

# PROBLEM SOLVING

WHAT IS PROBLEM SOLVING AND HOW DO YOU APPLY IT IN YOUR BUSINESS?



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# INTRODUCTION

Circular entrepreneurs need to be equipped with skills to problem solve effectively when innovating and transitioning to circular economy.

We invite you to learn about easy to use problems solving tools – such as RCA, 5Whys, CATWOE and others that can support you in your business innovation processes!



# EXPECTED LEARNING OUTCOMES

<b>KNOWLEDGE</b>	<ul style="list-style-type: none"><li>• Theoretical knowledge of the principles and benefits of a problem solving approach for circular economy business innovation.</li><li>• Knowledge of key problem solving tools and methods</li><li>• Knowledge of how to create a problem statement</li></ul>
<b>SKILLS</b>	<ul style="list-style-type: none"><li>• Identify the main principles and benefits of a problem solving approach.</li><li>• Complete a root cause analysis to generate insights into stakeholder perspectives and root causes</li><li>• Develop a problem statement for your (circular) business</li><li>• Describe a case study where defining a problem/challenge led to innovative circular economy products.</li></ul>
<b>ATTITUDES</b>	<ul style="list-style-type: none"><li>• Appreciate how problem solving approaches generate innovation</li><li>• Engage with different methods of generating deeper knowledge of perspectives and root causes</li><li>• Acknowledge the importance of a sound problem statement as a starting point for business innovation</li><li>• Willingness to apply problem solving approaches to your own business</li></ul>



# SELF-REFLECTION EXERCISE

Welcome! In this quiz, you will face some questions that will show you the initial basic knowledge you have about problem solving in general and methods to deal with it. Good luck!

[Click here to be taken to the quiz.](#)



# CATWOE ANALYSIS

## CATWOE

What do you do when you have to deal with a serious business issue? For example sales of your recently developed circular products are down, and you need to know why.

You might naturally start brainstorming the possible reasons, and then apply a range of different problem-solving skills. But what if you have focused on the wrong problem, or you're just looking at a symptom of a larger problem?

By focusing on one specific problem, you tend to stop looking for other problems. And that is when you risk missing something that is potentially more fundamental than the problem you first decided to investigate. This is where the CATWOE ANALYSIS can help you avoid being on the wrong track.



CATWOE Analysis is a problem-solving method that requires you to look at an issue from six unique perspectives. CATWOE stands for:

**CUSTOMER**

Real beneficiaries and consumers of the transformation



**ACTORS**

Persons responsible for doing transformational activities



**TRANSFORMATION**

Brief mention of the high level business process



**WORLDVIEW**

Stakeholders' belief of the world affects the business



**OWNER**

A person with the authority to direct the transformation activities



**ENVIRONMENT**

Rules under which the business operates





**Customers** – These are the company's customers/key stakeholders. Who are they, and how does the issue affect them?

**Actors** - Who is involved in the situation? Who will be involved in implementing solutions? And what will impact their success?

**Transformation Process** - What processes or systems are affected by the issue?

**Worldview** - What is the big picture? And what are the wider impacts of the issue?

**Owner** - Who owns the process or situation you are investigating? And what role will they play in the solution?

**Environmental Constraints** - What are the constraints and limitations that will impact the solution and its success? It is about the actual environmental elements that may influence the company and can limit or restrict the system. Examples include ethical boundaries, regulations, financial constraints, and environmental factors.





The CATWOE Analysis makes it easier to identify the problem areas.

When you look at all six of these elements, and consider the situation from all of these perspectives, you open your thinking beyond the issue that sits directly in front of you. By using CATWOE, the output of your brainstorming and problem solving should be much more comprehensive, because you have considered the issue from six, very different perspectives.

In fact, CATWOE Analysis can be used at various stages of the business change life-cycle and for many purposes during a project, especially as a means of understanding a stakeholders perspective of a business system.

# PROBLEM STATEMENT

A problem is not usually seen as a good thing. But when it comes to innovation, it is. Contrary to what we believe, ideas are not the first step of innovation, problems are. This is true for business innovation, too, including circular business innovation.

A business problem statement can help analyze the problem and come up with new and creative ways to solve it. It enables you to approach the problem in a more systematic, measurable, and objective way.

