# THE ART OF
# THINKING
# IN SYSTEMS

*Improve Your Logic, Think More Critically, And Use Proven Systems To Solve Your Problems*

## STRATEGIC PLANNING FOR EVERYDAY LIFE

Steven Schuster

# The Art Of Thinking In Systems

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**Table Of Contents**

# Introduction

Would you like to think more complexly? Understand why certain things happen to you sometimes seemingly by chance, sometime seemingly by law? Or to become more productive finding shortcuts where no one else is looking? What about improving your relationships understanding why certain arguments truly arise? What would you think if I told you that you can achieve these things by working smarter, not harder? I've yet to meet a person who wouldn't say "Sign me up!" I, too, want all of those things for my life. I'm here to show you how it just might be possible with a shift in your thinking. A paradigm shift in the way you think about the world to systems thinking.

Everything in the world around us is part of a system. A system is a combination of both physical and abstract things, and how those things interact in relation to one another. Systems thinking is being able to examine and analyze ourselves and the things around us with the express purpose of being able to improve upon them. It requires us to be more observant and aware of the things that impact us, in both big and small ways, and then be willing to take the necessary steps to change the obstacles in our path.

Your whole life is a system. It is made up of a lot of parts that interact with one another. First, you have physical components like your body and the things around you that you can touch: your house, car, clothes, cell phone, books, *etc*. Then we add in the abstract pieces to the puzzle: your beliefs, convictions, ideas, and values — everything that defines your core sense of self and makes you who you are on the inside. Finally, we incorporate the things in your life which you

do not have complete control over, like your relationships, your health, and your finances. All of these things work together to make up the system of your life.

In systems thinking, it is often helpful to make diagrams so that we can visualize and better understand how things influence one another and work together within the whole system. It is only then that we really begin to be able to break down and analyze our systems so that we can improve them. Systems thinking is not something that will happen overnight and immediately come easily. It is a way of looking at the world that will take time to develop.

Let's start by thinking of your life as a system. When you begin to diagram, map, or list the components of your life as a system, begin by thinking of the people you encounter and the things you do nearly every day, as those will have a great impact on your life system. Your list may begin to take shape like this:

| | | |
|---|---|---|
| • You (your body) | • Boss/ Colleagues | • Sleep |
| • Friends | • Career | • Food |
| • Family | • Hygiene | • Exercise |

While you would be off to a good start, the list of your life as a system would be nowhere near complete (although that is all many outside observers may assume your list includes). You would need to add many more components to it, such as:

| | | |
|---|---|---|
| • Pets | • Beliefs | • Faith |
| • Car | • House | • Clothes |
| • Health | • Wealth | • Worries |
| • Values | • Cell Phone | • Computer |
| • Television | • Acquaintances | • Traffic |
| • Books | • Newspapers | • Internet |
| • Education | • Bills | • Social Media |
| | | |

| Weather | Prices/Costs | World Events |
|---|---|---|
| Financial Markets | Fears | Grocery Shopping |

Now the combination of the two lists would be much closer to an accurate representation of a life system, but it is by no means an exhaustive list. Everyone's life system will be unique.

Once you have drawn, written, or mapped out your list, you are now ready to start analyzing it. The beauty now is that you are more aware of the things that are impacting the system of your life. You are tuned in to how you are spending your time, and whether there are improvements that can be made to increase your productivity and help you achieve your goals. You can be more cognizant of the ways in which the parts of your life system interact with one another and impact your life. You can begin to make the kinds of positive changes that you would perhaps never even have realized you needed without shifting the way you look at the world to systems thinking.

Systems thinking is, at its heart, looking at problems in a way we haven't before. It is a realization that everything is interconnected, and we should look at things as a whole rather than just a group of independent parts. Systems thinking means looking at the big picture first, then digging in deeper to examine its parts and focusing on the relationships between them. It is a supportive framework that helps you develop habits in your mind. Those habits give you feelings of strength and power that make you understand you have the ability to tackle even the most complex problems and affect positive change. [i]

Anytime we can create habits in our minds, we save time, because we can do things without having to consciously think about them, and thus our brains are free to think about other things. Making an investment by taking some time at

the beginning to solve a problem, either by changing a system that isn't working or creating a new system, will save so much more time in the long run. This holds true whether you are working toward a personal or professional goal. Adopting even just a little bit of systems thinking into your life can help you to improve countless areas.

In this book, we will explore the basics of systems thinking. We will examine its elements and see how it works. We will develop the tools you need to help you apply systems thinking to your daily life and relationships.

Along with a powerful paradigm shift in the way you look at the world and the problems you may encounter in it comes the opportunity for making mistakes. We will study three of the many possible errors that may arise in systems and help you to avoid or overcome them.

It's time to take the first step toward seeing our world through a different lens, and it all begins with a turn of the page.

# Chapter 1: What is Systems Thinking?

As a teacher, I often found that visual demonstrations were the best at helping my students to understand difficult or abstract concepts. For one lesson, I brought in a boomerang, a curved, flat piece of wood designed to be thrown and originally used as a weapon for hunting. I opened a box containing a boomerang and held the boomerang in my hand, walking around so that my students could see it up close. Then I threw the boomerang. I asked my students what made the boomerang come back to me. They unanimously thought it was me throwing the boomerang. I told them that we would further test their theory. I held the box that the boomerang came in and threw it the same way.

Of course, this time the box did not come back to me, but rather flew for a short distance and dropped to the ground. We went on to discuss that it clearly was not my hand or the way I threw the boomerang that made it behave the way it did. When my hand released the boomerang, it freed the boomerang to operate in the way its structure was designed to. While we were discussing a lesson on physics, the same lesson is central to systems theory. Systems thinking allows behavior that is already present within the structure of a system to be suppressed or released as we study and understand systems and problems.

