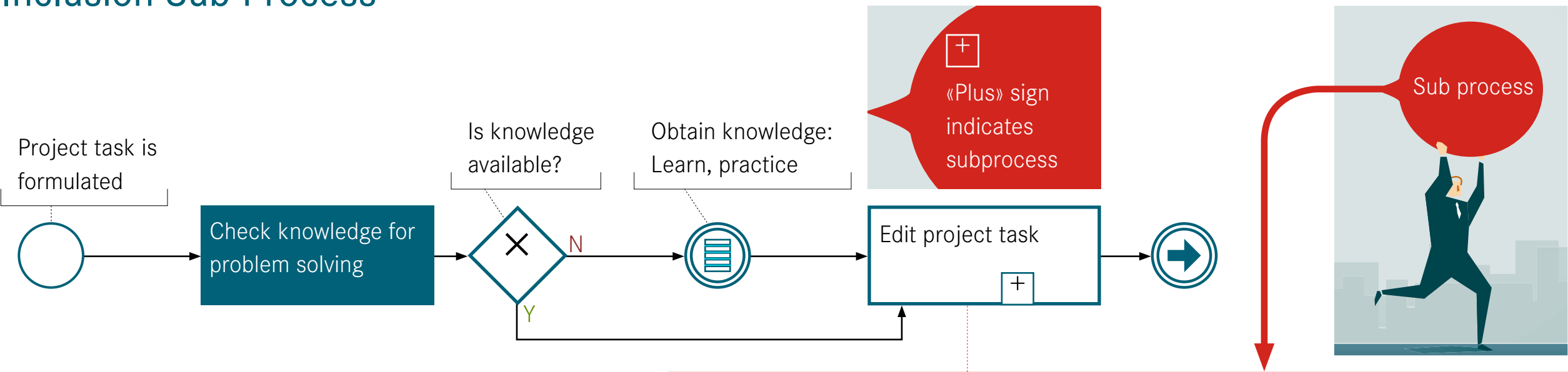
	Start		Message occurred		Artifact
	End		Message triggered		
	Between		AND	<ul style="list-style-type: none"> • Split Gateway: Splits process path for tokens • Joined Gateway: Merges process path for tokens 	
	Y, N Yes, No		OR		
	Activity		XOR		

BPMN Symbols & Examples



BPMN: Solution of a Project Task

Inclusion Sub-Process



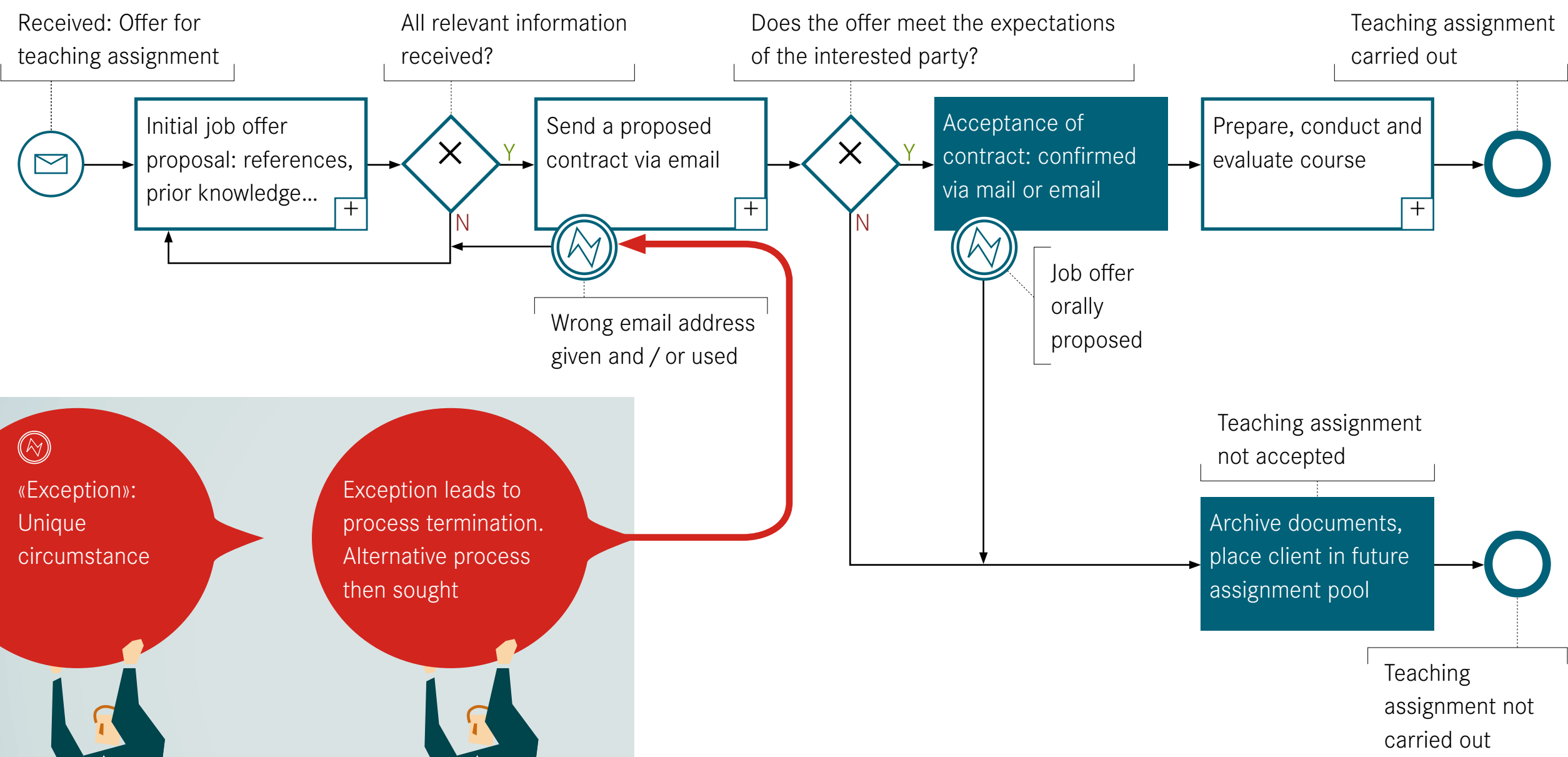
○ Start	✉ Message occurred	⌋ Artifact
○ End	✉ Message triggered	
Ⓐ Between	⊕ AND	• Split Gateway: Splits process path for tokens
Y, N Yes, No	◇ OR	• Joined Gateway: Merges process path for tokens
Activity	⊗ XOR	