A business problem statement defines the problem that your company is facing. It involves a complex analysis of the problem, details relevant to the situation, and a solution that can solve the problem. It is a simple but effective way to present a problem and its solution concisely.

In other words, a business problem statement is a communication tool that helps you visualize and minimize the gap between what's ideal vs. what's real. Or in a business context, the expected performance, and the real performance.



## How to write a problem statement

### 1. DEFINE YOUR PROBLEM

### 2. PROVIDE PROBLEM ANALYSIS

### 3. PROPOSE A SOLUTION

### 4. CONSIDER YOUR AUDIENCE

Before writing a business problem statement, it is crucial to conduct a complete analysis of the problem and everything related. When you are done with your research, you should be equipped with the knowledge to describe your problem and also suggest a solution to it.

#### How to develop a problem statement

A popular method that is used while writing a business problem statement is the 5W2H (What, Why, Where, Who, When, How, How much) method. These are the questions that need to be asked and answered while writing a business problem statement.



A business problem statement consists of four main components:

- The problem: The problem statement begins with mentioning and explaining the current state.
- Who it affects: Mention the people/stakeholders or organisation who are affected by the problem.
- How it impacts: Explain the impacts of the problem.
- The solution: Include a proposed solution for solving the problem.

A problem statement:

- It should neither be a statement of the Vision and Mission of the company nor any philosophy.
- A problem statement should be brief and clear.
- A problem statement should be specific and measurable.
- The context must always be made clear.

## Examples:

### 1. Problem statement by a manufacturing business

The problem of an inefficient manual assembly process affects the productivity of the company, and the workers have to manually install some parts, which consumes more time. This impacts the production goals and efficiency. An efficient solution would be to install conveyor belts to optimize the manufacturing process.



## 2. Netflix

Netflix sought to avoid video stores and instead deliver movies to your mailbox, allowing you to keep the movie as long as you'd like. Netflix's problem statement would probably look something like this:

**Problem:** "Going to the video store requires lots of time - fighting traffic and waiting in long lines just to get a single movie."

**Solution:** "Netflix allows anyone to enjoy thousands of titles streamed directly to their home or delivered to their mailbox."

In just two sentences you have given a potential investor an easy-to-digest problem/solution statement.



