Young Innovators

Climate-KIC

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Booklet with Tools and Guidelines for Young Innovators

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The five tools contained in this booklet are examples of Visual Thinking techniques developed by Climate-KIC's Transition Hub. They were originally designed to put experts and stakeholders working together to face, understand and generate solutions for complex problems such as climate change, raw materials, energy, food and other subjects that are related to sustainability. They have now been adapted, so they can be used by teachers and students to apply and explore current local challenges.

Each technique is useful for certain outcomes:

Pentagonal Problem allows students to understand all the 'parts' and perspectives involved in a problem, and also to see the potential consequences – dependent on the different viewpoints of the people taking part.

Context Map is useful to set the problem and understand how the stakeholders' current actions are affecting and/or modifying it, so students can begin imagining a solution for the problem.

Cover Story is a very dynamic technique that needs all the imagination and creativity of the students. They are encouraged to travel into a near future in which their innovative idea has become a solution with a highly positive impact.

Actor Tree will help students to better understand the perspectives of the different stakeholders surrounding a complex problem featured by smaller complex conflicts. It is a really useful tool for students to get used to understanding the needs of specific actors that inform or feed in to a situation. It is also useful to help understand complex situations where a broad issue with a high level of detail needs to be understood.

Credential Cards empowers students to explore the relationship between a specific stakeholder with the problem or the challenge. It helps to reveal if their place in the challenge is within the very core of the conflict and is active or passive. Students will reflect on their expected behaviours and generate a list of expected decisions on supporting the innovative projects or not.

These tools should be used in the order they are presented as they follow a logical sequence, but they can also be used individually if teachers consider that they can be useful for other purposes. (See the ***'How to Combine the Tools***' document for more guidance.)

Note - is important to recognise that any modification of the elements belonging to each tool, or the alteration of the sequence of techniques - could lead to confuses results.

Planning advice:

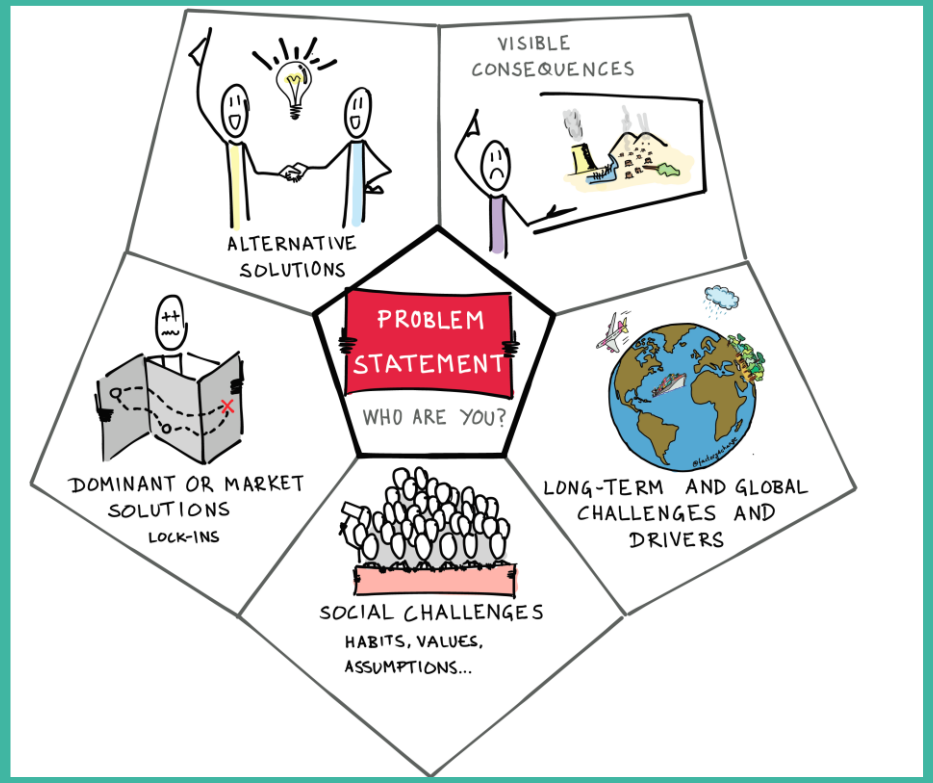
- Per tool, allow around 45 to 60 minutes to introduce, complete and share findings with the student groups. Students should form groups of around 4 to 6 or even up to 8 to 12 people - dependent on the application of the challenge you are exploring.
- It is advisable to have a topic, case study or local issue students are involved with and to share this in advance of using the tools and so they properly prepared, with context, to face the challenge during each session.
- Print or draw a big white canvas (as large as possible - maybe use flip chart paper) and give a copy to each group.
- Give each group some stickers/Post-its and colour pens to record and form their ideas. Some might like pencils in the early stages… but do encourage them to feel positive and able to contribute.
- Group tables together so the students can form around the canvas tool and have creative discussions and move freely around. You can also stick canvases on the walls.

