

Beyond Connecting the Dots: Mastering the Hidden Connections in Everything that Matters

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Chapter 1

Beyond Connecting the Dots

A live book for mastering the hidden connections in everything that matters

Ludwig von Bertalanffy⁽¹⁾ first proposed, in 1937, that the same basic structures operated across all disciplines, and if one learned how these structures operated one could transfer much of their learning from one discipline to another. When moving from one discipline to another, one would simply have to learn the structures that were operating, and the labels on the elements of the structures. On first reading this may seem most profound, or maybe even preposterous.

However, if you think about it, maybe there is some truth to it after all. What follows is the introduction to a live Systems Thinking book presented from a cross discipline models perspective. Live in the sense that the models are presented in a form that allows you to actually interact with them.

von Bertalanffy wrote “Allegemein Systemlehre” which was translated into English as “General Systems Theory”⁽²⁾ and I expect we’ve still not recovered from the translation error. What he intended was a “General Theory of Systems” or “General Systems Teaching,” a way to support learning about the structures which operated across all disciplines. Today there are a set of structures referred to as Systems Archetypes which I believe are just what Bertalanffy had in mind.

In the words of von Bertalanffy, “The student in ‘system science’ receives a technical training which makes systems theory – originally intended to overcome current overspecialization – into another of the hundreds of academic specialties”⁽¹⁾

Systems Thinking is not a method though more of a way of looking at the

world around us and understanding based not from understanding things though more from understanding relations and interactions between things. And while there are many who believe that Systems Thinking or a Systems Perspective provides the best foundation for creating effective approaches of dealing with challenges and shaping a better tomorrow. Yet even with that view, over the past 75 years it has not become widely adopted, even though during that period dozens of approaches have been developed with claim to embrace the Systems Thinking world view. I believe Pogo had it right when he said, “We have met the enemy and he is us.” I have repeatedly commented to people that the greatest impediment to the adoption of Systems Thinking is Systems Thinkers.

This should provide you with a sense of why this book has to be different. Now let me offer you a view of how it will be different.

It is our intent to provide a basis for recovering from this overspecialization by offering an extensive series of models from everyday life that will show the value of looking at things though a different lense. We will then build on this to develop an understanding without all the terminology and complexity that typically drives people away from Systems Thinking.

Models and Patterns

Models are the way we look at the world around us. All we have are our models. They are the way we understand everything. This is so because we build our understanding based on what we already understand. The world around us simply has too much detail for us to pay attention to all of it. As such we filter much of the detail and choose what to pay attention to. In the midst of what we choose to pay attention to there are patterns. And it is these patterns that we attempt to make sense of. And we understand these patterns by linking them to extend patterns we already understand.

Consider the following

- I have a box that’s about 3’ wide, 3’ deep and 6’ high
- It’s a rather heavy box
- The has a couple of doors on it
- When you open the doors it’s cooler inside the box than outside
- One compartment is much cooler than the other
- When you open the door a light comes on
- There’s food inside the box
- The box is in a kitchen
- There are sticky notes all over the front of the box
- There’s a collection of papers and stuff on top of the box
- If you move the box you’ll probably find a lot of dust under it
- The box is plugged into an electrical outlet
- From time to time you can hear the box running

At some point in this sequence you became convinced that what was being described was a refrigerator. Now stop for a moment and ponder just how it is that you realized what was being described was a refrigerator? As long as you knew beforehand what a refrigerator was the statements could have been given to you in any order and still at some point you would have finally realized what was being described. If you had never seen, nor heard about a refrigerator you would still be wondering what was being described and what to call it.

You have also most likely come to understand that all refrigerators are not identical. Some have one door with a separate compartment inside. Some have two doors and a drawer. Some are much smaller than others. Some can fit under a counter and some even fit on top of a counter. Some can be so large you can walk into them. Though if you see any of these you generally readily ascertain that it is a refrigerator. How does that happen? Gregory Bateson, one of the giants of Systems Thinking, said, "It's the pattern that connects." If you reflect on this statement you should come to realize there are actually different ways to interpret what it means. In this particular case the pattern connects you to the following purpose

- The box keeps food from readily spoiling by keeping it cool
- Part of the box is a freezer which keeps food from spoiling for even longer

and you understand it to be a refrigerator.