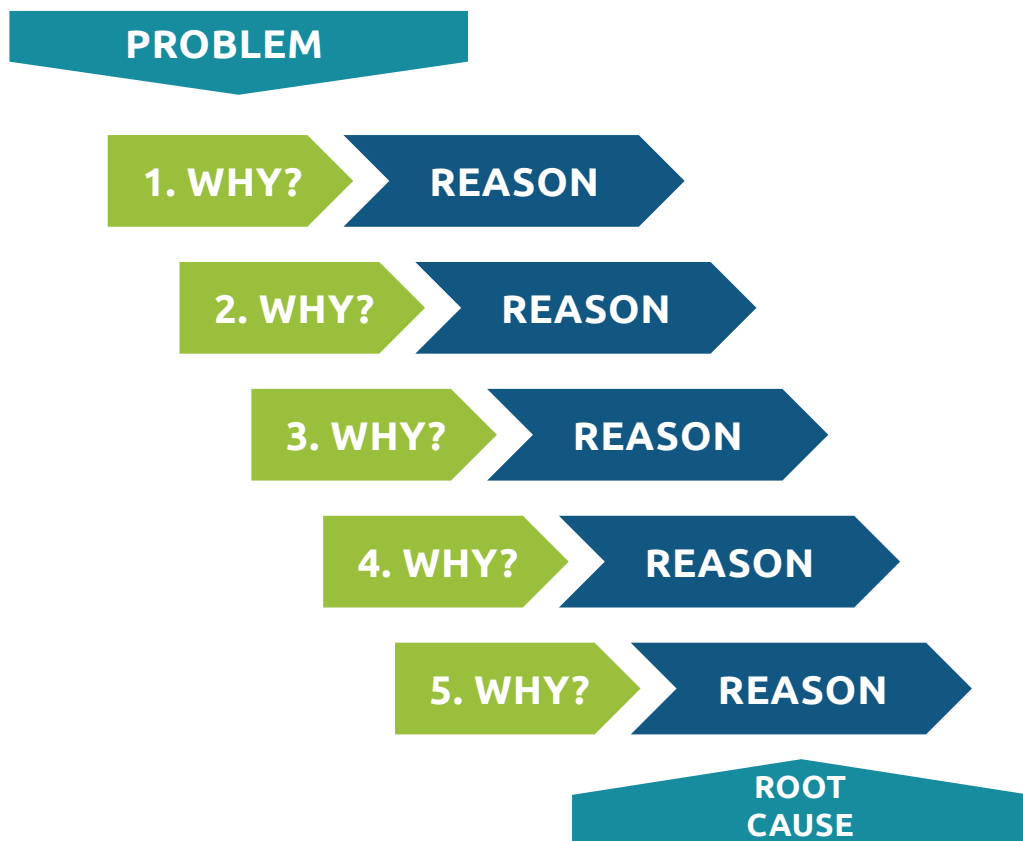
# 5 WHYS AND RCA



## 5WHYs

The '5 Whys' strategy is an easy to use, effective tool for uncovering the root of a problem. You can use it in troubleshooting, problem solving and quality improvement projects. It is equally effective for start ups as it is for long established businesses.

Start with a problem and ask 'why' it is occurring. Make sure that your answer is grounded in fact, then ask 'why' again. Continue the process until you reach the root cause of the problem, and you can identify a counter-measure that prevents it recurring. Bear in mind that this questioning process is best suited to simple to moderately-difficult problems. Complex problems may benefit from a more detailed approach such as Root Cause Analysis/Cause& Effect Diagrams (Fishbone Diagram)



## The Root Cause Analysis Process (RCA)

RCA is a useful process to work through if you want to deepen your understanding of a problem and increase your chances of solving it in a valuable way.

First, figure out what negative events are occurring. Then, look at what goes on around those problems, and identify key points of failure (root causes). Finally, envisage solutions to address those root causes.

RCA has five main steps.

### 1) Define the Problem

- What do you see happening?
- What are the symptoms?

### 2) Collect Data

- What proof do you have that the problem exists?
- How long has the problem existed?
- What is the impact of the problem?

A helpful tool at this stage is CATWOE. With this process, you look at the same situation from different perspectives (see above at the article about CATWOE)

### 3) Identify Possible Causes

- What sequence of events leads to the problem?
- What conditions allow the problem to occur?
- What other problems surround the occurrence of the central problem?



#### 4) Identify the RootCause(s)

- Why does the causal factor exist?
- What is the real reason the problem occurred?

Use the same tools you used to identify the causal factors (at step 3) to look at the roots of each factor. These tools are designed to encourage you to dig deeper at each level of cause and effect.

#### 5) Identify Solutions

- What can you do to prevent the problem from happening again?
- How will the solution be implemented?
- Who will be responsible for it?
- What are the risks of implementing the solution?

Analyse your cause-and-effect process, and identify the changes needed. It is also important that you plan ahead to predict the effects of your solution. This way, you can spot potential failures before they happen.

You can use many tools to support the Root Cause Analysis process, including Cause and Effect Diagrams, Brainstorming and '5Whys'.



# CREATIVE PROBLEM SOLVING (CPS)

You may think of creativity as something that is only for artists and of no practical use in the business world. However creative problem solving (CPS) is a very valuable tool for finding fresh perspectives and coming up with innovative solutions. It can free your mind to make leaps that you would not have otherwise even considered.

Creative problem solving (CPS) is based on separating divergent and convergent thinking styles, so that you can focus your mind on creating first, and then on evaluating.

At the divergent stage you want to be as open and creative as possible, generating lots of different ideas. At the convergent stage you pull it all back into focus and whittle down the ideas.

There are different models for CPS, but they all involve a clear structure of identifying the problem, generating new ideas, evaluating the options, and then formulating a plan for successful implementation.

## The Steps of the Creative Problem-Solving Process



## Clarify

As a first step identify your goal or challenge. This is crucial as it is easy to assume, incorrectly, that you know what the problem is. However, you may have missed something or have failed to understand the issue fully, and defining your objective can provide clarity. You can use the **RCA/5Whys or the Fishbone method** for getting to the root of the problem quickly.