## What is Systems Thinking?

The term "systems thinking" was coined by Barry Richmond in 1987. According to Richmond, "Systems thinking is the art and science of making reliable inferences about behavior by developing an increasingly deep understanding of

underlying structure." [ii] In The Fifth Discipline Fieldbook, author Peter Senge states, "Systems thinking [is] a way of thinking about, and a language for describing and understanding, the forces and interrelationships that shape the behavior of systems. This discipline helps us to see how to change systems more effectively, and to act more in tune with the natural processes of the natural and economic world." [iii]

In order to get a better understanding of what these two experts are telling us, let's go back to the basics. What is a system? A system is a group of things that are interconnected and demonstrate their own behavior pattern over time. Systems are usually the cause of their own behavior. Even when outside forces act on a system, it reacts in a way that is consistent with the character of the system. If the same outside forces were to act on a different system, there would likely be a different outcome.

**Why is thinking in systems useful?**

Systems thinking helps us look at the world in a new way because it encourages us to look at events and patterns by focusing on the connection and relationship between a system's parts, instead of only looking at the individual parts in isolation. Systems thinking leads us away from trying to come up with a quick fix to a problem, which we too often do, in favor of considering the long-term consequences our actions may cause. It supports a deeper level of understanding than we typically take the time to seek.

Systems thinking is a paradigm shift from our more traditional thinking patterns because we have been taught to look at things rationally, and to try to look for clear cause and effect connections. We are now used to trying to study things in small, digestible pieces, and to attempting to solve problems as quickly as possible by taking control of situations around us. Quite often, we focus on external sources as the cause of all of our problems instead of looking internally

at our systems to see what improvements can be made.

Western culture tends to look for a problem's cause as coming from outside of our systems, instead of within. There are times throughout our history when this worldview has proven very effective. Many big problems have been solved by looking outward, like finding cures and vaccines for deadly diseases, finding ways to produce enough food to feed the people of the world, and developing mass transportation systems. The problem is that when we fail to take the time to examine our internal systems as well, sometimes our solutions create new problems. These problems can be significant, serious, and very hard to overcome, if they are really ingrained in the structure of a system.

While that traditional method of analysis may be helpful at times, it can't help us to solve every problem we face despite all of our best efforts. War, harm caused to our environment, people suffering from drug addiction, people who are unemployed or living in poverty, and many life-threatening diseases are all examples of problems that remain despite years of analysis and technological advances. These problems persist because they are systems problems. No one wanted to create them and everyone wants them to be solved, but they won't be until we take a good, hard look at the structures of the systems they are part of. Instead of looking to assign blame as to what caused the problem, we need to roll up our sleeves and dive deeper to find a solution. The solutions are within our reach if we are willing to do what is necessary to find them. We need to be willing to look at things from a whole new perspective. This book is all about showing us a different way of seeing and thinking about the world and everything in it.

That's why systems thinking is so vitally important. Some problems are systems problems. No matter what we do, these problems simply won't go away though linear or event oriented thinking. After all, it has been said the definition of insanity is doing the same thing over and over again and expecting different results. There is nothing wrong with linear thinking. There is a time and a place

for it, for sure. It has served us well on countless occasions throughout human history. Thinking in systems just gives us a more complex and complete picture of events.

As we have discussed previously, systems thinking doesn't immediately come easily to most people and it takes time to develop this skill and adopt the new way of seeing the world until it becomes an automatic habit. In fact, up to 95% of our population is unable to think in systems. They focus on searching for a simple cause and effect connection when it comes to solving problems. The difficulty lies in that it simply won't give a complete and accurate view of the problem, and it is ineffective in solving systemic issues.

Systems thinking allows us to reclaim our instinct about whole systems while we strengthen our abilities to understand their parts and how they are interconnected. Thinking in systems enables us to ask "what-if" questions about the behaviors we may see in the future, and gives us license to be bold enough to unleash our creativity when it comes to redesigning our systems. We begin to come up with solutions that would never have crossed our minds before.

Systems thinking gives us a complete picture by allowing us to examine the interconnected relationships between the system's components instead of only looking at them as independent individual parts. It brings to mind an activity I did with my kids when they were little. I blindfolded them and set out bowls of ingredients on the kitchen counter, telling them we were going to work on a project together. I asked them to feel the items one by one and tell me what they thought we were going to do. When they felt the licorice, they thought it might be a pencil. After feeling the gumdrops, they thought they were marshmallows, and that either rice Krispy treats or hot chocolate were in their very near future.

The gumballs threw them again, as they believed they might be marbles and part of a game we would play together. They were torn between thinking that the icing was either toothpaste or the shaving cream that we practice spelling words

in. I chuckled all along at where their imaginations were taking them with each item they touched. Even though they were blindfolded, I could see that my kids were confused. They were trying to see how everything might fit together, but by only being introduced to the parts one at a time, they had too limited information to draw any reasonable conclusions from. After I was finished torturing my children by keeping them in suspense far longer than they liked, I removed their blindfolds and revealed the activity they were about to enjoy: making gingerbread houses. Finally they understood how everything was connected, and it all made perfect sense.

The fun I had with my kids can teach us a lesson about systems thinking. It is impossible to know the behavior of a system just by knowing the parts that make up that system. We have to dig deeper to understand the relationships between those parts and the impact they have on the system as a whole. That is a central tenant of systems thinking, and one we should never ignore.

No one thinking method is better than the others. There are times and places to use them all. Systems thinking is not better than linear thinking. They are both necessary for us to see and appreciate the world around us completely and in all its complexity. Trying to only use one way of thinking is like going through the world with one eye closed. It distorts our perception and limits what we can accomplish. All ways of thinking are necessary in order for us to get the whole picture.