BPMN Symbols & Examples



BPMN: Clients' Contacts

Errorhandling | Perspective: Independent Contractor



«Exception»: Unique circumstance

Exception leads to process termination. Alternative process then sought

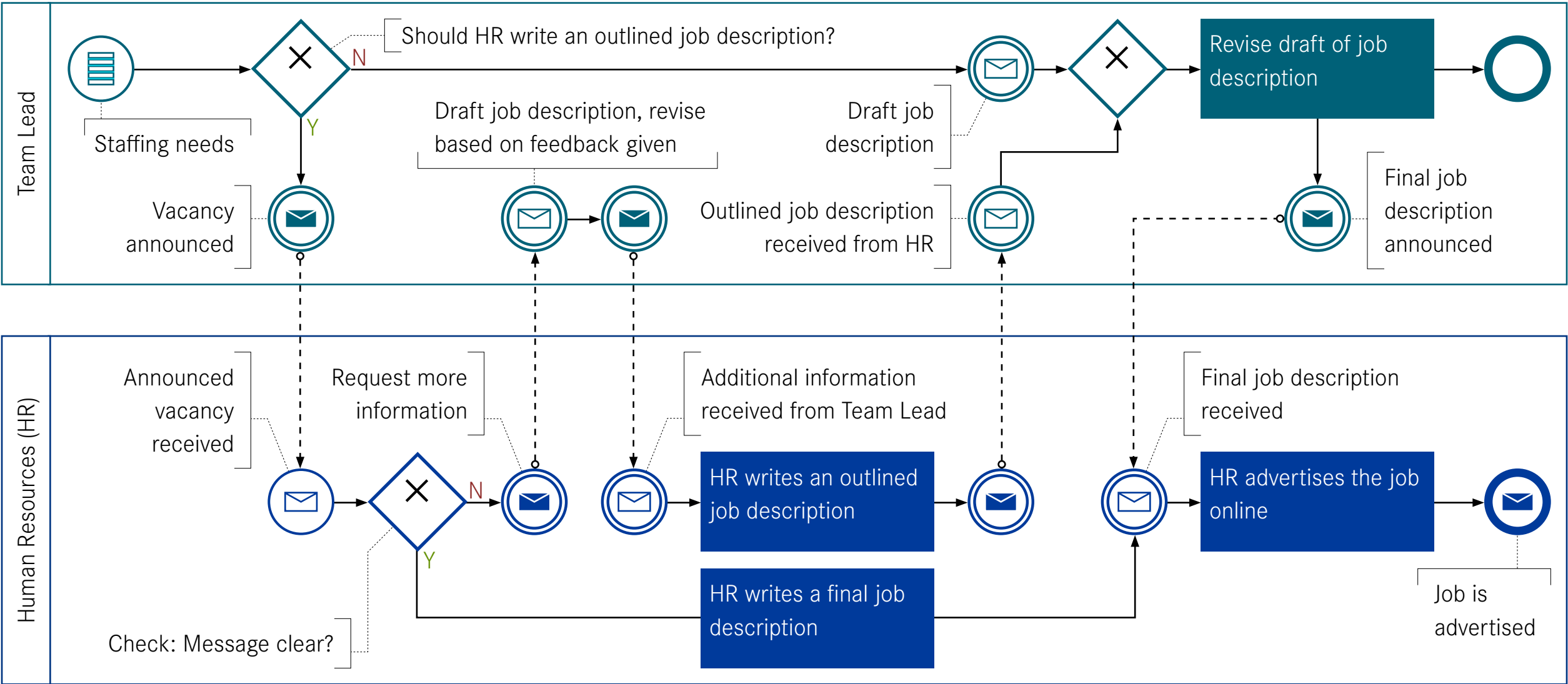
	Start		Message occurred		Artifact
	End		Message triggered		
	Between		AND	<ul style="list-style-type: none">• Split Gateway: Splits process path for tokens• Joined Gateway: Merges process path for tokens	
Y, N	Yes, No		OR		
	Activity		XOR		

