PROBLEM SOLVING

Concepts and Approach

for

Systems and Strategies

V. 1.1 (2017-01)

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Thank You

Through this guide I would like to share
everything I learned about problem solving.

I use the presented
concepts, principles, thinking patterns and steps

to solve problems related to systems or requiring a strategy.

Solving problems isn't about following a procedure,

but rather about adopting a way of thinking.

I noticed some people follow wrong principles or use thinking patterns preventing
them from solving problems efficiently.

Common thinking patterns leading to even more problems
and traps are also presented.

Enjoy it. Use it. And get rid of problems.

Thank you for your interest.

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Content

1. General considerations
2. Problem in the context of a **SYSTEM**
   a) Ineffective problem solving methods
   b) Understanding Mechanisms
   c) Problem Concepts
   d) Solution Concepts
   e) Solving Approach
3. Problem in the context of a **STRATEGY**
   a) Strategy Concepts
   b) Strategy Elaboration Approach
   c) Techniques

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WHY Problem Solving

ESSENTIAL/BASIC LIFE SKILL

- Problem solving is about
  - **IMPROVEMENT**
  - **Turning dissatisfaction into satisfaction**
- Contributes to **HAPPINESS AND SUCCESS**
    - Problems make us (and other people) unhappy.
- Many of our problems **WE CREATED OURSELVES**
  - **because of poor problem solving skills**
- Good for the economy, society, …
  - More efficient companies
  - More happy people → lesser frustration, lesser violence

Important to study it more in depth
and to train our problem solving skills !

WHAT

A **problem** is

- something we have to or should deal with
- and it is difficult to do so

Elements

- Concerns a discrepancy between a undesired reality and a better and wanted state.
- Requires a change of a situation
  - Given or present situation
  - Desired result, goal, to-be
  - Gap
  - Process of change
- A difficulty – We don't know something or we can't (It can be easy for someone else)
- A risk or certainty of loss or damage
- There is often a dissatisfaction involved
- An obligation to deal with it (obligation can be moral, legal, personal, …)
- Someone imposing the problem
- Someone that has to deal with the problem (can be the one imposing it)

WHAT

A difficulty can be located at three levels:

1. In determining or defining the final state, the result, the product, the outcome
2. In determining the way to realise or reach this final state
3. In the execution of the process

Types of losses

- Absence or lack of something
- Damage
- Dysfunctioning or limited usage
- Impossibility to play a role fully or to fully exploit something
- Unpractical usage
- Goal not reached
- Unfulfilled needs
- Unfulfilled expectations

- Lack of quality
- Loss of power, significance
- Loss of opportunity
- Unreliability
- Cost
- Risk, danger
- Inefficiency, ineffectiveness
- Loss of value, worthlessness
- …

TRAINING PROBLEM SOLVING SKILLS

Everybody can solve problems. But there is a gigantic difference between a good and trained problem solver and a ordinary problem solver.

Problems can be complex. Problem solving can be difficult. But techniques and skills may help you to deal more easily with them.

The quicker you solve a problem, the lesser problems you have.

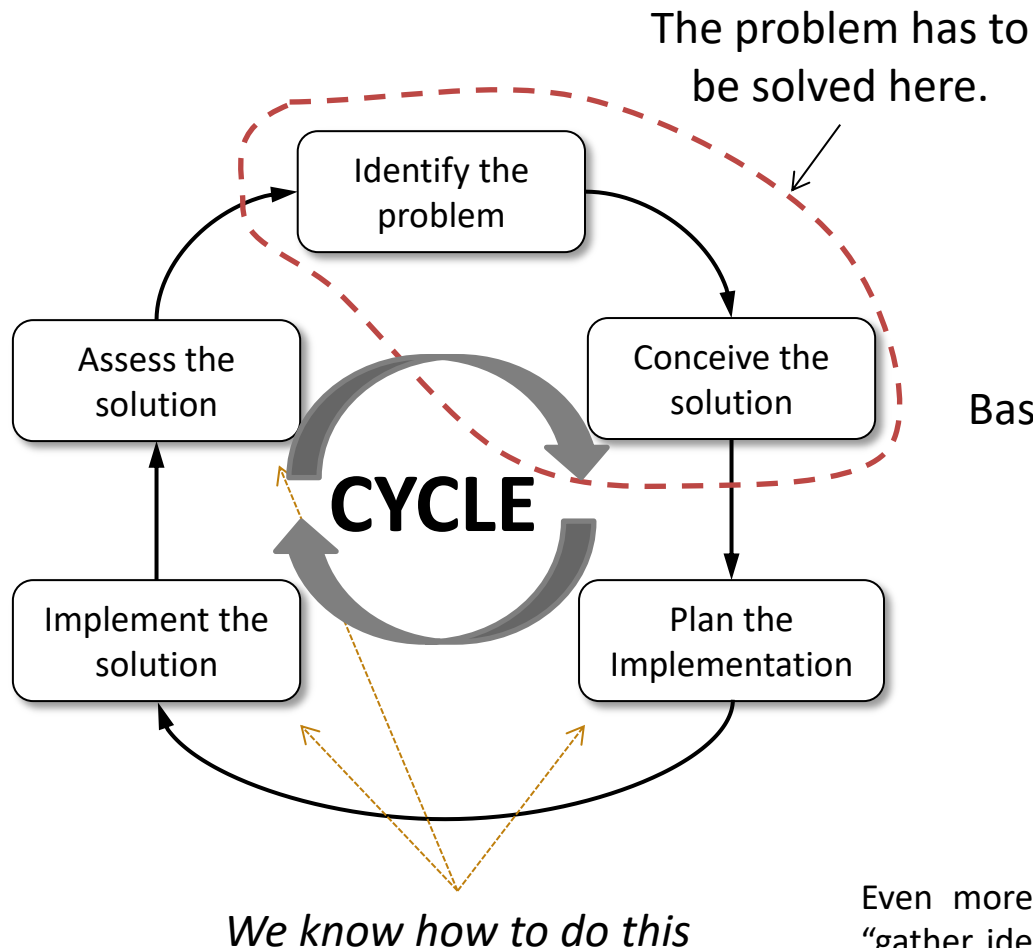The better you solve a problem, the lesser you create new problems.

Solving problem are thinking patterns that must be learned and trained in order to apply them automatically. Then it becomes an ordinary daily skill.

Ignoring problems and avoiding training the problem solving skills will make things worse.

What happens if we avoid 'Problem Solving'

- Picking only easy challenges (life doesn't bring only easy problems)
- Remaining in the comfort zone
- Getting stuck, no progress
- No innovation anymore
- Loss of problem solving skill
- Loss of the ability of leadership. Becoming dependant / a follower.
- Becoming a "**Solution Consumer**"
  - Quicker looking for replacing things instead of repair and build (building = solving)
    - more expensive
    - more standard solutions (others buy the same 'solutions' as well)
  - Externalisation of problems
    - Examples: outsourcing, privatisation, use of others services
    - more expensive
    - greater dependency of others → loss of control
    - looking for external solution becomes a habit
  - Does buying or externalisation delivers real solutions?
- Becoming weaker and/or poorer
- Problems will start accumulating and ruin life, system or environment

Traditional Problem Solving Cycle

The problem has to be solved here.

Identify the problem

Conceive the solution

Plan the Implementation

Implement the solution

Assess the solution

CYCLE

We know how to do this

→ This <u>type of</u> model doesn't support the core aspect of problem solving.
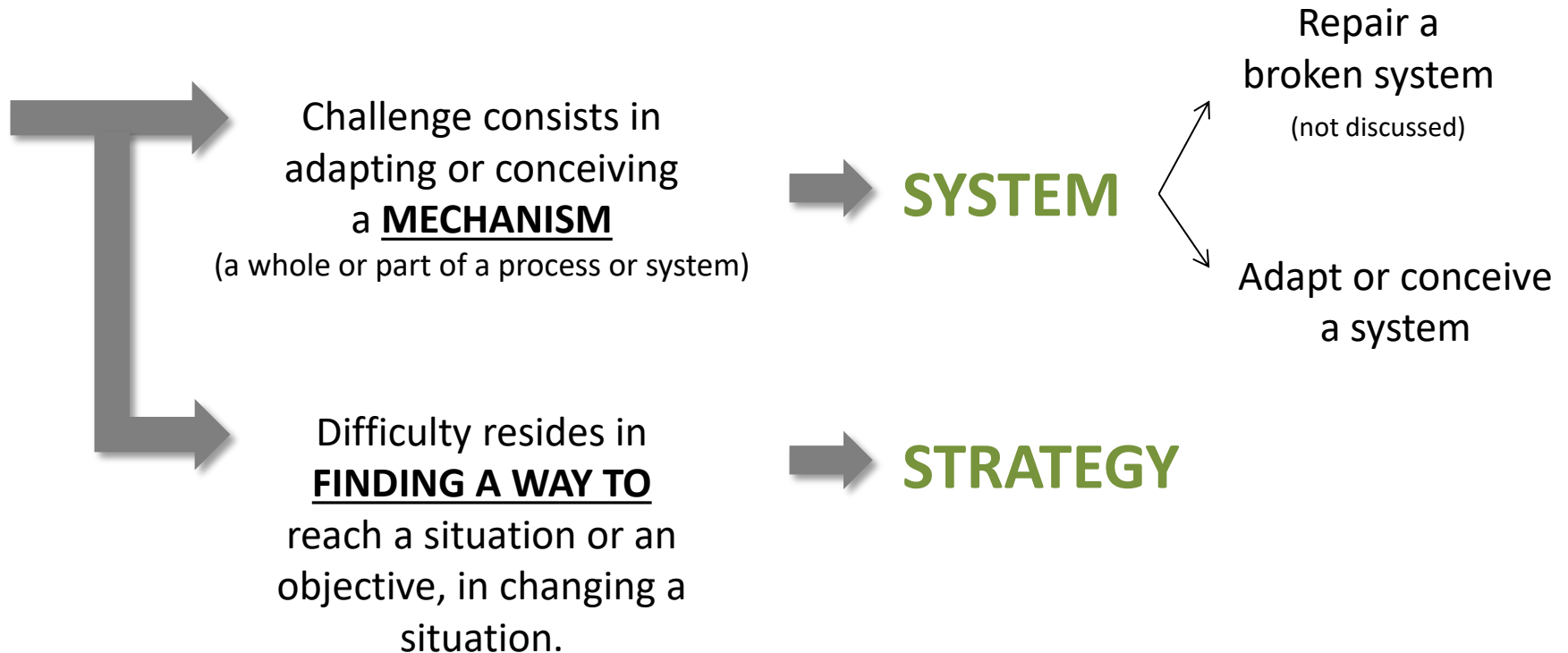
Basically the model says "TRY UNTIL YOU SUCCEED" (=cycle)

TOO SIMPLISTIC
Not very HELPFUL

Even more 'detailed' models including steps like "gather ideas", "brain storm", "conceive alternative solutions", "select the solution" offer still insufficient real support in problem solving.

TWO DIFFERENT APPROACHES

Challenge consists in adapting or conceiving a **MECHANISM**
(a whole or part of a process or system)

→ **SYSTEM**

Repair a broken system
(not discussed)

Adapt or conceive a system

Difficulty resides in **FINDING A WAY TO** reach a situation or an objective, in changing a situation.

→ **STRATEGY**

Notes:
- Possibly a problem requires the conception of a system and then a strategy to implement it. Both approaches are then useful.
- When dealing with strategy, we may encounter systems and have to deal with them.

PART 1
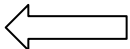
PROBLEM WITHIN / REQUIRING A SYSTEM

Some Thoughts & Principles

- *Building* and *improving* is problem solving

- *Innovating* is problem solving

- Solving a problem is about
    a. eliminating (root) causes (= adapting the system)
    or conception and adding a 'system' into a supra-system or system landscape
    b. and about correcting impacts (= any consequence of the flawed system)

- Solution Complexity ↔ Problem Complexity
    – A complex problem may sometimes be solved by a simple solution.
    – A simple problem may sometimes require a complex solution.
        - A simple problem doesn't imply a simple solution and a complex problem doesn't imply a simple solution (important for estimating required time and effort for solving a problem (projects!!)).

INEFFECTIVE
PROBLEM SOLVING TACTICS & TRAPS

PROBLEM WITHIN / REQUIRING A SYSTEM

- **Ineffective Problem Solving Tactics & Traps** ⇐
- Effective Problem Solving
    - General considerations
    - Understanding Mechanisms
    - Problem Concepts
    - Solution Concepts
    - Solving Approach

Chapter: Ineffective Problem Solving

- Origin of Problems

- Before Detection

- Detection
  - Barriers to Detection
  - Attitudes & Emotions
  - Thoughts & Communication
  - Inappropriate Reactions
  - Postponing Strategies
  - Time Wasting Approach

- No Acceptance
  - Ad Hoc Corrective Actions
  - Symptomatic Treatment

- Acceptance and Adaptation
  - Levels of Adaptation

- Contamination

- Other Ineffective Practices and Warnings

- Focus on Solution or on Problem

- The Big Confusion

- 'Problem Havers' & 'Solution Builders'

- Externalisation

- Problem Solving Cycle

Before Detection

ORIGIN OF PROBLEMS

- Some problems just happen

- Some problems are created by others

- Some problems are created by ourselves

    - Because of lack of insight, lack of competencies, impatience, short term thinking, lack of readiness to do the required effort and invest resources, our beliefs, our drivers, scope is too narrow (too much focussed on the problem only), misplaced trust, fears, underestimations, …

BEFORE DETECTION

As long as the problem isn't solved (or at lease contained)

- Problem persists. It continues to harm or to be a risk.

- Problem lives its life. It may evolve. It may expand.

- Problem may infiltrate our lives, systems and environments

- Detection is the first step before diagnosis.

Detection

DETECTION

1. Symptoms can be noticed and effects can be experienced
resulting in complaints, unsatisfying results, data shows issue

2. Feeling something is wrong, something can be better
(still no awareness and recognition yet of the problem)

3. Now, there is awareness and recognition of the existence of the problem.

4. Problem receives a name and is identify able → now we can start solving it … maybe!
(possibly no precise localisation and diagnosis yet)

Identification of a problem ≠ diagnosis !!

BARRIERS TO DETECTION

- Problem can be sleeping (risk)
- Problem can be hidden
- Missing information
- Lack of insight
- Lack of curiosity. Vague feeling something is wrong. Inability to explain what exactly is wrong. No further investigation of the issue.
- Not searching for existing problems

Detection

- **ATTITUDE - EMOTIONS**
  - Being 'Positive'
    - Focus only on progress, good things, ...
    - While not wanting to see and to talk about dangers, shortcomings, ...
  - Fear of consequences
    - Fear of the seriousness of the situation
    - Fear of communicating the problem
      - Fear of being labelled as a 'negative person'
      - Fear of hurting someone
      - Fear of being wrong
      - Fear of others disagreement or judgement
    - Ego, fear for reputation or for practical consequences
      - The problem may indicate we did a bad job earlier → judgement, evaluation, being fired, ...
    - Fear of having to solve the problem. Unsure of the own competencies.
    - Fear of the work (effort) and cost it will require

Detection

- **THOUGHTS & COMMUNICATION**

  - 'Problem' is a taboo. It's a negative word.

  - Don't talk about problems

    - "I don't want to hear about problems"

  - It's forbidden to have an opposite opinion

    - "I don't want to hear critics"

  - Don't consider problems. Focus on progress only.

  - Labelling a person as "negative people" or "difficult person" because (s)he disagrees, bring up problems or risks, or criticise. Are they really negative persons? (See diagram below)

Organizational culture !!
Management style !!

Negative message ?

But what is the INTENTION?

- Complaining
- Blaming
- Slandering and denigration
- Undermining the reputation or authority
- …

- Creating awareness
- Making people to take decisions and action
- Pushing towards improvement
- …
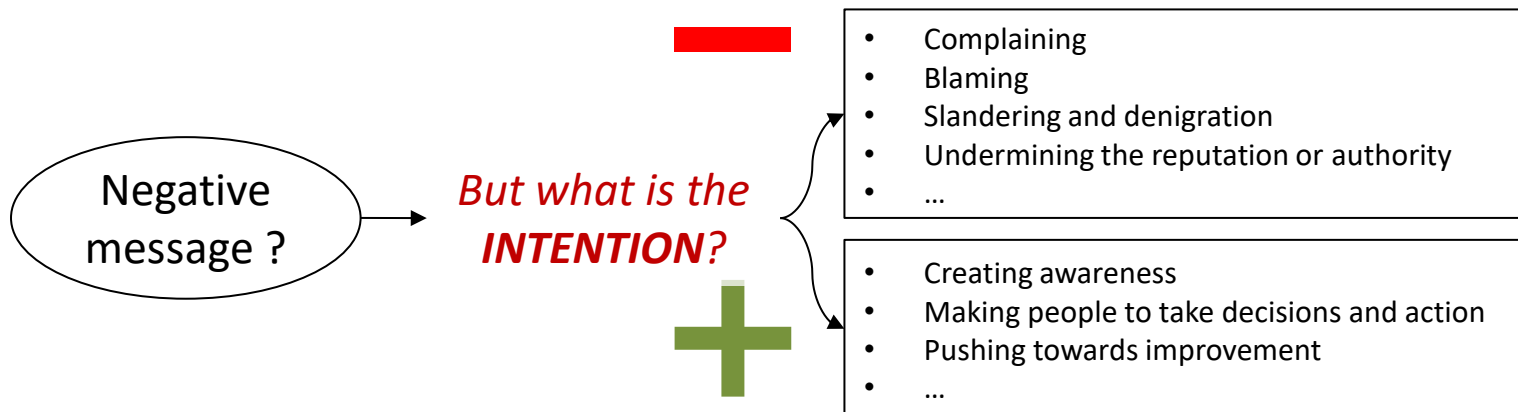
Detection

- **INAPPROPRIATE REACTIONS**

  - Ignoring it

  - Minimizing the effects

  - Waiting (until it goes away by itself?)

  - Masking, hiding, cover-up

  - Make someone else to discover it

  - Upon the communication:

    - "I don't want to hear such things"; Shooting the messenger

- **POSTPONING STRATEGIES**

  - We have other priorities than dealing with the problem, don't we?

  - Putting it on the agenda

  - Organising a meeting

  - Taking the decision to deal with it later, then following a lengthy decision process

  - Ordering an investigation (for having a delay, while not being involved)

  - Analysis paralysis : Sticking in an analysis/learning/information gathering phase

  - It is incredibly easy to find a reason to postpone important things. Events of the present or short term desires or goals are perfect for this. Then we got a "not now" or "not today" excuse. It's a way to escape to the real thing, to what really matters.

Do You Recognise This Process ?

Timeline

SOLVED

WASTED TIME

Attempts to solve with increasing seriousness

Subsequent attempts ("iterations", "improvements"), possibly with increasing earnest

Plan the problem solving

Decision to tackle the problem

Few more attempts

First attempt to try to do 'something' about the problem
Tackle consequence with inappropriate solution because seriousness of problem is minimised.

Awareness of the presence of a problem. Recognition and identification.

Awareness that something is wrong (not yet recognised as a problem)

Symptoms are notices or problems are experienced

Birth of the problem

Where, when and how have the diagnosis and analysis been done in this approach? Have they been done (genuinely)? Probably not.

No Acceptance

We don't accept the problem, or its consequences.
But instead of dealing with the cause, we adapt everything around the flawed system but leave the flawed system untouched.

1. **AD HOC CORRECTIVE ACTIONS**

   Individuals encountering a shortcoming or its consequence(s) will spontaneously try to correct the consequence(s), to adapt to the shortcoming or devise a solution for that particular issue.

Situation often encountered in human organisations

"It will be faster if I do it myself",
"I can solve it myself",
...

System

Problem

Bad Output

Correct Output
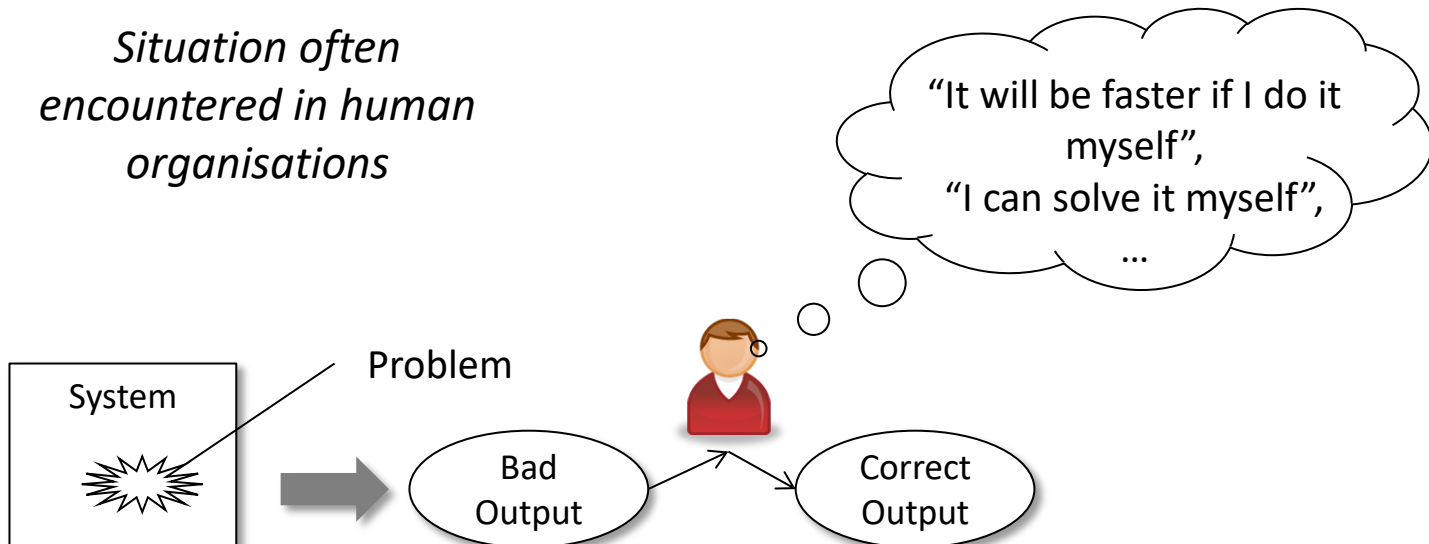
Ad Hoc Corrective Actions

Drawbacks and Risks

- Some consequences of a same problem may not be detected or corrected

- Possible inefficient process (corrective action or its solution can be inefficient)

- Correcting the consequence is done every time someone faces the consequence. Every person may react to it or correct it in a different way.

- Issue is analysed multiple times and multiple solutions are created for the same problem

- Risks for inconsistency
    - Example: Corrected information may be inconsistent with other information in the organisation

- Risk of applying a local solution to a local issue → creating issues elsewhere

- Solves only a consequence and doesn't solve the real problem

- Masks the (real) problem. Delays the identification of the real problem

- No control of the quality. Decrease of level of control.

- What competencies have been used to solve what (cause or consequence)?

- Many ad hoc corrective actions to a system may lead to the erosion of the system: Decreases the concrete value of something → decreasing trust → fading awareness of the real purpose and value of something → will be used wrongly or for wrong reasons instead of purposely → finally, it won't be used anymore

No Acceptance

2. SYMPTOMATIC TREATMENT

1. Symptomatic treatment is a systematic way to address the consequences without dealing with the problem.

2. Possible causes

    1. Quicker, easier, cheaper
    2. Impossibility to deal with the problem
    3. Failure to understand the real problem
    4. Omission of searching the root cause

3. Symptomatic treatment can be used to deal with the problem in the short term, while the problem will be solved but requires more time.

Difference between ad hoc corrective actions symptomatic treatment:
Symptomatic treatment recognises the existence of a problem, although possibly identified only a consequence, and deals with it in a more systematic way. Ad hoc corrective actions are spontaneous actions correcting individual outputs as they occur.

Acceptance and Adaptation

1. **Adaptation of norms, expectations, …**

   Already hard to get rid of it

   Acceptance happens when there is an unawareness of the problem or when we belief or accept that nothing can be done about it.

   - Lowering expectations: "It has always been like that", "It is normal", "Others aren't better than us", "We have an average score", "We are not the worse", …
   - Norms are not put in question anymore.
   - Lowering norms
   - Complacency
   - Failure to (re-)act, to fight, to improve, to innovate
   - Possibly estimated probability and impact are small

Acceptance and Adaptation

2. Adaptation of behaviour and work method to the problem

Much harder to get rid of it

- "It is impossible. So we don't do …"
- "We can't".
- Organisational structure, working methods , habits, … are not put in question
  - "We have always done it like that."
- Playing the game and voiding to make waves in order to maintain balance and harmony (we adapt ourselves to a something that is flawed)
- May influence habits and company culture
- A greater effort is required. Activities, working methods and processes take the shortcoming into account. This results in extra work or inefficient work.

3. **Other systems have adapted concepts, architecture and features to deal with the shortcoming (flawed design)**

Extremely hard to get rid of it

- The shortcoming in a system (mechanism) influences the design of systems (mechanism) at the same level with which it interacts.
- Implementation of distorted concepts not reflecting the reality, inelegant design, …

4. **Shortcoming of an element influences the development (or design) of situation, mechanisms, systems or processes built on top of it**

- Something built on top of a flawed foundation, will have to deal with the underlying shortcomings
- It may be weak, inefficient and unstable
- Possibly limited options and expansion possibilities

Just wait for a total collapse or for the next revolution, unless it dies a slow death.

Wrong ideas and concepts are accepted and become fully integrated in our life, in our organisations and in our society.

CONTAMINATION

Adaptation

ADAPTATION consists of adapting the surrounding of the problem to the problem to mitigate its effects and to restore a kind of balance and harmony.

- Adapting:
    - Objectives and expectations
    - Behaviour and habits
    - Choices and decisions
    - Work and processes
    - Structure
    - Downstream systems or other mechanisms
    - Things built on top (situations, environment, systems, …)
- Motivation:
    - Problem unknown but consequences or risks are known
    - Problem 'unsolvable'
    - Can be quicker, easier, lesser risky and requiring lesser resources than solving the problem
- Consequences (possible, not exhaustive):
    - Inefficiency
    - Unfair situation
    - Increased complexity
    - Postponement of solving the problem → risk: price to be paid later
        - time bomb: the problem can continue to grow
        - Possibility to build on top of something containing a shortcoming
- Examples:
    - Anti-virus software: Why not conceiving an OS that makes it impossible to develop viruses?
    - EAI implementations: EAI-layer used as additional layer on top to 'solve' (and mask) design flaws causing interoperability problems. Why not redesigning one of the systems to ensure interoperability by design?

Contamination

COMMON REASONING & APPROACH

Experience or notice a negative aspect

↓

We want to get rid of that problem

↓

How to get rid of it?

↓

Finding a solution that eliminates it

↓

Everything is OK. Problem solved!
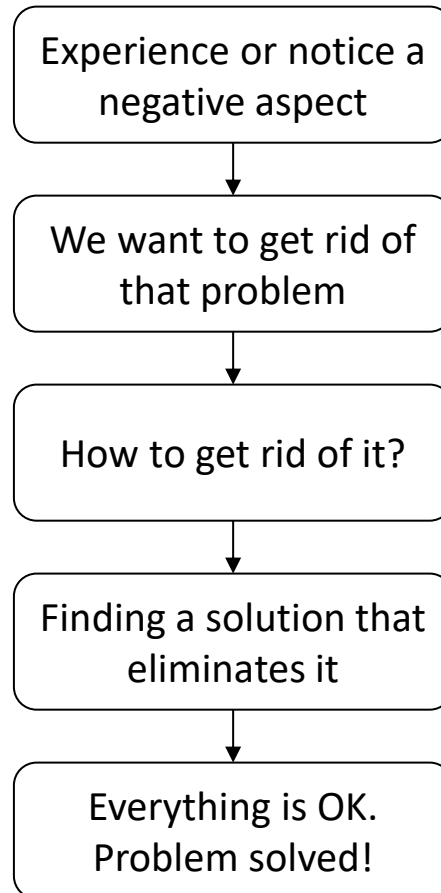
Is everything fine?

(answer on the next slide)

Contamination: The Common Trap

COMMON REASONING

```
┌─────────────────────────┐
│ Experience or notice a  │
│    negative aspect      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│  We want to get rid of  │
│      that problem       │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│   How to get rid of it? │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ Finding a solution that │
│      eliminates it      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│   Everything is OK.     │
│    Problem solved!      │
└─────────────────────────┘
```

We experience the consequences of problems. They are also normally the first things we see of a problem. They disturb us.
We don't experience the causes. Often, they remain hidden unless we do an investigation.

It's easy to define the problem as the presence of the consequence. Solving the problem then means eliminating the consequence.

The consequence has been eliminated. The causes (and root cause(s)) are still there.

The flawed design remain in place and the environment or other systems are adapted to this flawed design.