Some of the vocabulary used will be new to you and students as it pertains to this programme and who to work with problem solving in this method. Please make sure you have the **GLOSSARY** provided available at all times when using the tools.

Then:

1. Students should have limited time to face each section of each technique (see following guidance for each canvas), and this time must be an incentive to create, not a source of stress.
2. Every student should write their own ideas, and every idea has to be stuck in the relevant section – all thoughts and ideas are good ones!
3. As ideas develop, students should debate and consolidate connected information and views before going to the next section.
4. When all the sections are finished, it is time for the students to explain their findings, and to express their feelings about the techniques they have used.
5. Remember that there are neither right nor wrong ideas, nobody’s idea is better than another’s and that the debate is always enriching when facing challenges.

The Pentagonal Problem



How many: For 1 person to 10. Ideally 4 to 6.

How long: 40-60 min

Difficulty: Low

- **What you get:** Better understanding of the challenge you are facing, its causes, consequences and potential solutions.
- **What you need:** Basic knowledge of the problem and the different stakeholders involved as well as and an open mind to see the issue at hand from different perspectives.
- **What is next:** With this depiction of the challenge you might opt either for a deeper analysis of the stakeholders or for an enriched description of the system and challenge. That is, you might go for a stakeholder analysis tool or the system analysis method (such as the **Context Map** or the **Visual Story**)

TEACHERS:

1. **WHAT IS IT:** It is a visual tool to help students to identify a problem and its different components and details.
2. **WHEN TO USE:** Whenever students face a complex problem that is difficult to summarise in a single sentence or paragraph.
3. **WHY IS IT USEFUL:** It allows students to understand the multiple aspects surrounding a complex problem within the climate change context. After defining the stakeholders surrounding the conflict, they will be able to have a deeper multi-level approach.