BPMN Symbols & Examples



BPMN: Job Posting

Collaboration Chart | Perspective: Employer



Compare «<https://camunda.com/bpmn/>»

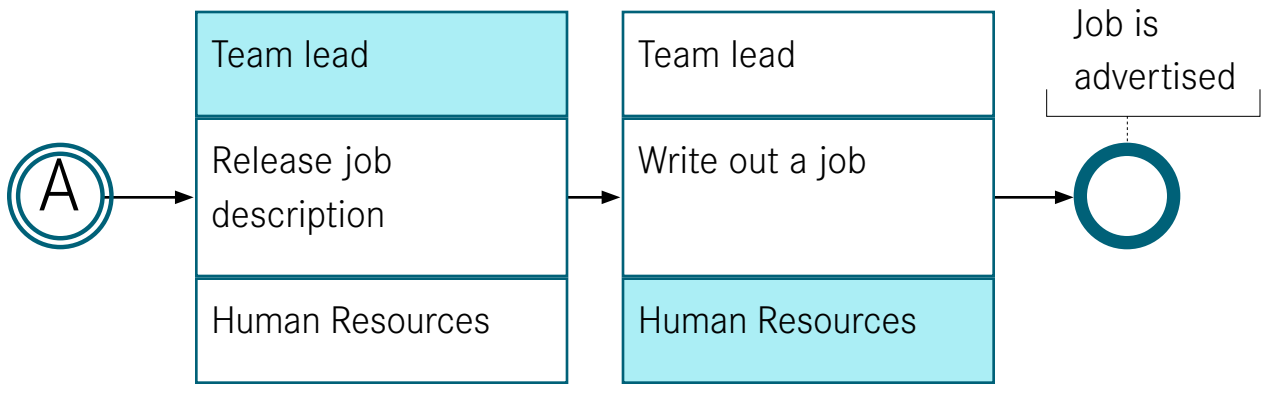
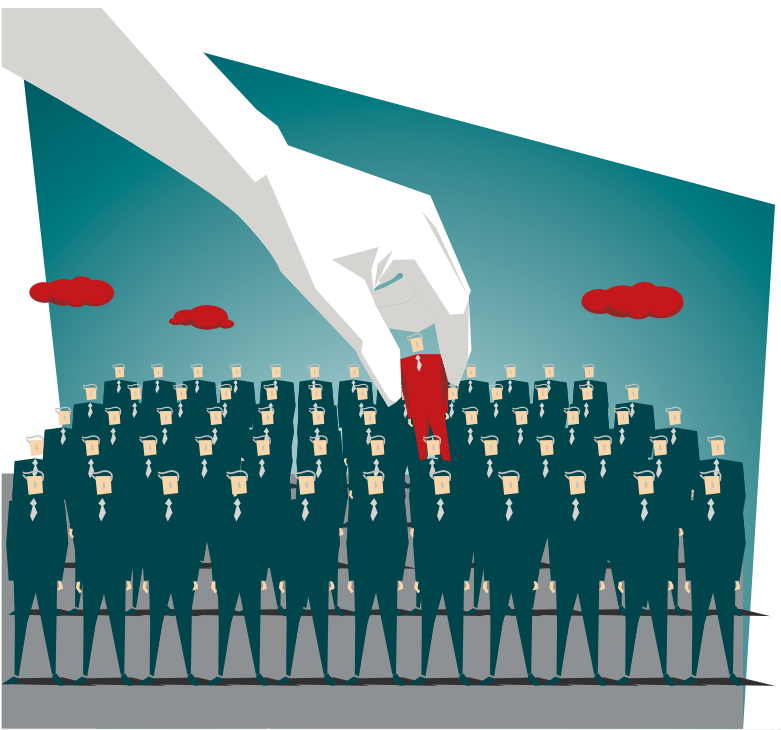
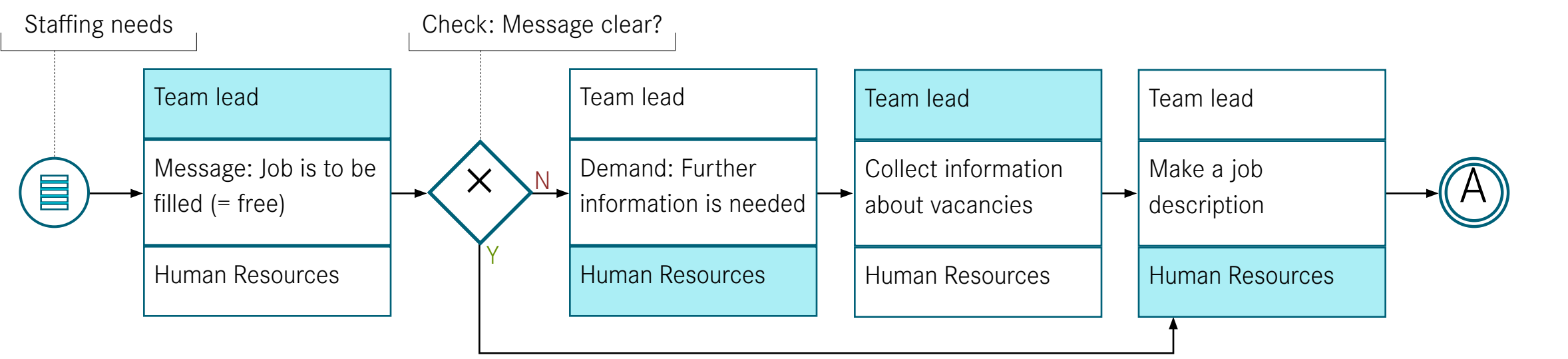
○ Start	✉ Message occurred]- Artifact
◉ End	✉ Message triggered	
Ⓐ Between	⊕ AND	• Split Gateway: Splits process path for tokens
Y, N Yes, No	◇ OR	• Joined Gateway: Merges process path for tokens
Activity	✖ XOR	

