

Introduction to Systems Thinking

Lesson 3.1: Systems and Structures

## Introduction to Systems Thinking

### Overview

Read the material on this page to learn about the structure of a system.

### Article: "How to See 'Structure'"

This short article by Richard Karash presents what some systems thinkers call the iceberg tool, a diagram that helps you see deeper structures in systems.

 Read ["How to See 'Structure.'"](#)

### Key Points

- Structure is a network of relationships that create behavior.
- Structure is difficult to see in any given situation. Because of this, structure is often thought of using the metaphor of an iceberg, where much of it is hidden underwater.
- Internal structures are those networks that are embedded within an organization or situation.
- External structures are those networks that act on an organization or situation from the outside.
- It is important to look for structure at multiple levels as if diving down to look at the bottom of an iceberg.
- Structural observations must include a causal connection. That is, random events that do not cause outcomes in a given situation or case study are not structural.

### The Case of the Curtailed Supplies, Revisited

#### Part 1

The new director of Tasha's medical-product design team, Dr. Karen Forrester, started the first of the month. By midweek, it was pretty clear that Dr. Forrester was a stickler, but that was fine with Tasha. The previous director, Dr. Kim, had been too careless for Tasha's taste, and the lab had gotten sloppy. It was time to get the standards back up.

Rodney, who managed the logistics team, felt differently. He, like Dr. Kim, enjoyed a looser, friendlier atmosphere, where people talked to each other instead of filling out all those forms. Tasha thought she might have a bit of an advantage over Rodney with Dr. Forrester.

At the quarter-end staff meeting, as Dr. Forrester was going over the two teams' results, she made two particularly notable comments.

- "We seem to have a shortage of a number of important components in the storage room. Tasha, it's up to you to make sure we have what we need on hand at all times. Get that fixed immediately."
- "At the same time, I don't want to waste our limited budget on items that are nice to have but not needed. Rodney, your team has to monitor those requests. Anything you find on the order list that you think is unnecessary, please remove or talk to me."

Dr. Forrester closed the meeting by stating that she was applying for several new grants and hoped the new funding would allow for more work, including more employees and the potential for several promotions.

Tasha began generating purchase orders for everything her team was short of, sending them to Rodney. She dismissed that nice to have, not needed idea. It was all important. She figured that the more she ordered, the more likely it was that her team would get what they needed.

Supplies trickled in, but more and more frequently, her purchase orders would come back with "rejected" stamped on them in big red letters. It felt as if the more orders she submitted, the less likely any of them were to be approved. When she asked Rodney about it, he simply shrugged and said, "It's all about the budget. Dr. Forrester is watching it too closely. Sorry."

After a few weeks, Tasha went to the storage room for four common items and only found two of them. Because her team could not proceed to the next round of trials, Tasha was frustrated and put them to work doing the only thing she could think of:

cleaning an already clean lab

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After the frustration of having to put her highly qualified designers to work on cleaning, Tasha did a full inventory of the storage



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orders.

"Oh, you could have just called me, Tasha," he replied. "But now that I look at these, I can already tell you I'll have to reject most of them. Dr. Forrester really wants me to stay under budget."

"But we need these things, Rodney," Tasha replied. "This isn't a matter of just buying things to fill up the storage room."

"Well, are you going to go tell that to Dr. Forrester? Because I certainly am not. She'd be furious," he replied.

Tasha didn't say anything, even though she was upset, and went back to the lab.

Three months later, at Dr. Forrester's second quarterly staff meeting, she announced that the largest grant had been approved and additional funding would begin to flow immediately. She made all the usual announcements and updates, then dismissed everyone except for Tasha and Rodney.

"I need to ask the two of you what's going on. I walked by the lab this morning, Tasha, and three of your designers were playing cards instead of working. You know I'm considering both of you for the new assistant director position, but when I see things like this, I just have to wonder what to do.

"And Rodney, you're delivering budget numbers that don't align at all with the last couple of years. I appreciate that you're trying to save the company money, but it isn't making sense to me."

### Iceberg Tool

Now you have a chance to apply the Iceberg Tool, explained in the "How to See 'Structure'" article, to this case study as a way to identify a system's context, patterns of events and behavior, and interconnections.

 [Iceberg Tool on Patterns and Structure](#) (Word version)

Note: The Word version can be downloaded to the computer.

### Iceberg Tool, Completed for Comparison

See if your ideas for the Iceberg Tool are similar to this version, completed by a systems thinking expert:

 [Iceberg Tool on Patterns and Structure](#) (PDF version)

### Attributions and References

#### Reference

Karash, R. (2018). *How to see "structure."* The Systems Thinker. <https://thesystemsthinker.com/how-to-see-structure/>

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