# Chapter 2: The Elements of Systems Thinking

It has been said that those who do not learn from history are doomed to repeat it. The same can be said for systems thinking. Removing a leader from power without addressing and changing the system that was in place during their rule will only mean that the same patterns will continue to repeat themselves, and a very similar leader will step into fill the position. A child who is taught hatred and prejudice from a young age will grow up to practice hatred and prejudice unless the system is improved and the cycle is broken. Talking about a system is simply not enough. If there is little or no understanding of the system, nothing will ever change.

## The parts of a system

Systems are made up of three parts: elements, interconnections, and a function or a purpose. The word "function" is used when talking about a non-human system, and the word "purpose" is used for human systems. [iv]

The elements are the actors in the system. In your circulatory system, the elements are your heart, lungs, blood, blood vessels, arteries, and veins. They do the work. The interconnections would be the physical flow of blood, oxygen, and other vital nutrients through your body. The function of the circulatory system is to allow blood, oxygen and other gases, nutrients, and hormones to flow through the body to reach all of your cells.

A basketball team is a system made up of elements including players, coaches, the ball, hoops, and the court. The rules for playing the game, the plays drawn up by the coach, the talking and signals between the players, and Newton's Laws of

Motion that dictate how the ball and players move are the interconnections. The purpose of the team is to win games, earn scholarships or a paycheck, get exercise, or just have fun.

A school is a system, with the elements represented by teachers, students, principals, custodians, secretaries, bus drivers, cooks, parents, and counselors. The interconnections are the relationships between the elements, the school rules, the schedule, and the communications between all of the people in the school. The purpose of a school is to prepare the students for a successful future and to help them reach their full potential.

Systems are everywhere. Companies, cities, governments, economies, animals, and plants are all examples of systems. It is possible to have multiple smaller systems as a part of a larger system. For example, our body is a system that is made up of many smaller systems like the skeletal, digestive, respiratory, and nervous systems. An ocean is a system made up of the plants and animals that live there. The Milky Way galaxy is a system made up of our solar system, and each planet in it is also a system of its own.

Elements are usually the easiest parts of a system to identify, because many of them are tangible things that we can see and touch. The elements of a family may include the parents, grandparents, children, aunts, uncles, cousins, pets, *etc.* Elements do not always have to be tangible, though. In a hospital, the desire to help people and save lives is an intangible that is a very important element of that system. In a neighborhood, a sense of pride and a feeling of community are intangible elements that play a big role in that system. It is possible to list countless elements of a system once you start. It is important not to get so bogged down in individual elements that you lose sight of the system.

Interconnections are a critically important part of a system. In our example of the circulatory system, the interconnections were the actual physical flow of blood, oxygen and other gases, nutrients, and hormones through your body, and also the

signals sent by the brain to all of the parts of the body, communicating to them how to do their jobs and help the body function. These physical flow interconnections tend to be the easiest ones to see.

Oftentimes, interconnections are not physical flows, but rather the flow of information. These interconnections are usually harder to see, but if you look deeply enough, the system will always reveal itself. For example, when I was teaching, the single most important interconnection in determining the success of the students in my classroom was the teacher-student relationship. Having a good rapport with each of my students and creating a positive classroom community was absolutely crucial if I wanted any learning to happen during the school year.

Learning is hard. There are a lot of abstract and difficult concepts that my students were expected to learn. If I had a good rapport with my students, they were willing to try anything for me. When times got tough and their frustrations rose, they would push through and persevere because they knew I cared about them, only wanted what was best for them, and I would be with them every step of the way. That opened their minds and made them receptive to the information I was teaching them. Without that positive teacher-student relationship, the flow of information would have stopped in my classroom.

The flow of information occurs when you research items before you buy them. You consider things like your income and savings, supply of goods at home, prices, supply of goods in stores, and the ratings of other consumers before you decide whether or not you wish to purchase the item. A baseball team and their coaches demonstrate a flow of information when the coaches use hand signals from the dugout and field to communicate with the players about what type of pitch to throw or whether they should run or stay on base. Doctors run and analyze a series of tests to gain enough information to accurately diagnose a patient.

A system's purpose or function doesn't have to be written down or spoken aloud. It can be expressed just through the system's operation. Watching a system for a bit to see how it behaves is often the best way to figure out its purpose.

A government may profess that educating children is a high priority, but if it slashes education funding, then clearly educating children is not a primary purpose of that government. If a cat catches a lizard, but then bats it around and plays with it, then its primary function was not to hunt the lizard for food. We figure out the purpose or function of a system from the way it behaves, not from our expectations or the purpose the system says it has.

One of the biggest problems with systems is that sometimes the purposes of the subunits of the system may combine to create a behavior no one wanted. Creating high-stakes testing in schools was done with the best of intentions, hoping to ensure that all students were receiving a rigorous, quality education by having them meet a uniform set of standards. Unfortunately, some unintended negative behaviors have occurred as a result. Consider the purposes of the actors in this system:

- Teachers feel pressure to earn good evaluations and merit pay based on test scores, which affects their job security.
- Students feel pressure to avoid remediation classes, repeating a grade, or disappointing parents and teachers if they perform poorly on tests.
- School districts want to earn the highest grades to attract students.
- Businesses and realtors pressure schools to achieve high scores so that people will want to live and work in the community, and so that an educated workforce graduates from high school and college.
- Lawmakers penalize schools who do not perform well by withdrawing funding and imposing sanctions.
- Parents want their children to earn high scores, and to attend schools with the highest scores.

- Community members are less likely to pass levies to increase school funding or support community schools if they do not think they are performing well enough.