BPMN Symbols & Examples



BPMN: Job Posting

Choreography Chart | Perspective: Employer



○ Start	✉ Message occurred]-- Artifact
○ End	✉ Message triggered	
Ⓐ Between	⊕ AND	• Split Gateway: Splits process path for tokens
Y, N Yes, No	◇ OR	• Joined Gateway: Merges process path for tokens
Activity	⊗ XOR	

BPMN Symbols & Examples

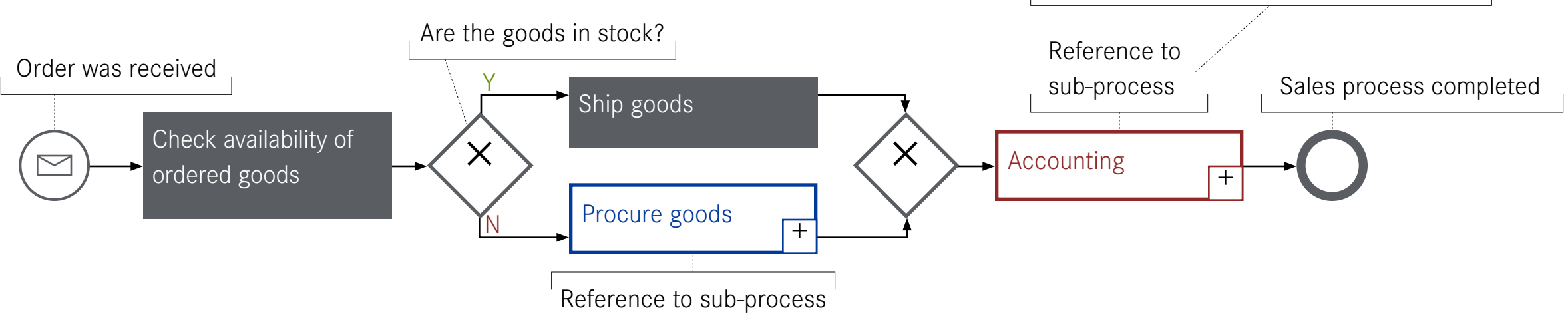


BPMN: Mail Order Business

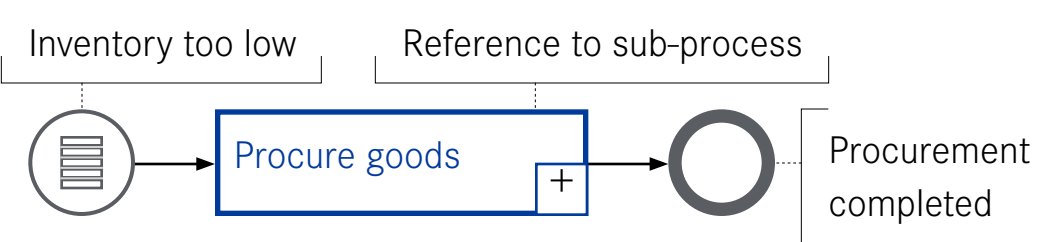
Multiple Use of Sub-Processes