For example, an eco-farm could face a problem of having got polluted water, but it would not be enough to solve the problem only on that farm. Clarifying would involve identifying the source of the pollution to adequately tackle the problem.

## Ideate

This is a convergent step. Generate ideas that answer the challenge questions identified in the previous step. It can be tempting to consider solutions that you have tried before, as our minds tend to return to habitual thinking patterns that stop us from producing new ideas. Try to use your creativity!

In case of the previous example of the eco-farm - if a farm does not have clean water, for example, potential causes of toxic water must be listed and as many as possible of these causes eliminated. Then steps to investigating solutions to bring the water back to a safe state must be taken. If, for instance, nearby livestock are polluting the water, the livestock should be isolated from the water source.



## Develop

This is the convergent stage of creative problem solving, where you begin to focus on evaluating all of your possible options and come up with solutions. Analyze whether potential solutions meet your needs and criteria, and decide whether you can implement them successfully. Next, consider how you can strengthen them and determine which ones are the best “fit.”

In the preceding example, adding a chemical to the water may not be a feasible solution to the eco-farmer. He might prefer a filtration system, but the cost of that solution might not be practicable. Alternative solutions should be identified and assessed to find one that is most cost-effective and feasible.

## Implement

Once you’ve chosen the best solution, it’s time to develop a plan of action. Start by identifying resources and actions that will allow you to implement your chosen solution. Next, communicate your plan and make sure that everyone involved understands and accepts it.

In the farm with polluted water example, the solution could be reducing runoff from toxic insecticides by adding prairie strips, buffers of grass, and vegetation along banks of streams.



**EXAMPLES OF CIRCULAR  
ECONOMY SOLUTIONS FOR A  
MORE SUSTAINABLE WORLD /  
HOW THINKING CIRCULAR CAN  
SOLVE PROBLEMS?**



Circular economy ideas are taking off around the world, with creative solutions tackling climate change, biodiversity loss, waste, and pollution.

These are two examples of circular economy companies with a strong emphasis on the problem they are trying to solve and on the solution they use.

### **Cleango - Environmentally car wash technology**

Drinkable water represents a huge problem around the world.

According to the United Nations, water use has grown at more than twice the rate of population increase in the last century. By 2025, an estimated 1.8 billion people will live in areas plagued by water scarcity, with two-thirds of the world's population living in water-stressed regions as a result of use, growth, and climate change.

In the meantime, globally, some 69,000 litres of pure water is being used every second for washing cars and the hazardous chemicals can make their way back in the environment despite water treatment.

These are the challenges, Cleango, a Hungarian car wash service company would like to address by using environmentally friendly car wash technology instead of costly, wasteful infrastructure. Cleango uses only 4 deciliter of water to wash a car. While the technology is not completely new the company made it successful with their business model. By using the Cleango cleaning application platform the customer can request and get car washing services to



a parked vehicle in an environmentally friendly way directly in the location where the car is parked. This saves time and fuel for the customer, the washing material is biologically degradable and hundreds of liters of water is saved.

Another benefit is that the company creates job too, even for those who are not qualified, so it is ideal for e.g. students. While there is more and more car on our roads this business can be a perfect response to help and stop or at least reduce wasting water.

### **FOLDO – eco design for sustainable furniture**

Manufacturing furniture requires lots of materials and energy. Like many other manufacturing industries it generates carbon emissions. Therefore there is a great scope for the industry to assess and reduce its carbon impact. The embedded carbon contained within the materials and technological processes used for the manufacture of the furniture products are the highest contributors to the carbon footprint. Thus reducing the materials used in a product, or selecting lower impact (environmental-friendly) materials can considerably reduce the carbon footprint of furniture products.

FOLDO, a Romanian circular business, addresses the need for sustainable home furniture – lightweight furniture, made of 100% recyclable cardboard - whose production process implies significantly lower amount of energy as well as carbon foot print than in case of traditional furniture, in the same time contributes to waste reduction and irresponsible consumption, as well as prevention of cutting down trees for production.



FOLDO's products are lightweight modular home or office furniture, easy to transport, handle and store. The FOLDO products are delivered folded and can be easily assembled by customers without any tools.