In this system, the high-stakes nature of the tests cause school districts to put a lot of pressure on their teachers to teach to the test and base their evaluations on their test scores. Teachers feel the need to compete with one another to earn the highest scores, as well as gain job security and an increased salary, so they no longer share ideas with one another and they may even cheat when administering the tests. Students feel a lot of pressure to earn high enough scores to be promoted to the next grade or avoid remedial classes, so they may cheat on the test. This was not the intention of putting these tests into schools, and everyone agrees that those results are awful. Unfortunately, if the sub-purposes and the overarching system purpose are not aligned and coexisting peacefully, a system can't function successfully.

## What is NOT a system?

Anything that is only a collection of items without the interconnections or a function is not a system. Taking shells that have been deposited on the beach and making them a group doesn't make them a system. The shells are just there, left behind as the waves deposited them on the sand. They are simply there, randomly and without any unifying purpose.

Think of the businesses in your community. The ones that have been established make up a system. They have relationships with clients and other businesses that unite them in a common purpose and make them an interconnected part of the community. When a new business comes in and opens up, it takes time for them to establish those same connections and relationships. They don't instantly realize their role in fulfilling the purpose of the group. It will take time and effort for them to become an integral part of the system.

A system isn't just a combination of parts. It can change and adapt as it tries to achieve its goals and protect itself. Systems exhibit many human qualities, even though they are often made of nonliving things. Systems can often be very resilient in fixing themselves and evolving over time.

**The most important part of a system**

Perhaps the easiest way to examine how a system's elements, interconnections, and purposes compare in terms of importance within a system is to speculate how the system would be impacted if each component was changed one at a time.

The least impact on a system is usually felt when its elements are changed. While certain elements may be very important to the system, by and large, if the elements are changed, the system can still continue to exist in a similar form and work to achieve its purpose or function.

In a school, teachers, administrators, and other employees may leave, transfer, or retire. Students move away or may enter higher grade levels beyond the school. The elements may change, but the school is still easily identified as a school, and it still has largely the same objectives and sense of purpose.

A marching band may replace its members or even its director, but it is still a band. It may perform better or worse than it did before, but its purpose is still the same.

Trees may lose their leaves, animals may shed their fur, and we may replace our cells every few weeks, but the trees and animals are still the same and our bodies continue to function in exactly the same way as before the elements were changed.

Systems almost always continue on, maintaining their identity and changing only slowly and slightly, even when significant numbers of their elements are changed, as long as the interconnections and purpose remain strong.

Changing the interconnections of a system is quite different. If the interconnections change, the system will be impacted significantly. It may no longer be recognizable, even if the elements remain in place.

Putting the students in charge instead of the adults in a school setting would undoubtedly change that system dramatically. Changing the rules by telling a marching band that they would now begin to sing instead of playing their instruments would alter it greatly. If our respiratory system no longer distributed oxygen throughout our bodies and removed carbon dioxide, we would be behaving more like plants. When the interconnections of a system are changed, the whole system is changed drastically.

Changing a system's function or purpose also greatly impacts the entire system and may render it unrecognizable. If our school's main purpose is no longer educating children, but is now to make money by recruiting students to charge tuition, obviously the system is dramatically changed. If the marching band no longer has the purpose of entertaining fans at football games, but now its purpose is earning scholarships for college, the system will change significantly. If trees and animals no longer have the purpose of surviving and reproducing offspring, but rather only want to grow as large as they can, their systems will be altered greatly as well. Changing the system's purpose changes it immensely, even if all of the elements and interconnections remain unchanged.

Every component of the system is essential. Elements, interconnections, and the purpose or function all interact with each other and each one plays a vital role in the system. The purpose or function of a system is often the least noticeable, but it definitely sets how the system will behave. Interconnections are the relationships within the system. When they are changed, the behavior of the system is also usually altered. The elements are typically the most visible parts of a system, but are often the least likely to cause a significant change in the system unless changing an element impacts the purpose or interconnections as well. Each part of the system is equally important as they work hand in hand, but

changing a system's purpose has the greatest impact on the system as a whole.

# Chapter 3: Types of Thinking

There are many different types of thinking. No one type of thinking is better than the others. They are all useful in certain situations. We shouldn't only use one type of thinking to the exclusion of all others. This chapter will examine some of the most common types of thinking and how they can be helpful in our lives.

## Linear Thinking

Linear thinking is the way we were typically taught to think throughout our lives. It involves looking for a link between a cause and an effect. This type of thinking believes that one cause has one effect. Linear thinking tells us that there is a cause and an effect, a problem and a solution, and a beginning and an ending. This model of thinking looks for a simple one-to-one connection.

Linear thinking can be quite helpful in solving specific kinds of problems. For example, your cell phone shuts off (effect) because the battery was dead (cause). If you plug in your phone and charge the battery, your phone will work again. Or you overslept (effect) because your alarm wasn't set (cause). If you set your alarm, you won't oversleep the next time. Linear thinking is a quick and easy way to find a solution to a problem.

Linear thinking also comes with its drawbacks. It doesn't look at things as complex systems and chooses only to focus on one small piece of a much larger puzzle. There is often much more to any given situation than linear thinking allows us to examine. When we focus on just one small part without taking into account how it is connected to a larger system, it is possible that our solutions may create unintended consequences that are not always beneficial.

## EventOriented Thinking [v]

Event-oriented thinking does view the world as being more complex than linear thinking typically does, but it thinks of life as being made up of a series of events and not as a system. In this thinking model, an event is something that happened or is going to happen. Every event is believed to have a cause, and if we change the cause, the event will also be changed.