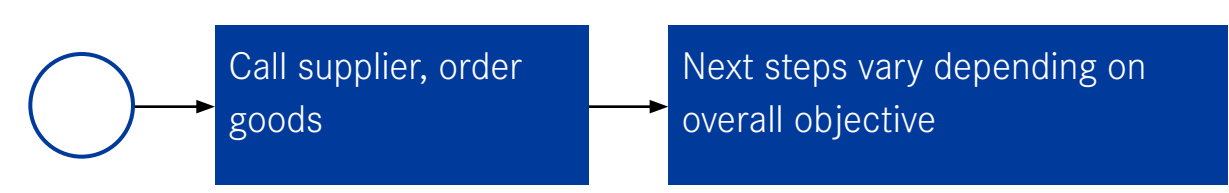
Sales Process



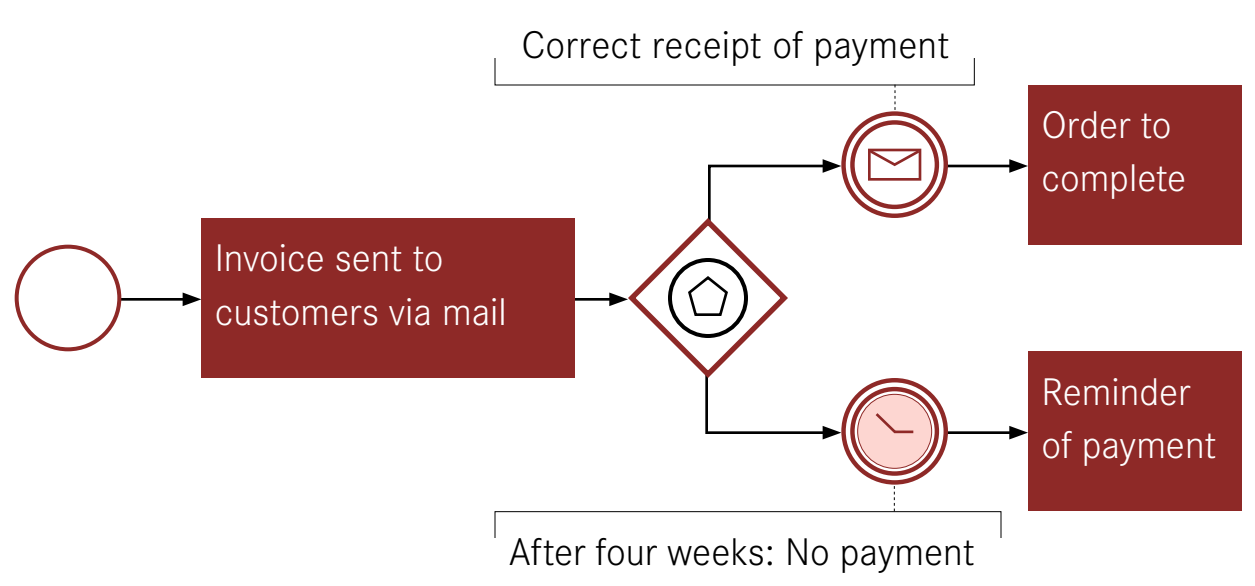
Warehousing



Subprocess «Procure Goods»



Subprocess «Accounting»

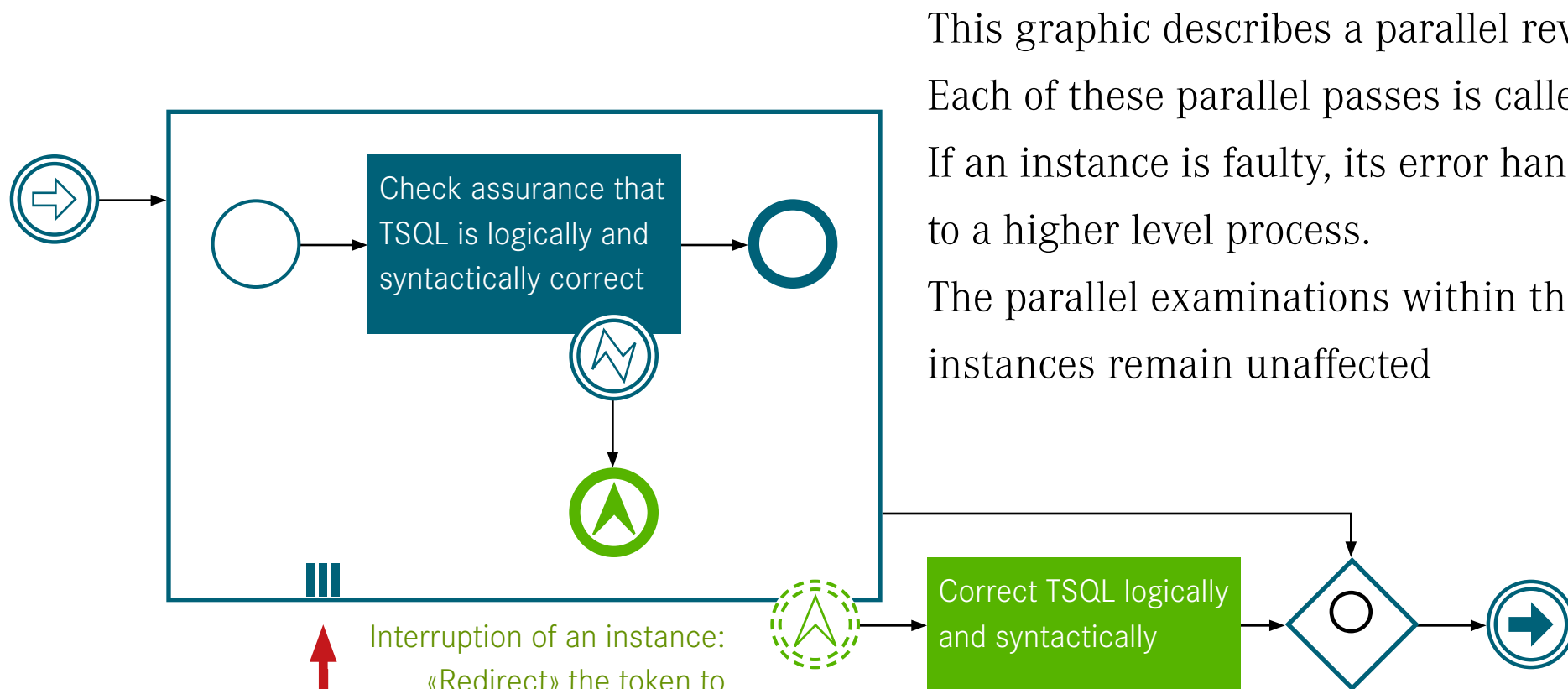


	Start		Message occurred		Artifact
	End		Message triggered		
	Between		AND	<ul style="list-style-type: none"> • Split Gateway: Splits process path for tokens • Joined Gateway: Merges process path for tokens 	
	Y, N Yes, No		OR		
	Activity		XOR		