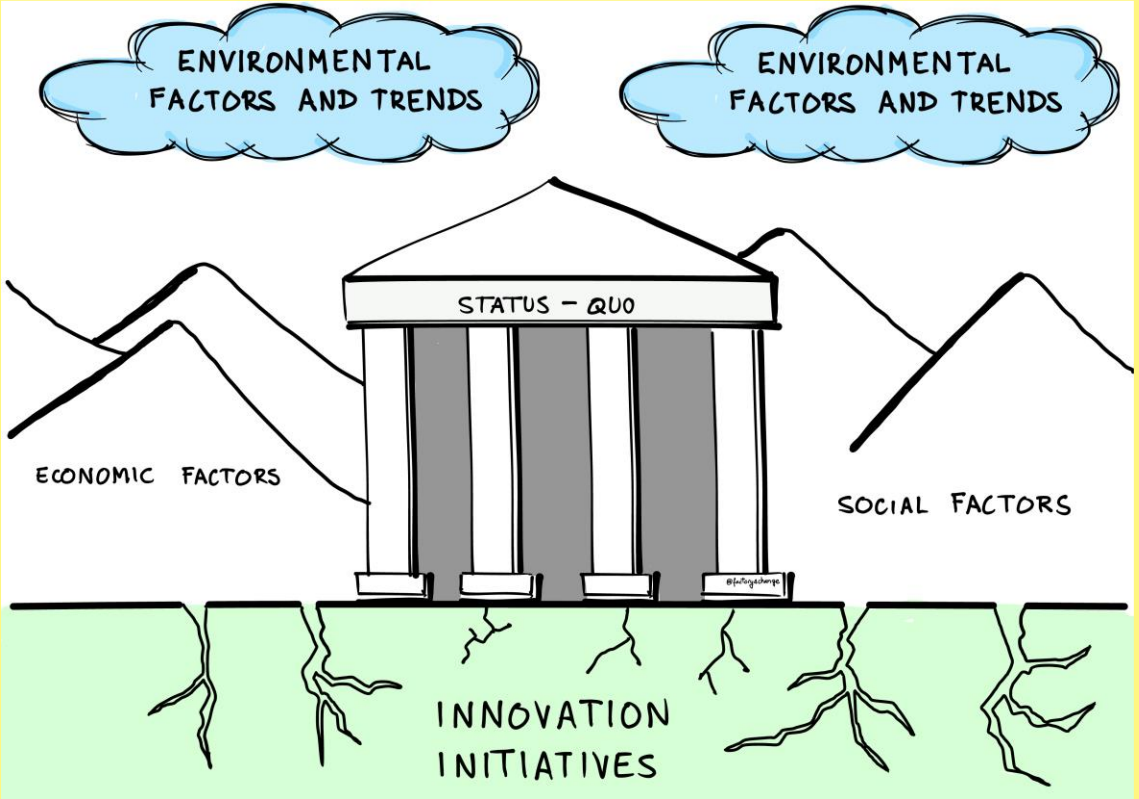
STUDENTS:

1. **WHO YOU ARE AND WHAT IS THE PROBLEM:** Are you a company? Are you a government? Are you an association? Just a customer? Or are you the leader on the search for a solution?

   Just use the centre of the canvas to reflect all the perceptions about you/your group with the number of stickers that you need (minimum one or two per student).

   Remember: all the ideas are good, and there is no 'right' or 'wrong' idea or perspective! Then, try to describe the problem in a single sentence. Be conversational: the sentence or paragraph should be the result of a discussion between the partners of the group. Avoid any detail: this will be reflected in the following steps.

2. **VISIBLE CONSEQUENCES:** Try to describe generally the most visible and evident consequences of the problem. You don't need to classify them, just write down a single consequence per sticker.
3. **GLOBAL TREND CHALLENGES:** CO_2 emissions? Water scarcity? Deforestation? Put one sticker per climate change issue or challenge in this section. Remember that here you have to reflect environmental problems only.
4. **CURRENT SOLUTIONS:** What does current technology offer that is weakening the problem? Are there technical problems or bottlenecks surrounding the issue that you have defined? So, again write a single idea per sticker and place them on the canvas.
5. **SOCIETAL CHALLENGES:** How does society affect the problem? Identify the values, habits and behaviours that are contributing and so that the problem remains as it is, or even gets worse. Again, use a sticker per idea or social group and place them on this side of the canvas. When put on the canvas, you can group them by the type of collective to have a broader idea.
6. **EMERGING SOLUTIONS:** Are there solutions applied to other fields that could be useful for the problem we are facing? Are you missing new technology? Or is it a question of new regulations? Does society need some more awareness about it to begin facing the problem properly? Write down an idea per post-it and, after placing them on the canvas, feel free to group them to identify the main sources of gaps for the challenge.



How many: For 1 person to 10. Ideally 4 to 6.