Our brains like event-oriented thinking. Our brains feel good about handling problems that are simple and familiar to us. From the earliest human history, we planted crops in the spring so we could harvest them in the fall and still have enough to eat in the winter and throughout the year, we lived near water so we could have easy access to drinking water, fish for food, and a path for transportation. We made sharp arrowheads to help us to hunt better, and we banded together in groups to help us to stay safe and make sure that everyone's needs were being met. Event-oriented thinking is the foundation for our logic. If we do A, then B will happen. This type of thinking is quick, easy to apply, and easily understood.

Event-oriented thinking is ineffective in dealing with complex problems or systems. As our society has changed over time, event-oriented thinking has not evolved along with it. The problems we are faced with today often require a deeper understanding than event-oriented thinking allows. Events can have more than one cause, and each cause can have multiple causes as well. If we don't take these more complex relationships into account, we can also mistakenly miss the unintended consequences that may result when we begin to alter systems. That is beyond the scope of event-oriented thinking.


## Lateral Thinking [vi]

Lateral thinking involves more creative thinking that isn't immediately obvious

to those who rely heavily upon traditional step-by-step, logical thinking to reach conclusions. Lateral thinking was invented by Edward De Bono in 1967. He developed techniques for creative thinking to counteract the natural tendency of the human brain to want to lock in our thinking until it becomes an automatic, subconscious habit.

Lateral thinking strives to generate new and innovative ideas in a way that we can easily repeat over time. Lateral thinking is beneficial when you are trying to get beyond thinking of problems as having one set solution and want to expand your thinking beyond the patterns you have typically thought in. It is particularly helpful in brainstorming sessions and when the desired outcome is invention or innovation.

The disadvantage with lateral thinking is that a clear objective and ending point may not be identified. This type of thinking lacks some of the structure and goals that other types of thinking capitalize on. The nature of lateral thinking is that no idea is discouraged, so all ideas are initially given the same weight, even if they are inappropriate. This may cost you precious time or get the problem-solving process off track.

## Critical Thinking [vii]

Critical thinking involves analyzing facts in an objective manner so that a judgment can be reached. It also often entails thinking about your thinking and reflecting on the way you are reaching decisions in order to overcome any biases and improve the quality and efficiency of your cognition.

Critical thinking is effective when you are trying to find logical connections between ideas. Critical thinkers don't accept things at face value; they dig deeper to be sure that there is rational thought and solid reasoning behind any information they are presented with before they accept it as true. It is highly beneficial when a systematic approach to solving a problem is needed.

This type of thinking is very helpful in many ways. It may just need to be monitored to make sure that it isn't taken to an extreme. Healthy skepticism and a questioning of points of view is an important life skill, as long as the skepticism and questioning of authority is with good reason and backed up by facts.

**Systems Thinking**

As we have previously discussed, systems thinking is the study and analysis of systems. A system is a group of interconnected parts that work together toward a common purpose or function. Systems exhibit certain identifiable characteristics and consistent patterns of behavior. When one part of a system is changed, all other components of the system are impacted as well. Systems thinking requires an understanding of the elements, interconnections, and purpose or function of a system. The goal is to take that understanding and analysis and be able to apply it to other systems at any level and in any field. There are different levels of systems thinking maturity: Level 0 — Unawareness [viii]

Operating at a level 0 of systems thinking means you are totally unaware of the systems thinking concept.

Level 1 — Shallow Awareness [ix]

This level of systems thinking means that you are aware of the concept of systems thinking, but you do not exhibit any depth of understanding. You may feel like you are a systems thinker because you are comfortable speaking using the terminology that accompanies systems thinking, but you have not exhibited success in being able to distinguish between a good systems analysis and a bad one. Many people get stuck in this level of systems thinking maturity.

Level 2 – Deep Awareness [x]

If you are operating at this level of systems thinking maturity, you are

completely aware of the key concepts of systems thinking and you understand how important this type of thinking is and what can be achieved at its full potential. You would be able to read and comprehend the casual flow diagrams and simulations models that are a part of systems thinking, and even be able to think with feedback loops at a beginning level, but you would not yet be able to create good diagrams and models of your own. You understand system structure and know what reinforcing and balancing feedback loops are at this level, and you can see why the forces that the feedback loops create are so powerful when it comes to human systems.

Level 3 — Novice [xi]

Operating at this level of maturity means that you have a deep awareness of systems thinking, and you are even starting to dig into the black box that assesses why a system behaves in the manner it does. You can now create your own causal flow diagrams and can use them to help you solve some easy and moderately difficult problems. A really good novice would also be able to read simulation models well.

Level 4 — Expert [xii]

If you are at the expert level, you are now able to use system dynamics to create your own simulation models. You are able to solve difficult and complex social system problems. Organizations who are working on complicated sustainability problems would be well-served to have at least one expert leading their team through the analysis, along with many novice level participants.

Level 5 — Guru [xiii]

This level of systems thinking maturity is rarely achieved. If you are a guru, you can teach other people to become experts, and you are able to offer significant input in solving the most challenging of social system problems.

If moving beyond shallow awareness of systems thinking is your goal, start by

studying the book The Fifth Discipline: The Art and Practice of the Learning Organization by Peter Senge. This book was almost single-handedly responsible for getting a large portion of American businesses onboard with systems thinking in the 1990s when it was first published. If you carefully read the first five chapters, you should be much closer to reaching the systems thinking maturity levels of deep awareness or novice.

If you are serious about advancing your level of systems thinking even further, possibly to the expert level, continue your studies by reading Business Dynamics: Systems Thinking and Modeling for a Complex World by John Sterman. This book will help to elevate you beyond a systems thinker to a modeler using systems dynamics as a tool.