BPMN Symbols & Examples



Compare «<https://camunda.com/bpmn/>»

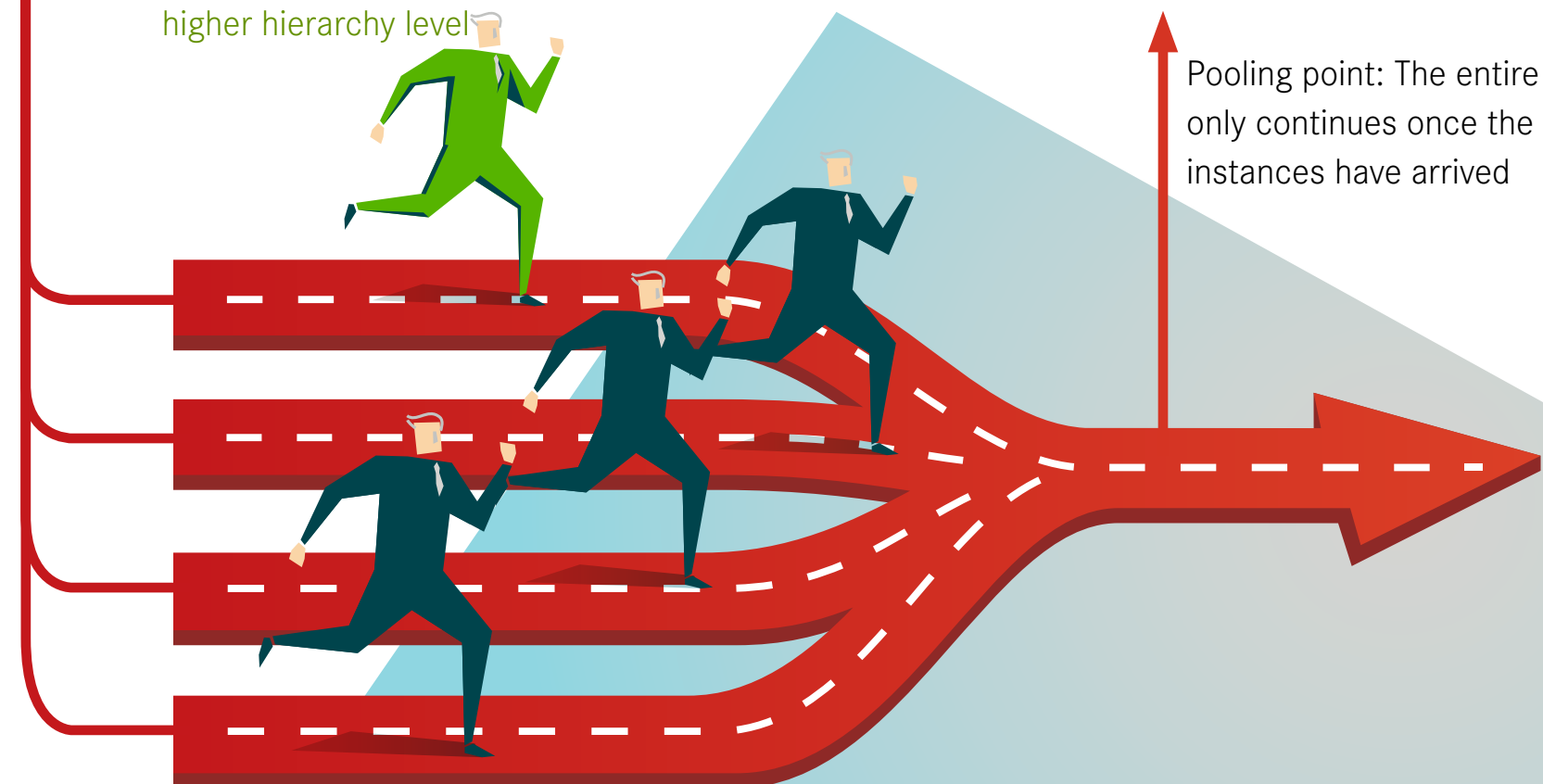


This graphic describes a parallel review of TSQL code. Each of these parallel passes is called an instance. If an instance is faulty, its error handling is passed on to a higher level process. The parallel examinations within the remaining instances remain unaffected

