1 Investigating overview

Figure 1. Focus Group Discussion Nepal (Irene2005 CC BY 2.0)

The importance of investigating

Investigating is part of all of our lives. When we try to find out the answer to something we do not know, we are investigating. Every day, you ask questions of the people around you, observe, and record information. These are all strategies that are important for finding out the so-called *known unknowns*. In other words, finding out the answers to things you know that you do not know.

However, investigating is also very important for things you might think you know about, but really do not. Often we think we understand what is happening around us, and why people do what they do, but our knowledge has been formed with very little information and experience. We are very quick to judge the conditions around us and come to conclusions that guide our actions in the world. This is a natural human instinct and useful most of the time. But, sometimes these conclusions are wrong, because we have not investigated and understood people and systems thoroughly enough.

An interesting example of this is the problem of traffic congestion. For a long time, people assumed that the obvious solution for traffic congestion is to build new roads. This is exactly what governments around the world have done. Unfortunately, research shows that when we build new roads, it causes more drivers to use their cars, so that traffic congestion stays the same and sometimes even gets worse.

Transportation planners often had an incorrect understanding of how systems of traffic worked, and how human beings behaved. Planners believed that tr[illegible]c is like a liquid which requires a certain volume of space for it to pass through at a given rate. However, we now know through investigation that traffic is more like a gas. It

through at a given rate. However, we now know through investigation that traffic is more like a gas: it

ıds to fill up all the space it is allowed (Schneider). If transportation planners and governments had ioned or interacted with car owners to understand their behaviour in the transportation system, they would have formed a different mental model of how traffic worked. Then they might have developed a different solution to traffic congestion.

Figure 2. Building more roads is not the answer ("Traffic Congestion" CC BY-NC-ND 4.0)

There is much that we cannot see easily about the way the world works and why people behave as they do. We need to slow down our thinking. We need to investigate carefully, gathering information from different perspectives and with a variety of methods in order to understand people, their communities and the world so that we can take more effective action to improve it. This is often done more easily and thoroughly in a group, so if you are considering a project you may want to get a team together rather than trying to do everything on your own.

The Iceberg Model

Figure 3. Much of an iceberg is below the water's surface, invisible (Weith, CC BY-SA 4.0)

Have you heard the expression “that’s just the tip of the iceberg”? When people use this expression, they mean that you are seeing only very little of a situation. In the ocean, very little of an iceberg is visible above the ocean. Most of the iceberg is below the water, invisible.

The iceberg is an analogy that can help you think about all the invisible information in the world. Systems thinkers have developed an ***Iceberg Model*** to help changemakers like you gather and organise more of the invisible information you need to understand the world, its problems and needs.

The Iceberg Model has four layers of information to understand situations. We are going to use this model to guide the investigation stage of your project. The next sections of the Youth Mayors Field Guide address the invisible layers of information in the Iceberg Model. When you finish your investigation, you should be able to identify points of ***leverage***, where action can effectively solve problems and meet people’s needs.

- **ents** - This is what happened, or is happening, in a situation, what you can see. It is the 'tip' of the iceberg. In r traffic congestion example, the event is the stalled traffic.

- **Patterns of behaviour** - Things change over time. Often we can find patterns in changes over time and these can help us understand the events we see and help us plan for the future. In traffic congestion, we can find the growth in the number of cars using the highway over time, or at particular times of the day.

- **The structure of a system** is like the rules of a game. They define and give direction to human behaviour and cause the patterns we see in the layer above. These structures may be written or unwritten, visible and physical or invisible. In traffic congestion, structures may include the visible, physical layout of the roads. Or they could be the invisible norms of work that put so many people on the road at 7:30 in the morning.

- **Mental models** are the way we think about the world. Our assumptions, beliefs, perceptions, values and culture help us create the visible and invisible structures in the world that then cause patterns and events. Mental models can be very difficult to understand because they are so deeply a part of human thinking that we are not aware of them. As we said in the traffic example, transportation planners had a mental model that traffic acts like a liquid and this led them to build more roads to increase the space for that 'liquid' to flow.