The Basis for Flawed Learning

As I have indicated since Bertalanffy's initial work in the 30's numerous models and methods have been developed with claim to embrace the Systems Thinking worldview, that it is the relations between a number of elements which is far more responsible for the nature of a thing than simply the nature of the parts of which it is made. As such we will begin with models that everyone should be familiar with and demonstrate the nature of those models and how they actually occur across numerous disciplines. And in the process we will demystify the myriad of model and methods that embrace Systems Thinking, distilling and demonstrating that the essence of Systems Thinking is essential contains in a single word, "AND".

Really this is an outgrowth of an old Sufi saying.

Because you think you understand one, you think you understand two, because one and one equals two. But first you must understand AND.

Because we live in the moment, even though we may think about the past, or the future, we tend to relate to things in the moment. It is this living in the moment that is most responsible for us tending to think in terms of cause and effect, i.e., A caused B. Even when we consider things that have evolved over time we tend to ignore the passage of time, and more often than not simplify

situations to one dimensional cause and effect, e.g., Wall Street is responsible for the Financial Crisis; Corporations aren't hiring more people because their taxes are too high; Obama is spending the US into ruin; etc. And as you might have gathered from these examples the simplification often produces beliefs that may not even be true. It's our enduring need to make sense of things, along with our lack of a better way to consider things, that drives us to fabricate meaning, even if it is at times invalid.

A More Meaningful Perspective

Consider the items in Fig. 1 and ask yourself what they have in common?

Fig. 1 - What do these have in common?

What they have in common is that they all present a character of growth. Growth in population or growth in size. There is one underlying structure responsible for their nature as depicted in Fig. 2.

Fig. 2 - Simple Reinforcing Growth Model (Video)

If you consider each item in figure one to be an amount of something that something increases over time. And the amount that it increases depends on how much of that something there is already and a factor.

Fig. 3 - Growth with Initial Value = 1 and Growth Factor = .1

With a small initial value and small growth factor the amount doesn't grow very much over a 20 year period.

Fig. 4 - Amount Growing with Initial Value = 10 and Growth Factor = .25

With a somewhat larger initial value and growth factor notice the marked difference in the resulting value between fig. 4 and fig. 3.

The question I hope you might now be asking is, "If the growth depends on the initial value, amount, and growth factor, why doesn't everything just keep on growing?" We know that nothing ever grows forever and that is the case because everything that grows consumes something. Notice that one end of the flow in Fig. 2 isn't attached to anything. For the amount to grow it something has to flow in from somewhere. There are times when the stuff comes from doesn't matter and there are times when it does. We'll get to this in a more advanced version of the growth model.

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Chapter 2

Chapter 1 - It's The Pattern That Connects

What you learn and your capacity to learn serves as the basis for everything that you do in your life. Yet, have you ever thought about how you really learn about the world around you? Yes, there are some things you memorize early in life like the times tables, and you learn to remember these, though is that really learning? Do you remember that if you put your hand on something very hot it will burn you, or is that something you learned? And if you learned that, how was it that that learning happened?

Consider the following

- I have a box that's about 3' wide, 3' deep and 6' high
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- The has a couple of doors on it
- When you open the doors it's cooler inside the box than outside
- One compartment is much cooler than the other
- When you open the door a light comes on
- There's food inside the box
- The box is in a kitchen
- There are sticky notes all over the front of the box
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- If you move the box you'll probably find a lot of dust under it
- The box is plugged into an electrical outlet
- From time to time you can hear the box running

At some point in this sequence you probably became convinced that what was being described was a refrigerator. Now stop for a moment and ask yourself just

how it was that you realized what was being described was a refrigerator? Yes it would have been easier if I had just showed you a picture of a refrigerator though that would have spoiled it, wouldn't it.

As long as you knew beforehand what a refrigerator was the statements could have been given to you in any order and still at some point you would have finally realized what was being described. If you had never seen, nor heard about, a refrigerator before you would still be wondering what was being described and what to call it.

You have also most likely come to understand that all refrigerators are not identical. Some have one door with a separate compartment inside. Some have two doors and a drawer. Some are much smaller than others. Some can fit under a counter and some even fit on top of a counter. Some can be so large you can walk into them.

If you see any of these you quickly decide it's a refrigerator. How does that happen? Gregory Bateson, one of the of the giants of Systems Thinking, said, "It's the pattern that connects." If you reflect on this statement you should come to realize there are actually different ways to interpret what it means. In this particular case the pattern connects you to the following purpose

- The box keeps food from readily spoiling by keeping it cool
- Part of the box is a freezer which keeps food from spoiling for even longer

and you understand it to be a refrigerator. Though now that we've arrived that this point we still haven't addressed the question of how you know. You probably were not actually taught that it's the above purpose that defines the essence of a refrigerator. Most people were not, though they have essentially learned it over time.