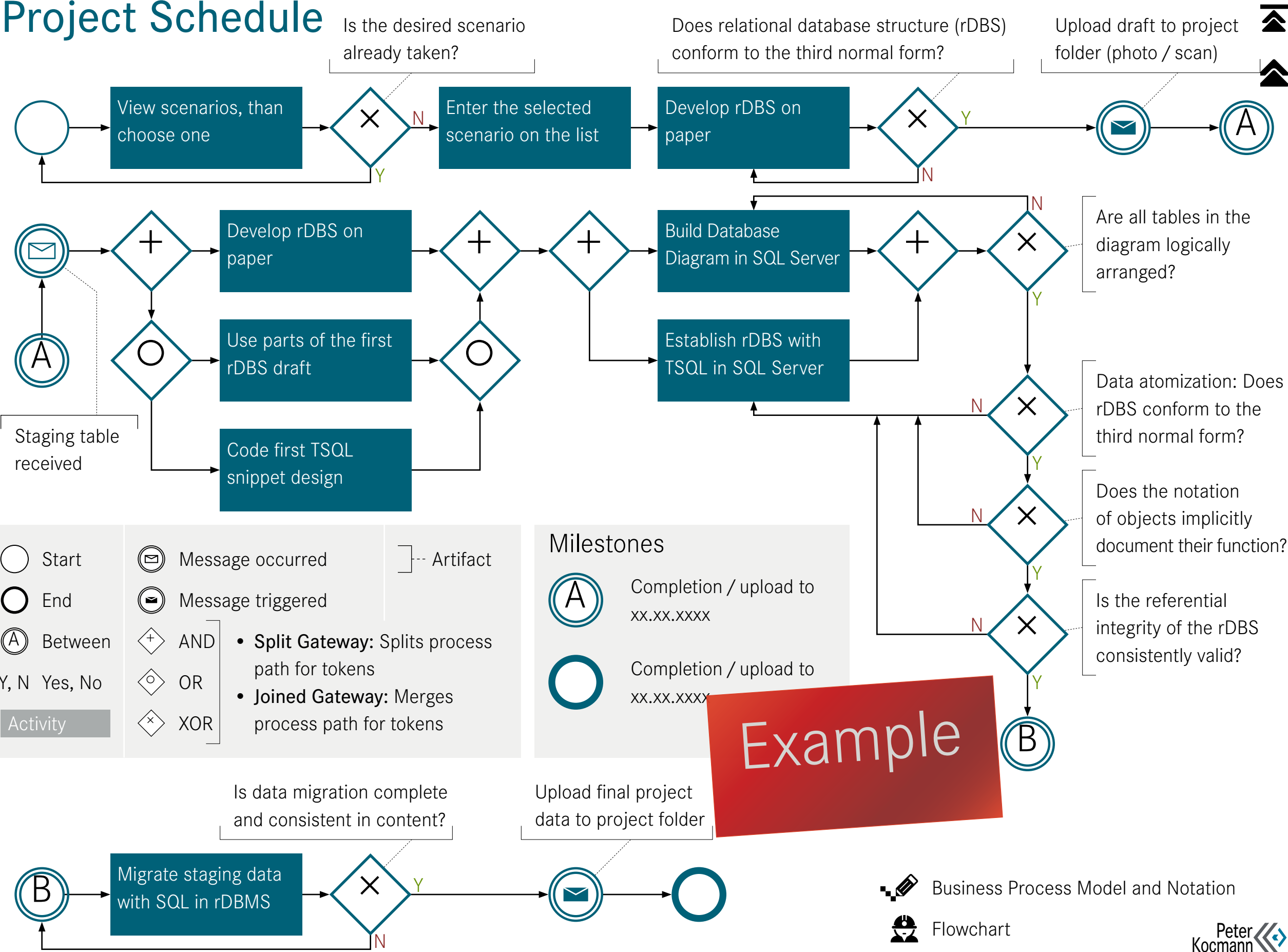
Interruption of an instance: «Redirect» the token to higher hierarchy level

Pooling point: The entire process only continues once the tokens of all instances have arrived

In parallel, several instances are performed. What is meant: At the same time, the tokens (runners) move in their respective instances



Project Schedule



Start ○

End ○

Between (A)

Y, N Yes, No

Activity [shaded box]

Message occurred (envelope icon)

Message triggered (envelope icon with arrow)

AND (diamond with +)

OR (diamond with o)

XOR (diamond with x)

Artifact [bracket]

- Split Gateway:** Splits process path for tokens
- Joined Gateway:** Merges process path for tokens