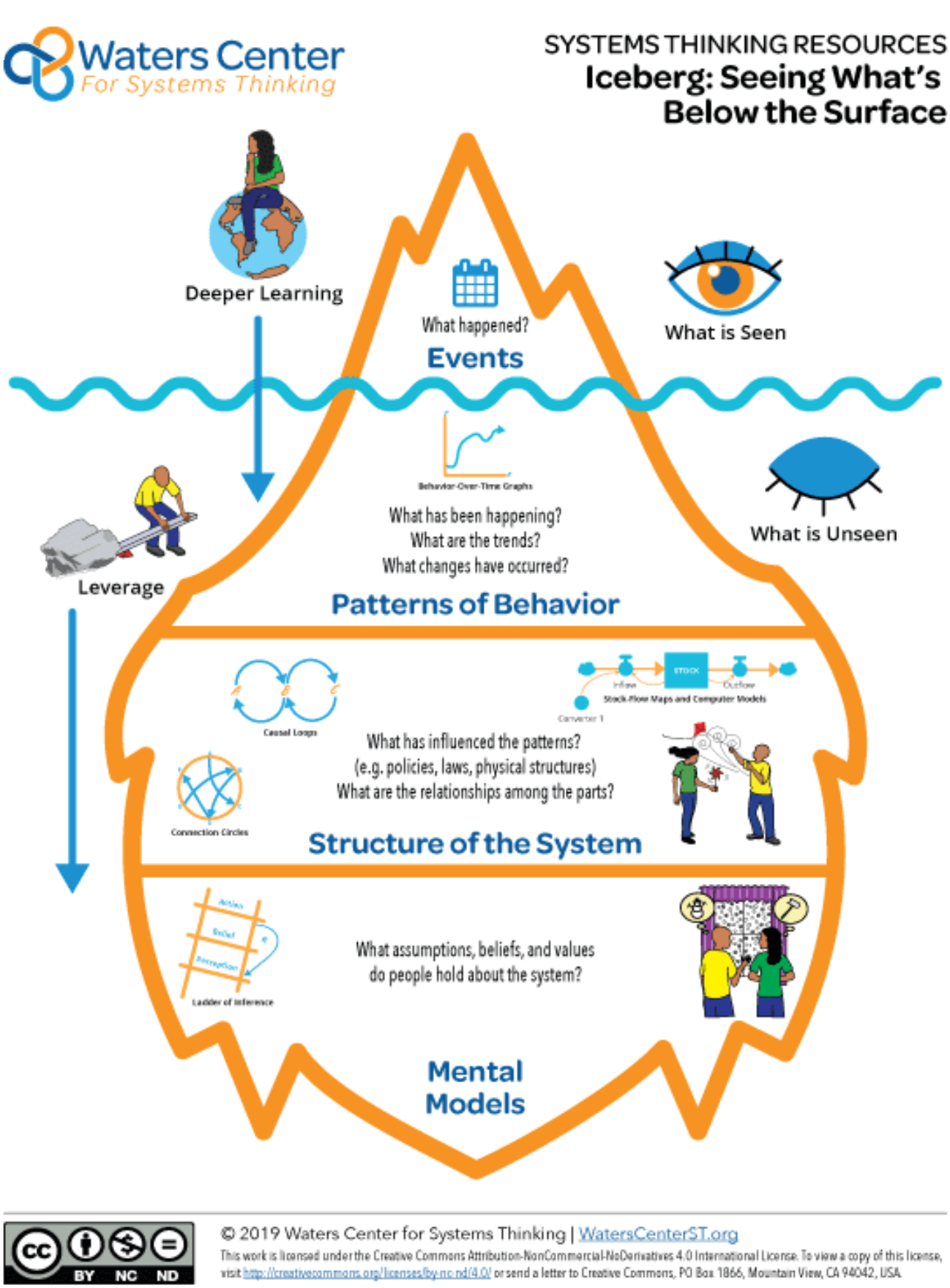

Figure 4. The Iceberg Model (*Resource: Ic* ⓘ *3*, CC BY-NC-ND 4.0)

ctice Activity

Consider how the Iceberg Model might help you better understand the situation below to develop an appropriate solution. This is best done in a small group. Don't worry if you find it difficult to discuss the Iceberg Model at this point. You will have more practice with thinking about patterns of behaviour, systems and mental models in the upcoming field guide modules.

Event: Some students are late for school every morning. Their lateness means that they miss out on learning and interrupt class for other students. Some school administrators believe that the students just do not care enough to come on time. They want to punish the lateness with after school detentions. Others believe that the issue might be more complex and that different responses may work better. They decide to investigate the situation thoroughly by looking below the tip of the iceberg.

1. **Pattern of behaviour:** What data could you gather about students' lateness that would help you identify the pattern of behaviour of the students?

2. **System structures:** What system structures might be influencing the pattern of behaviour (lateness)? Consider physical / visible and invisible systems, written or unwritten systems. What research strategies could you use to find out about these?

3. **Mental models:** What assumptions, beliefs, perceptions, values and cultures may be influencing the system structures and patterns of behaviour (lateness) you identified in the previous two questions? Consider those of the students, as well as the other stakeholders. What research strategies could you use to find out about these?