Contamination

Contamination happens through :

- acceptance and adaptation of everything except the problem area
- or through spreading of consequences & possibly adapting to these consequences

Environment adapting to a shortcoming - horizontal influence

Situation A contains a shortcoming. Situation A evolves into situation B. A part of situation B is adapted to the original shortcoming. Possibly harmony has been restored. Possibly, only the effects have been attenuated. Possibly, situation B is inefficient. Since the problem still exists it may have been turned into a time bomb.
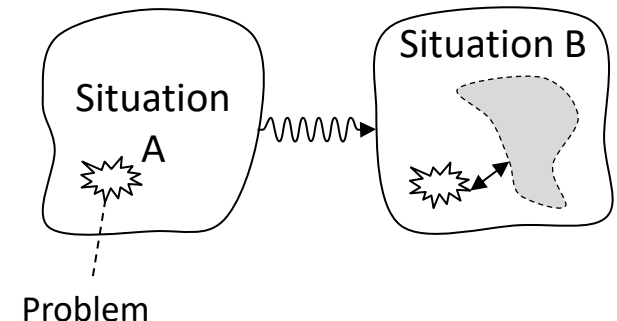
Usage of systems & output

We deal with shortcomings of a system by adapting our usage of it and/or the usage of the output of the system

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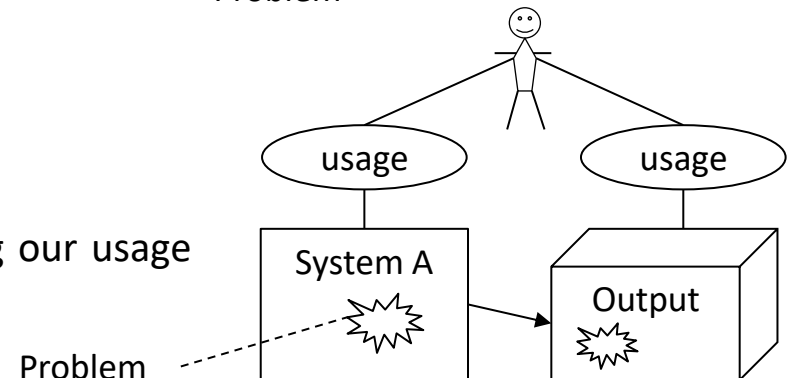
Contamination

Horizontal influence in systems

System A is connected with the newer system B. System A has some shortcomings (for example in its design). Being unaware of this shortcoming (or not wanting to redesign system A), the design of system B is takes into account the weaknesses of system A.
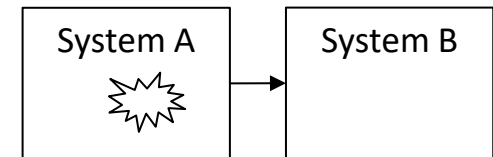
Layers built upon beliefs and ideas - vertical influence

- A design of a system is based on beliefs and ideas.
- A company culture is based on ideas, values and norms.
- Our beliefs determine our world view. They determine our behaviour and the relations we build with other people. They determine our social group and how we build our life.
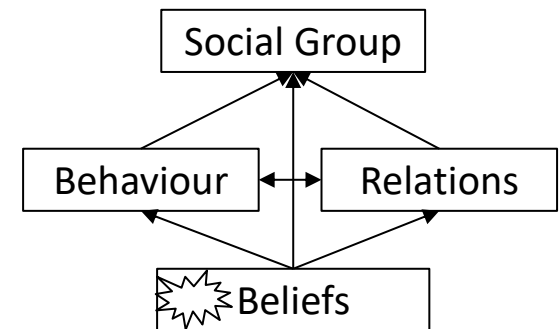
Vertical influence in systems

System A serves as a foundation for system B and C. They are built on top of system A. The design of both systems are adapted to system A.
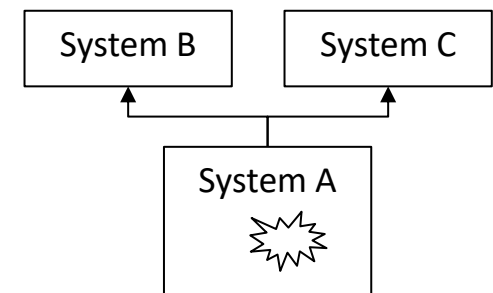
Dissemination of wrong information throughout the systems of an organisation
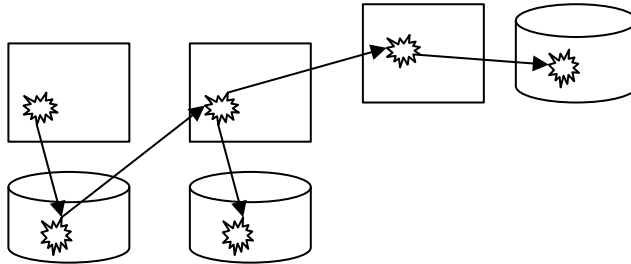
Dissemination of an erroneous idea on the web

It may affect our life, environment, work, …
and even society.
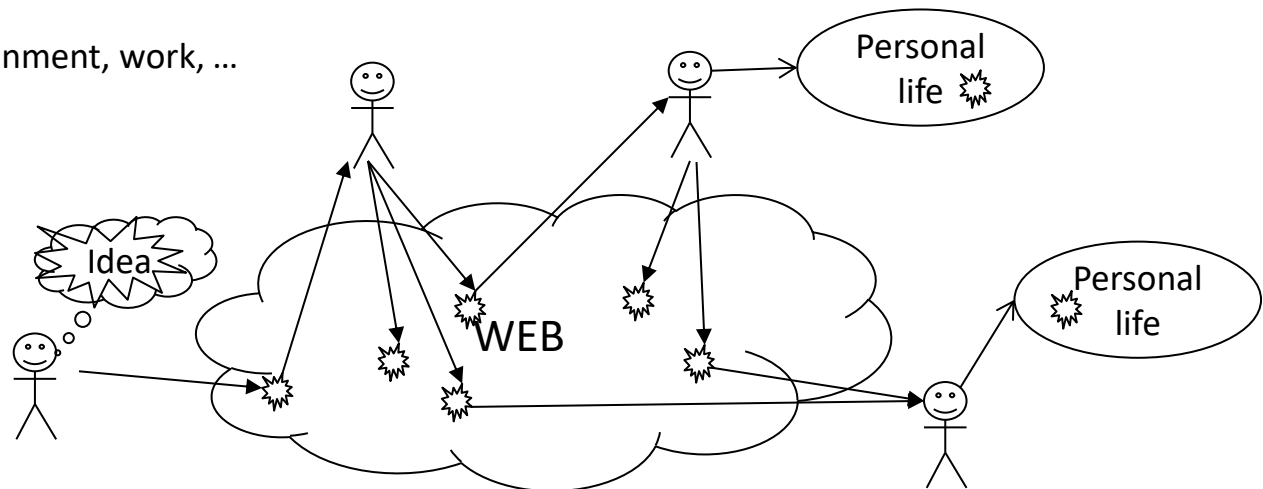
Contamination & Root Causes

**Contamination
is one of the cause
of the existence of (deeper) root causes**

- We failed to identify the root cause,

and

- we only eliminated the consequence(s)
- or/and we adapted to the consequence(s)

Contamination & Root Causes

We prefer to consider the problems happening after the implementation of a system as "new problems" rather than as consequences of a flawed design of the systems.

If the problem is 'new' (and require an additional solution) then we don't have to

- (re-)investigate the existing system (dealing with something new is more attractive than dealing with the existing).
- admit our mistakes or limits
- take responsibility of design flaws
- jump back to an earlier milestone. We can continue to focus on 'progress'
- admit that we didn't progress as much as we thought
- undo and redo work
- admit that some invested effort and resources have been wasted
- question our work or the work done by others
- face that maybe we were not that competent
- face other's judgment and critics (vulnerability, self-confidence, evaluation, ego), justified or not.
- critic others (the conceivers)
- communicate unpleasant news

But ... real competency, responsibility, maturity, integrity, cost, long term effects, ...?

Contamination & Root Causes

Progress →

| Problem | | Implementation of Inappropriate Solution | New Problem | | Implementation of Inappropriate Solution | ... |

Problem
- Cause → Consequence

Implementation of Inappropriate Solution

New Problem
- Consequence

Implementation of Inappropriate Solution

...

Cause ← = Consequence

Cause ← = Consequence

Cause ← = Consequence

Root Cause ← = Consequence
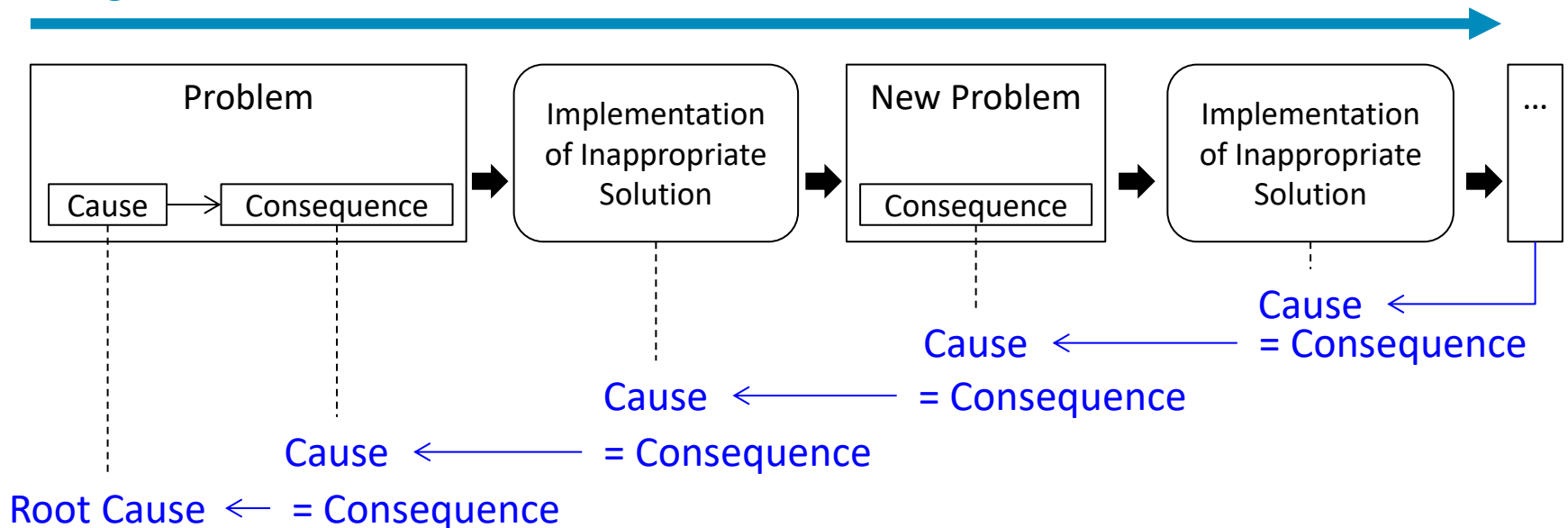
If we consider the consequences as a 'new problem' then we probably won't investigate the causes (and the steps backwards in blue won't happen).

The key question to a deeper understanding and to get to the root causes is the WHY-question.

Ineffective Problem Solving

- **OTHER INEFFECTIVE SOLVING PRACTICES**

  1. Solving a problem without proper diagnosis or without proper analysis

  2. Lacking of insight

     - Accepting a solution without preceding decent analysis
     - Applying a 'solution' without real understanding the problem
     - Trying to 'solve' with only a vague vision of the proposed solution

  3. Not separating unrelated problems and attempting to solve everything at once

  4. Separating related problems (ignoring relevant related issues)

  5. Approaching a dynamical problem as if it was static

     - dynamism, interaction with environment, long term evolution, life cycle, …

  6. Approaching a global problem as if it was local

  7. Failing to consider all the perspectives (considering only the perspective of one person)

  8. Only the general case and ignoring all the exceptions (they may crash the system, make clients to be lost, …)

Ineffective Problem Solving

- **OTHER INEFFECTIVE SOLVING PRACTICES**

  9. Something may work for a small number and not for large numbers or many repetition

  10. Comparing the weaknesses of one solution (usually the old one we want to get rid of) and the strengths of the other (the new) solution. How about the strengths of the old and the weaknesses of the new? (positive of solution A versus negative of solution B)

  11. Solving wrong needs. Asking wrong questions.

  12. Not asking (sufficient) questions because we already "know".

  13. Asking only questions meant only to confirm one single idea and avoiding those that would undermine it.

  14. Allowing impatience and deadlines driving you. Instead, progress steadily and build with the long term in mind.

  15. Tendency to change the least in order to have the system to provide the expected output.

      Being satisfied when the system functions as it should is a norm that is inadequate. It is based on the perspective of the user's perspective in normal conditions. There are many other perspectives to consider. This is norm is largely insufficient when the system is expected to function in different conditions, when it is expected to be robust, to be efficient, to last over a longer period of time, to evolve, to grow or when other systems will be built on top of it. A design must be right and elegant (well-organised, clean, lean, …)

Ineffective Problem Solving

- **OTHER INEFFECTIVE SOLVING PRACTICES**

    16. If a system is designed to solve today's needs, when this system will be delivered it may solve yesterday's needs. Look far ahead and design for future needs.

    17. Copy solutions from elsewhere without knowing the difference between the other situation and your situation and without understanding why it worked there. Are there specific things about a solution that haven't been told?

    18. Confusing quality with luxury. ("I don't need a Ferrari. A 2CV is fine")

    19. Underestimating the really required qualities. Considering only the ideal situation when designing a system. One doesn't build ships to sail on calm seas only. Ships have to withstand storms as well.

    20. Getting some information and some insight, deciding, conceiving a 'solution', building it and look what's the outcome. Acquire some more insight and more information and continue cycling. ('Some' is not enough).

    21. Tell about the problem to people around you. Gather a maximum of opinions and ideas. Involve as many people as possible hoping someone will come with a solution.

    22. Confusing guilt and cause: Searching the guilty person and punish or remove him won't make the problem to be solved. It will make things worse.

Beware of …

Being satisfied with …

- Solution that eliminates only visible impacts (or only visible impacts have been checked)

- Local solution or only locally verified (risk for side-effects, sub-optimisation and long term issues

- Short-term solution

- Solutions that fit while some (non-fitting) aspects, constraints, needs, … have been ignored

- Solutions based on oversimplifications

- A simple but wrong answer

  - Is simple, easily understandable

  - Looks like a solution

  - Backed by a few simple (simplistic) arguments

  - Cheap and/or quick solution

  - Ignoring a part of the problem, doesn't take all aspects and criteria into account

- A quick answer to a question. It is not necessarily a right and useful answer.

- Being presented a too limited set of alternatives (maybe a better solution exists outside these alternatives)

- False alternatives: Having to choose from a set of bad solutions and only 1 'satisfying' solution

- Accepting unverified solutions

A solution to a problem is not a solution if it doesn't solve the problem or if

- It is not beneficial (economically, …)
- It is not feasible
- It is not practical
- it creates more new problems

Labelling something as 'solution' won't turn it into a real solution.

Beware of labelling something as 'solution'

Focus on Problem or on Solution

Focus on
Problem

Focus on
Solution
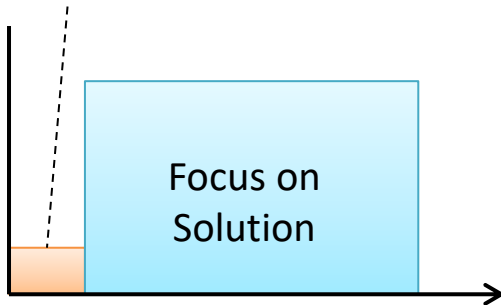
Little or no attention is spent on the problem.
Too quickly jumping to the 'solution'.

INCREASED RISK OF

- Conceiving a solution that does not solve the problem and which creates even more problems.
- Solving consequences
- Driven by urge to do something, to deliver quickly, to get it solved.

Focus on
Solution

Focus on
Problem
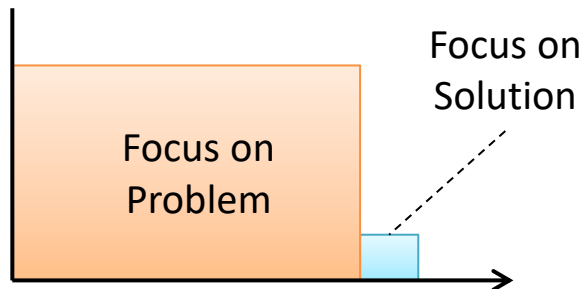
All attention is spent on the problem and little on the solution. Possibly the attention remains on the problem.

INCREASED RISK OF

- Analysis paralysis (= form of postponing)
- Never finding a solution
- Fear of taking decisions, fear of action, hesitation, feeling of inability to resolve it, …

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DEADLY IDEAS

- The need is the solution formulated in the demanded and we don't have it.
- The problem is that we don't have the solution described in the demand.
- The demand describes that what is required to solve the need.
- The demand contains requirements.
- The demand describes what we want.
- What we want is what is required and what we need.
- We create value by developing exactly what the client demand.
- Once the solution as described in the demand is delivered, then the problem is solved and the need is satisfied.
- Once the requirements are met, the expectations are also met and the client will be satisfied.
- …

These are assumptions which are not always or even rarely true.

THE BIG CONFUSION
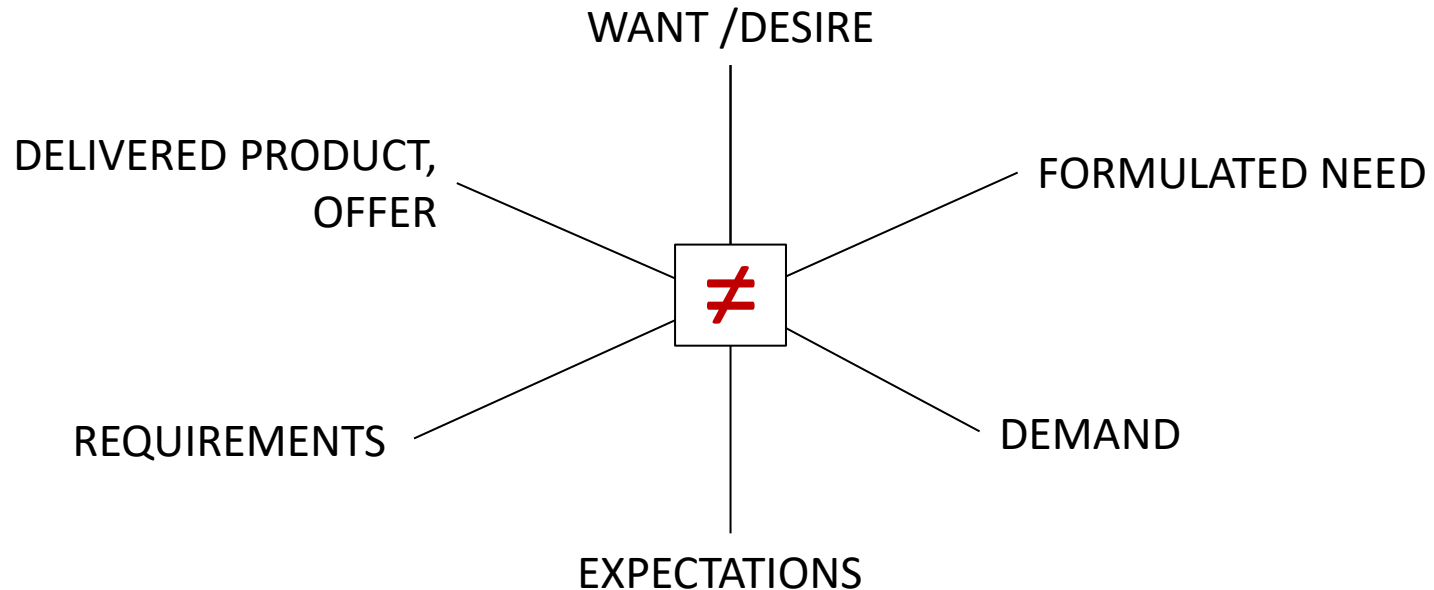
Never assume
- These elements are reliable.
- Match with each other, reflect each other, correspond to each other.
- Reflect what is really required.

While it should be, it is often not the case
        unless they has been thoroughly analysed and checked **(**by a professional analyst).

The Big Confusion Explained

- What we (or the client) want does not always (or rarely) reflect what we really need to solve: the problem or need.

- What we formulate as a demand doesn't always fully correspond with what we want.

- Satisfying the demand won't necessarily satisfy our expectations, because we expect more or we expect other things.

- Since the demand doesn't always reflect the real need and real solution, it can be that formulated requirements are not real requirements.

- People wanting to sell a product, concept or idea will always call their products or offer "a solution", independently of the situation and needs of the clients.

Why these differences?

- Improper diagnosis

- Insufficient understanding of the situation surrounding the need or problem

- Overestimation of what is possible (wanting an impossible solution)

- Underestimation of what is possible (not fully exploiting the available possibilities)

  One doesn't exclude the other.

- Lack of insight of the consequences of an idea, a decision, a design, a concept, a technology, a system, … a 'solution' (required time, work and skills; risks; flexibility; opportunities; cost; …)

- Lack of insight and control of the matching between need, wanting, requirements, expectations, …

Examples of Confusion

- **Example 1**
  - A client enters a do-it-yourself shop and ask for a drill.
  - Demand: a drill
  - Need: A drill?   Problem: He has no drill?
  - He wants to make a few holes in the wall?
  - Need: A few holes?   Problem: No hole in the wall?
  - The clients wants to fix a bookcase on the wall.
  - Need: A bookcase on the wall?   Problem: No bookcase on the wall
  - He wants it to store things on it to get a clean room
  - Need: A clean room

- **Example 2**
  - An employee wants a software application and submits a demand for it to the IT department
  - Need: the software application?   Problem: He (or she) has not a software application performing some functions
  - The software application should present him/her some information
  - Need: Information   Problem: He (or she) has not a software application
  - (S)He needs the information to take decisions about clients
  - Need: Taking decisions   Problem: Inability to take a decision
  - **Reflection:**
  - If it is possible to automate this particular decision process, then what is the actual need?
  - Why does the demand not reflect this need?

Examples of Confusion

- **Example 3**
  - **Lack of communication is a cause of project failure.**
  - Communicating more will NOT make projects to succeed. Why?
  - Real causes projects fail are, for example,
    - Stakeholders have different objectives and expectations
    - The project team doesn't understand the business domain and the situation of the business very well
    - Stakeholders think the project is doing well while unknowingly their attitude, actions and decisions hinder the project. They don't provide sufficient information, time and resources.
    - How do we solve this? By communicating more and purposely about these topics
  - A lack of communication is not the problem. (Better) Communication is the solution. (This is not the same at all!)
- **Example 4 -**
  - The business often wants to automate existing processes.
  - Automation of concepts from the "paper administration"
    - flow of documents/information
    - copy of information
    - visual verification
    - decisions taken by people
    - delays between process steps vs real-time

How about reviewing and optimising processes and implement more powerful concepts made possible with IT?

Externalisation of a Problem

Forms of externalisation: Delegation, outsourcing, privatisation, consumption (removal of the broken thing and buying new), disposal, …

BAD REASONS

- Externalisation driven by fear

- Because of lack of competencies (sometimes)

- Because of belief that others do it better (example: privatisation)

ALTERNATIVE

- Creating conditions and improving the own competencies and own system

- Learn, train competencies, try and learn again.

Externalisation of a Problem

DANGERS:

- Misplaced trust. Other parties may have other objectives or may ignore yours.

- Others may not understand your problem and situation as you do.

- Accepting of other's words, demands, proposals, solutions without investigation and critical evaluation → acceptance of wrong solutions

- Getting anything except a solution

- Loss of control

- Dependency of others

- Expensive

- After externalising the problem, what did we learn? Most problems we created ourselves because of our world view, our beliefs, our knowledge, our competencies and our habits. If we didn't learn, will we simply continue creating the same (type of) problems and externalise them over and over again?

Example: privatisation → loss of control over domains which are strategic for a country.

Complex Problems: Problem Havers & Solution Builders ?

"Problem havers" dealing directly with solution suppliers or solution builders/providers.

"Problem Havers" Owners, "Users"		Solution Builders & Suppliers
Homeowner	deals directly with →	Construction Company
Patient	→	Pharmacist
Car Buyer	→	Car assembly personnel
Business Community	→	Software Developer

- have usage knowledge and domain knowledge (or should have)
- may have authority, ownership and funds (Is this always justified?)

- build and deliver the solution

Assumption: One of the parties has the right competencies to do a correct diagnosis, a decent analysis and is able to conceive the solution.

THIS MODEL DOESN'T WORK FOR COMPLEX PROBLEMS

We see this model failing over and over again → trial and error approach → many problems and changes

Complex Problems: Problem Havers & Solution Builders ?

**"Problem Havers"
Owners, Users**

**Solution Builders &
Suppliers**

Architect	

Homeowner

Construction Company

Physician

Patient

Pharmacist

Car Engineers

Car Buyer

Car assembly personnel

Architects & Analysts

Business Community

Software Developer

Specialists in Diagnosis, Analysis, Modelling, Architecting, Engineering, Planning
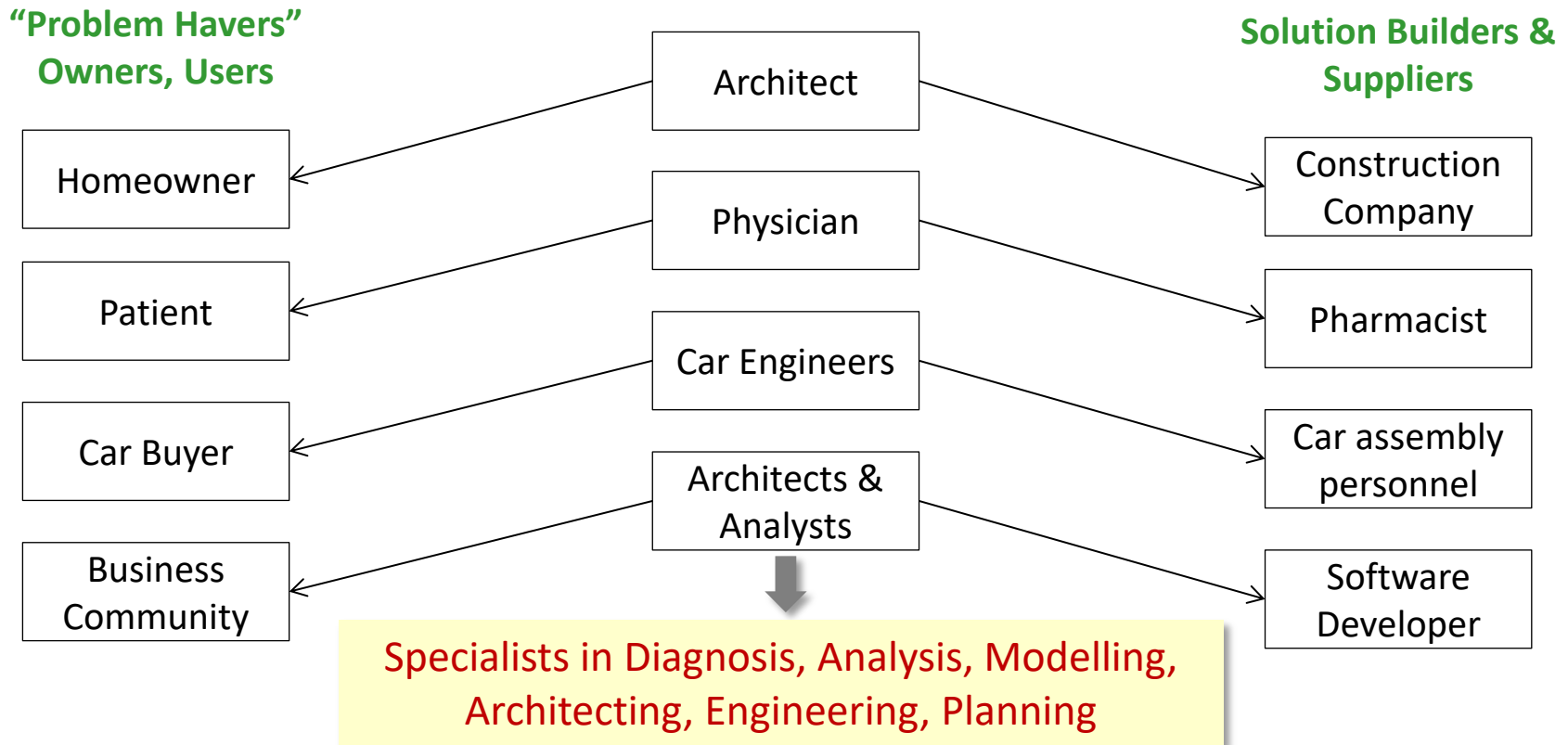
Essential specific discipline and skills neither possessed by the owners/users nor by the builders/vendors
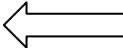
The process from problem to solution
- should **not skip** steps of proper DIAGNOSIS and CONCEPTION.
- should include **ALL** the required COMPETENCIES (disciplines & skills).