Milestones

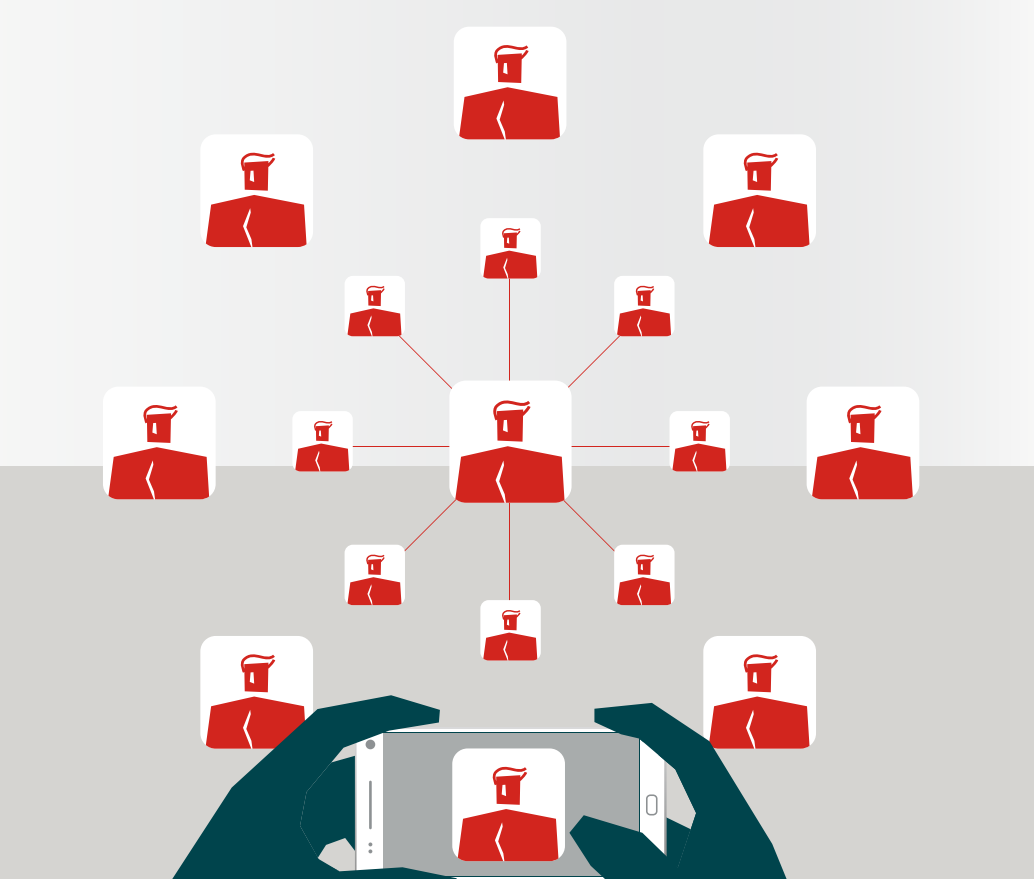
(A) Completion / upload to xx.xx.xxxx

(B) Completion / upload to xx.xx.xxxx



Scrum

Project Management



Working effectively and efficient

- Task Board in the Form of a Kanban
- Planning: Assessment Difficult Story
- Definition of Done (DoD)

Task Board in the Form of a Kanban



«As a user, I want function / property, so / because ...»

Requirement, formulated as a story

«As a shop owner, I want to know who sold what when. My goal: to identify salespeople with high sales volumes. »

Story: Wording by the Product Owner

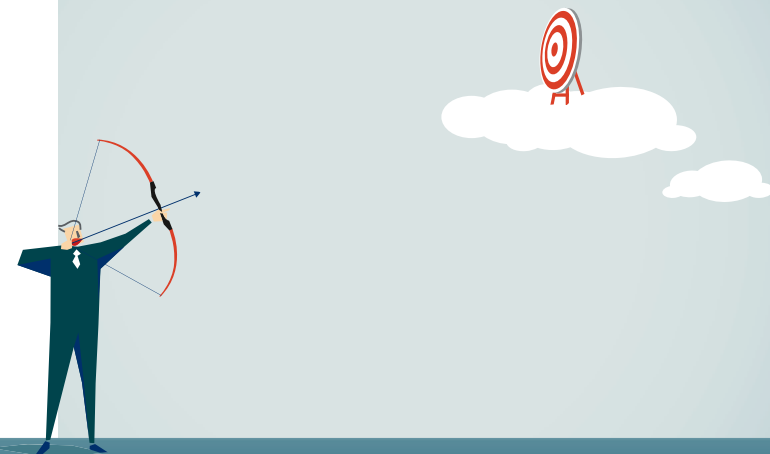
Story: Split into smaller, more manageable tasks



Requirements	ToDo	Doing	Done
Story 1	Three green rectangles	One green rectangle	Two green rectangles and one red rectangle
Story 2	One blue rectangle	One blue rectangle and one red rectangle	Three blue rectangles and one red rectangle
...	Two blue rectangles	Three blue rectangles and one green rectangle	Two blue rectangles, one red rectangle, and one green rectangle

Complex Problems

What makes it so difficult to solve complex problems?



Task-Cards

Who is responsible for the task?

Scrum

Project Management

0

0,5

1

2

3

5

8

13

20

40

100

?

Requirements	ToDo	Doing	Done
Story 1			

Task Board Planning Requires Effort / Time Estimation

Method: Planning Poker ©

- Every team member is given a set of cards.
- The Product Owner presents the Story.
- The team seeks clarification on any questions with Product Owner.
- Each team member selects a card that they believe represents the story's complexity.
- All chosen cards are shown simultaneously.
- Members with the highest and lowest estimates explain their reasoning.
- The estimation process continues until there's a consensus.
- If there's no consensus, the clarity of the story is reviewed.
- This method continues until all stories are assessed.

Scrum

Project Management



 Scrum.org


 Scrum (Wiki)


 Planning Poker: Mountain Goat

Definition of Done (DoD)



 Scrum.org

 Scrum (Wiki)

 Planning Poker: Mountain Goat

Requirements	ToDo	Doing	Done
Story			



Joint Team Understanding

When does a task count as «done»?

The «Done» criteria might vary for different tasks. What's crucial is that every team member understands what «Done» entails for a particular task before marking it as completed.

Example of a «Done» team agreement

- The solution contains code by standards
- The functionality of the solution was tested differentiated
- There is a comprehensible documentation of the solution
- The solution can be used immediately

Scrum

Project Management