There is no one right way of thinking. Think of it as being a handyman with a tool belt full of tools. You may like the hammer, and it might be your favorite. It may be the one you feel the most comfortable using, and the one you would choose to reach for every time, if you could. But as good as the hammer is, it is simply not appropriate, or the most helpful for every job you will encounter. The types of thinking we have discussed in this chapter are the same way. We may feel more confident and skilled in using one type of thinking over another.

We may choose to fall back on our favorite, but no matter how much we like it, it simply will not be the most efficient and helpful for solving every problem we will encounter. That is why it is so important for us to continue to learn, grow, and be willing to expand our thinking so that we call fill up our tool belt. We want to have the best tool possible for solving each problem when we need it. That is how we can evolve. If we appreciate all types of thinking for the value they can bring to us while understanding the limits of each one, we will be prepared to choose the correct thinking method for the appropriate situation.

It doesn't get much better than that.

# Chapter 4: How to Shift from Linear Thinking Patterns to Systems Thinking

Now that we have determined that there is a time and place for all types of thinking, let's explore how to shift our thinking away from linear thinking to systems thinking when we need to.

**Is it a Problem or a Symptom?**

The first step in moving away from linear thinking to systems thinking is to decide if something is actually the problem or simply a symptom of something deeper. Linear thinking is usually concerned with focusing on symptoms. It tends to stay on the surface to examine behaviors instead of digging deeper to find the true problem before correcting the symptoms. [xiv]

Think of it like when you go to visit the doctor because you are not feeling well. If the doctor just works to eliminate your symptoms without finding out the real cause of your illness, your problem won't ever get solved. In fact, correcting the symptoms without getting to the root of the problem may end up making things worse, because unintended side-effects may arise. The same is true of linear thinking when systems thinking is needed. If you take the time to carefully analyze the system's behavior patterns, elements, interconnections, and purpose or function, you can discover and solve the real problem, and you will often find that the symptoms have taken care of themselves and been eliminated as well.

How can you tell if something is the real problem or just a symptom of something bigger? Here are eight clues, based on the work of Jim Ollhoff and

Michael Walcheski, to look for as you try to determine if what you are focused on is part of a larger problem or actually the problem itself.

1. The size of the problem doesn't fit the amount of time and energy you are spending on it. If the issue seems smaller than the effort you are putting into addressing it, chances are it is simply a symptom and not the true problem.

2. People have the power to solve the problem, but choose not to. If they would rather spend their time complaining as opposed to fixing the situation, you are likely dealing with a symptom of a bigger problem.

3. You have tried to solve the problem repeatedly and haven't been successful — if you keep trying to solve a problem, but it changes into a related issue or keeps turning up again like a bad penny — the odds are good that you haven't uncovered the real problem yet.

4. There is an emotional barrier that stands in the way of solving the problem. If there are some things that people in an organization seem unwilling to address or even talk about, they are acting as an obstacle to imagination and innovation, and won't get solved until you break through the true problem.

5. If the problem has a pattern and seems to be predictable, it is probably a symptom of something more.

6. If a problem is kept around, an organization may subconsciously like it, and it may give them some comfort in being able to focus on it instead of getting to the real problem and fixing it permanently.

7. If an organization seems stressed out and anxious, it is quite likely that only symptoms are being focused on and the real problems are not being addressed. People may be afraid to speak their minds about the true nature of their concerns.

8. Just as you "solve" one problem, another one pops up in its place. If an organization is more focused on finding a cause and effect connection and fixing

it quickly as in linear thinking, you may find that it becomes like playing whack-a-mole. New related issues will keep popping up as symptoms until the deeper problem is addressed. [xv]

**Ten Enemies of Systems Thinking**

According to Ollhoff and Walcheski, there are ten statements — red flags — that linear thinking may cause and which act as obstacles to systems thinking.

1. "Let's fix it quick!" [xvi] There is nothing inherently wrong with wanting to get a problem fixed as soon as possible, and systems thinking doesn't require you to be slow in responding to problems, but jumping into a "solution" without fully understanding the problem is never positive in systems thinking.

2. "Just put a Band-Aid on it and we'll come back to it later." [xvii] The problem with putting a Band-Aid on a problem is that it may serve to mask the symptoms while the problem continues to infect the organization.

3. "We need the budget finalized before the end of the year!" [xviii] When budgets are involved, linear thinking is usually at work. Budgets cause us to make choices based on money rather than whether an idea is actually the best one. Once we add a fixed deadline into the mix, we couldn't be farther away from systems thinking.

4. "We must respond right away!" [xix] Panicking and trying to come up with an immediate solution causes us to rely on linear thinking, as we are in a rush. Calmly analyzing the situation would be a more systematic way of thinking.

5. "Who cares?" [xx] Being apathetic instead of being curious, creative, and imaginative in searching for solutions often means an organization is stuck in a rut and won't be able to break through and effectively solve problems.

6. "We need more information." [xxi] This may sound like it fits with systems

thinking, and there are times when it does for sure, but if an organization thinks gathering more data will solve the problem by itself, then linear thinking is more at work. The people have to be willing to examine the data and then be willing to act on it.

7. "You are overthinking things." [xxii] This means that we are trying to take a complex problem and break it down into small pieces. If someone accuses you of overthinking things, it probably means that you are disagreeing with their point of view. Systems thinking requires us to stretch outside of our comfort zone, and not everyone welcomes that.

8. "Forget the rest of the organization, we have to take care of ourselves." [xxiii] Linear thinkers often come up with win-lose solutions in order to be certain their needs are met. This is kind of the dinner table mentality. If you want seconds of dessert, you might hurry to eat so that you can go back for more before someone else eats it all. It also happens in schools when teachers know there is limited money to spend on supplies in the school budget, so they rush to get their requests in first, hoping that the money will be spent on their classrooms instead of others'. Systems thinking would try to find win-win solutions instead.