EFFECTIVE
PROBLEM SOLVING

GENERAL CONSIDERATIONS

PROBLEM WITHIN / REQUIRING A SYSTEM

- Ineffective Problem Solving Tactics & Traps
- **Effective Problem Solving**

  - **General considerations** ⟸
  - Understanding Mechanisms
  - Problem Concepts
  - Solution Concepts
  - Solving Approach

Origin of Problems

1. Some problems just happen

2. Some problems are created by others

3. Some problems are created by ourselves

    Lack of insight and missing holistic view

    cognitive biases (not treated by this presentation)

    beyond our control

    …
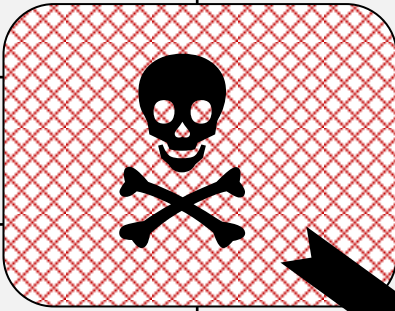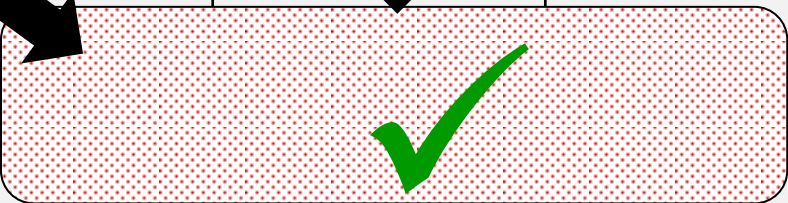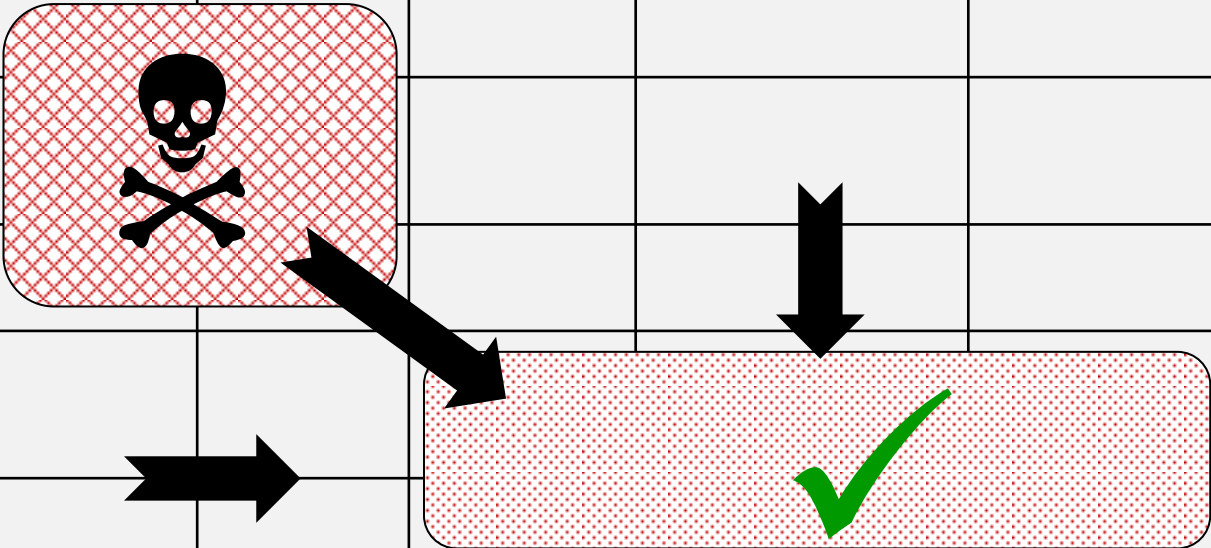
Many, problems find their origin in our world view, in our knowledge, in our lack of insight, in our ideas and in our assumptions.

SOLUTION:

- Training and practicing of analysis skills, critical thinking, problem solving skills
- Curiosity
- Study critical subjects (those that do matter in our lives)
- …

What Do We Really (Want to) Solve?

	Wrongly	Partially	Fully & suitably	Improvement	Innovation
Something else					
Problem Environment					
Result / Output					
"Cause" (Consequence)					
Root cause			✔		

- Proper diagnosis
- Excellent insight
- Architecting, Engineering skills
- Creativity

Focus on Problem or on Solution

HOW MUCH FOCUS ON PROBLEM AND ON SOLUTION?   50% - 50%?

Focus on Problem	Focus on Solution

Problem and solution of equal difficulty

Focus on Problem

Focus on Solution

Intensive focus on problem, conceiving the solution takes time

Focus on Problem

Focus on Solution

Easy problem, complex solution

Focus on Problem   Focus on Solution

Delays between problem analysis and on focus on the solution.

Focus on Solution

Focus on Problem

Complex problem, easy solution

Many patterns are possible !

Conclusion:
Focus as much <u>as required</u> and when required on problem and on solution.

5 Main Steps of Problem Solving

The Steps

Detection	First step to trigger the diagnosis process awareness + identification	Scanning
Diagnosis	Searching to detect the cause	Searching
Analysis	Getting a deeper insight of the structure, the components and their nature, mechanisms & behaviour, interactions, limits, evolution, environment, tendencies, …	Learning
Conception	Design of solution	Thinking
Execution	Building, implementing, applying, acting, …	Doing

We can perform these steps mentally or formally.

Example of a simple mental problem solving pattern
- What is the problem? Oh .. I see. This is the problem.
- What causes this? Why does it happen? Ok! Found.
- How does it work now? Ok, I understand.
- What can I use to solve this? I can do this and that like that. Then it will be fine.
- Let's do it. … Done.

5 Main Steps of Problem Solving

DETECTION		DIAGNOSIS		ANALYSIS		CONCEPTION		EXECUTION
Scanning	→	Investigating	→	Learning	→	Thinking	→	Doing
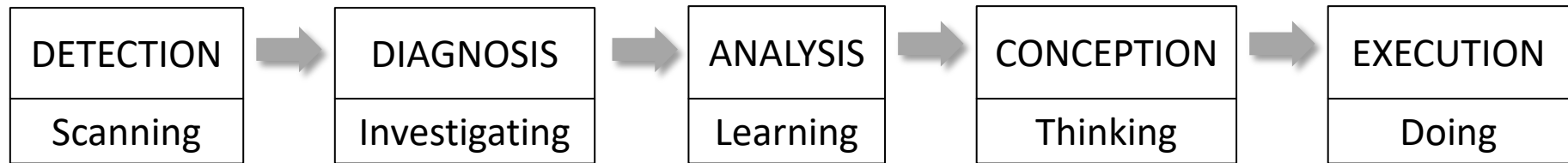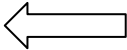
- The detection is the trigger of the process
- If the diagnosis fails, all subsequent steps will fail.
- If the analysis fails, all subsequent steps will fail.
- If the conception doesn't represent the solution, then the construction will fail.

CONSEQUENCES :
- Bad diagnosis and analysis lead to several attempts (=iterations)
- Creation of more change due to decisions and actions based on a lack of insight
- Creation of more problems
- More work to correct consequences of the created problems Rework (iterations) causing:
  - waste of work
  - wasted time and resources
  - waste of opportunities
- Sometimes we just can't iterate

Principle: Get things right (or as right as possible) from the first time.

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UNDERSTANDING
MECHANISMS

PROBLEM WITHIN / REQUIRING A SYSTEM

- Ineffective Problem Solving Tactics & Traps
- **Effective Problem Solving**
  - General considerations
  - **Understanding Mechanisms** ⟵
  - Problem Concepts
  - Solution Concepts
  - Solving Approach

A problem is something that we want to see resolved, something that disturbs us.
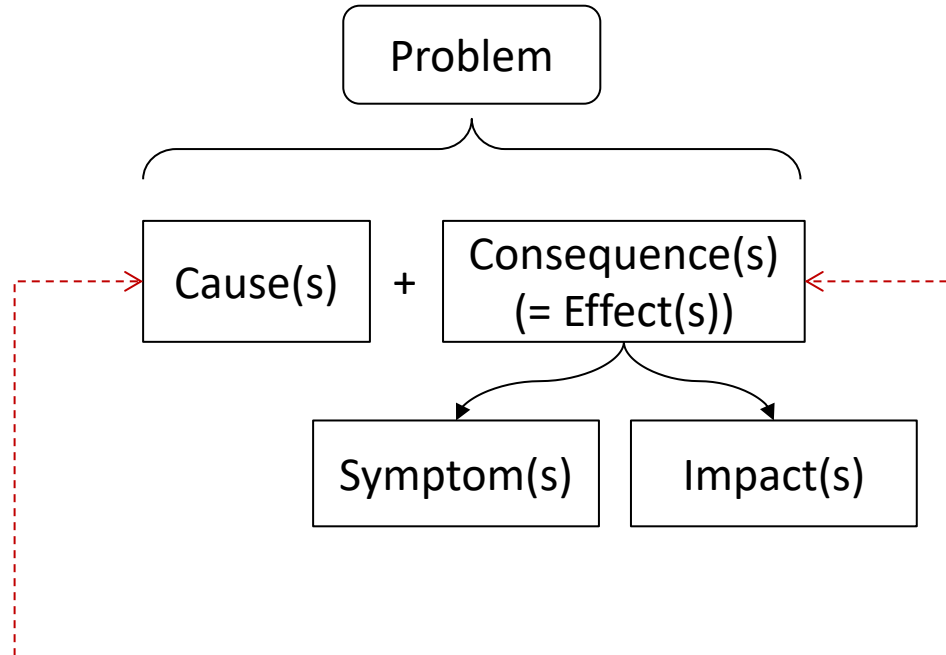
This is **WHAT WE HAVE TO** remove.

Causes do rarely disturb us. They are more often hidden.

This is what we see and experience and what disturbs us.
This is what we **WANT** to see removed.

Problem : Cause – Effect

Problem

Cause(s) + Consequence(s) (= Effect(s))

Symptom(s)   Impact(s)
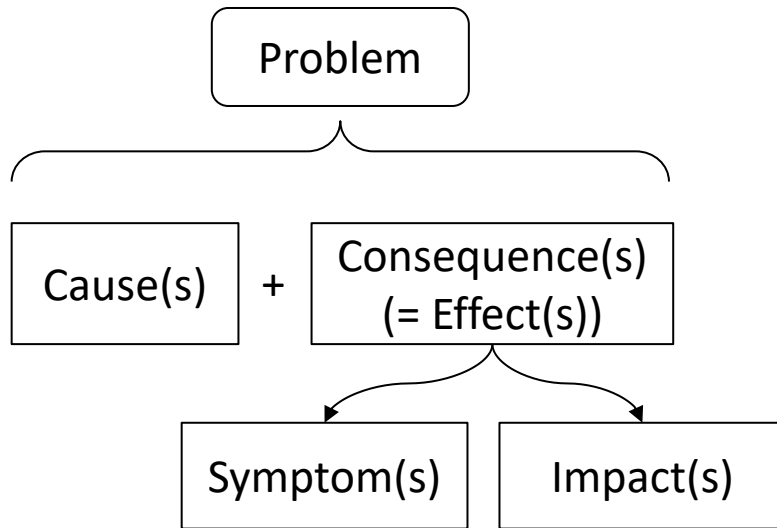
A consequence can itself be a cause
(or a cause can itself be a consequence)

Cause

Consequence
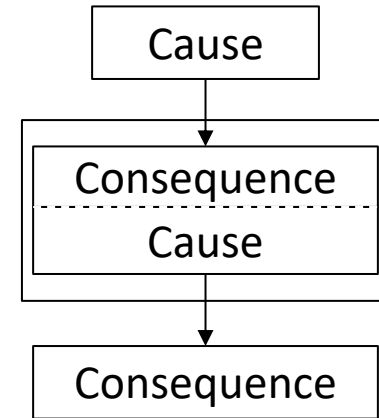
Cause

Consequence

Several consequences may have a same cause

Cause → Consequence 1 / Consequence 2
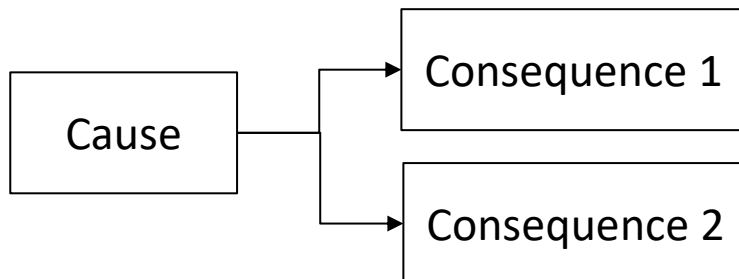
Several problems (causes) may create together a single impact.
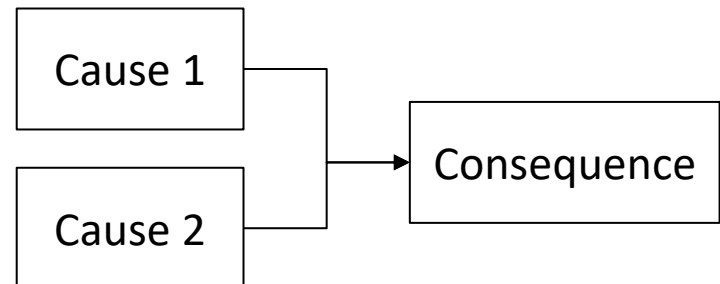
Cause 1 / Cause 2 → Consequence

A more complex diagram of cause-effect relations
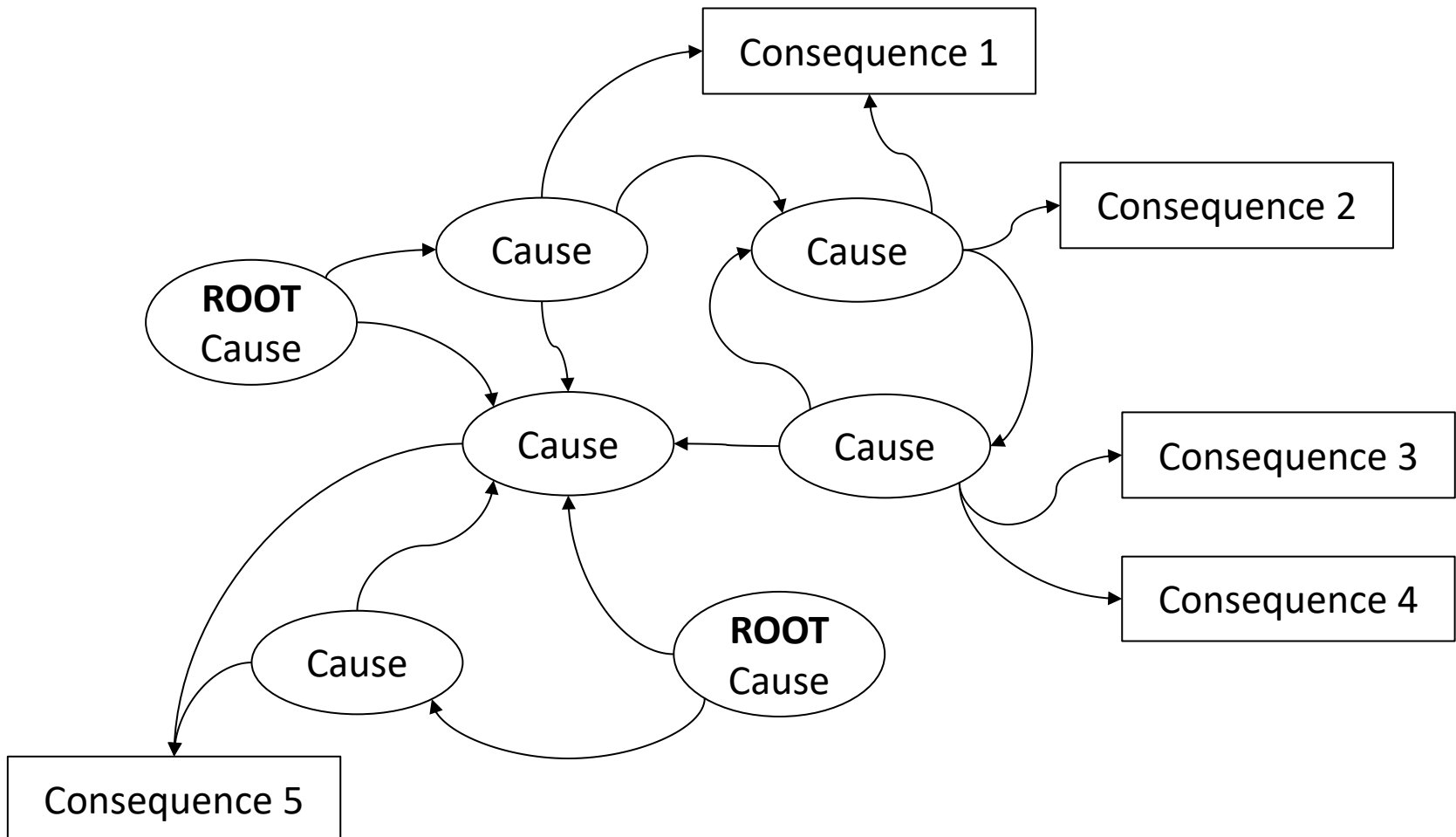
Cause - Effect Diagram: Complex Problem Map

Sometimes it's more complex than "cause-consequence" / "action – reaction"
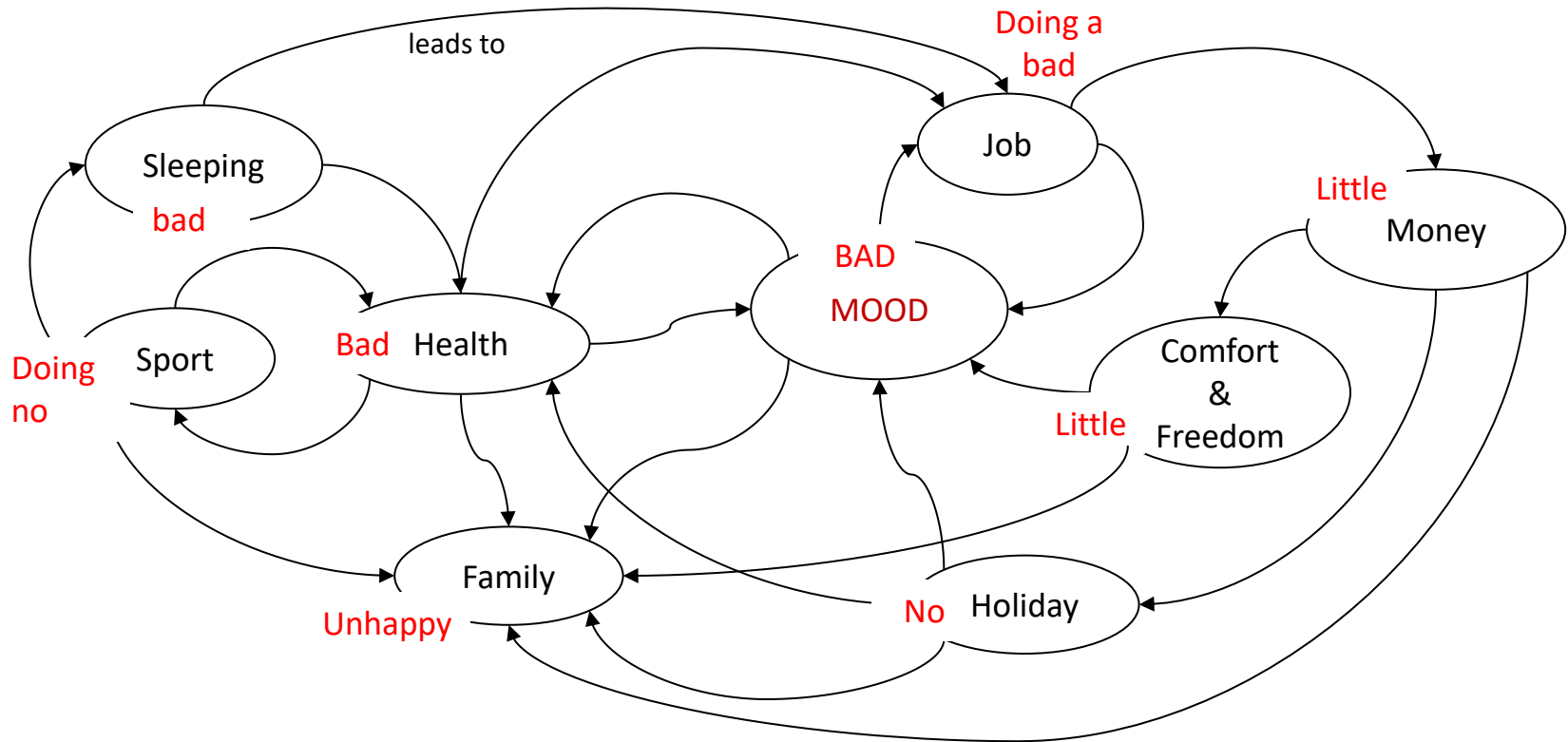
Causes and effects are not necessarily sequentially linked.
Causes & consequences reinforce themselves.
What is the root cause?

Problem Map – "Positive" Version
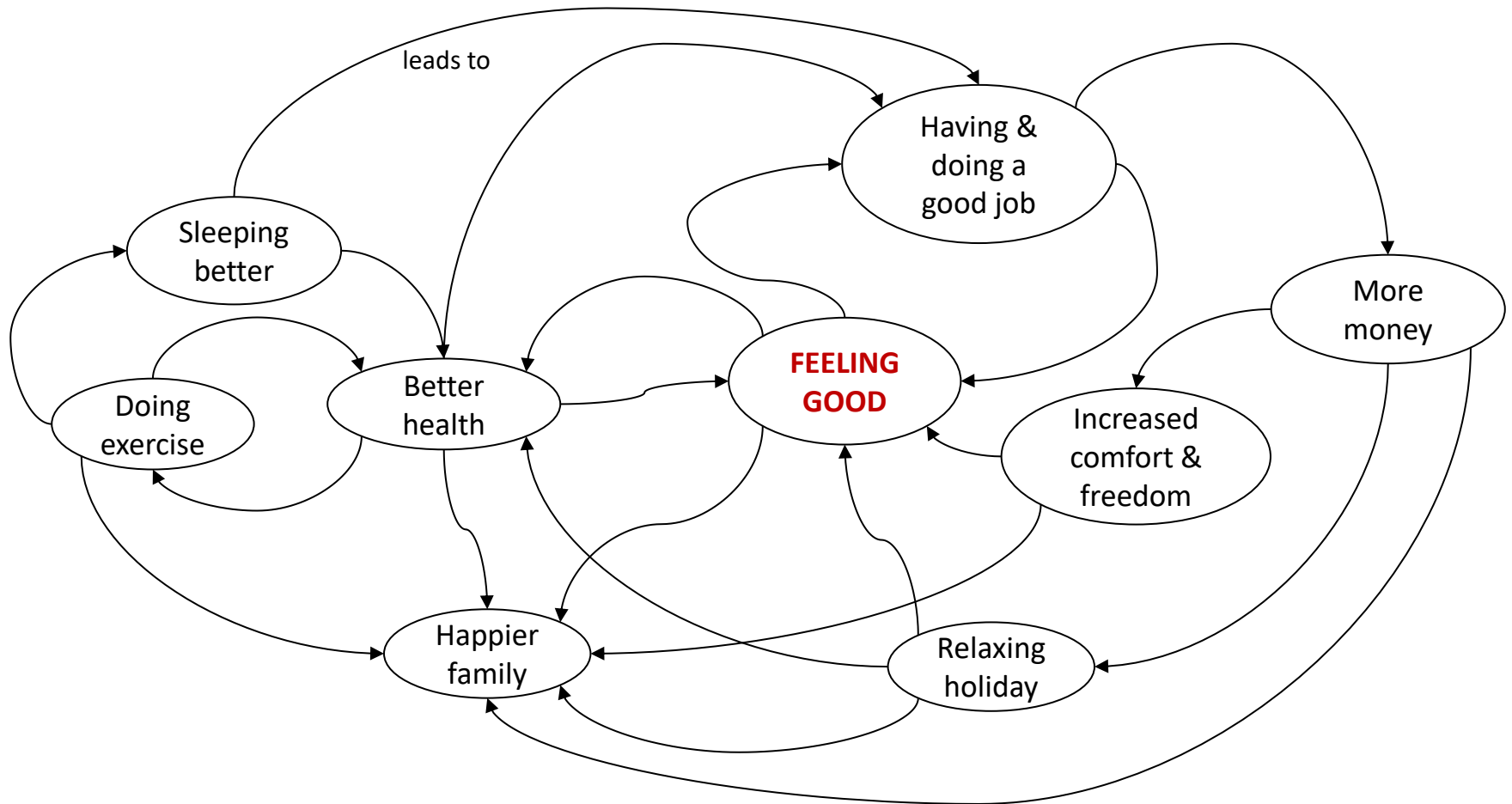
Different 'Mechanisms'

Problems may arise in different mechanism of different nature

- Any set of forces, tendencies, actions, anything in movement

- Mechanisms, systems, behaviours, processes, evolving situations or environments

- Different nature: financial, psychological, information, machines, …

- Different architectures

- Simple or complex, concrete or intangible

Understanding Mechanisms

- Critical to understand
  - Mechanisms
  - Structures
  - Cause-effect relations
  - Processes
  - Systems, types of systems, systems architectures

- Understand their nature, architecture, characteristics, limits, … in general and specific for the situation you want to solve.

Structure of a (Living) System

ENVIRONMENT

Role, Purpose, Goal

SYSTEM

CONTROLLER

PROCESSOR

Boundary
Interface
Input

Output
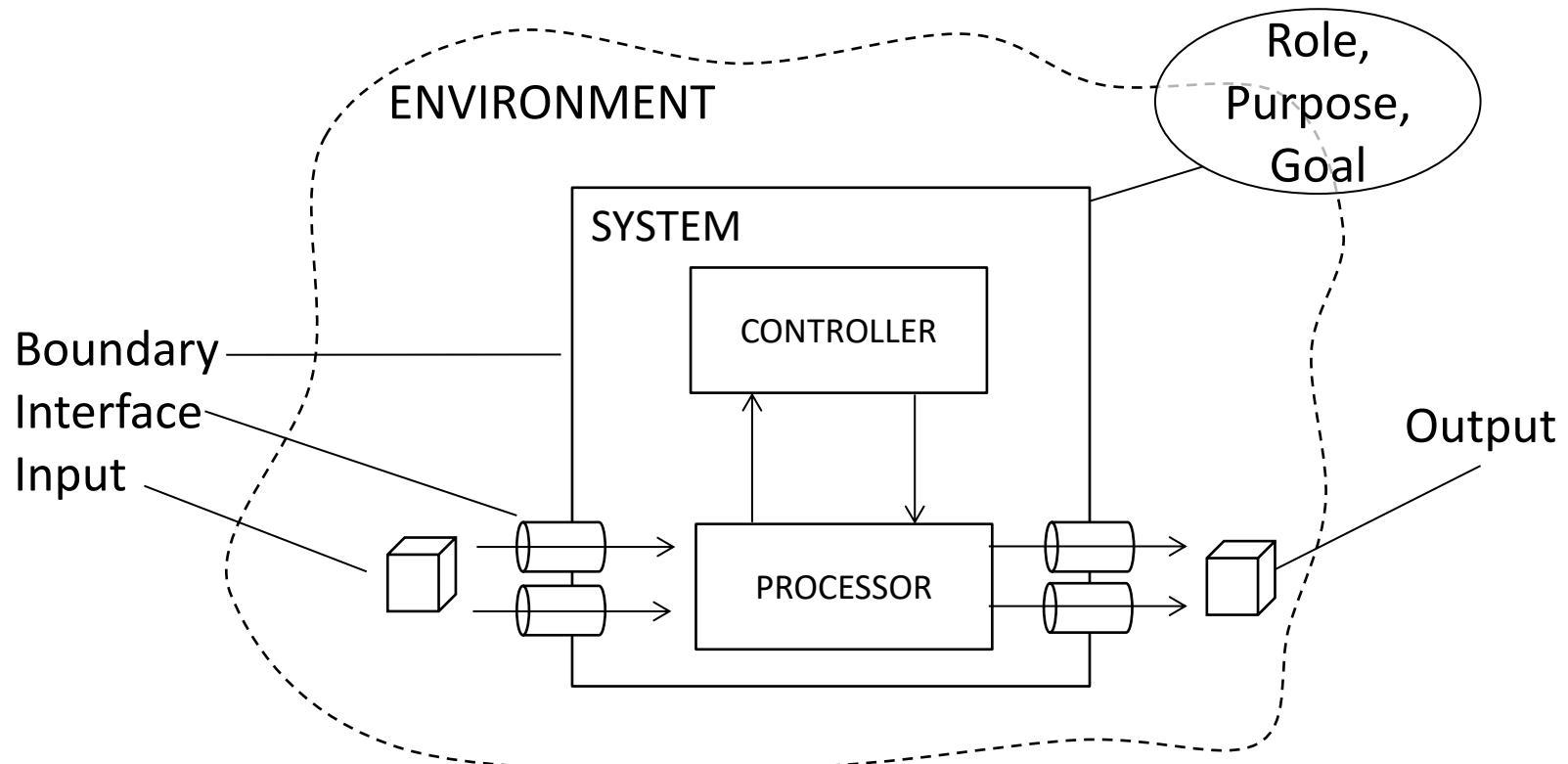
A system is of a certain type and nature. It follows rules.
It has qualities, capabilities, limits.
Preconditions must be satisfied.
It has an architecture and is composed of different constituents which play a role in the system and, if the constituent is a sub-system, collaborate with other sub-systems.
System types: human/mechanical, composite, monolithic, homogeneous/heterogeneous, open/closed, (nearly) real-time, natural/man-made, ….

A constituent can be a (sub-)system (with boundary, controller, processor, …) or a simple component.