How long: 40-60 min

Difficulty: Medium

The Context Map

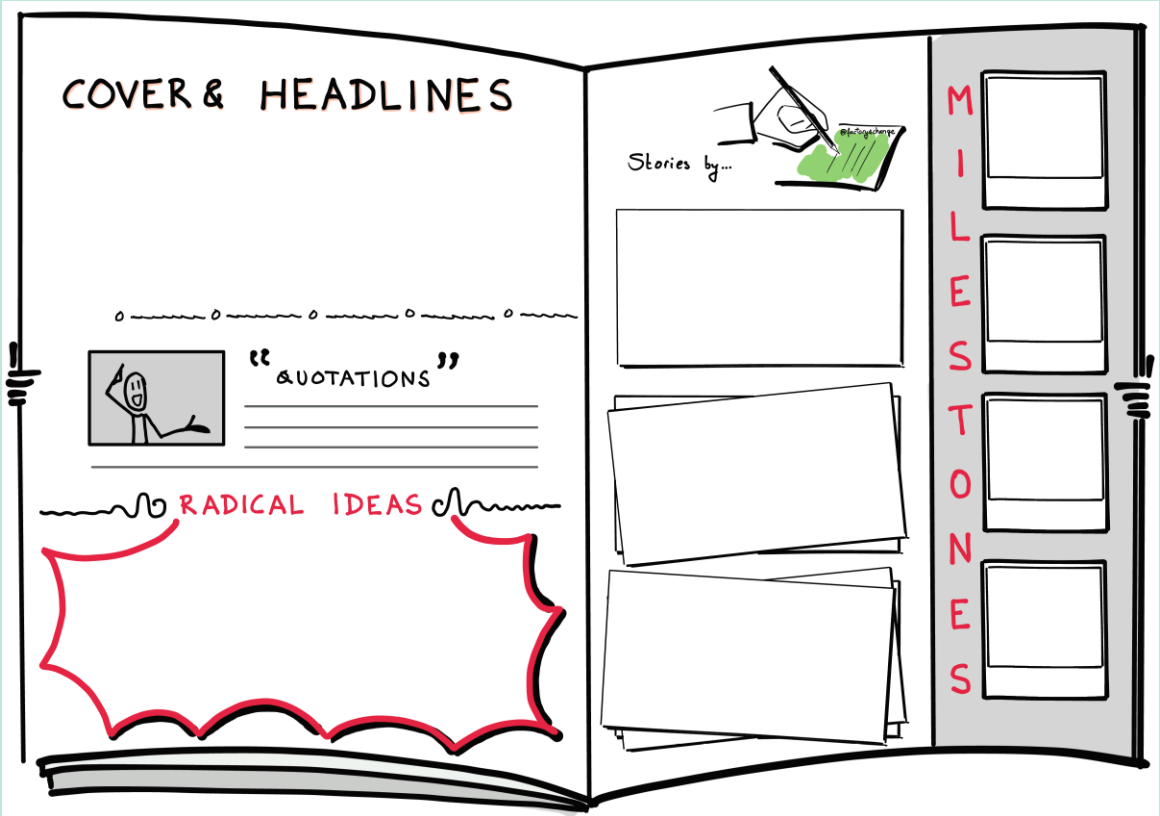
- **What you get:** An enriched picture of the context or system in which your challenge is embedded along with a sense of direction for different factors influencing each other.
- **What you need:** Access to different sources of information about the social, economic, technological and environmental context. Ideally, you should also have an idea about innovative initiatives taking place in the same area you are working on.
- **What is next:** Once you have this broad perspective of the challenge, it is time to either deepen your understanding or envision the future you want - or what the reality may look like in 10 or 20 years time.

TEACHERS:

1. **WHAT IS IT:** It is a visual tool for system analysis, focusing on trends as potential drivers for change.
2. **WHEN TO USE:** When students need to get a quick idea about the system around the challenge and how it works.
3. **WHY IS IT USEFUL:** It is not necessary to have a deep understanding of innovation systems. It helps students to understand how the system around the problem works, so they can spot opportunities or significant threats for their project. Overall, the Context Map broadens the scope and increases awareness of the context, putting students in a position to make better decisions or adopt more efficient strategies.