9. "We don't want any conflict." [xxiv] Some people would rather keep the peace at all costs, even if it is a hindrance to getting to the root of real problems and concerns. This reminds me of my extended family coming over for a Thanksgiving or Christmas meal. We avoid discussing politics at all costs because we know it will cause tensions to rise. Luckily, in our case, we aren't avoiding solving problems over the dinner table like some organizations do when they avoid conflict. We are simply trying to ensure that everyone will get up from the table still speaking to one another.

10. "We will do it this way." [xxv] Often, people in positions of authority rely on this linear way of thinking by imposing their individual will on the entire organization. This can stymie creativity and innovative thinking, as well as a

collaborative effort to solving problems. This reminds me of times when I was asked to complete a survey or evaluation, or serve on a committee to study a problem in my teaching career. I would put in the time to give my thoughtful comments and reflective analysis, only to find that those in administrative positions would go against the recommendations of the majority in favor of doing what they had intended to do all along. I found myself wishing if that was going to be their approach, they would just do it without asking the rest of us to waste our time giving input in an exercise in futility.

Systems thinking doesn't come easily to everyone. Many find systems thinking to be a bit unstructured and unorganized when they first begin to look at the world through this lens. It may be overwhelming and uncomfortable at first because they become concerned about taking action when they don't know the effect that their suggested solution may have on the system and its parts. Rest assured that this feeling of trepidation is perfectly normal and will begin to ease over time as you reach deeper levels of understanding into the way systems behave. I'm not here to tell you that transitioning to systems thinking is going to be easy; I'm telling you that it's going to be worth it.

# Chapter 5: Understanding System Behavior

Now that we have a better understanding as to the differences between linear and systems thinking, it is time to dive in and analyze systems' behavior in order to see how they work.

We know that systems are composed of elements, interconnections, and a purpose or function, but there is more to learn if we want to become adept at systems thinking. Before we learn about additional parts of systems, let's recap some of the key concepts in systems thinking that we have covered so far.

Keep in mind that systems:

- Are always greater than just the sum of their parts.
- Have interconnections that often function through the flow of information.
- Have a function or purpose, often its least obvious component, that is typically the most critical factor in setting a system's behavior.
- Have a structure that contributes to the system's behavior, which is shown as a group of events over time.

Donella Meadows identifies additional parts that make up systems. [xxvi]

- Stock

A stock serves as the base of every system. Stock may be physical, like an amount of money, inventory, or information, but it does not have to be. Stock can also be feelings or attitudes that people hold. Stocks are not static. They change over time based on the impacts of a flow. Stocks are sorts of snapshots in

time, showing a current view of the changing flows in the system.

- Flow

Flows are the actions that impact a system. A flow might be a success or a failure, purchases or sales, deposits or withdrawals, or growth or decline.

**How are stocks and flows related in systems?**

- If there are more inflows than outflows, the level of stock will increase.
- If there are more outflows than inflows, the level of stock will decrease.
- If the amount of outflows and inflows is equal, the stock level will remain at its current level and will be unchanged (this is called dynamic equilibrium).
- The level of a stock is increased if its outflow is decreased or its inflow is increased.
- Stocks provide a sort of security barrier in a system, since they serve to delay the initial shock that may affect a system.
- Stocks preserve the ability of inflows and outflows to remain independent. [xxvii]

Let's look at a few examples. Employees in a company are a stock. New hires and recruits are inflows into this stock. Retirees, transfers, and those who resign or are fired are outflows from the stock.

Oranges in a citrus grove are a stock. The inflows are the growth of the citrus trees and the amount of oranges that can successfully survive until they are ripe enough to be harvested. The outflows are the oranges that fall from the trees or rot before they can be picked, the oranges that may not reach maturity because of the impact of freezing temperatures, the oranges that are lost due to insects or

disease harming the trees, and the inventory of oranges that are sold to consumers as fruit or juice.

Understanding how stocks and flows behave over time teaches you a lot about how complex systems behave as well. If you have ever tried to lose weight, you understand the dynamics of stocks and flows.

If you consume the same number of calories (inflow) as you burn through exercise and your daily activities (outflow), your weight (stock) will stay the same. This is what is known as a state of dynamic equilibrium. The stock level will not change, even though material is constantly flowing through it.

If you, like me, enjoy eating all of the delicious foods that the holiday season brings, and you eat more calories (inflow) while you spend more time visiting with family and friends and less time exercising and burning calories (outflow) than usual, your weight (stock) will increase. You will notice a few extra pounds the next time you step on the scale.

If you find some extra motivation and decide to eat more healthy foods and smaller portions, you will consume less calories (inflow). Combining that with a more active lifestyle and exercise routine will cause you to burn more calories (outflow). Your weight (stock) will start to decrease, and you will see a smaller number of pounds the next time you weigh yourself.

We can draw a few conclusions about stocks and flows from our simple example:

- The level of the stock will always rise if the total inflow is greater than the total outflow.
- The level of the stock will always decrease if the total outflow is greater than the total inflow.
- If the total outflow is equal to the total inflow, the stock level will not change. It will stay in a state of dynamic equilibrium.

Our mind has a tendency to focus more on stocks than flows. When it does focus

on flows, it seems that inflows are more easily concentrated on than outflows. That means that we may sometimes forget that there is more than one way for us to get our stock to the level we desire.

The stock level can be increased by either increasing the inflow or by decreasing the outflow. The stock level can be decreased by either increasing the outflow or decreasing the inflow. In our example of our weight, we tend to realize that we can lose weight by exercising more, but sometimes we may forget that we can also lose weight by eating less. Alternately, if you are one of the rare people on the planet who wishes to gain weight, that can be accomplished by either eating more or by exercising less.