System of Systems

- Many levels of systems – sub-systems
- Subsystems are of different nature (people organisation, information sys., financial, …)
- Sub-systems are imbricated in different ways
- Sub-systems have different architectures, purpose, capabilities, …
- Names: supra-system & system; system & sub-systems; landscape of systems

Supra-system
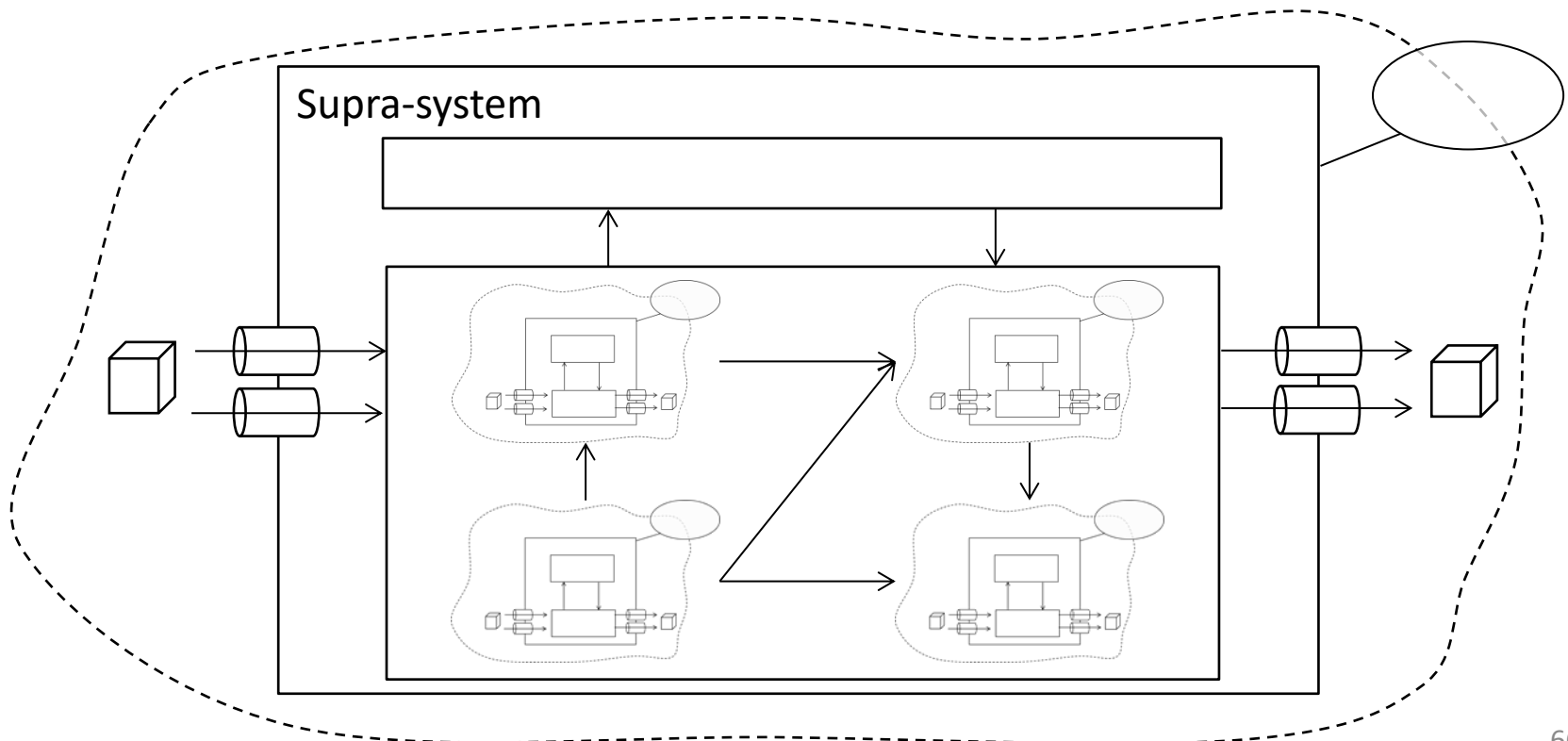
Processes

Things to understand of PROCESSES

- Sequence of steps: sequential or in parallel
- A process or step can by decomposed into sub-steps and each sub-step into sub-sub-steps, …
- Decision: selection of step(s)
- Repetitive, dynamic, continuous, …
- Resource, time, duration
- Preconditions, circumstances, trigger
- Ad hoc or pre-defined (formalised)
- Variability
- Linear or cyclic
- Controlled or uncontrolled
- Executor or executed by many actors or components
- Parts are executed on number of locations ?
- Responsibility divided over different actors?
- Input – out put (control on in put and output)
- Strengths, drawbacks and limits of a process
- Performance parameters
- …

Architecture and Structure

Things to understand of ARCHITECTURE and STRUCTURE

- Role : order, internal organisation, defining a place for the components, keeping the components in place, bearing
- All the characteristics and how they are created
- Physical or abstract
- Different types of architectures (centralised, decentralised, agents (autonomous components), networked, …)
- Architecture or structure
- Interdependencies
- Spread of responsibilities and control
- Strengths, drawbacks and limits of an architecture or structure
- Principles defining the architecture (why is this architecture like it is/should be, where do these reasons (principles) come from, how can we find and define them? What are their effects on the system?)
- Influence of the environment and its evolution on the architecture
- Influence of the components and their evolution on the architecture
- …

Components
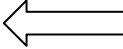
Things to understand of COMPOENTS

- Role within the system, role in processes
- Abstract or concrete component
- Behaviour and functions
- Capabilities
- Characteristics
- Strengths, weaknesses, limits
- Nature of the component
- Place in the architecture
- Interactions with other components
- Influence from the component's environment (inside the system)
- Component = sub-system? Then see concept of 'system'
- …

ANATOMY OF
THE CONCEPT 'PROBLEM'

Concepts to analyse, describe and understand the problem

PROBLEM WITHIN / REQUIRING A SYSTEM

- Ineffective Problem Solving Tactics & Traps
- **Effective Problem Solving**
  - General considerations
  - Understanding Mechanisms
  - **Problem Concepts** ⟵
  - Solution Concepts
  - Solving Approach

Basic Structure of a Problem

-\/\/\/\/\/\^ Evolving over time

Problem Area

Impact Area

Event / Trigger

T

Conditions (Circumstances)

S Symptom

(Contamination)

S Indirect Effects

Input → Mechanism (process, system) → Output

S

Influential Factors

Forces, Tendencies

Impact

Loss or Damage
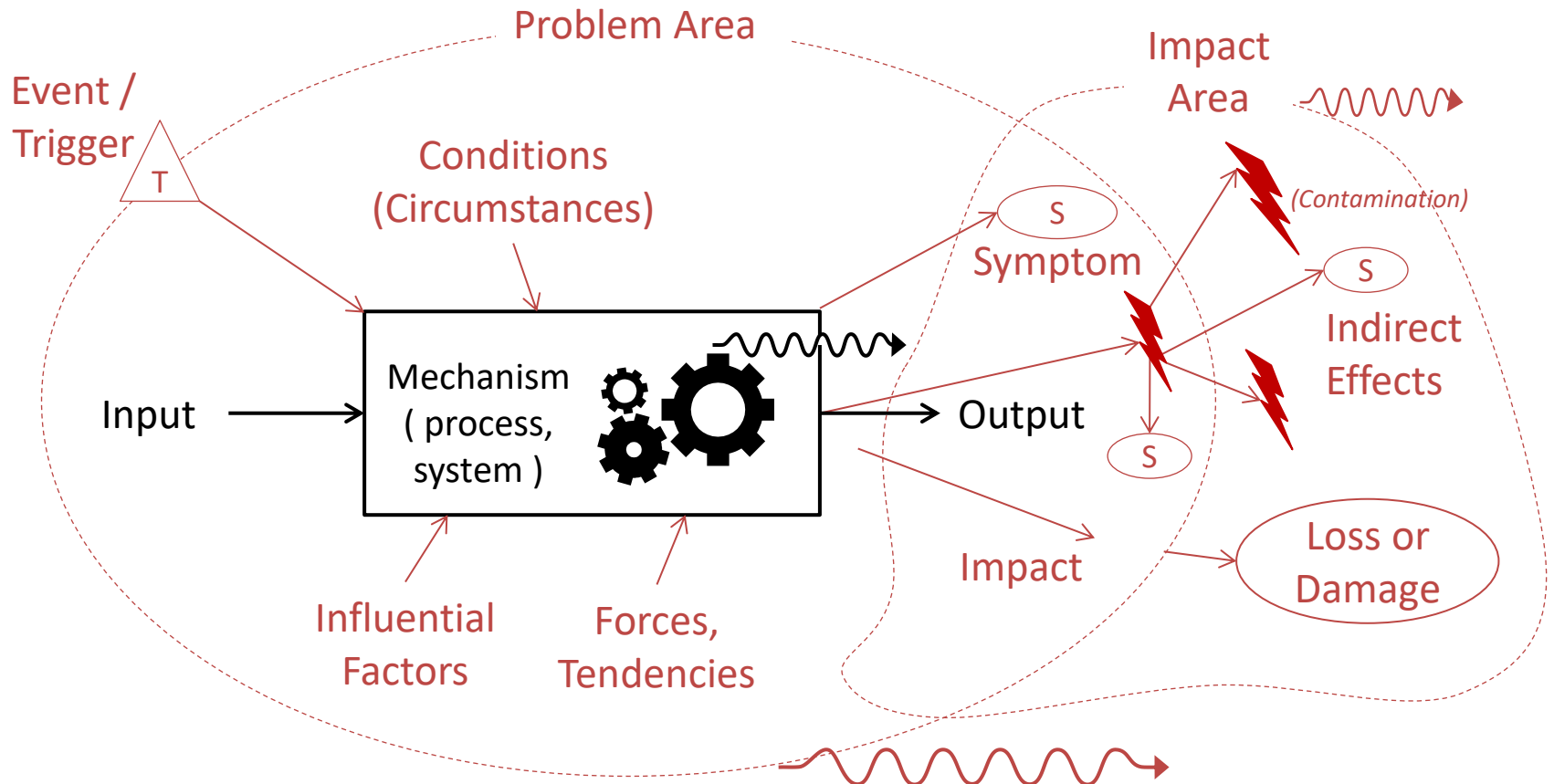
- Perceived problem vs true problem
- Nature of problem
- Problem domain
- Risks

The whole environment, situation, problem and impact <u>may evolve over time</u>
→ = dynamic!

Problem Concepts

Understanding in the following concepts helps
in analysing and solving the problem

1. Complaint
2. Symptom
3. Impact
4. Consequence
5. Risk
6. Damage, Loss
7. Problem
8. Nature of the problem
9. Perceived (subjective) problem
10. Problem Domain
11. Indirect Effects / Ripple Effect

12. Trigger, Event
13. Input
14. Condition, Circumstance
15. Cause-effect-Relation
16. Dynamic: System, Mechanism, Process
17. Problem's Evolution / Life
18. Forces, Tendencies
19. Problem Area
20. Impact Area(s)

Note: Concepts related to the solving-part of the process are presented later.

COMPLAINT

- Subjective or objective consequence that has been noticed, found dissatisfaction and expressed (formally or informally) by individuals or groups
- **Role:** Trigger and basis for further investigation
- Often (not always) the primary input to the problem solving process
- Should be captured as early as possible or even continuously
- Be attentive to complaints. Consider them thoughtfully and avoid minimisation & fast rejection or quick fixes
- Express them explicitly (formally)
- Gather (list) them

SYMPTOM

- Noticed effects of an existing problem
- **Role:** indication of a problem, information about the problem
- Can be harmless
- Can be of different nature (lack of quality, negative emotion, time pressure, bad practices, used vocabulary, …)
- May disappear when problem is solved
- To be checked after the problem has been solved

IMPACT

- Any result of a problem causing a damage or a loss.
- **Role:** form the basis for further investigation
- Can be expressed in complaints or found through metrics and analysis
- Impact can be continuous, sporadic (in specific circumstances) or one time.
- Input to the problem solving process
- Impacts should be recorded, managed and monitored
- Probably to be dealt with (as quickly as possible / accordingly to priorities)
- Ideally, all impacts should be identified and handled
- **Risk:** Focus on the impact → solving only them → "symptomatic treatment"

DAMAGE, LOSS

- Damage is the destruction or loss that has been created by the problem (in this context)

CONSEQUENCE

- Any noticed or unnoticed result of one or more problems (symptoms, impacts, risk)
- **Role:** indication of a problem, information about the problem
- Can be harmless
- Can be of different nature (lack of quality, negative emotion, time pressure, bad practices, used vocabulary, … - emotional, practical, …)
- "Hidden consequence". Consequences of a problem exist, but haven't been noticed yet and haven't produced a negative impact. (ex. wrong data, produced by a system, hasn't been used yet). They may still produce a negatively impact later, even when the problem has been solved.
- Risk of propagation of other problems
- Can be accepted without being considered as problematic, without being linked to a problem
- May trigger spontaneous ad hoc corrective actions
- Can be an indirect consequence (consequence of a spontaneous corrective action / symptomatic treatment)
- Some consequences may disappear when problem is solved. Beware of hidden consequences.
- To be checked after the problem has been solved
- **Description**: nature, severity, localisation, conditions of occurrence, repetition, duration, …

RISK

- Risk is a potential loss, harm, injury, liability, danger or any other negative occurrence that is probable to occur.
- Description: period, probability, severity
- A problem may engender risks. A problem and consequences can be sleeping or remain undetected. The negative impact didn't occur yet.
- Risks can only be identified when consequences have been identified and/or problems have been diagnosed properly
- Risks have to be managed
- When the problem is solved, check whether risks are still present

PROBLEM

- "**Sleeping** problem": Problem that is present but which hasn't produce (negative) consequences yet.

- "**Hidden** problem": Problem that is present but which haven't been discovered yet.

- Problems may occur suddenly, or may grow gradually. Their growth is not necessarily linear.

- **Nature of a problem**: logical, information, financial, emotional, capability problems, resource problems, …

- Permanent or 'sporadic', one-time or repetitive (describe the problem, its **life cycle**, evolution, location, occurrence, size, …)

- **Pre-problem:** This is the 'problem' as it is seen based on the complaints and symptoms. It is defined early in the process before any proper diagnoses and analysis have been performed.

- **Subjective** or **Perceived Problem**: This is the problem as it is perceived by the problem haver (customer, owner, individual, business community, …). It is often the same as the pre-problem and can be different of the actual problem.

- The investigation allows to determine the real problem or problems (objective diagnosis).

- One pre-problem or one subjective problem may turn out to concern a few real problems.

PROBLEM DOMAIN

- The problem domain concerns the area (business domain, personal finance, work, health, …) in which the problem occurred and the related disciplines.
- One single problem may concerns several domains.
- Important for determining the required competencies (determine all domains).

TRIGGER, EVENT

- The trigger is not what creates the fault. It is what started an erroneous mechanism.
- Not always present.

INPUT

- Inappropriate input may disturb the functioning of a mechanism and lead to erroneous result.
- Any system (or process) should always first verify its input before accepting it.

CONDITION, CIRCUMSTANCE

- The problem and/or its consequences may occur in specific circumstances.
- They help to locate and to diagnose the cause(s) of the problem.

CAUSE-EFFECT - RELATION

- Implies presence of a mechanism
- Not always just a single cause-effect relation. It can be much more complex. (See few simple models below as examples)

Conflict between two parties (Party A may ignore his past actions and fail to consider that the actions of B are a reaction to it.)
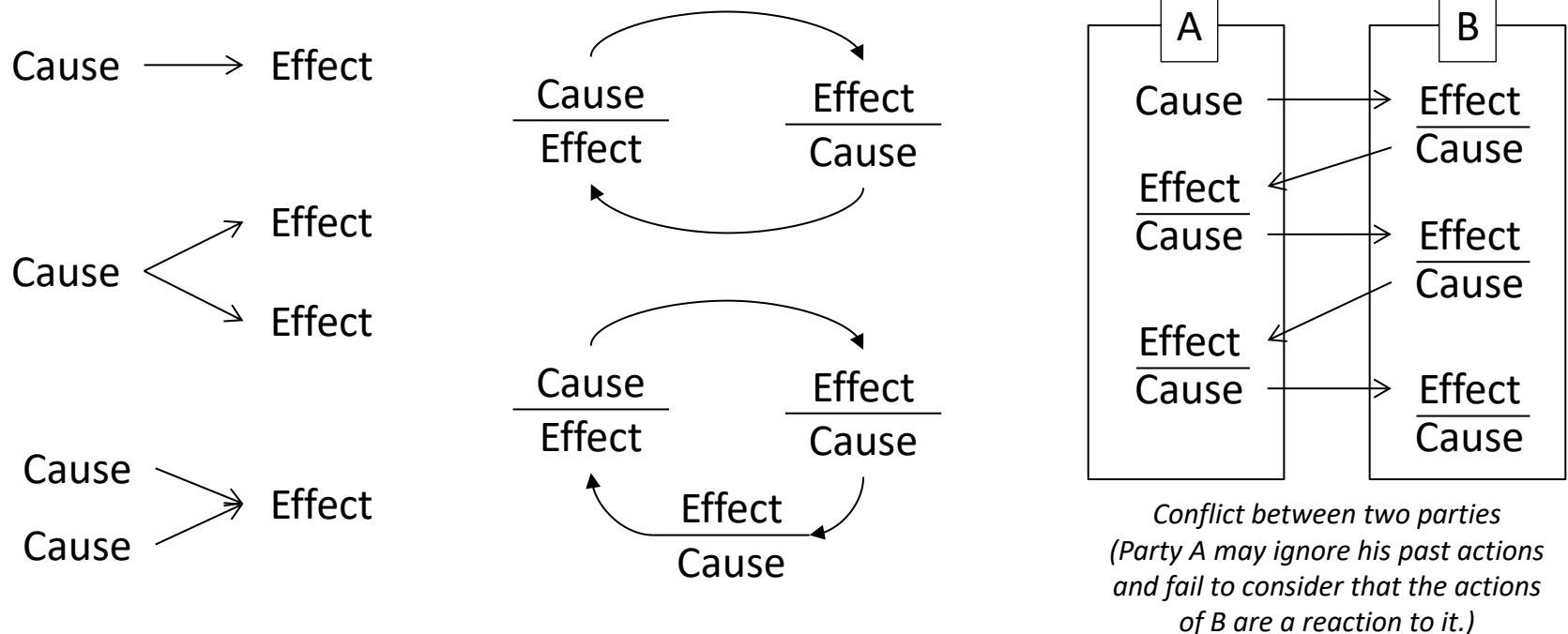
DYNAMIC – SYSTEM - MECHANISM - PROCESS

- See slides 'Understanding Mechanisms'

PROBLEM's EVOLUTION

- A problem may happen in a second or may grow regularly or irregularly. It may change over time. But it may remain the same.
- Some 'problems' have no or little effect when they are small. Once they have a certain size or a certain form, they have more serious effect.
- Important to foresee the future of a problem → proactivity, avoiding worse

FORCES, TENDENCIES

- Forces may be active on a situation.
- A mechanism or situation may also be subject to some tendencies.
- Example: People have some tendencies making their behaviour to change gradually.
- Forces and tendencies may understand a problem and help to forecast its evolution.

IMPACT AREA

- Area in which consequences (impacts and symptoms) can be found

- Consequences can be located far from the problem (in distance, time, other domain, different nature of problem, …)

- Important to find (all) the consequences

- To be investigated in order to learn more about the problem

- Can be practical to identify several area's or to sub-divide the impact area into several area's.

- Impact analysis – estimation of risks and damage

- Identify impacts in order to correct the consequences

- Study how the environment reacts on the consequences → for learning and later prevention

PROBLEM AREA

- The Problem Area is the area in which we expect to find the problem(s) and which is to be investigated.

- May overlap with impact area (not always. If no overlap then it may be more difficult to identify the real problem, since we have to look further from the impact.)

- Problem area can be adapted or expanded as more information is available and as the insight grows.

- Its investigation leads to the identification of one or several problems.

- Several problems can be grouped into one or several sets to be solved together. → possibly several problem areas.

- Do not limit the problem area to an area too close to the problem itself (immediate environment) → narrows the vision → not a holistic vision → risk for sub-optimisation or creating problems elsewhere.

- You can't solve what you don't understand

SOLUTION CONCEPTS

Concepts used to elaborate a solution

PROBLEM WITHIN / REQUIRING A SYSTEM

- Ineffective Problem Solving Tactics & Traps
- **Effective Problem Solving**
    - General considerations
    - Understanding Mechanisms
    - Problem Concepts
    - **Solution Concepts** ⟸
    - Solving Approach
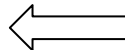
Solution Concepts

Goals

Intention

Expectation

Preference

Constraint

Solution Area

Requirement

Cause

Root cause

Barrier

Assumption / Hypothesis

Decision / Choice

Intervention points

Solution element

Solution part

Partial solution

Model

Feasibility

Proof of concept

Prototype

Answer

Temporary solution

Option

Alternative solutions

Solution

Solution environment

Cost / Benefit

System's qualities:

"Abilities"

Capability

GOAL

- Not always expressed as one single quota. It can be a situation.
- A goal can be a set of criteria's, which can be related or unrelated to each other. They may form a hierarchy or linked as a network.
- Supported by solid arguments. If you can't justify it, maybe you don't understand your goal (its reasons and drivers) or the goal isn't really justified.
- Can be difficult to measure, subjective, emotional
- SMART, if possible !
- Make sure the goal is valuable and worth to be a goal.
- Coherence of goal with environment, other's goals, laws of nature, …
- Achievable. But, know you can go beyond your present limits if you really want to and if you are ready to learn and to progress.

INTENTION

- Intentions are not always expressed in the goals
- May remain hidden
- May be incoherent and changeable(!), while goals and planned initiatives remain unchanged
- To be managed and verified regularly

EXPECTATION

- not always expressed in the goals and criteria
- may remain hidden
- may be incoherent and changeable(!), while goals, planned initiatives, acceptance tests, and so on, remain unchanged
- to be managed and verified regularly

PREFERENCE

- not always rational and founded
- may be in conflict with goals or with success
- may remain hidden
- If not followed, may create frustration and discontentment and undermine the motivation or the interpersonal relations
- may be changeable

CONSTRAINT

- A constraint is something that imposes a limit or a restriction on the endeavour or on the solution.
- **Objective constraints** are constraints imposed by the situation.
- **Subjective constraints** are constraints imposed by people, for example their limited readiness to invest time and money.
- To loosen up an objective constraint, you need to work on the solution or on its environment.
- To loosen up a subjective constraint, you need to deal with people.

SOLUTION AREA

- Area potentially affected or concerned by the solution.
- Area in which the solution will be implemented
- It contains the elements that will be changed.
- Is much broader than the problem area
  (in case of change, not in the case of a simple repair)
- contains elements that may contribute to the solution and its implementation.

Role of the three area's:

Delineating the investigation of various problem solving activities to organise the activities (authorisations, authority) and to increase the focus.

- Areas are often only mentally defined. Doing it formally may help thinking.

- May vary in size and form as the insight increases. Adapt the area's when required.

- Delineating increases the focus, but may also form a boundary for the mind.

The Three Area's

Consequence

Problem

Solution element

Solution Area

Contains anything that can be used to conceive or build the solution & elements that can be changed

Problem Area

Impact Area

Area(s) suffering from the consequences
of the problem(s).
Symptoms have been observed here.
Complains come from these area
or they concern the area.

Area where we believe the problems are or where the problems have been localised.
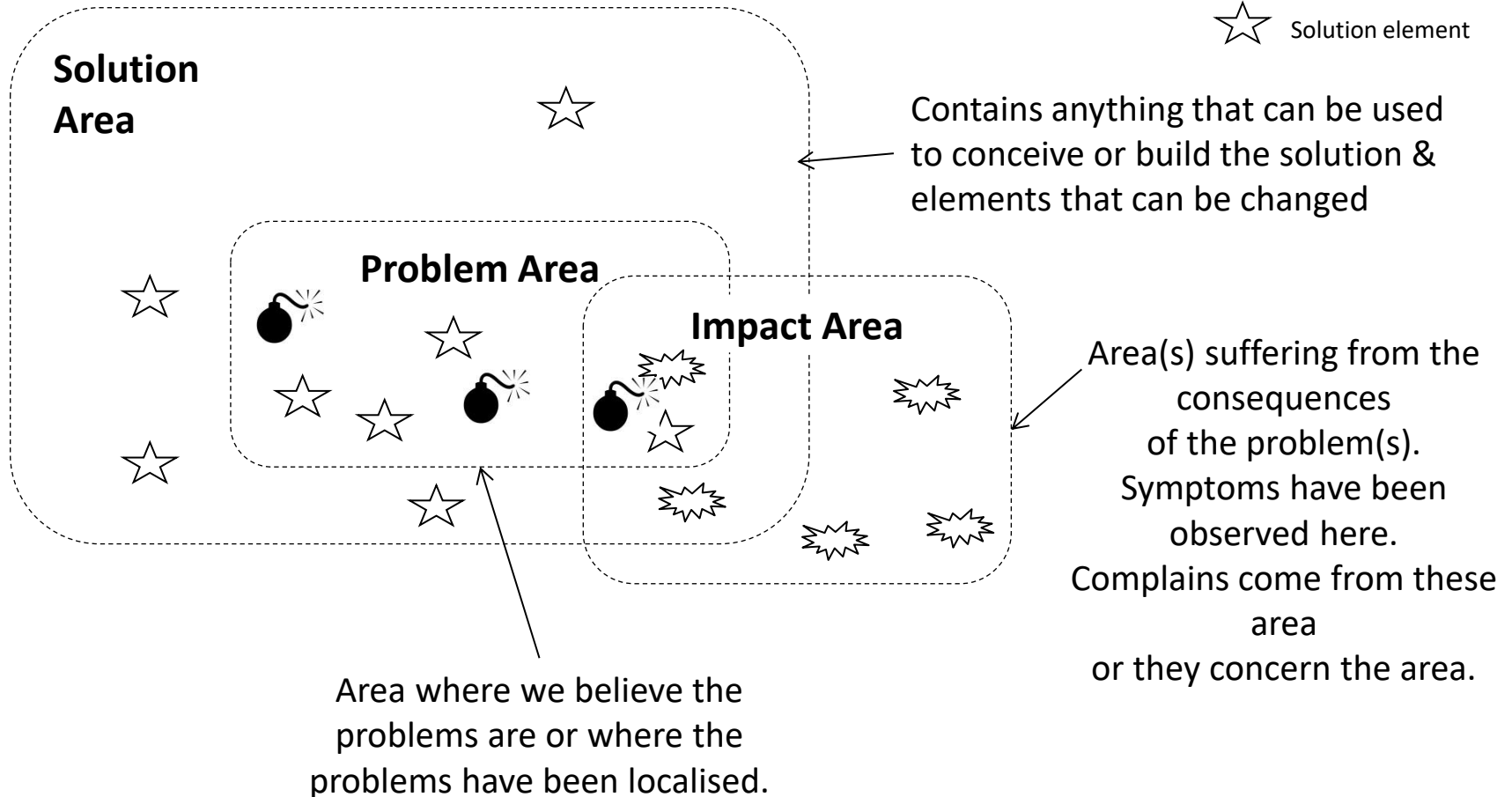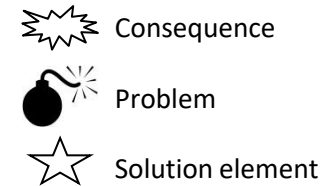
REQUIREMENT

- A requirement is a statement expressing a functional or physical characteristic, a capability that a solution (or system) must have.
- Eliciting requirements = investigation
  (eliciting ≠ gathering, simply gathering reqs is very unreliable approach)
- Conceiving a solution is more than simply eliciting requirements.

OBJECTIVE REQUIREMENT

- **Objective requirements** are requirements that are imposed by the situation. They are deduced from the insight in the problem and problem area.
- To change an objective requirement, the situation must be adapted.

SUBJECTIVE REQUIREMENT

- **Subjective requirements** are requirements based on assumptions, decisions, choices, desires, opinions and preferences.
- To change a subjective requirement, people have to change their mind.