STUDENTS:

1. **THE CANVAS:** As you see, the canvas is made up of four parts. The main system is on the centre of the canvas, and it is shown as a classical building (labelled 'status quo') with some columns supporting it and two side arrows pointing to it. These columns stand for all the significant variables that can condition the status quo. On both sides of the building we can see the social and economic factors that have a big influence on the system. The innovation alternatives are at the bottom and, finally, the environment occupies the top of the canvas, represented by big clouds.
2. **THE STARTING POINT:** Before starting with the canvas, you need to define briefly your challenge, whether it is an innovation, a project or a business idea. If you have previously used the **Pentagonal Problem**, you can use its outcome to do it. After defining your project, you should discuss where it would be located, so limitations and conditions can be taken into account.
3. **THE INNOVATION ALTERNATIVES:** Use one sticker for each initiative and place them on the cracks under the floor. It is usual that new ideas can emerge while explaining each initial sticker. If it happens, do not hesitate to write them down on other stickers and place them on the arrow. These initiatives can come from very diverse sources: universities, start-ups businesses, public organisations, and Research and Development departments. They can be relevant for your projects, perhaps potential allies or competitors. Is your idea one of these innovations? Write it and stick it on this section of the canvas.
4. **THE STATUS QUO:** It is time to describe the building. All the components of it –technologies, regulations and rules, institutions, user values – are combined with the social and economic factors and generate what we call the 'system'. Try to identify as many elements as you can for 10 minutes, working individually. Then, start group discussions as you stick your ideas on the canvas. You can generate columns that reflect regulative factors that affect the status quo, or technological improvements that are being implemented, or user values about topics like consumption, or institutions that are associated in the system… You can add as many columns as you want!
5. **THE ECONOMIC AND SOCIAL TRENDS:** Here you have to identify economic factors that have an influence on the status quo (access to investment, economic growth, the difficulties to create a business in the local area…) and also the social ones (cultural conditions, consumer habits…). For this part you don't need to conduct a market research study, but just pay attention to those visible factors that can affect your project opportunities.
6. **THE ENVIRONMENT:** All businesses and projects impact their environment (or at least this is the original intention). These impacts are linked to the geographical context. So, try to identify the environmental factors that affect your innovation. For instance, a problem like water shortages can become an opportunity for your innovation to enter the market, or climate change could ruin it. Reflect on these conditions on



The Cover Story

- **What you get:** A visual description of the best future scenario you can imagine for the current situation. It is a visual story on how reality was transformed as a consequence of your innovation initiatives.
- **What you need:** A sense of the possibilities of the current reality and the ability to dream with no constraints. This is not about listing solutions but rather about imaging a new future.
- **What is next:** Your vision provides you with a sense of direction for the current reality to evolve to. So, as to come up with innovative solutions in that direction you will first need to identify different paths of change by back casting changes from the future vision to the present time.

How many: For 1 person to 10. Ideally 4 to 6.

How long: 60-90 min

Difficulty: Low

TEACHERS:

1. **WHAT IS** It is a visual tool that helps to imagine an ideal future that could happen if the project previously designed would be successful..
2. **WHEN TO USE:** We should use it right after defining the problem/challenge we are facing, and also after visioning the conditions surrounding it. Starting to tackle projects should be done after understanding the present and envisioning the future.
3. **WHY IS IT USEFUL:** This storytelling technique allows you to introduce disruptive ideas that otherwise would be too shocking in the present. In this regard, the Cover Story suspends all connections with the present time, empowering disruptive thinking and creativity.

STUDENTS:

1. **COVER:** Try to tell the great story of success and change in just a couple of lines. You have changed the world, or at least your environment, so put yourself in a journalist's mind and begin to tell us your story in an appealing way.
2. **RADICAL IDEAS: '**Radical Ideas' documents initial ideas for the project that drove you to this shiny future. That is, the ideas underlying the radical innovation. What ideas fuelled the process? Where did they come from?
3. **QUOTATIONS:** If your innovation is radical enough, then a lot of significant individuals (real or not) will speak about it. Use these uplifting quotations to explain the new scenario.
4. **STORIES:** These are the smaller and more specific stories that can describe the new future situation: How stakeholders relate now between themselves, how energy is consumed or distributed, how food is produced and consumed, how do we move… Try to look for new different and significant aspects in the future scenario and describe them. With these descriptions, people should understand how technology, habits, social structures, politics, regulations and environment would work in the future according to the impact generated by your innovation.
5. **MILESTONES:** Now generate four images to describe four fundamental changes that happened to make this new scenario come true. These changes can be technological, social, regulatory, institutional, and environmental.