Foldo's circular model is aiming at creating:

- social impact that of creating local jobs, educating consumers in a more responsible consumption;
- environmental impact of decreasing waste and carbon footprint due to using recyclable materials in production; and
- the economic impact of supporting local production of high quality recyclable cardboard.



# FINAL ASSESSMENT TASK

## **TITLE OF THE TASK:**

Drive innovation in your business by using CATWOE

## **AIM OF THE ACTIVITY:**

To apply the knowledge gained in using the tool CATWOE Analysis to developing a problem statement, in order to to bring innovation in your small business (e.g. transform it into a circular one)

## **TIME REQUIRED:**

Task requires 4 hours in total

## **MATERIALS REQUIRED:**

Articles, links and video in Eduzine.

Creative thinking

Laptop

Internet access

## **FORMAT FOR THE PRESENTATION:**

Pptx, Google slides



## STEPS TO COMPLETE THE TASK:

- **Step 1:** Think of your existing or imaginary circular business – the services/products it offers (would offer). Do some research on the problem you want to solve – that will lead to innovation within your business. Take notes.
- **Step 2:** Create the draft version of your problem statement. Show it to others, share with other participants so you can test it before you show it to your team or stakeholders and ask if they can get the general idea. The more clear the problem statement the more certain that it can be used in the real life.
- **Step 3:** Complete your problem statement based on the feedback you got.
- **Step 4:** When the statement is finalised start to apply the CATWOE Analysis steps to your business system to see if your proposed solution (the change within your business) is sustainable enough.
- **Step 5:** Prepare a summary-slide of your analysis using the CATWOE template:



**FINAL TEST**

Are you ready to show what you have learned from this Eduzine?

Do you feel you know more about problem solution now than when taking the self-reflection quiz at the beginning? Once you have read all of the articles in the Eduzine, you will have no problem completing this quiz.

[https://docs.google.com/forms/d/e/1FAIpQLScn5DleHr4HhLipaxgs7ODvmeNIhntTfbCjkcMp6YPxHaneuA/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScn5DleHr4HhLipaxgs7ODvmeNIhntTfbCjkcMp6YPxHaneuA/viewform?usp=sf_link)





# **FURTHER READING AND RESOURCES**

Small circular practices from Europe

<https://livecircularcanvas.eu/en/circular-practices/32/foldo>

Creative Problem Solving Process

[https://openstax.org/books/entrepreneurship/pages/6-2-creative-problem-solving-process?fbclid=IwAR3MRLIpk5A95WWsyLvWMzxHwomZmhZLUvucAAIwSNw0kZAq6woS4BCm\\_dk](https://openstax.org/books/entrepreneurship/pages/6-2-creative-problem-solving-process?fbclid=IwAR3MRLIpk5A95WWsyLvWMzxHwomZmhZLUvucAAIwSNw0kZAq6woS4BCm_dk)

Innovation Is Problem Solving...And A Whole Lot More

<https://www.forbes.com/sites/larrymyler/2014/06/13/innovation-is-problem-solving-and-a-whole-lot-more/?sh=216790133b93&fbclid=IwAR1NTBYaUwl42SdB8mVL0sbrtVvyCzJ4OWIA32pUmDETcAbfimftDhXFnHE>

Creative Problem Solving

Finding Innovative Solutions to Challenges

[https://www.mindtools.com/pages/article/creative-problem-solving.htm?fbclid=IwAR3btOo8hoL0cmmKv1rxRg9wcW348Ujpw8\\_hOEErRD\\_3hgsPoTJIG9nR82U](https://www.mindtools.com/pages/article/creative-problem-solving.htm?fbclid=IwAR3btOo8hoL0cmmKv1rxRg9wcW348Ujpw8_hOEErRD_3hgsPoTJIG9nR82U)

What is Problem Solving?

<https://asq.org/quality-resources/problem-solving>

How to Solve Problems

<https://hbr.org/2021/10/how-to-solve-problems>

What Are Problem-Solving Skills?

<https://www.thebalancecareers.com/problem-solving-skills-with-examples-2063764>



## How To Write a Problem Statement Step by Step (With an Example)

<https://www.indeed.com/career-advice/career-development/how-to-write-a-problem-statement>





# LEARNING CIRCLE



cantabria  
perma  
cultura



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