Situation & Problem(s) → Objective Requirements | Subjective Requirements ← (people)
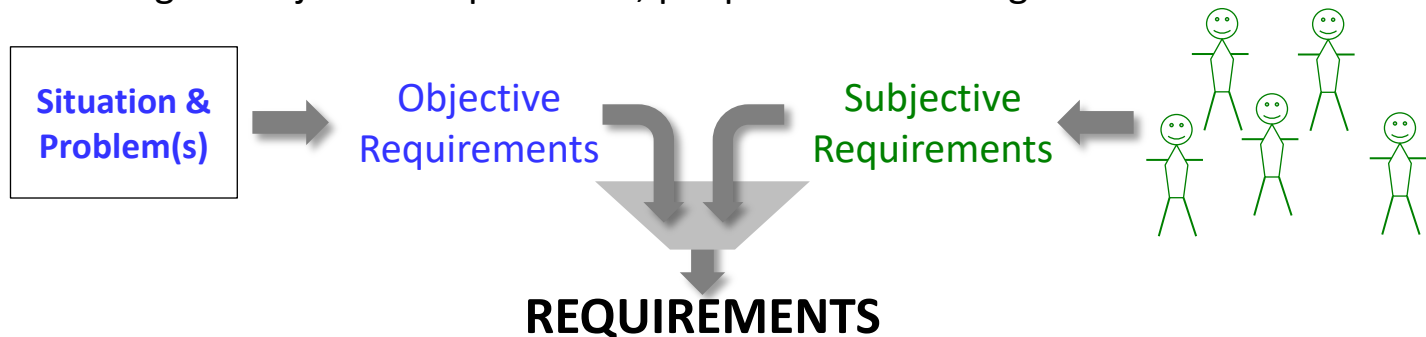
REQUIREMENTS

Objective & Subjective Requirements

Merging objective and subjective requirements → possible conflicts

Objective Requirements **vs** Subjective Requirements →

Subjective Requirements
Objective Requirements

Subjective Requirements **vs** Subjective Requirements →

Clarification, re-focus, negotiation, compromise, decisions, choices, …
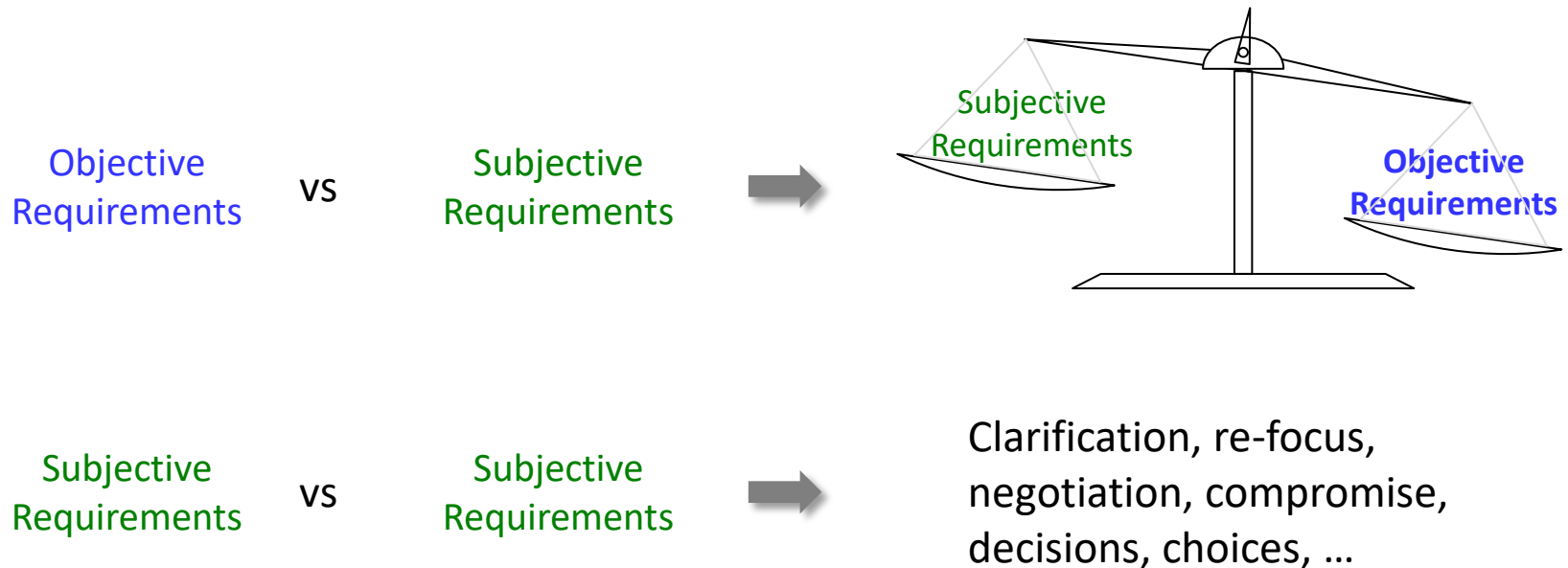
- What happens if objective requirements remain unknown or are ignored?

- What happens if subjective requirements are considered as more important than objective requirements and overrule them?

CAUSE

- The cause is the event or change, or series of them, that occurred that changed the situation so that it is not satisfying anymore.
- A cause is often only one aspect in combination with specific factors that made the dissatisfying change possible.

ROOT CAUSE

- The root cause is the original cause that started everything.
- Its role is crucial in solving the problem (or need) correctly and avoid any spreading and contamination. It helps to build on a sane basis.

BARRIER

- A barrier is any obstacle that prevents us or makes it more difficult to come to a solution.
- Their detection helps to avoid unfeasible solutions, to chose better paths to a solution, to avoid some pitfalls, to foresee the right resources and to take the right actions.

ASSUMPTION – HYPOTHESIS

- In the process of understanding a situation, commonly we make assumptions (which may lead to first understanding that turn out to be not completely true).
- In the process of conception of a solution, we may also use assumptions.
- The more we are aware of the assumptions, the quicker we can test them and understand when we are wrong.

DECISION - CHOICE

- On some design aspects we may have a no choice, while on other aspects there is a choice to make. This means that there are alternatives.

INTERVENTION POINT

- An intervention point is a place in the system in which we can and probably will have to take action in order to solve the problem.

SOLUTION ELEMENT

- A solution element is an existing element that can be used to create the final solution.
- In the process of conceiving a solution, we can start to look at elements that we can use and those which we can't use to conceive the solution.

SOLUTION PART

- A solution part is a piece of the solution that we have conceived or are about to conceive and which didn't exist before.

PARTIAL SOLUTION

- A partial solution is something that looks like the complete solution, but still doesn't solve everything yet.

MODEL

- A model is a simplified representation.
- Role: to support the thinking and to communicate.

FEASIBILITY

- A solution that can't be built, is not a solution. The building and implementation and usage or the application must be feasible.

PROOF OF CONCEPT

- A proof of concept is a simplified system addressing a critical aspect created to proof the practical feasibility of the solution or of a part of it.

PROTOTYPE

- A prototype is model of the complete solution that shows how the final solution will look like. There are different types of prototypes, of which, for example, some are meant to be thrown away and others will be turned into a final solution.

ANSWER

- An answer is the response we get from a question. This can be right or wrong as well as everything in between.
- Do not confuse the answer with the solution.

TEMPORARY SOLUTION

- A temporary solution is a solution that is not meant to last, usually because it lacks of some functionalities, capabilities or other characteristics.
- It can be very dangerous to accept a temporary solution as a definitive one.

ALTERNATIVE SOLUTION

- Alternative solution is another solution.
- To be able to compare and to chose the best solution.

OPTION

- **Two types of options:**
  - Option in the conception (design) provides the possibility to come to different (alternative) solutions
  - Options that are possibilities that are still open for the future once the solution is implemented allowing the solution to evolve in different ways. (PRINCIPLE + PROCESS !!!)

SOLUTION

- System or set of changes to a system that resolves the problem (eliminate the root cause(s) and resolves the damages) or need.

SOLUTION ENVIRONMENT

- The environment in which the solution will be implemented. The environment surrounding the solution, impacted by it, interacting with it, or influenced by the presence of the solution. It is also the area that contains element that may lead to a solution and help to build and implement it.

COST / BENEFIT

- Costs and benefits determine the economical (& moral?) feasibility.

CAPABILITIES / "ABILITIES"

- Engineer the capabilities and abilities into the system
  - To avoid: Capabilities and abilities coming by 'luck' into the system.

SOLVING APPROACH

The process to conceive a solution

PROBLEM WITHIN / REQUIRING A SYSTEM

- Ineffective Problem Solving Tactics & Traps
- **Effective Problem Solving**
  - General considerations
  - Understanding Mechanisms
  - Problem Concepts
  - Solution Concepts
  - **Solving Approach** ⟸
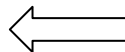
Using the Approach

- Activities that are not applicable to a specific situation can be skipped. If a situation require additional steps they have to be added. If another order of activities make sense for your situation, that's fine as well. The goal is not to follow the process, but to come to a suitable solution. The essence is the way of thinking.

- Activities are presented in the order they are most likely to be executed. However, jumping back to an earlier activity should happen frequently for getting more information or deeper insight or for ensuring consistency with new findings. The activities are numbered to facilitate discussions.

- Some activities may appear a few times. This may concern either a review of it based on the new findings and insight or it may concern a same activity but at a greater level of detail.

- Depending on the size, importance and complexity of the problem, activities can be executed mentally or in formal steps with recorded information.

! DO NOT "FOLLOW" THE PROCESS OR METHODOLOGY !

THE PROCESS IS NOT RESPONSIBLE FOR THE RESULT. YOU ARE!

Starting point - First Perception

Legend:
- S — Symptom
- Impact (negative)
- Unknown or unclear situation, hidden issue
- Problem

UNCLEAR SITUATION

Hidden Symptom

Hidden Impact

Reaction

- Complaints
- Spontaneous ad hoc actions to correct consequences
- Attempts to solve what is perceived/ experienced as 'problem'
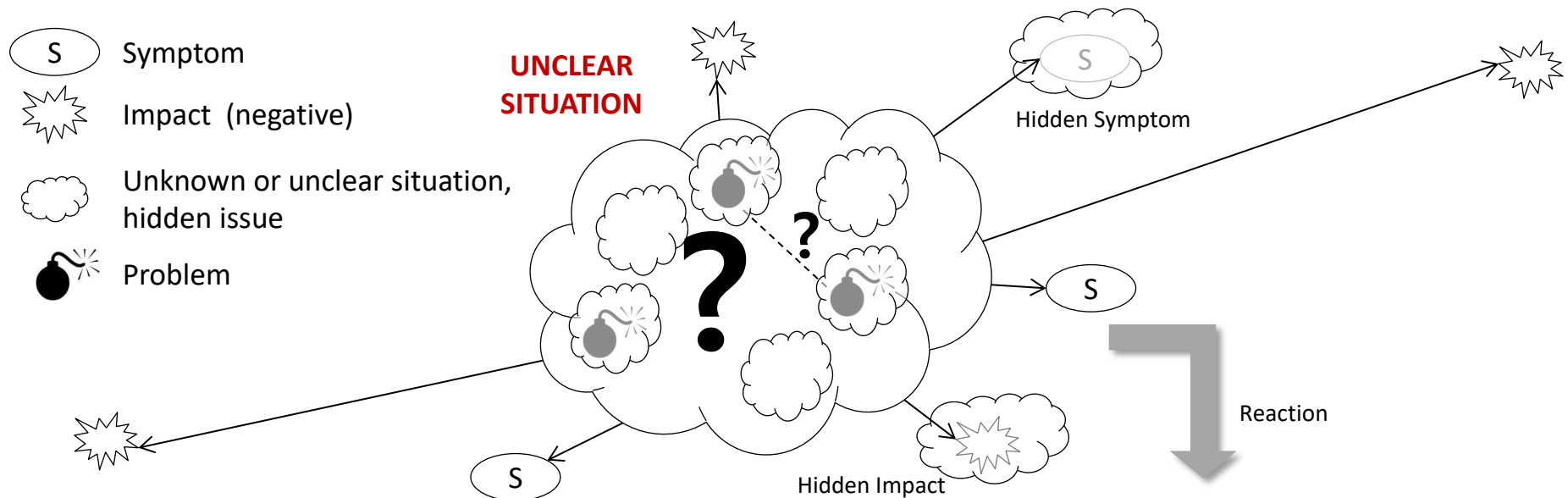
- Symptoms
- Impacts of different nature, in different areas, some far away
- Complaints. Is a complaint a problem?
- Are there one or more problems?
- Is a problem not a consequence?
- What consequence is related to what problem?
- What is the relation between the problems?
- Vague interpretation of situation
- Interpretations, assumptions, beliefs, unknowns

Many unknowns → vague subjective, intuitive diagnosis → requires correct diagnosis

Consequence (Impact) = Problem

These are the problems. Let's solve them !

Visible / Experienced consequence

Jumping from consequence to solution

Root Cause

Root Cause

Consequence / Cause

Consequence / Cause

Problem

Solution

Environment

Hidden consequence
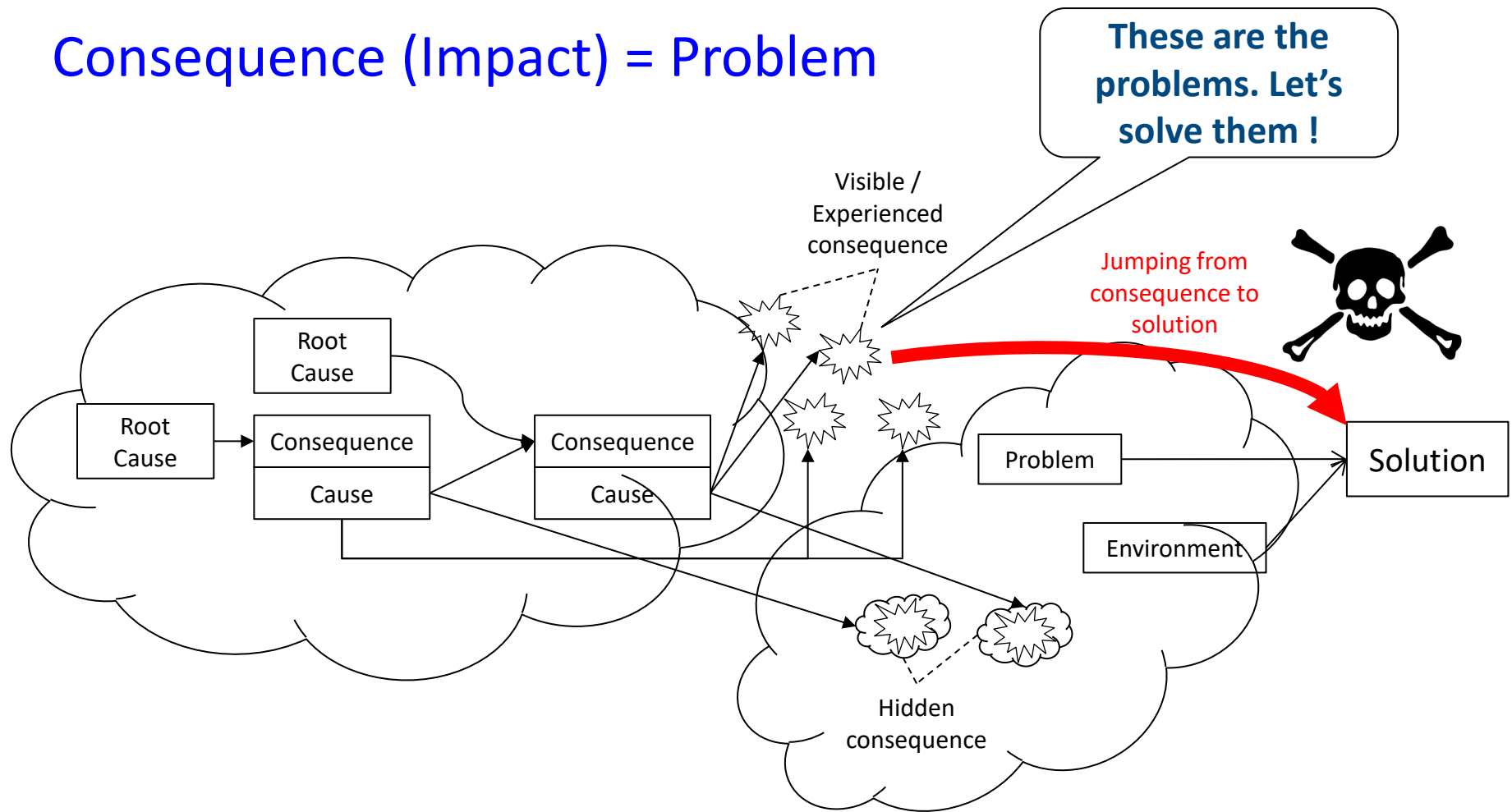
Good Problem Solving Approach

MAIN PRINCIPLE
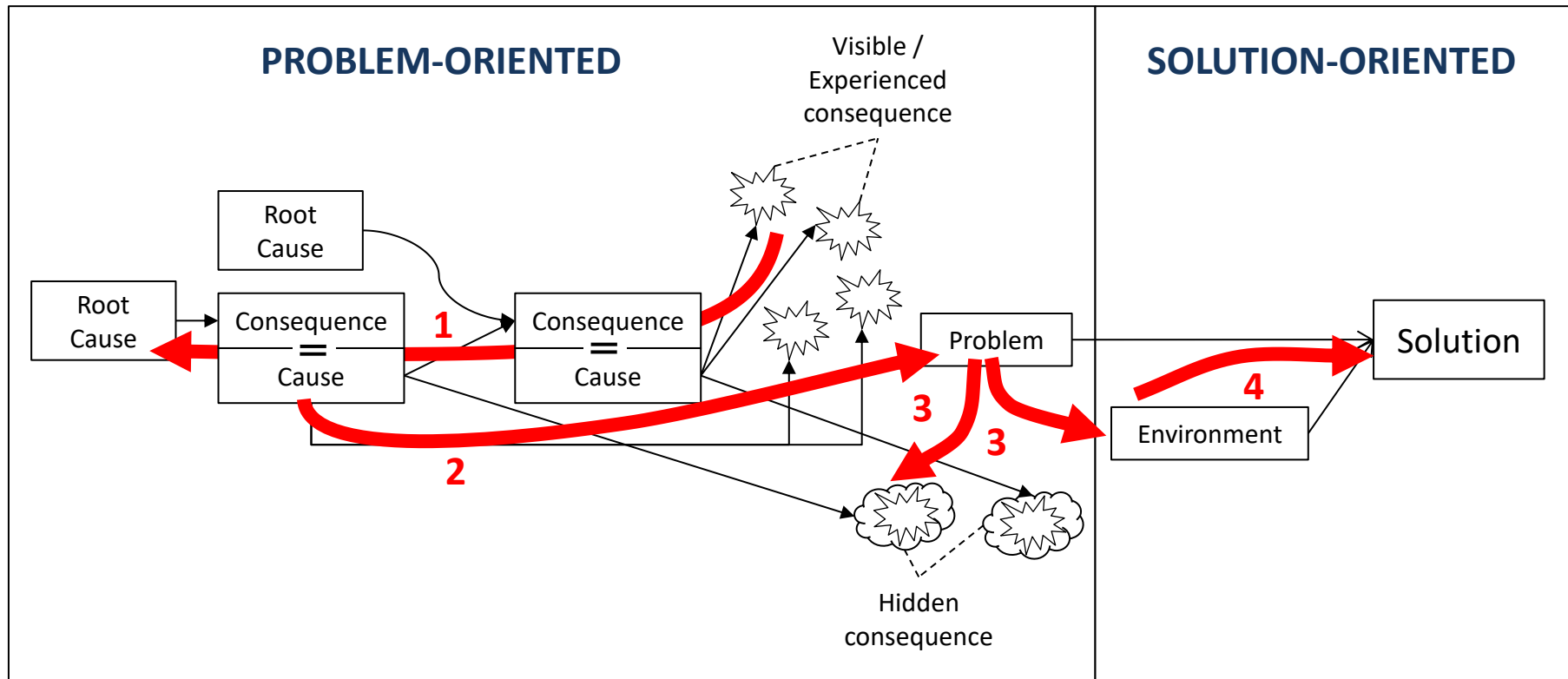
General Idea:
1. Focus first to the problem and causes
2. Shift focus towards the solution
(general idea → not strict)

Overview of the (Suggested) Process

Problem Detection & Identification → Subjective Diagnosis → Structure the Problem → Analysis (*Problem & Solution Area*) ↔ Objective Diagnosis (*Problem & root causes*) ← Impact Analysis (*Consequences*) → Evaluation & Selection (*Establish the criteria* / *Evaluate and select*) → Conception of the solution → Plan → Execute (Build & Implement) / Correct Impact → Post-implementation Evaluation

Contain the Problem

Correct and Improve (optional)

- Iterations and jumps to earlier activities are not shown in the diagram
- Activities are not strictly sequential.
- Examples:
  - during the analysis some ideas about the conception can already be noted
  - during the conception, planning can already be started

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Main Links between Activities and Requirements
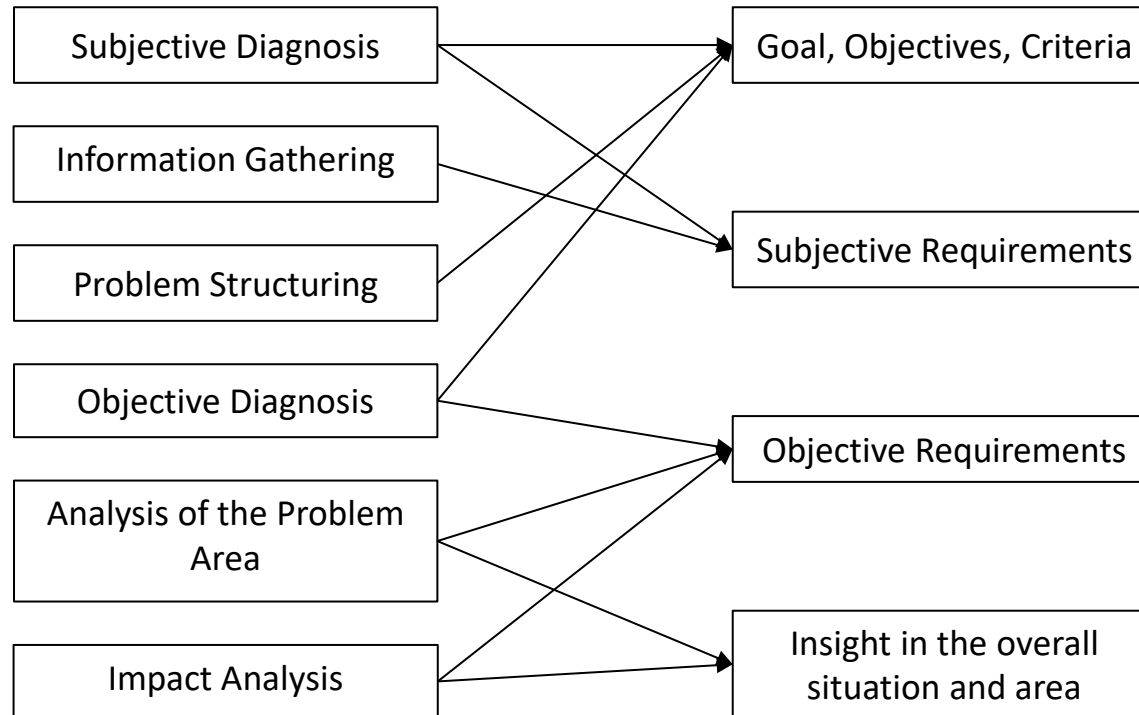
Notes:
- These are the **main** links. It is possible to discover requirements and goals in all activities. All activities will provide some insight in the overall situation and problem area.
- Information gathering is executed in parallel with many other activities. It feeds them continually with information.

1. DETECTION AND IDENTIFICATION

GOAL: Get a (preliminary) identification and get a formal recognition of a problem (awareness)

1. **Detect** the presence of a problem by search for information: complaints, objectives not met and other data. Through analysis search for gap between goal and reality.

2. Once found, become **aware** and elaborate a <u>preliminary</u> **definition** and description of the problem as it is known upon detection (a first formulation)

   name, (possible) location, gap, complaints, goal, dissatisfaction, priority, severity, desired target date, first definition of problem area (involved elements/items), nature of problem, …

2. SUBJECTIVE DIAGNOSIS

GOAL: Get a preliminary definition and description of the problem as it is perceived before any deeper investigation and real diagnosis (based upon perceptions and opinions).

1. Identify involved groups and persons

2. Gather complaints, facts – manage the complaints

3. Gather perceptions about the problem and define the perceived problem

4. Gather ideas about the solutions

5. Capture the expectations

6. Define the (subjective, perceived, assumed) gap

7. Define a preliminary problem area

8. Confirm the perceived problem, problem area, objectives & intentions, expectations and perceived solution.

!! Wants, needs, demands, expectations, intentions, objectives, dissatisfaction, success criteria, requirements may differ from one another or be inconsistent/incoherent !!

How about the readiness to invest?

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3. CONTAINMENT (not always required)

GOAL: Limit the harmful effects of the problem

1. As soon as possible, isolate the problem and try to limit the harmful effect

   Be careful not to create more problems.

   Activity may go on until the final solution is in place and works

   Consider that containment activities or solutions are temporary and will have to be changed (eliminated) once the final solution is in place.

2. Communicate about the problem to warn people, to avoid other people to deal in an ineffective way with it and to let them know something will be done about it.

3. Once the solution is solved, remove the containment measures.

4. GATHERING INFORMATION

GOAL: Gather information about the problem

Techniques:
- Information Gathering
- Interview
- Brainstorming

1. Identify the main elements in the preliminary problem area: persons, groups, systems, organisations, processes and other elements

   The list of involved elements help to know where to look for information about the problem.

2. Search for effects, list them and gather information about them.

   These are consequences like damages, lowered expectations, reaction of people, adapted behaviour, adapted processes, …

3. Verify all the input you received

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5. PROBLEM STRUCTURING

GOAL: Organise the problems.

Techniques:
- Affinity Diagram

1.   Define the problem area

2.   Describe the problematic elements (aspects that are unsatisfying)

3.   Identify the different problems

   There might be several different problems in an environment or system.

4.   Group information per perceived problem or per concerned item (like a system or aspect)

5.   Identify the relation between the different problems

   Different problems can influence each other, be a consequence from one another or they may have a common cause.

6.   Form sets of problems per mechanism and/or problem nature

   Possibly different problems are related (for example to a same matter, by a same nature or a same location) or they are connected (interaction). They can be solved together. (example: all collaboration problems together, all problems related to a single system or department together)

   The problems will be analysed and maybe solved per set. Avoid to separate related problems and avoid to put unrelated problems together in a same set.

7.   Review the problem identification and problem area

   If different persons are involved or if other specialists are assisting in the problem solving process, then the findings should be discussed with these persons. Every concerned person should be informed. Reach a consensus about the problems and their grouping.

6. OBJECTIVE DIAGNOSIS

GOAL: Obtain a diagnosis based on a decent investigation and expertise

NOTE: *From here on we deal with one problem or set of problems*

1. Reformulate the key objectives and reach consensus about them
   - Investigate and clarify the key objectives. Clarify the set of objectives (goal modelling)
   - Investigate the underlying intentions, drivers and concerns. What situation would be satisfying in the short & long term?
2. Draw a global map of the problem area
   - Identify the main elements (systems, concepts, items, …) in the problem area
   - Describe the interaction of the problem area with the outside world and influences between them
   - Describe the interactions between the elements in the problem area
3. Reformulate and describe the actual problem (nature of the problem, ….)
4. Locate problems on the problem area map, system models, …
   - Identify the circumstances and conditions and input – analyse them
5. Investigate the problems in depth (includes problem area, context, …)
   - Analyse the identified consequences
   - Find more symptoms, complaints, facts, trigger, … other effects or reactions on consequences (corrective actions, …), conditions.
   - Identify causes. For every cause, find the root cause (Iterate !! Ask multiple times why things are or happen!)
   - Verify the (root) causes
   - Describe and analyse the problem: location, occurrence, size, origin, evolution (life cycle, future)
6. Draw a picture of the actual problem (if possible)
7. Deal with the difference between subjective diagnosis and objective diagnosis
8. Present the findings and reach consensus with the concerned people
   - Present and review the actual problem, root causes and the overall key priorities and the objectives
   - Define success criteria (When will the objective be reached ? Criteria about acceptance, satisfaction, and expectations and objective criteria)
   - Reach consensus

Techniques:
Goal modelling, Soft Systems Methodology (SSM), Rich Pictures, Ishikawa diagram (fishbone diagram), 5W1H, 5Why's, mind map, other diagrams

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The following are 7 <u>important</u> problem categories that may help to diagnose problems. For other categories, look at the system's characteristics.

CATERGORISE THE (ROOT) CAUSES → DETERMINES THE TYPE OF SOLUTION(S)

1. **Identity / Cultural**

    Concerns worldview, beliefs, drivers, values, norms, attitude, tendencies, motivation, ….
    Identity & culture = <u>dynamic</u>!

2. **Functional**

    The system doesn't function accordingly to a right logic. It doesn't have the right features. (what the system does and what it doesn't)

3. **Structural**

    The system is internally not well organised or its internal organisation (structure, architecture) can't support the system correctly during its whole lifetime.

4. **Interaction**

    Concerns interactions between the system parts inside the system and the interaction with the environment.

5. **Process**

    Processes may be inefficient, not fluent, clean and neat. They may produce too much waste. They may lack of robustness and be unreliable. They can be inconsistent and buggy. (how the system does it)

6. **Capacity**

    This concerns all kinds of time, speed and volume (or number) issues.

7. **Input & resources**

    The system doesn't get the right input and resources.