Models

Models are the way we look at, and understand the world around us. All we have are our models. They are the way we understand everything. This is so because we build our understanding based on what we already understand. The world around us simply has too much detail for us to pay attention to everything. A refrigerator has many pieces though how many do you really pay attention to? Probably not many unless you build or repair refrigerators. We filter out much of the detail around us so we don't become overloaded and we choose what to pay attention to. Some times we do this consciously and sometimes subconsciously. In the midst of what we choose to pay attention to there are patterns. Whether we realize it or not it is these patterns that we pay attention to and attempt to make sense of. We understand these patterns by linking them to extend patterns we already understand. And much of the world around us we simply ignore for if we didn't we would just become overwhelmed.

Remember: A model is a simplification of reality intended to promote understanding.

Learning

When we experience something that experience falls somewhere between complete novelty, meaning that we can't connect it with anything in our past experience, and complete confirmation, meaning that it represents something we perceive as already completely understood. The things we experience which lie somewhere between complete novelty and complete confirmation provide a basis for learning. They represent a basis for connecting to current patterns we understand and extending our understanding and what results is learning.

Consider running into a refrigerator that looks like no refrigerator you've never seen before. From an initial view you are likely not to perceive it as a refrigerator. As you inspect it to find it serves the purpose you've come to understand for refrigerators or if someone tells you it's a refrigerator you then expand your awareness of the range of patterns that constitute a refrigerator.

A Basis for Flawed Learning

While reading the previous paragraphs did it dawn on you that all this pattern recognition/connection/extension learning doesn't happen consciously? We connect with patterns and extend our knowledge at times without even being consciously aware that it is happening. And when it happens in an unconscious manner there isn't really any critical validation that happens along with the learning. Because this ongoing learning happens without critical validation there are things we learn and come to believe which are actually incorrect. We have perceived patterns and extended our learning in a flawed manner. The really annoying thing is that we then act on these beliefs and when we produce results that don't go the way we planned we wonder why. Or even worse we don't actually learn from the results and correct our flawed models.

When we act on flawed beliefs when attempting to solve problems we typically create more problems than we fix. It has been said repeatedly that the majority of today's problems are the direct result of yesterday's solutions. Wouldn't this provide a sense that we might really benefit from a better way to think about the world around us, develop better understanding, and develop solutions that don't come back to haunt us in the future?

Ladder of Inference

The best explanation of how we build our beliefs was developed by Chris Argyris and is referred to as the Ladder of Inference. When we consciously traverse this ladder we're in good shape. Though when we traverse this ladder in an unconscious manner we often create learning that is not accurate. We then act on this inaccurate learning and produce inappropriate or undesirable results.

Because we live in the moment, even though we may think about the past, or the future, we tend to relate to things in the moment. It is this living in the moment that is most responsible for us tending to think in terms of cause and effect, i.e., A caused B. Even when we consider things that have evolved over time we tend to ignore the passage of time, and more often than not simplify

situations to one dimensional cause and effect, e.g., Wall Street is responsible for the Financial Crisis; Corporations aren't hiring more people because their taxes are too high; Obama is spending the US into ruin; etc. And as you might have gathered from these examples the simplification often produces beliefs that may not even be true. It's our enduring need to make sense of things, along with our lack of a better way to consider things, that drives us to fabricate meaning, even if it is at times invalid.

As such many of the models we develop to make sense of thing are actually flawed. And as previously stated, when we act based on models that simply aren't correct, flawed in some way, the results of our actions are generally simply not what we intended or expected.

A Better Way

Based on the understanding I hope you've developed to this point it should be obvious that we need a better way to develop models that are more likely to be correct as well as surface flaws in many of our current mental models.

Ludwig von Bertalanffy(1) first proposed, in 1937, that the same basic structures operated across all disciplines, and if one learned how these structures operated one could transfer much of their learning from one discipline to another. When moving from one discipline to another, one would simply have to learn the structures that were operating, and the labels on the elements of the structures. On first reading this may seem most profound, or maybe even preposterous. However, if you think about it, maybe there is some truth to it after all.

I'm not asking you to believe the previous statement just because it was provided here. Though if you give me a few minutes the experience that follows may allow you to arrive at a sensibility of the statement from your own perspective.

Consider the images in the following figure and ask yourself what it is that all these different items actually have in common.

They all represent collections of stuff. Admittedly each image represents different stuff though stuff just the same. Because this stuff collected over time it's really more appropriate to refer to the the collections as accumulations.

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