The Pentagonal Problem

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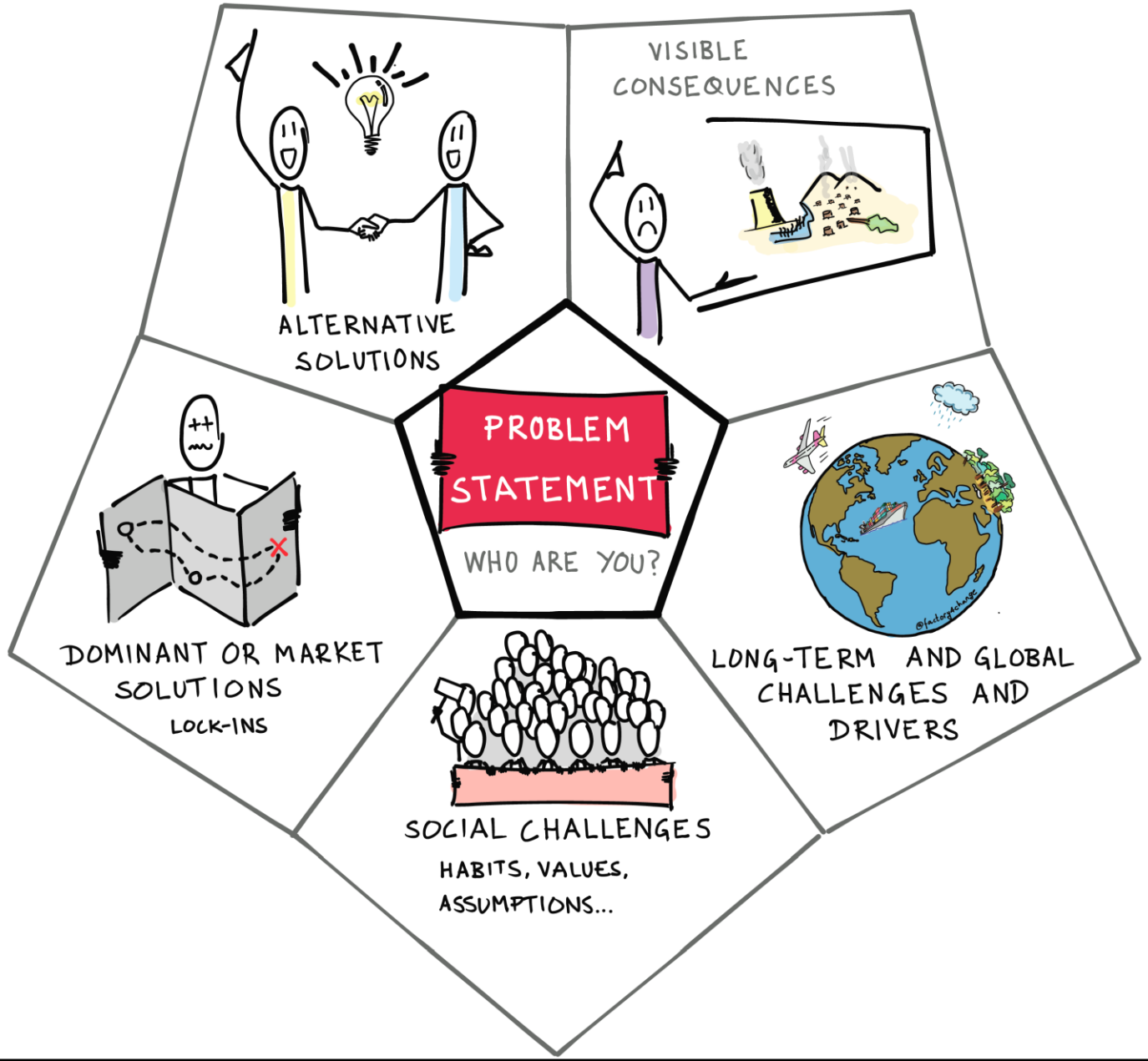