• **Other ?**

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Possible Location of Problems
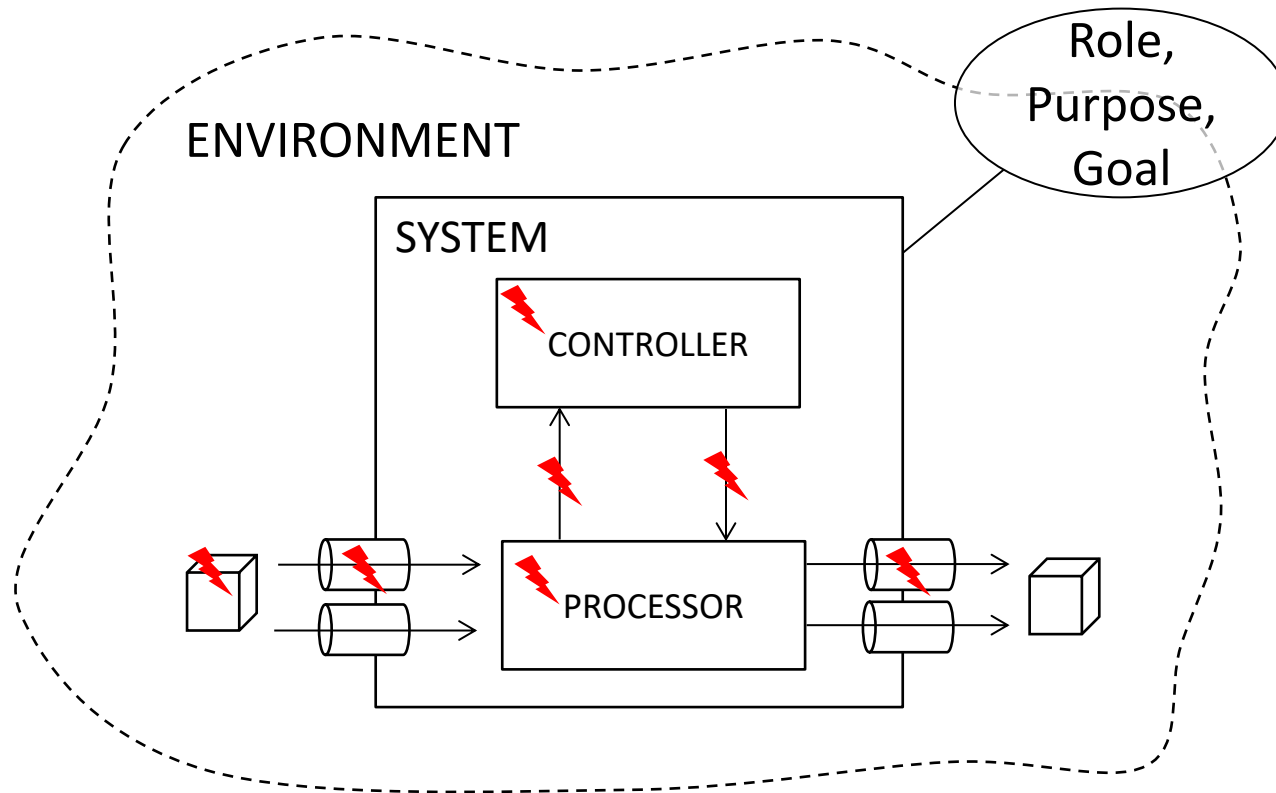
Problems may also occur in the prerequisites, limits, constraints, capabilities, qualities, collaboration, system structure (architecture), operating conditions, alignment of among the constituents (role, function, capabilities, operating conditions, …), alignment constituent with supra-system, fit between system and environment, … ➔ Understanding systems is essential !

7. STUDY THE PROBLEM AREA

GOAL: The knowledge of the problem area is a preparation to the conception of a solution

1. Decide whether it is more appropriate to focus on the problem or to consider the situation from a broader perspective. (prefer objective and long term criteria over subjective or local and short term criteria)

    Sometimes we may focus our attention on the point where the problem happen and on the problem itself. This can be dangerous since we forget the rest of the system and the interaction of that problematic part with the whole system. We may create problems elsewhere or miss the root cause. Therefore, sometimes, it is wiser to consider the system in its entirety, the broader environment and a larger time frame. We may consider entire lifecycles and apply "what-ifs" on tendencies. A holistic approach can be required.

2. Identify the elements in the problem area

    These elements are the players, components, elements, systems, process steps, inputs, outputs, competencies, forces, factors, obstacles, tendencies, evolution, relations, interactions, uncertainties, …

3. Gather more information about these items and their aspects

    Sometimes knowing some more suffice and sometimes an in depth insight of an element or of a part of the area is required.

4. Analyse information about the elements in the problem area

5. Describe the environment

    The essence is not to "have a description", but to have a good insight in the problem area.

    This insight is required to start thinking about a solution. Describing the area or drawing models help us to think more in depth about the area. The description and models are tools to support our thinking (like not to forget some aspects), to communicate about the problem and its area and to create a common understanding.

Techniques:
   Soft Systems Methodology, Rich Pictures, mind map, problem map, system dynamics model, other diagrams

8. IMPACT ANALYSIS

GOAL: The knowledge of the impact area is a preparation to the conception of a solution. This identification of the consequences will help to design better systems, to do damage repair and to learn how to react correctly on problems.

Techniques:
    Previous models

1. Define the impact area.
2. Identify the impacts. Monitor and manage them.
    - "Follow the flow". By following interactions and relations between elements and with the environment, new impacts can be found. This way we may detect consequences not identified so far. (Where else have the wrong data being used? What is the reaction of people to the problem? …)
    - Not only the flow, but the new insight in the whole system may lead to the discovery of new impacts.
3. Identify contaminations
    - Find corrective actions, behaviours, new bad habits, lower norms and expectations, … or other forms of contamination
    - Has the flawed system influenced the design of other mechanisms built or adapted after the design flaw was introduced?
        - System interacting with the weakly designed system, built on top or built further in the flow.
        - Processes that appeared or have been changed after the shortcoming
        - New tools that have been added to correct the shortcoming, …
    Check whether the reason for introduction was the shortcoming or whether the design of it has been influenced by the shortcoming. This should be corrected.
4. List, measure and evaluate the impacts
5. Identify and asses risks (do Risk Management) (at this point we know the problem and its impacts)
6. Conceive a way to verify the impact (to be used once the impacts have been solved)
7. Conceive actions to correct the impacts
8. Elaborate requirements for the new solution to prevent such kind of impacts.

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9. CONCEPTION

GOAL: Conceiving the actual solution

Techniques:
  Brainstorming, systems analysis and design, …
  Previous models.

- Reformulate the priorities and constraints
- Decide about how local or radical the solution should be
  Decision: Correction, adaptation, re-design of the system from scratch, make-or-buy, throw-away or leave it as is. Building everything in one shot or in several blocks, steps, phases, parallel tracks, … ?
- Identify the required competencies (based on the involved domains)
- Define the solution area and manage this definition
- Identify the intervention points (elements on which we can act upon (and those that can't be touched))
- Identify solution elements and options
- Identify the options that must be kept open
- Elicit requirements (elicit ≠ gathering!)
- Define different directions that may lead to a solution
- Conceive partial solutions
- Conceive the overall solution framework(s) or architecture(s)
- Conceive one or more solution (by using solution elements working on problematic aspects)
- Conceive paths towards a solution
- Identify assumptions that have been made
- Identify preconditions (and adjust the solution)
- Evaluate the implications of each solution (practical, economical, evolutionary, health, social, …)
- Identify critical points, difficulties, side-effects and draw-backs
- Evaluate the required time and resources
- Identify and evaluate the risks
- Identify and evaluate the options (per solution)
- If you get stuck, then go to last best known option/solution and re-examine things or try other solution (what can be changed?). If there are unexplored paths or options, jump back to the appropriate state.

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10. EVALUATION AND SELECTION

GOAL: Get the best solution

- Identify solution criteria

  – Make sure they match the objectives
  – Make a difference between objective criteria and subjective criteria (preferences, intentions, expectations, …)

- Evaluate the solutions

  – Evaluate feasibility of the solutions
  – Identify strengths, weaknesses and limits
  – Define and prioritise the pro's and con's of the solutions
  – Perform a financial evaluation

  Consider the solution in its operational environment. Look at the global picture (not linear, but cyclic, over long period of time, in different circumstances which can/do happen)

- Pre-solution Improvement (Iterate to conception)

  Considering the weaknesses and other con's, can the solution be improved so that some of them can be reduced or eliminated.

- Select the solution
- Reach consensus

Other solutions may remain in the running as plan B.

Techniques:
  Weighted Scoring Method (weighted criteria assessment matrix), Electre, Electre II, Promethee, Net Present Value, ROI, Payback period, Cost-Benefit Analysis, Accounting Rate of Return, Adjusted Present Value, Internal Rate of Return, …

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11. PLANNING

GOAL: Thinking about how (the process and organisation to) to build and implement the solution

- Plan the solution implementation

  Planning is in the first place thinking about the steps to execute to build the solution and to put it in place. Time can be critical. But respecting timing won't help if the wrong solution is implemented. If the difference between the reality and the plan becomes too big, then review (adapt) the plan.

Techniques:
   Planning techniques

12. IMPLEMENTATION

GOAL: Get the solution built and implemented

- Implement the solution

Techniques:
   Depending on the solution

13. CORRECT IMPACT

GOAL: Come to a clean situation. conception of a solution

- Clean-up the damage

- Check damage has been cleaned up

- Check if the identified symptoms are still present (and if so, deal with it)

- Check for still existing ad hoc corrective solutions, lower norms, adapted work procedures, … still do exist.

Techniques:
   Depending on the damage and solution

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1. Detection and Identification
2. Subjective Diagnosis
3. Containment
4. Gathering Information
5. Problem Structuring
6. Objective Diagnosis
7. Study the Problem Area
8. Impact Analysis
9. Conception
10. Evaluation and Selection
11. Planning
12. Implementation
13. Correct impacts
14. Post – Implementation Evaluation

14. POST IMPLEMENTATION EVALUATION – FOLLOW-UP

GOAL: The knowledge of the problem area is a preparation to the conception of a solution

- Evaluate the process to solve (conceive, building and implementation)

    The reaching of the objective, risks, cost, decision making process, …

Techniques:
Depending on the solution

- Evaluate the solution

    The pro's & con's, side-effects, limits, weaknesses, excluded options/opportunities, …

- Review the evaluation criteria and their importance (priority, weights)

- If after a few trials the problem isn't solve, then it is time to question your understanding, your skills, your approach, to check your assumptions, …

- Learn lessons: Learn how you, people and the organisation as a whole reacted to the problem and to its consequences. Record the lessons, embed them in courses and in management guidelines and policies, share them. Learn from it for future problems.

- Learn lessons

Note: If essential or elementary stuff haven't been addressed or have been wrongly solved, or if many new problems have been created, then this means that the problem and the problem area weren't understood or that the diagnosis was incorrect.

→ improve your analysis, diagnosis and design skills, improve the work conditions for these activities, spend more time on it, … Take it more seriously!

LEARNING LESSONS is an activity in the methodology and WBS, but which in practice is often ignored(observed in many organisation ☹). It is meant to avoid to make the same mistakes over and over again and to save money on later projects and to strengthen the competencies.

Lessons should be integrated in future work. If you have no system in place to "learn lessons", no specific processes to evaluate, shared, record and disseminate lessons, no specific activity (like a reflection session), then likely no lessons are being learned.

Strategies

- Work backwards

- Considering the situation from different angles

- Guess & check

- Divide and conquer

- Consider extreme cases (begin, end, middle, huge volumes, signals in disorder, no respons, …)

- Rule of thumb

- Apply one or more theories

- Intelligent guessing and testing

- Logical reasoning (chronology, follow-the-flow, cause-consequence, action-reaction (cycles or spirals of action-reaction), decomposition, backtracking, …)

- Visualisation (drawings, models)

- Patterns

- Abstraction : usage of model before using the solution in real life

- Analogy : usage of solution of analogous solution

Backtracking
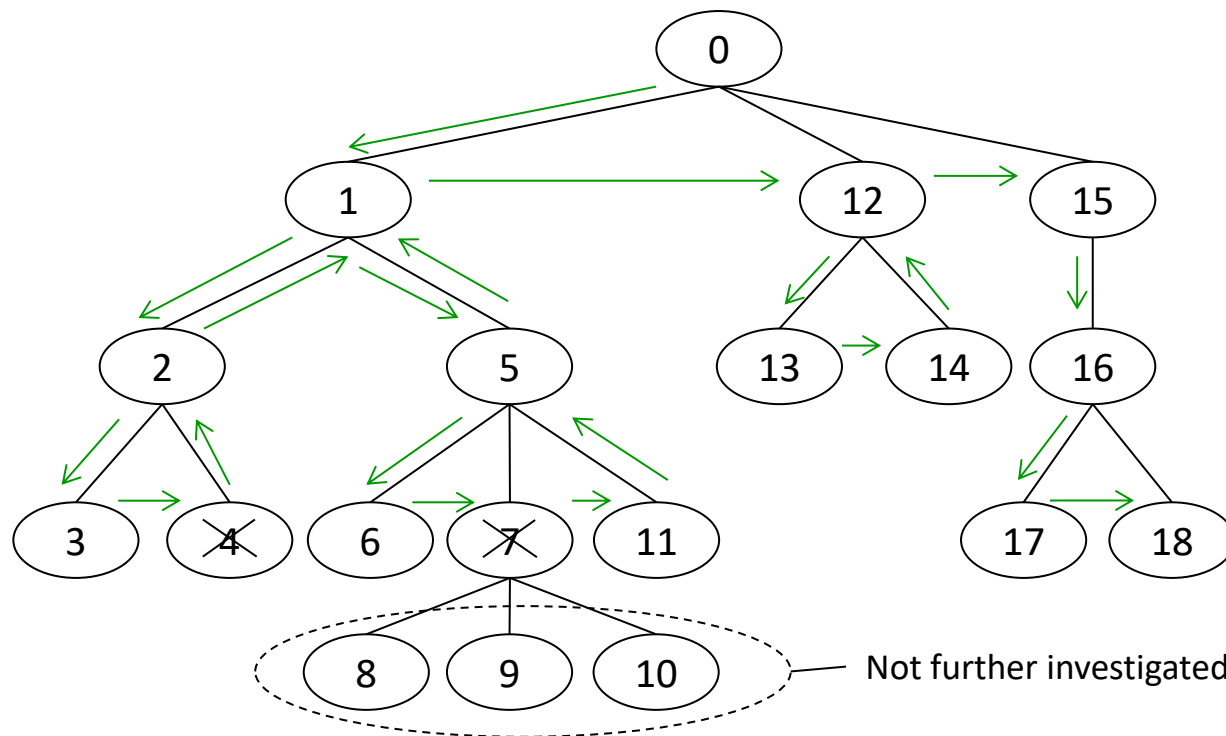
Back tracking is a way to run through a structure of options to search for a solution. Stop at the first solution found, or find them all and evaluate them to find the best one.

Solution investigation:

0, 1, 2, 3 → Ok. A first possible solution found. Continue the search by investigating next lowest step.
0, 1, 2, 4 → step/option 4 doesn't work. 4 is last step. Get a level higher and search for next step.
0, 1, 5, 6 → Ok. A second possible solution has been found.
0, 1, 5, 7 → 7 doesn't work. Don't investigate deeper (8, 9, 10) . Investigate next.
0, 1, 5, 11 …

Possible Techniques

- Goal modelling
- Information gathering
- Interviews
- 5W1H (= What, When, Why, Who, Where, How)
- 5 Why's
- Soft Systems Methodology
- Rich pictures
- Ishikawa diagram / Fishbone diagram
- Mind map

- A3 thinking
- Brainstorming
- CATWOE
- Correlation Matrix (Cause/Effect Matrix, Prioritization Matrix)
- FMEA (Failure Mode and Effects Analysis)
- **Selection techniques**
  - SWOT
  - Decision Table
  - What-if (event-scenario-analysis)
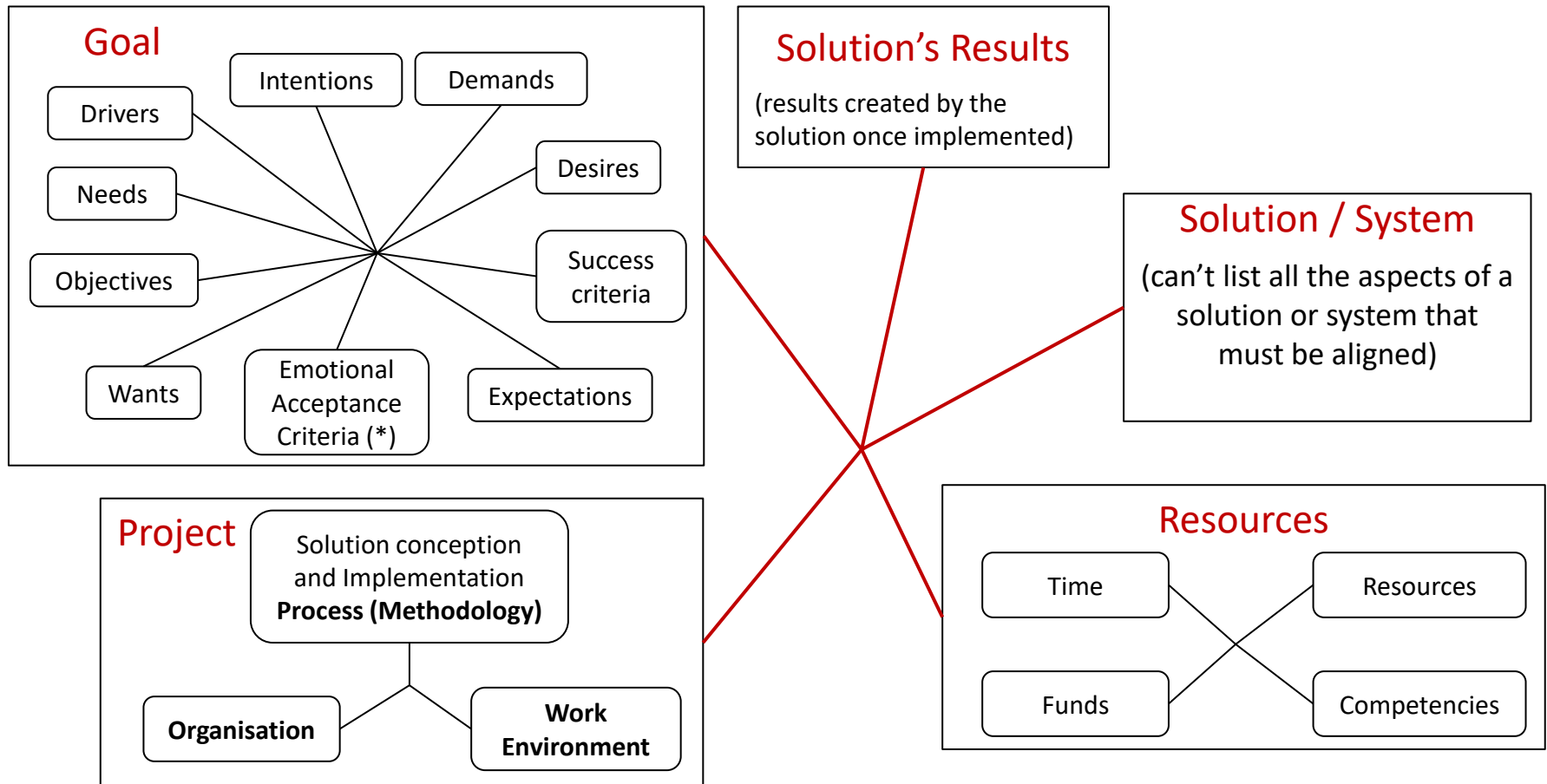 - Cost benefit analysis

Required Skills

- Investigation skills
- Analytical thinking
- Listening skills
- Empathy
- Intuition
- Systemic thinking – Holistic thinking
- Critical thinking

- Verification
- Synthesising
- Structured thinking
- Abstract thinking
- Creativity
- Leadership
- Negotiation skills
- Persuasion skills

Methodologies

- APS (Applied Problem Solving)

- Eight Disciplines Problem Solving

- GROW model

- How to Solve It

- Kepner-Tregoe Problem Solving and Decision Making

- OODA loop (observe, orient, decide, and act)

- PDCA (plan–do–check–act)

- RPR Problem Diagnosis (rapid problem resolution)

- TRIZ (in Russian: Teoriya Resheniya Izobretatelskikh Zadatch, "theory of solving inventor's problems")

- STRIDES

ALIGNMENT FOR SUCCESS

Goal
- Intentions
- Demands
- Drivers
- Desires
- Needs
- Success criteria
- Objectives
- Expectations
- Wants
- Emotional Acceptance Criteria (*)

Solution's Results
(results created by the solution once implemented)

Solution / System
(can't list all the aspects of a solution or system that must be aligned)

Project
- Solution conception and Implementation **Process (Methodology)**
- **Organisation**
- **Work Environment**

Resources
- Time
- Resources
- Funds
- Competencies

Principle: The more all these elements and aspects are coherent, the more likely the problem is solved successfully. (Project Management)

(*) A solution may objectively meet the success criteria, it still can be emotionally not be accepted. We don't like it. It is not 'our' solution. Some objective criteria have not been taken into account. Conflict with supplier. Or any other reason…

DLL: Double Loop Learning !!

SINGLE LOOP LEARNING

Feedback

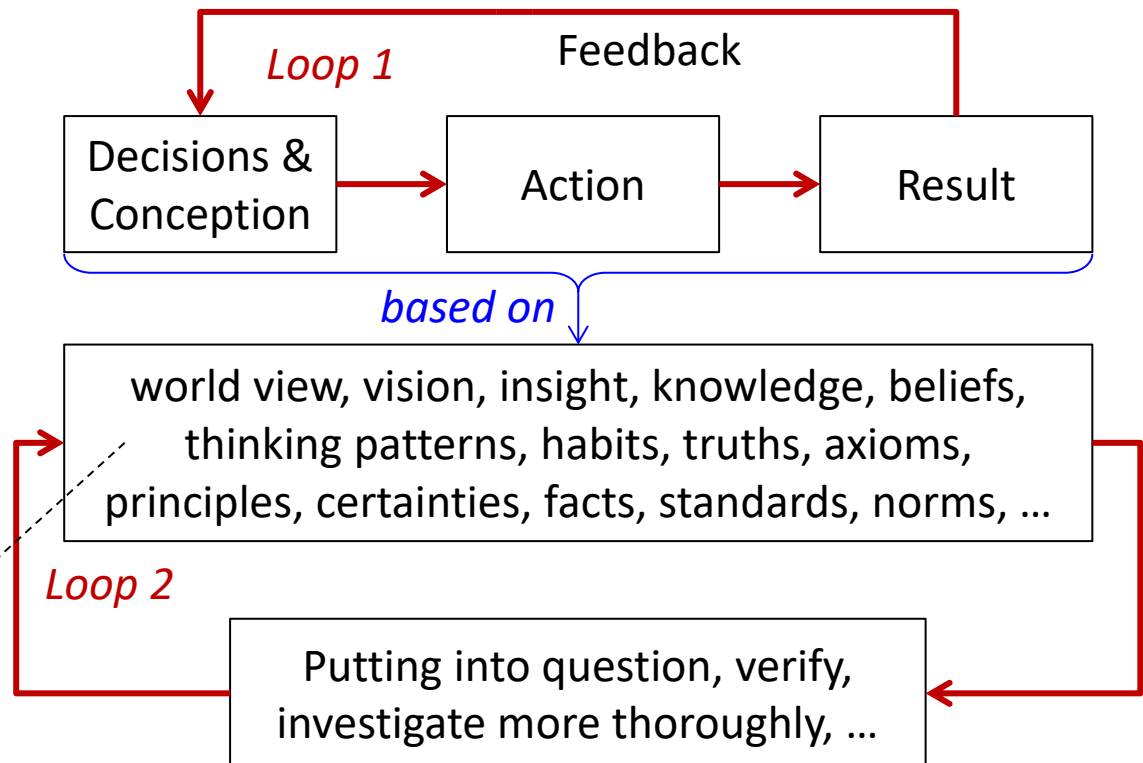| Decisions & Conception | → | Action | → | Result |
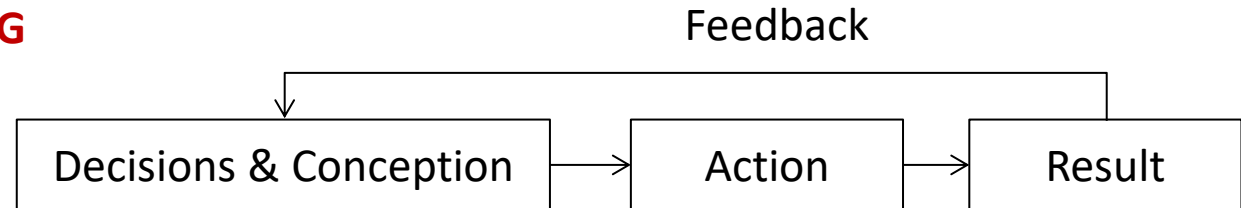
DOUBLE LOOP LEARNING

To be used when
- no satisfying result are reached
- no breakthrough
- no innovation

Is Corporate IT a candidate for the double loop?

Things we simply 'know'.
"Everybody knows that ..."
"We have always done it this way."

Loop 1 Feedback

| Decisions & Conception | → | Action | → | Result |

based on

world view, vision, insight, knowledge, beliefs, thinking patterns, habits, truths, axioms, principles, certainties, facts, standards, norms, ...

Loop 2

Putting into question, verify, investigate more thoroughly, ...

Keep Your Organisation Problem Free

1. Have a vision

2. Maintain long term goal

3. 'Problem Detectors': have feedback/monitoring/detection system in the system place

4. Continually or regularly investigate your world – Be a 'Problem Hunter'

    Problems won't surface if they are not allowed to.

    Continually search for symptoms, complaints, gaps, dissatisfactions, mismatches, bottlenecks, …... Norms, benchmarking, SBB's ("Should Be Better")

    IT: Analysts: Role: Continuously study the business and search for problems and opportunities

5. Management of these findings

6. Have processes in place to act upon these findings and to solve an build what is necessary
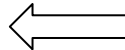
> Early Detection – Swift Reaction <

PART 2

PROBLEM SOLVED BY STRATEGY

STRATEGY
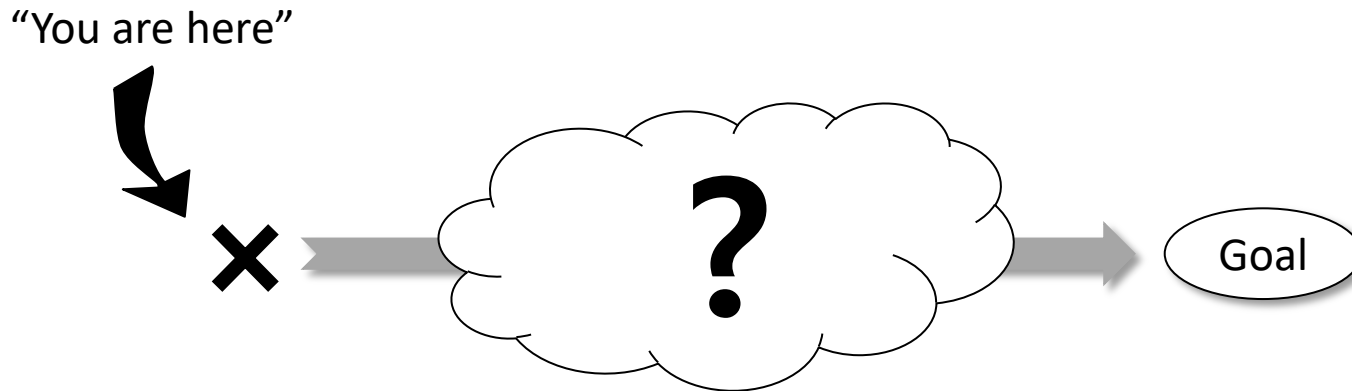

PROBLEM SOLVED BY STRATEGY

- **General Considerations** ⟸

- Strategy Concepts

- Strategy Elaboration Approach

- Techniques

"You are here"

? Goal

A strategy is the <u>thoughtfully</u> conceived <u>pattern</u> of <u>related actions</u> required to achieve a long-term or overall <u>goal</u>.

This pattern can be expressed in a, usually high-level and global, plan.

And it can be observed in the course of actions, decisions and communication.

4 Myths

Myth 1: We need to know everything beforehand.

The more we know, the better we understand the situation, the better we can define a strategy and execute it.

- Because we live in a **complex** world, it is sometimes just impossible to know everything beforehand and to have a full understanding of a situation.
- Because we live in a **dynamic** world, things that are known at the start may change.

We may remain in the information gathering / analysis phase by trying to know everything beforehand and risk never come to action.

On the other hand, engaging in an endeavour with too little understanding, competencies and resources is also very risky.

It's a trade off. The risks inherent to a lack of insight are much greater than the risks of having somewhat too much information. The former may prevent from building the right solution and may jeopardise the whole effort. The latter is more likely to waste only some time and effort.

A genuine effort is required to have **a fairly good insight** in the endeavour and minimising risks. The degree of insight require depends of the complexity and of what is at stake.

Be vigilant about what you know, about what you don't know and about changing environment.

Myth 2: Once a decision is taken, it can't be changed.

New worthwhile ideas helping to reach the goal may come to our mind at any moment. Positive and negative events may happen during the execution of the strategy. Therefore it can be very advantageous to review some decisions.
We need to allow ourselves <u>some</u> flexibility. Keeping plans unchanged and stick to the plan may undermine the endeavour. Following a plan is lesser important than reaching the objective. But often some stability is required. Continual changes engender waste and risks and may lead nowhere.

Myth 3: The goal may not change during the journey.

It is preferable that the goal remains stable. However, we live in a dynamic world. As the environment can change, so can the goal. During the journey, the insight will increase and new ideas may pop up. It can be advantageous to adapt the goal.