Understanding what is below the surface of the water can help you develop solutions that might be more effective.

Given the patterns of behaviour, system structures and mental models, what other solutions, besides punishing late students, might be appropriate to reduce the tardiness of the students?

Triangulation

Figure 5. Don't forget to triangulate your findings where possible. Where you have more than one source that indicates findings, they will be particularly robust (Artur Salisz, CC BY-NC 2.0)

As you investigate, it is important that you are accessing multiple and varied sources, and using different research methods. This is called triangulation. ***Triangulation*** means using at least three sources or types of data (like a triangle) in your research.

Triangulation is important for a number of reasons. It helps to:

- broaden your understanding of the problem or need you are researching;
- deepen your understanding of the problem or need you are researching;
- enrich (complicate) your understanding of the problem or need you are researching;
- identify biases and refute hypotheses during the investigation; and
- confirm / validate your research findir efore you start looking for solutions.

- There are a number of ways to triangulate your research and it is important to plan these into your research process. You can:
- use multiple data sets: varying times, and place;
- use multiple researchers, group research;
- use multiple theories, or multi-layered theories like the Iceberg Model;
- use multiple data collection methods, like interviews, surveys, observations, camera studies, etc.;
- include multiple stakeholders in your qualitative and quantitative research; and
- use both primary research (you create new data through observation, interviews, surveys, etc.) and secondary research (you find out what other experts have said about the problem or need).

Before you start your research you need to carefully consider your research question and all your sources and methodologies, to ensure they are appropriate and varied. This will make it more likely that you can get some triangulated conclusions when you are done. It is important to develop a good research plan and to discuss it with someone (like a teacher) to get feedback for improvement. You can use the **Research Plan** template in the Tools section below to help you do this. In addition, you may want to include the various research pieces into a **Gantt chart**, which is a planning tool to communicate the stages of a project. Gantt charts are discussed in more detail in Module 2(c). A Gantt chart tool, with links to a template is also included below.

Before you start your research you need to carefully consider your research question and all your sources and methodologies. It is important to develop a research plan and to discuss it with someone (like a teacher) to get feedback on whether it makes sense. You can use the template in the Tools section below to help you do this.

Two notes before you begin

It is very important that you read through and understand sections 1(a) - 1(e) before you start your investigation. When you do your research, you will often use tools that require that you combine information from all the Stage 1 Investigating modules. For example, when you do an interview, you will probably need to ask questions about patterns of behaviour, systems and mental models, so it is important that you understand all of these before you start your research.

Secondly, it could be the case that you start to form conclusions about the problem or need before you are done with your investigation. You may even have some ideas about actions that could be taken. Be careful not to let these initial ideas colour your investigation. You may want to create a document where you write down such ideas, like a parking lot, so you don't lose them, but also do not keep them hanging around in your head to distract you from your investigation.

Figure 6. Put any early conclusions and action ideas in a parking lot to revisit later during brainstorming. It is important not to jump to conclusions and action ideas too early, or you may miss information that can lead to better strategies (Rei, CC BY-SA 3.0)

Tools

RESEARCH PLAN

A table to help you plan your research, considering various methods and objectives. The table asks you to justify your choices to ensure they are thought through.

Works Cited

2005. “Focus Group Discussion, Nepal.” Flickr, Yahoo!, 22 Oct. 2006, https://tinyurl.com/thouvwr.

Rei. “Bicycle Parking Lot Niigata.” *Wikipedia*, Wikimedia Commons, Niigata, Japan, July 2006, commons.wikimedia.org/wiki/File:Bicycle_Parking_Lot_Niigata.jpg.

Resource: Iceberg/Graphics Template. Waters Center for Systems Thinking, 2019, waterscenterst.org/resources/iceberg-graphics/.

Salisz, Artur. “Triangulation.” Flickr, Yahoo!, 6 July 2014, https://tinyurl.com/ya336dkp.

Schneider, Benjamin. “You Can't Build Your Way Out of Traffic Congestion. Or Can You?” *CityLab*, Bloomberg L.P., 25 Apr. 2019, www.citylab.com/transportation/2018/09/citylab-university-induced-demand/569455/.

“Traffic Congestion.” *Flickr*, Yahoo!, 11 July 2008, www.flickr.com/photos/worldbank/2658286137.

Weith, Andreas. “Iceberg in the Arctic.” *Wikipedia*, Wikimedia Foundation, 10 Feb. 2019, en.wikipedia.org/wiki/Iceberg#/media/File:Iceberg_in_the_Arctic_with_its_underside_exposed.jpg.

With the support of the Erasmus+ Programme of the European Union