The Context Map

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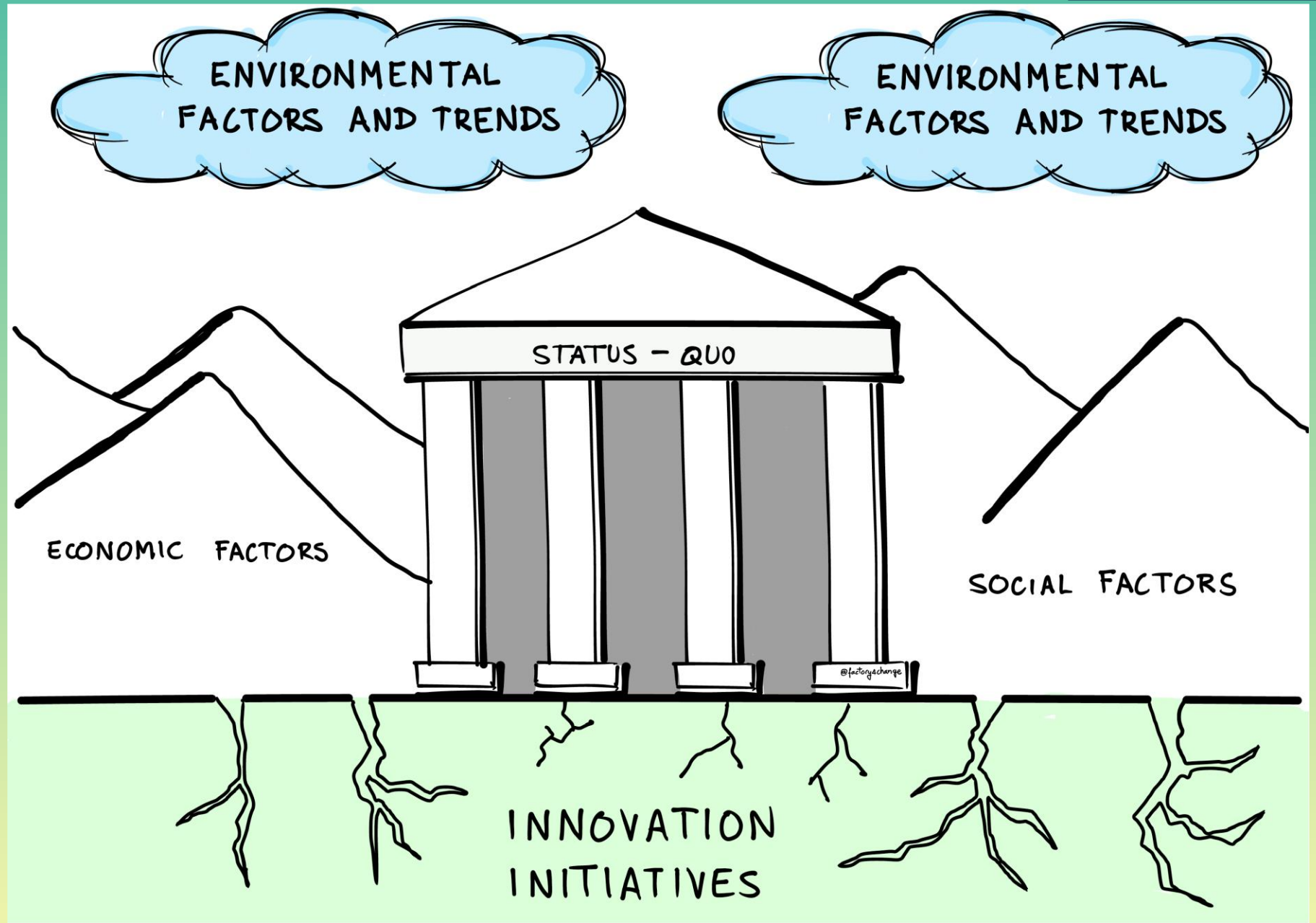

The Cover Story

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