Usually, this should be rather a refinement of the goal. Or, the goal may be changed, but the direction in which we evolve remains the same. However, there are cases in which a complete switch, moving to an opposite direction, appears to be better.

4 Myths

Myth 4: The strategy must be completely planned

The goal, the main drivers and the key principles must be defined. The main route of the journey with intermediate stages or positions should be defined.

It is however possible that there are still unclear areas, that some supportive actions aren't known yet or that the resources aren't available yet.

But you have to know that when you get there, you will know how to get further to the next stage. You have to know that you will be able to find the resources. You know you will find a solution and succeed with it.
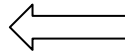
Two Remarks

- Strategies are used in different domains. The terms may be dependent of these domains. Understanding the concepts is the essence.

- The strategy elaboration process is not prescriptive. It describes a way of reasoning.

- Strategies may differ in nature and structure. They may require a different process to define the strategy.
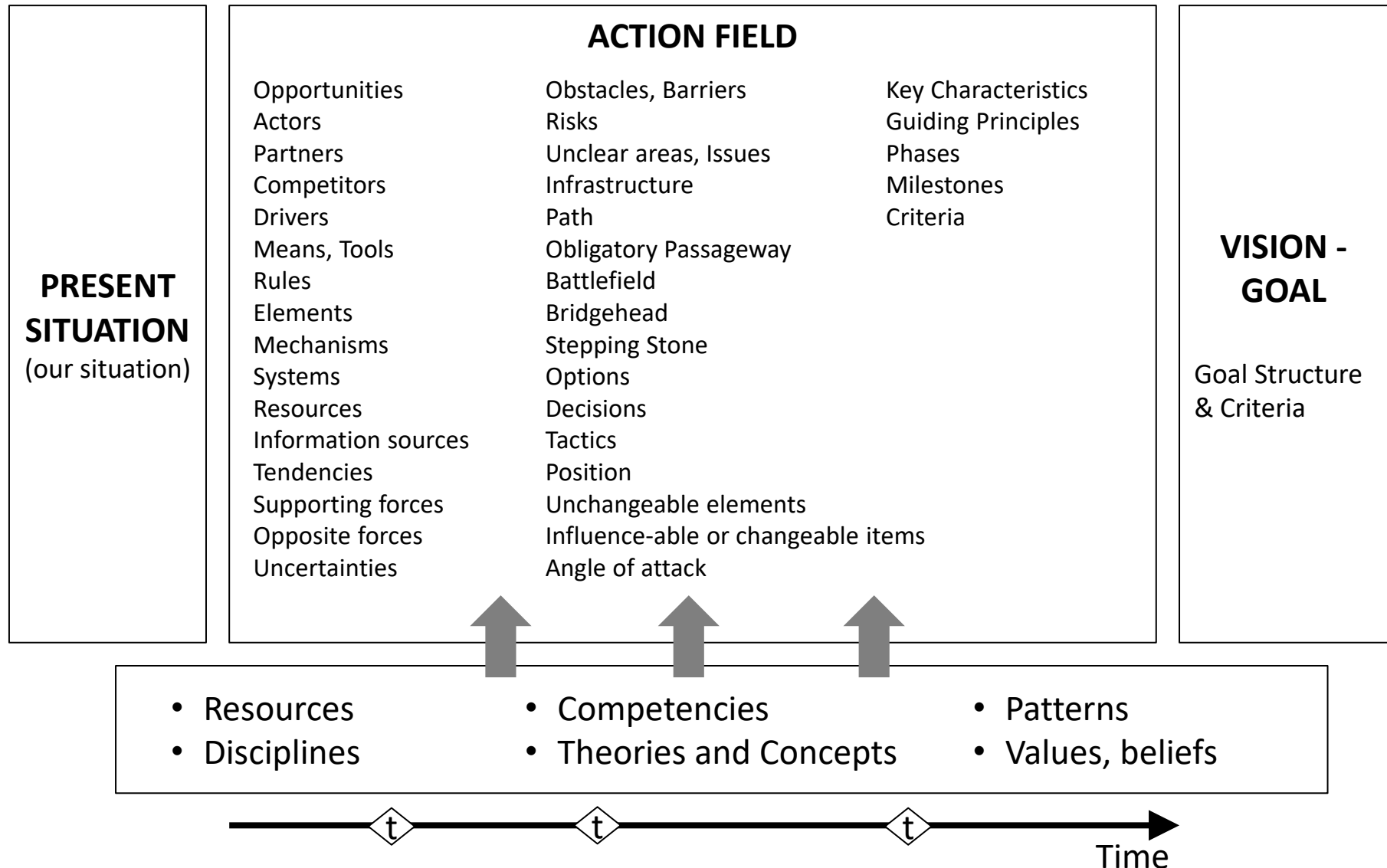
STRATEGY CONCEPTS

Concepts useable to understand and conceive a strategy

PROBLEM SOLVED BY STRATEGY

- General Considerations
- **Strategy Concepts**   ⟵
- Strategy Elaboration Approach
- Techniques

Concepts in the Elaboration of a Strategy

PRESENT SITUATION
(our situation)

ACTION FIELD

Opportunities	Obstacles, Barriers	Key Characteristics
Actors	Risks	Guiding Principles
Partners	Unclear areas, Issues	Phases
Competitors	Infrastructure	Milestones
Drivers	Path	Criteria
Means, Tools	Obligatory Passageway	
Rules	Battlefield	
Elements	Bridgehead	
Mechanisms	Stepping Stone	
Systems	Options	
Resources	Decisions	
Information sources	Tactics	
Tendencies	Position	
Supporting forces	Unchangeable elements	
Opposite forces	Influence-able or changeable items	
Uncertainties	Angle of attack	

VISION - GOAL

Goal Structure & Criteria

- Resources
- Disciplines
- Competencies
- Theories and Concepts
- Patterns
- Values, beliefs

t   t   t

Time

VISION

- A <u>vision</u> is a **complete**, **clear**, **coherent** and **thoughtful high-level image** of a (long-term) future that we want to achieve of accomplish. The different ideas or concepts should be complementary and match with each other to form a whole and should contribute to the overall intention. It must also fit into a broader context (larger, more complex and complete than a situation).

- Vision ≠ an idea or a collection of (vague and loosely related) ideas !!

GOAL

- Can be one or a set of specific objectives, a statement, a situation or a vision

- <u>Objectives</u> can be described measurable criteria (with concrete numbers)

- <u>Situation:</u> A mix of objectives and statements describing a situation.

  - Example: I want to have a happy family with 3 children, living in a comfortable house, having a good work-life balance and doing a lot of sport.

PRESENT SITUATION

- The present situation focus on your starting point. We can't elaborate a strategy if we don't understand the present situation and if we don't understand what has to be changed, in what it should be changed and what the effect of this change will be.

- The present situation contains resources, opportunities, obstacles, things suitable for improvement, other players, systems, rules, mechanisms, …

- Techniques: Rich Pictures or other techniques depending on the domain.

ACTION FIELD

- Abstract area is defined by the elements potentially concerned and helpful to the strategy. It contains the resources, partners, means, obstacles, various forces, and so on.

- **Role**: By considering it as a concept, and even represent it more formally, it helps to see the overall context, to understand it and to obtain a picture of all the elements that play or <u>may</u> play a role in the strategy. It defines the domain and elements that have to be studied in order to understand the nature of things, their limits, their interactions and all other aspects useful for the elaboration of the strategy. It is in this area that the actions will be taken to reach the goal.

- Try to represent visually all the elements that are potentially usable represented with a picture and organised on a sheet of paper. It can be represented with Rich Pictures or with other types of models.

ACTION FIELD (2)

- This is much broader than your battle fields. The battle field is much more specific than the action field (as it is defined here).
- Failing to define it and to understand it, may prevent to see all the options or may lead to ignoring some aspects to be taken into account.

BATTLE FIELD

- This is the area within the action field in which one (or several?) battles will be engaged.
- A battle is an intermediate objective difficult to overcome. Timing is usually important.
- Loosing one battle is spiteful, but it doesn't necessarily mean losing the war (having to abandon the overall goal and vision). A lost battle is however the opportunity to check your resources, review your position and plans, evaluate your strategy and look for alternative ways to win the battle.
- Not all actions are battles or happen on the battle field.

ACTOR

- Some people and organisations play an important role in the action field or in the strategy. Others may offer some options useable to device the strategy.

PARTNER

- Partners are people or organisations that play a positive role in the strategy. Maybe an neutral actor has to become a partner.

COMPETITOR

- Some people and organisations play are opposed to you and to your strategy. You may have to take them into account or even deal with them.

DRIVERS

- Something that drives you, people and organisations. The understanding of these drivers is valuable to the understanding the environment.

MECHANISM

- A mechanism is here used as generic term for any dynamic element like system of causes and effects, process, system and behaviour.
- It can be used, adapted, influenced, built or taken into account.

SYSTEM

- Likely the environment in which the strategy will unfold contains systems. They may have to be used, adapted or built.

TENDENCIES

- A tendency may represent an opportunity, a favourable force or an opposite force.
- At all levels: Nature, people, the society, economical sectors and markets have all their own tendencies.
- Different levels
  - At the surface we may see actions going in different directions.
  - Somewhat deeper under the surface, we may discern some streams.
  - At a deeper level we can observe tendencies that shape the LT evolution.

ELEMENT

- 'Element' is a generic term for any item or aspect relevant to the action field or to the strategy.
- Elements can be changeable, influence-able, or not changeable. They can be in our control or outside our control. They may have a power, can be dependent or independent, and so on.

OPPORTUNITY

- Opportunities are situations that can be exploited.
- Opportunities are important to be looked for. They provide possibilities to conceive the strategy and they may lead to options, alternative courses.
- They can be created, or circumstances can be influenced so that the chance that they appear is increased. But you have still to see (detect) them.
- Seize opportunities thoughtfully. Taking any opportunity may disperse the attention, resources and forces. You may lose direction.

RULES

- Any element in the action field may follow some rules which have to be taken into account by the strategy.
- The strategy itself may have to follow rules (your own rules or rules from your organisation)

SUPPORTING FORCES

- Forces in the environment that have a positive effect on the environment, on the strategy or on you to reach the goal or realise the vision.

OPPOSITE FORCES

- These are forces that will hinder your. Maybe you can deal with them or avoid them.

UNCERTAINTIES

- Uncertainties may constitute a risk to your strategy or they may require decisions to be taken.
- They have to be verified, now or at a certain time in the future, or it may be necessary to keep an eye on them.

OBSTACLES, BARRIERS

- Things are rarely easy. Know the barriers. Obstacles should be overcome, circumvented, lowered, eliminated or a combination of these.
- Do they constitute a risk, slow you down or require more effort or resources?
- Seek and understand the possibilities you have to deal with them.

RISKS

- Risks are those events or situations that may occur and which may cause the strategy to fail.
- Identify them, evaluate their likelihood and potential consequences, monitor them and mitigate them.

PATH

- A strategy is a process formed by a set of actions.
- An Action is performed sequentially or in parallel with others.
- Actions which are optional form alternative paths.
- Timing can influence the success of the strategy. It can even be crucial.

POSITION

- Make sure you are in a strong position to start a strategy. Try to strengthen your position and to move to more advantageous positions.

OBLIGATORY PASSAGEWAY

- When analysing the area between the present and the envisioned future, we may discover some things that must be realised to reach the goal. These are the obligatory passageways. Before and after the passageway, the process may be unclear or may vary (options, choices). These blanks will have to be filled in during the conception of the strategy.

OPTIONS

- Options give you the possibility to have a strategy with some alternatives with some smaller differences or even a complete different strategy. They provide flexibility in the strategy. Having more options allow you to adapt if circumstances changes.

MEANS, TOOLS

- In the action field, you may find means and tools that may help you to execute the strategy.

TACTICS

- Tactics are 'sub-strategies'. They are executed at a more local level, are shorter in time and aim to achieve a sub-goal. They can be used, even several times, within a same strategy.

BRIDGEHEAD

- Within the strategy we may conquer a domain, achieving a level or building something. The rest of the strategy can then rely on this bridgehead. A bridgehead may constitute a milestone. It's a conquered terrain, a strong position. It may lead to new resources, to new options, to a new phase in the strategy, to a part of the strategy that is different from the part before, and so on.

STEPPING STONES

- Like a bridgehead, a stepping stone can be created. It will help to execute one or a few next steps, the next phase or a part of the strategy.

ANGLE OF ATTACK

- An aspect, item, obstacle or position can sometimes be approached from different angles and in different ways. When facing a challenge, we may seek for different approaches, different angles of attack, chose one or attack it from different angles, at once or more orchestrated. There are plenty of options.

KEY CHARACTERISTICS

- These are characteristics that will define the future strategy.
  For example, in some strategies timing and synchronisation are crucial. The strategy will thus likely contain mechanisms to synchronise. The synchronisation of activities and progress of the strategy will be monitored more carefully.

GUIDING PRINCIPLES

- These are principles to be applied and respected throughout the strategy. They can serve as guide or as limit that may not be crossed.

Structure of a Strategy


```
┌─────────────────────────────────────────────────────┐
│                 Influencing Actions                 │
└─────────────────────────────────────────────────────┘
                          ↓        ↓
┌──────────────┐   ┌──────────────────────────────────┐
│              │   │  Actual Strategy Process         │
│              │   │                                  │
│ Preparation  │ → │    • Main Process                │
│              │   │    • Options                     │
│              │   │    • One or more "plan B"         │
└──────────────┘   └──────────────────────────────────┘
                          ↑        ↑
┌─────────────────────────────────────────────────────┐
│                Supporting Activities                │
└─────────────────────────────────────────────────────┘
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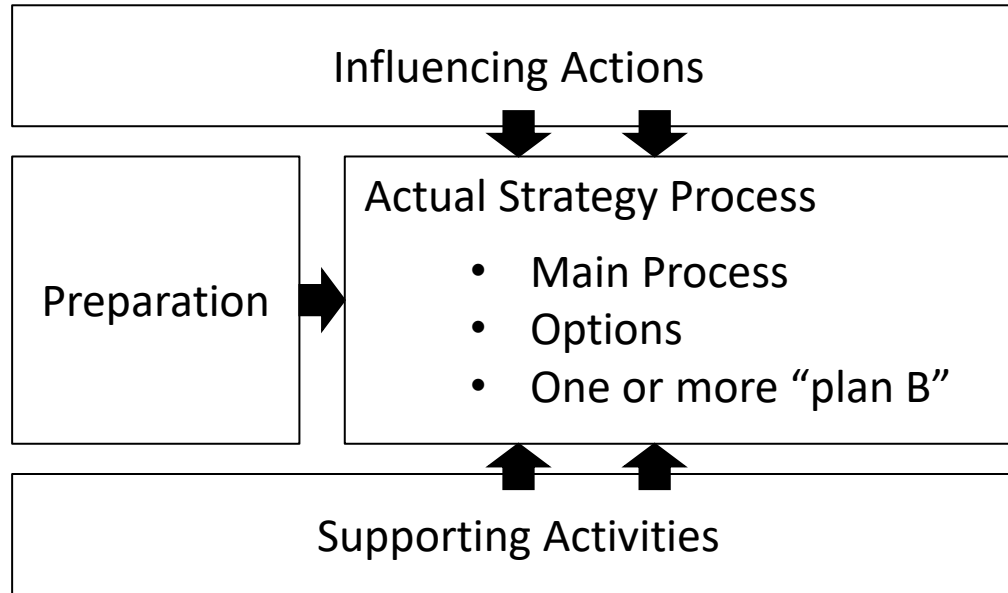
ACTUAL STRATEGY PROCESS

- The actual strategy is a planned process, although
- not everything can be planned
- The plan will have to be reviewed and adapted regularly
- Contains the main process, positions, gates, options (which lead to possible variations of the plan) and on or more alternative plans.

Structure of a Strategy

PREPARATION

- The preparation aims to be ready before entering the action field, before starting the actual execution of the strategy.
- Concerns being physically fit, having the time, the resources, the competencies, the means, … (having only a plan is not (necessarily) the same as "being ready")

INFLUENCING ACTIVITIES

- These activities aim to influence the **target** or change the **environment** in order to improve the conditions of the strategy and decrease the external risks.
- Are 'outside' (parallel) to the actual strategy
- Often, they go on for certain period
- Examples: communication to influence customers, lobbying, …

SUPPORTING ACTIVITIES

- Activities that contribute to your execution of the strategy by changing you or by providing things to the strategy executor needed for the execution.
- Examples: Finding funds, logistics, hiring people, training.

Strategy defined as a set of activities to reach a goal.
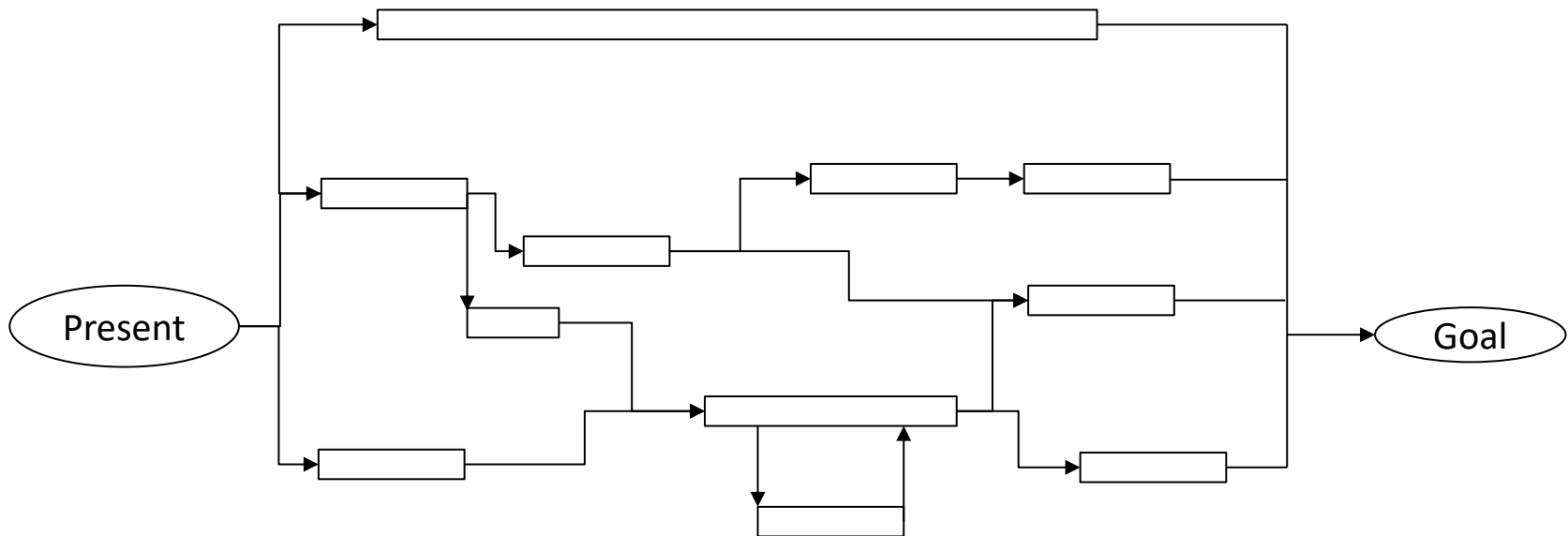
Strategy defined as a hierarchy of options (strategy depending on the opponents moves).
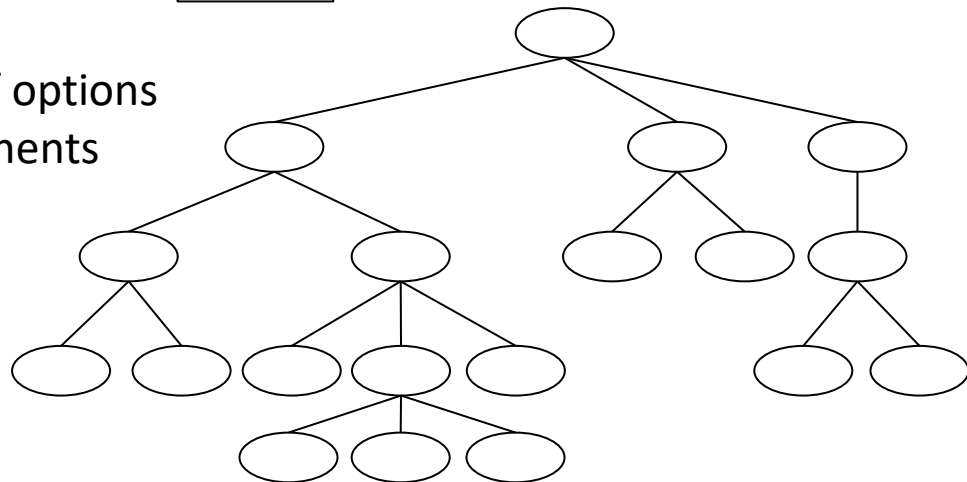
STRATEGY ELABORATION APPROACH

The conception of the strategy

PROBLEM SOLVED BY STRATEGY

- General Considerations

- Strategy Concepts

- **Strategy Elaboration Approach** ⇐

- Techniques

  - Strategy Modelling Language

  - Goal Modelling

  - Criteria
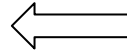
Global Approach
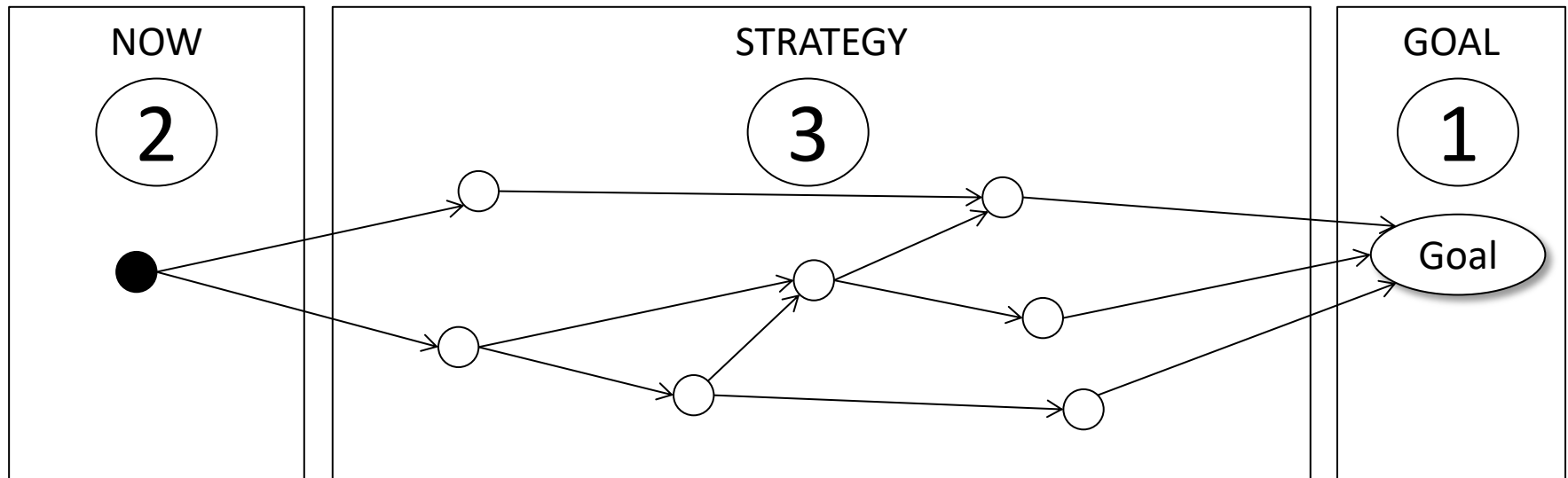
GLOBAL APPROACH:
1. Determine the goal
2. Study the present situation
3. Elaborate the strategy
4. Execute it
5. Evaluate it
6. Review, adjust or refine the strategy

Here we focus only/mainly on the elaboration of the strategy.

Some Principles

- Avoid executing a strategy without being ready.

  It's not about assuming or deciding one is ready but about being ready. Sometimes one can't wait to be ready, but it is a risk. Prepare if you can. It's a trade-off. If you have to go, know you aren't ready and be even more careful.

- A strategy is a dynamic thing. Think dynamically.

- Try to expand your resources, your capabilities, your competencies, your opportunities during the execution of the strategy. Do this intentionally. If possible, include actions to this purpose.

- During the execution of the strategy, the environment may change. Monitor it. Be ready to adapt. Have options.

- Your strategy will change elements in the environment. It may change your position, your possibilities in a planned or unplanned way. Use this when crafting the strategy.

- It can be useful to define stages or gates.

- Often (but not always), progressing and getting results is more important than being on-time. Use milestones to drive you, not to punish if the expected result or even more is obtained somewhat later than planned.

- Including pauses in the strategy can be useful. (to review the situation, to get things internally in order, stabilise situation, for deception, …)

- To craft a strategy, it is essential to asks as many (useful) questions as possible and to find the best answers. Then you can work with the knowledge/ideas provided by these answers to craft the strategy. Take every aspect of every element concerned by the strategy and ask a thousand of questions about it.

- Avoid dividing your forces and resources. But sometimes you can or it may even be the best strategy.

SOME PATHS …
- Are longer
- Are more complex
- Require more time
- Require a greater effort
- Require more resources
- Require different skills, resources, means, …
- Exclude alternative paths or choices
- Are more risky
- Use or don't use key resources
- Offer better opportunities
- Are one shot (all or nothing, not repeatable)
- Are a matter of gradual increment
- Are sequential, with overlap or to be executed in parallel
- …
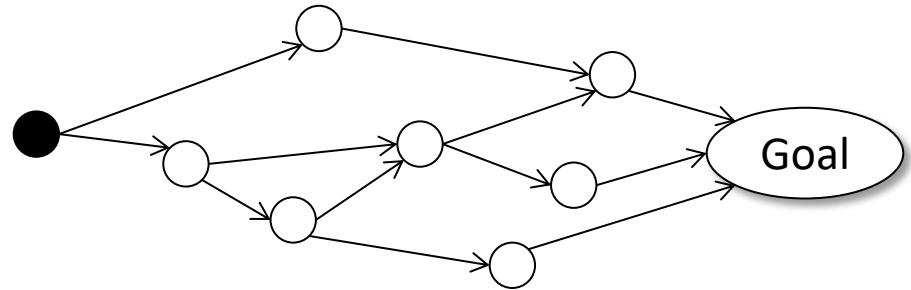
About Results

Although a strategy is a process, it are the results which are important. Every step should produce a result which will bring us closer to the desired goal.

Obligatory results:

> some results must be obtained independently of the chosen strategy.

Intermediate result:

> It can be advisable to determine intermediate results. They can be used as a new baseline, as a basis to plan the next phase, as a moment of communication, as a moment to review the whole initiative and as a moment of celebration.

Supporting results:

> These are results that won't necessarily be part of the final result but which are important to facilitate the process and to decrease the risks. Obtaining resources and support, unity among the stakeholders created by communication, high level of motivation are typically supporting results.

Strategy Elaboration

START

Elaborate a vision
Define the goal

Analyse the (your) present situation

Determine the gap between the
vision/goal and the present situation

Immediate
actions to be
taken? → Take immediate
actions

Analyse your
abilities

Determine and
analyse the action
field

Define the guiding
principles
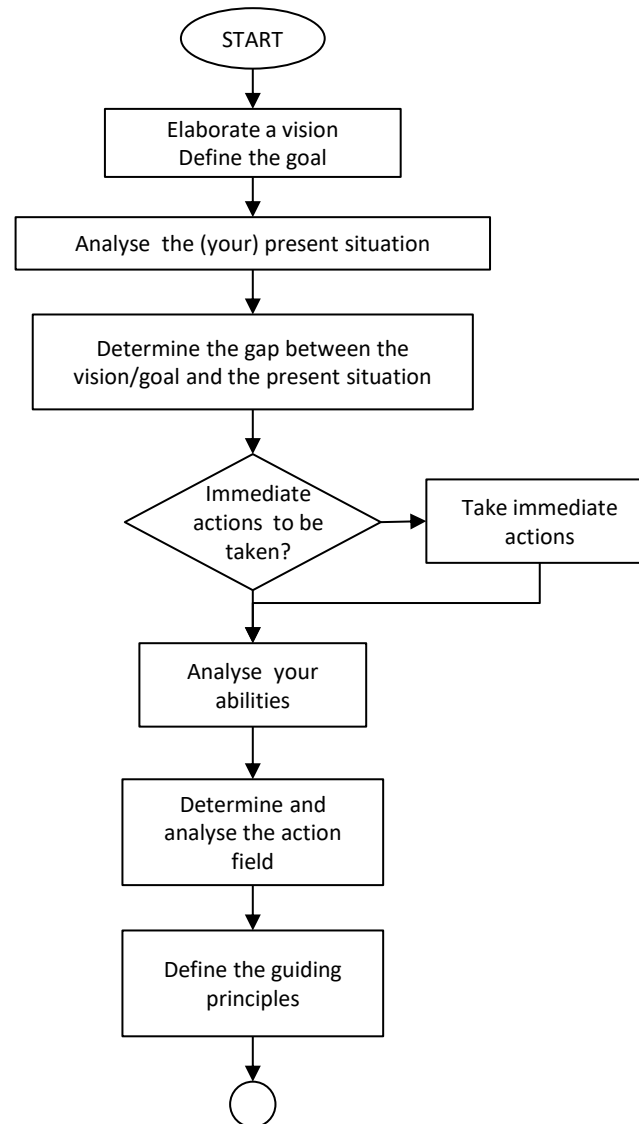
Note:
The flow chart presents an simplified overview of the elaboration process.

It doesn't show things like building blocks, what-if's, criteria definition, indicators, strategy consolidation, strategy selection, planning, …

Strategy Elaboration
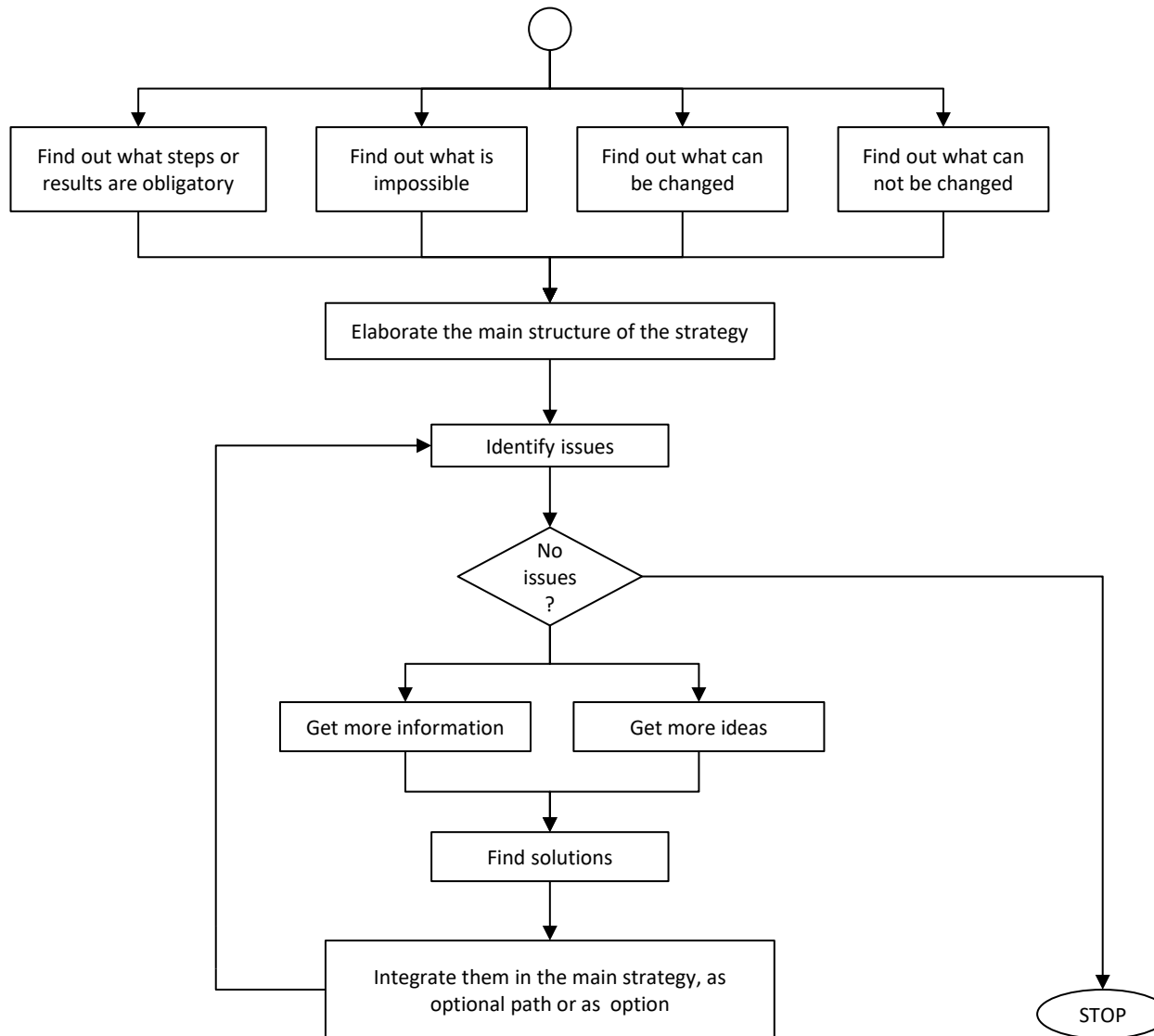
Strategy Elaboration Process

1. VISION - GOAL

GOAL: Obtain a clear idea of where you or the organisation is going

1. Elaborate the vision. Write it down. Make sure the vision is a vision (not always required)

2. Define the goal

   What is the nature of the goal? What's the value and importance of the goal? Why? How critical is it? Why? What are you options then? Will you be satisfied when the goal is reached? Why? Is it reachable?

3. Model the goal structure (if the goal is complex)

4. Establish criteria determining precisely when you have reached the goal.

   Minimum viable criteria and acceptance criteria
   Mandatory and alternative criteria example: "A and (B or C)"

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Strategy Elaboration Process

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2. SITUATION ANALYSIS

GOAL: Get a clear view of the position, the fitness, the direct environment and the readiness to engage in a strategy towards the goal.

1. Delineate the situation and area to be studied (this delineation can be adapted when useful)
2. Identify involved elements, persons, systems, organisations, …
3. Describe (understand) the main characteristics, interactions, strengths and weaknesses.

3. GAP ANALYSIS

GOAL: Understand what the major required changes have to be expected and their nature.

1. Identify what's wrong with the present situation.
2. Identify the elements that have to be changed in the present situation to reach the goal and realise the vision.
3. Identify the probable changes to be implemented.
4. Make sure the identified changes (the gap) contribute, directly or indirectly, to the goal

Strategy Elaboration Process

4. STRATEGY'S KEY CHARACTERISTICS

GOAL: Identify the key characteristics. The attention will be focussed on them during the elaboration of the strategy. They will drive the strategy engineering.

1. Determine the top key elements that will drive, define and characterise your future strategy.

- Timing and speed
- Risk or the lack of it
- Cost
- Result
- Learning
- Deception & surprise

- Finding resources as the strategy is executed
- A single process with little options or many options
- Based on having to use a lot of influence on people
- Reaction of the competitor (or other opposed actor)
- Overcoming resistance
- …

2. Describe these key characteristics more in details.

Examples:

- If timing is essential, then what are the milestones or what key events should be synchronised?

- If scarcity of resources is a characteristic, how can we craft a strategy that uses as little as possible of a certain type of resources? During which phases of the strategy, what resources, who much and where should resources be found?

The key characteristics may already be important for the next step: Immediate Actions.

Strategy Elaboration Process

5. IMMEDIATE ACTIONS

GOAL: It may be useful to (to save time) to start with some activities.

1.   Possibly, there are a few first actions of different kind that can be taken
    - Investigation: gathering information, communication to concerned persons
    - Preparation: Prepare yourself or the organisation for executing the strategy.
        - Example: if the goal is to study a domain, then your preparation can be to eat well, sleep well, prepare a place to study. This is independently of the choice of study or strategy that will be elaborated.
    - Strategy execution: Sometimes the first steps of a strategy are clear. Whatever the chosen strategy, these first steps are mandatory.
        In some cases it might be advised to avoid executing steps which are visible to opponents.

6. ABILITY ANALYSIS

GOAL: Understanding what you abilities and capabilities are and what resources you have.

1.   Investigate your state or the state of your organisation
    - Analyse your strengths and weaknesses
    - General state, resources and their availability, capabilities, skills, workload, morale, health, endurance, limits, capacity, …

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7. ACTION FIELD ANALYSIS

GOAL: Understand in what environment your strategy will unfold. The environment has also much to offer to you to elaborate and execute your strategy.

1.   Delineate the 'Action Field'

List all the relevant evolved elements: actors, systems, …

List the relations between these elements

2.   Gather relevant information

3.   Analyse the Action Field

Describe the relevant elements: their purpose, drivers, position, capabilities, authority, qualities, possible roles, size, distances, their environment, nature of the relations, tendencies, … any relevant information

Describe what they are, what they mean to you and how you can deal with them

This field should not be a constraint. Include, add and create new and relevant elements to this area continually.

This field is not static. Elements change in many ways. They may live their own life. Possibly we can change, strengthen or influence elements in this area.

They may offer opportunities and increase the chance of success.

Strategy Elaboration Process

8. STRATEGY ELABORATION (1)

GOAL: Understand in what environment your strategy will unfold. The environment has also much to offer to you to elaborate and execute your strategy.

1. Define the guiding principles (principles consistently applied in the strategy)

2. Identify the fixed (unalterable) elements within the action field

   - Mandatory passageways & obligatory intermediate situations
   These elements provide a structure, a backbone, to the strategy. Achieving an overall strategy structure is not always possible from the first time. Sometimes existing models may hemp (like types of business models). Later you can think of how to link these elements together by adding intermediate steps. This way the main process of the whole strategy is cut into smaller pieces.
   These elements may also constitute building blocks to elaborate variations on the strategy. Try also to think to strategies without these mandatory elements.
   Define some steps preceding the passageway that have to be taken to get to the passageway (form some sequences of steps as building block).

   - Identify the obstacles

   - Identify elements which are beyond your control or other unchangeable elements

   - Verify whether there is no way to adapt, control, influence, mitigate or avoid them

3. Identify changeable elements within the action field

   - Identify the elements that can be adapted

   - Identify the elements under your control or within your sphere of influence

   - Identify the ways to change or influence them.

     It is only useful to know the ways to change or influence them in order to know that it can be done. For now, if they will be adapted or influenced and what these changes will be aren't known yet.

Strategy Elaboration Process

8. STRATEGY ELABORATION (2)

3. Analyse the evolution of the elements and the evolution of the action field
   - Identify dynamic elements beyond your control
   - This concerns the elements that change independently of your actions. They have their own life or they are possibly changed by someone else. At glance, you can't do much about it. But since they may evolve during the strategy execution, it's a good thing to be aware of it.
   - What drives this evolution? Look to several decades ago. What has changed?
   - Tendencies, positive and negative forces,

4. Seek options
   - Options linked to elements in the action field
     - If required even 'outside' the action field → enlarges the action field.
   - Options coming from your own potential

5. Seek opportunities
   - Find, select and exploit existing opportunities offered by elements within the action field
   - What are favourable locations or areas where opportunities supporting the strategy can be created?
   - Creating favourable conditions may generate opportunities spontaneously.

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8. STRATEGY ELABORATION (3)

6. Use Building Blocks (if possible and applicable)
   a) Create the building blocks
   b) Classify the building blocks:
      - Classification:
         - Main strategy process
         - Option (= not necessarily used)
         - Alternative ("plan B")
           To be used in well-defined conditions. Criteria and/or decision will trigger this alternative.
         - Influencing action
      - This classification is dynamic. It may/will change as the strategy is developed.
7. Create general strategy structure (framework) with obligatory passages and most likely paths (activities)
8. Usage of Battles (if useful)
   a) Define the battles and choose the battle grounds
      - These are specific actions to conquer something, to overcome an obstacle or to reach a specific (sub-)goal.
      - What is the challenge? What/who is the enemy?
   b) Establish the conditions and requirements to win the battles
   c) Find ways to satisfy these conditions and resources to fight the battle
   d) What tactics will you use (per battle) (How will you want to win the battle?)
9. Fill the gaps in the general strategy structure
10. Solve remaining issues. Highlight weak areas, critical issues and risks.

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8. STRATEGY ELABORATION (4)

1. Assemble the strategy
   - Assemble the building blocks into the structure of the strategy
   - Try to fill the gaps with building blocks
   - Try to fill the gaps with individual actions and solutions
2. Link the obligatory passageways and other sequences of steps into a single process
3. Run what-if scenario's,
   - define criteria and elaborate more options linked to what-if's
4. Define alternative paths
5. Verify the respect of the strategy key characteristics and guiding principles
   Can the strategy be improved on these points?

Strategy Elaboration Process

9. STRATEGY CONSOLIDATION

GOAL: Adds elements and activities around the strategy to make it more effective, increase the control, lower the risks, and so on.

1. Define the pre-conditions on different steps or stages and the corresponding verification process

2. Define the criteria to be reached on intermediate steps or stages and criteria of supporting activities and the verification process (the overall criteria have been defined in phase 1)

3. Determine the assumptions that have been made. Analyse the assumptions

4. Check the uncertainties and certainties

5. Analyse Risks. Plan measures to deal with risks.

6. Determine possible actions to influence elements in the action field.

   • Can elements be influenced? How? Can conditions favourable to the strategy be created?

7. Establish the required support. Define the required support activities.

8. Establish strategy execution indicators

   • Indicators of the progress of the strategy execution.
   How fast do we progress in the execution? Resource usage?

9. Establish strategy performance indicators

   • Indicators of the performances obtained by the strategy.
   Is the strategy itself effective and thus yielding results?

10. Establish the preconditions and required preparation activities

11. Establish the verification process to start the strategy (move from preparation to the actual strategy)

12. Verify the strategy

Strategy Elaboration Process

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10. RESOURCE ESTIMATION

GOAL: Estimate needs in resources.

1. Estimate the required resources
2. Evaluate the feasibility
3. Review the pre-conditions and criteria

11. STRATEGY EVALUATION and SELECTION

GOAL: Select the strategy that will be executed.

1. Estimate the expected effectiveness of the strategy
2. Define the parameters: Feasibility, timing, resources, results, risks, available options, …
3. Evaluate and select the strategy
4. Other strategies or optional paths may remain as options or "plan B"

12. STRATEGY PLANNING

GOAL: Plan the strategy.

1. Plan the strategy
2. Plan the monitoring of the strategy and strategy reviews

Strategy Elaboration Process

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13. STRATEGY EXECUTION

GOAL: Execute the preparation, supporting activities, influencing activites and the actual strategy.

1. Prepare for the strategy execution
2. Verify the readiness before executing the actual strategy
3. Execute the actual strategy
4. Monitor the progress and obtained results
5. Monitor critical issues
6. Monitor the action field (environment)
7. Monitor the own resources, state (readiness & fitness) and capabilities
8. Review the pre-conditions and criteria
9. Keep finding options, alternatives, better solutions, …
10. Control the appropriateness of the strategy
11. Ensure the validity and achievability of the goal

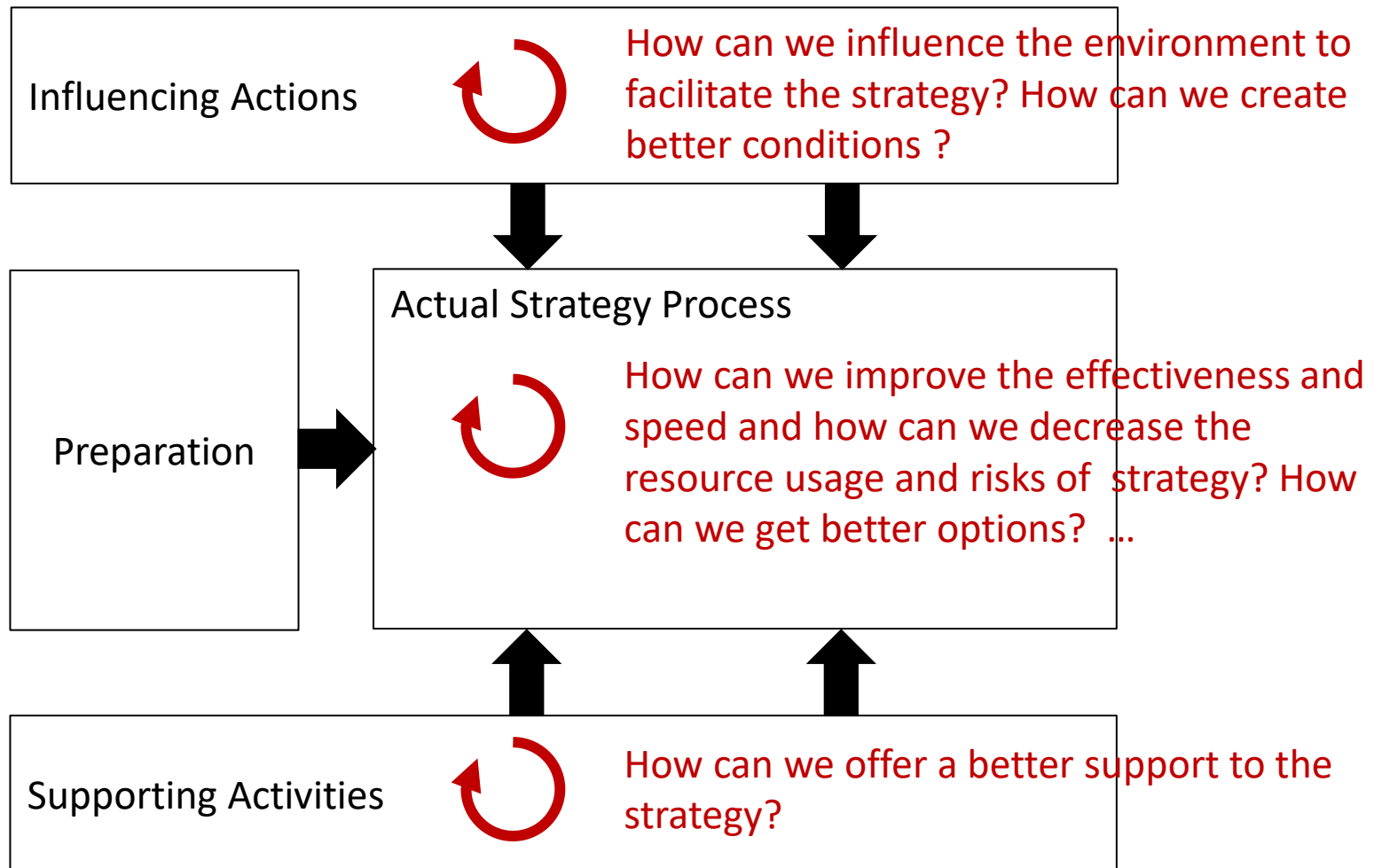## 14. EXECUTION EVALUATION

GOAL: Evaluate the execution of the strategy.

1. Evaluate the performances
2. Evaluate the quality of the strategy

    What went well? What was more difficult? What was the reactions?

    Are there weaknesses to work on?
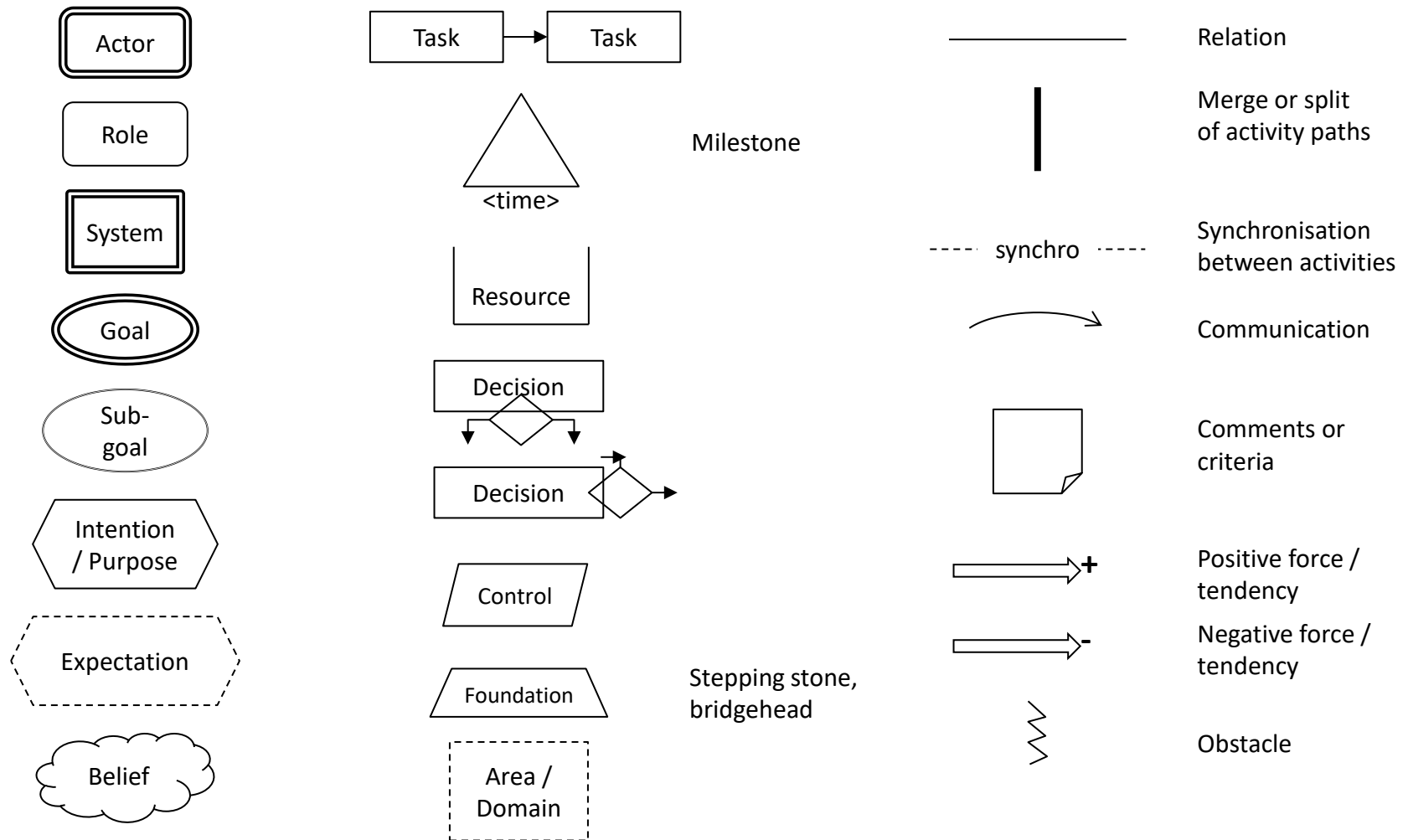
3. Learn lessons

Continuous Strategy Improvement

During the strategy elaboration and during the strategy execution …

Influencing Actions

How can we influence the environment to facilitate the strategy? How can we create better conditions ?

Preparation

Actual Strategy Process

How can we improve the effectiveness and speed and how can we decrease the resource usage and risks of strategy? How can we get better options? …

Supporting Activities

How can we offer a better support to the strategy?

A FEW TECHNIQUES

Proposed symbols (inspired from the i* notation (i star))

Actor		Task → Task		Relation
Role		Milestone		Merge or split of activity paths
System		Resource		Synchronisation between activities
Goal		Decision		Communication
Sub-goal		Decision		Comments or criteria
Intention / Purpose		Control		Positive force / tendency
Expectation		Foundation — Stepping stone, bridgehead		Negative force / tendency
Belief		Area / Domain		Obstacle

Note: Additional symbols can be added accordingly to the needs.

Goal: Break Down – Analysis – Modelling

- Goals breaking down into sub goals

- One sub-goal can support different goals

- Conflicting (sub-)goals

- Different priorities or importance of goals

- Different chronology

- Goals can be sequential, in parallel, influencing each other or be unrelated to each other.

- Timing of reaching a goal can be essential

- Goals show progress

- Reinforcement of a goal can be continuous, incremental, at certain point or period in time.

- Reaching an (intermediate) goal may mean 'being ready': Several criteria to be satisfied at a point in time to be able to tackle a next part of the strategy

Note: A goal is not a process

Goal: Break Down – Analysis – Modelling

- Motivation
  - Why is it a goal?
- Meaning, Value
  - What does it mean to reach the goal?
- Importance
  - How important is it to reach the goal?
  - What if you don't reach it ? Or partially?
- Alignment
  - Is the goal acceptable with norms and values?
    If the goal is not acceptable, it will be difficult to convince people.
  - Is the goal aligned with the vision?
  - Does it fit with your values?
  - Does it support a progress?
- Feasibility
  - Is it feasible?
  - What is the least required to have a viable solution?
- Acceptance
  - What is acceptable? What is inacceptable?
- Commitment
  - What are you prepared to invest ?
  - What are you prepared to loose ?
- Clarity - Understanding
  - Are you able to communicate the goal clearly?
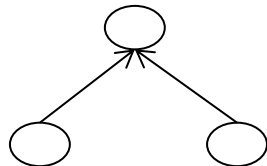 - Do others (the audience) understand the goal?
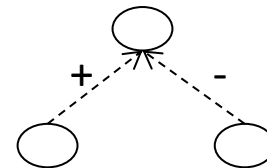
- ## Model the goals
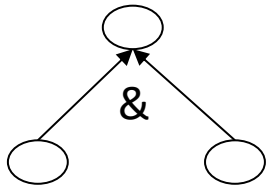
A goal can be decomposed into several sub-goals. Reaching the all sub-goals is required in order to reach the overall goal.
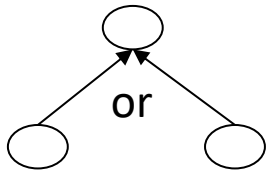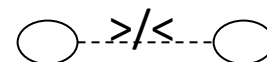
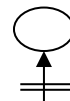One of the goals must be reached in order to reach the overall goal.

Reaching the two goals enable .

One goals has a positive (+) or negative (-) influence on another.
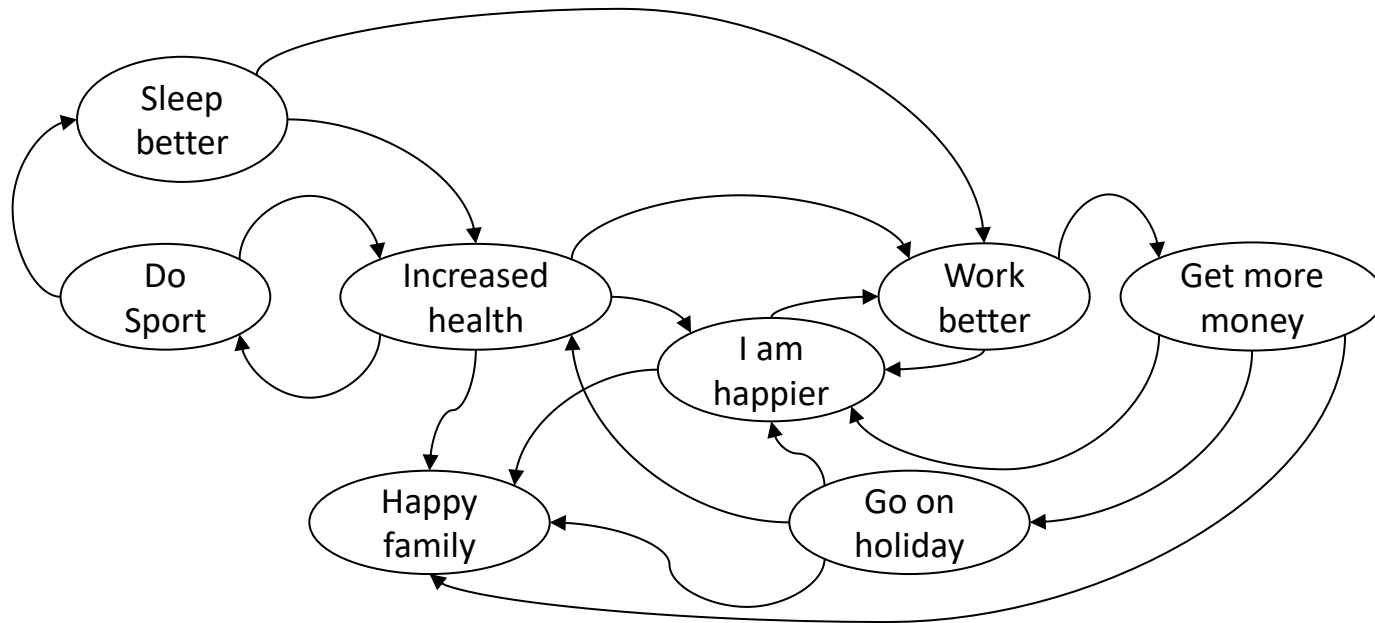
Conflicting goals

Barrier to reach a goal

- ## Model the goals

Factors for the Elaboration of the Success Criteria

1. **Vision - Goal**

   Does the solution contribute to the vision and goal?

2. **Objective requirements**

   Does the solution respect all the requirements imposed by the situation, the nature of things and the environment?

3. **Solution**

   Does the solution really solves the real need or problem?

4. **Minimal Viability**

   Is the solution viable (over a longer period of time, in different conditions, …)?

5. **Acceptance**

   What is required for the solution to be accepted ?

6. **Adoption**

   Will the solution be adopted (not just accepted but also liked and used) ?

7. **Formulated needs and demand**

   Does the solution meet the expressed needs and demand?

8. **Business requirements**

   Does the solution match the (business) requirements?

9. **Satisfaction**

   Does the solution give satisfaction to all the different stakeholders?

10. **Intention**

    Does the solution support the intentions? Intentions are often unexpressed.

11. **Expectation**

    Does the solution support the expectations? Expectations are often unexpressed.

Usages of Criteria

- ## "Criteria can't be set"

  It's better to set a criterion than to have no criteria. Later the criterion can be adjusted.

- ## "Low criteria"

  Low criteria yields low results.

  The criterion is set to 200 and the obtained result of 210 is obtained. We can celebrate. But is it a real success if a result of 500 was practically feasible?

- ## "High criteria"

  A criterion that is too high (not feasible) may demotivate people. The initiative will be too quickly be labelled as a failure.

- ## "Right criteria"

  Criteria should drive people. Use criteria that are somewhat challenging. This will motivate people to do better. New ways to reach the criteria can then be found.

GOOD LUCK

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