Looking to our goals for our environment is another way to find some easy examples of the ways we can impact our stock levels. One major concern for our environment is how much trash we add to our landfills each year. If we want to decrease that stock, we could either recycle more or reduce the packaging that our goods come in. Another concern for the environment and world is that we wish to increase our stock of oil reserves. We can accomplish this by either finding new places that are safe enough, environmentally speaking, to drill in, or we can find new and innovative ways to consume less oil.

Flows can change very quickly if we want them to. It is easy to eat a big bowl of ice cream or go for a run around the neighborhood in a matter of minutes. However, stocks react much more slowly. Our weight doesn't instantly drop or rise. It takes time. In a system, stocks usually change slowly. They can act as the buffers or delays for the system. They are the keepers of a system's momentum. They reveal a great deal about why a system behaves the way it does.

Planting a seedling doesn't mean that there will be an increase in wood overnight. It will take years for the tree to grow. Areas affected by droughts do not immediately see their reservoirs return to their normal water levels. Negative impacts from global warming are not instantly reversed. Changes in stocks set

the pace of the whole system's dynamics.

Understanding a system's momentum can give you an opportunity to steer it toward the positive outcome you are hoping for. Just by the nature of stocks being present in systems, inflows and outflows are allowed to be independent from one another, and even out of balance with each other. People continually observe stocks so they can decide the action they need to take in order to adjust the level of stocks and ensure that they are in acceptable ranges. Systems thinkers are always studying this feedback.

## Feedback Loops [xxviii]

When a system displays a behavior that is consistent over time, it is highly likely that there is a mechanism that is working to control and create that behavior. The mechanism works through a feedback loop. Seeing a consistent pattern of behavior over time is the first signal that a feedback loop might exist.

A feedback loop is created when changes in the level of a stock affect the inflows or outflows of that stock. Think about your bank account as an example. The amount of money in your account is the stock. How much money (stock) you have in your account determines how much interest your bank will pay you (inflow). The amount of money in your bank account (stock) can also determine if you are charged a fee by your bank for allowing your money to dip below a certain amount (outflow). How much money flows into or out of your account is not a set amount; instead it will change based on how much money (stock) you have in your account in any given month. [xxix]

Feedback loops either keep a stock's level within a certain range or allow it to increase or decrease. No matter what the feedback loop does, the inflows and outflows to and from the stock are determined by the level of the stock itself. When a stock's level is observed, a corrective action is taken when needed. In

the example of your bank account, it may be as simple as the bank sending you an alert that your account has dipped below the level you are required to maintain in order to avoid being charged a fee. Once you receive the alert, you may decide to take the corrective action of depositing more money into that account. Brokers on Wall Street monitor the levels of stocks and bonds constantly and make corrective decisions on behalf of their clients as they choose to buy, sell, and trade those investments. Once the inflow or outflow for a stock has been adjusted, the stock's level will change. Then the stock will go back through a series of actions in order to control itself.

There are two feedback loops responsible for producing dynamic behavior: a reinforcing loop and a balancing loop. Understanding how these two loops work is a cornerstone of systems thinking.

A feedback loop happens when a change in stock leads to a further change in that stock.

If the further change in stock continues in the same direction, it is called a reinforcing (positive) loop. If the further change in stock level moves in the opposite direction, it is called a balancing (negative) loop. These feedback loops shift dominance over time. Dominance is a key concept of systems thinking. During the period that one loop dominates another, the dominant loop has a more powerful impact on the system's behavior.

As you analyze the data coming to you in the form of predictions and forecasts, you want to determine if the model that is being created is an accurate representation of reality. Ask yourself three important questions:

- Are the driving factors likely to act as predicted?

This is just going to be a guess about what might happen in the future. There is no way to know for sure what will happen. In order to increase the likelihood of a correct prediction, a systems analysis is often run to test what might happen if the driving factors act in a variety of ways. This is not supposed to generate a

forecast of what is expected to happen, but rather to provide various scenarios worthy of consideration in the decision-making process.

- If the driving factors act as predicted, would the system react as expected?

This question is about whether the model is an accurate one that is able to express the dynamics of the system correctly. It asks you to put aside any doubts that you may have about the original prediction and move forward with a "what-if" analysis of the system. You are now assessing whether the basic behavior pattern is realistic.

- What is the guiding force behind the driving factors?

This question involves examining what is controlling the inflows and outflows. It is distinguishing whether the driving factors are truly independent or if they are also ingrained in the system. It is trying to determine if there are other factors at work beyond the driving factors.

In analyzing system behavior, it is important to remember that one balancing feedback loop often works hand in hand with another, and also with a reinforcing loop. Any changes that happen within a system will incur delays. Let's think of this in terms of a retail clothing store system.

The buyer for the retail store must constantly monitor the stock of the system and the inflows and outflows at work in order to make decisions about inventory. As the buyer analyzes the behavior of the system, no matter how they may try to overcome them, there will inherently be delays in the process. There are three delays which are very common in business systems when it comes to inventory analysis.

First, there is a "perception delay." This may be an intentional or unintentional delay. In the case of analyzing inventory, it is often intentional. When the buyer of a retail store is trying to decide whether or not to order additional stock, they do not want to immediately react to every small blip of an increase of decrease

in sales. Before making ordering decisions, they will want to average the sales for at least a small amount of time to differentiate actual sales trends from just a temporary uptick or downturn.

Next, there is a "response delay." Once it becomes clear that more clothing needs to be ordered, the buyer doesn't want to make a complete adjustment in one single order. They make partial adjustments over a small period of time to be sure that the trends they are observing are real.

Finally, there is a "delivery delay." This is one that is largely out of the buyer's control, but must be accounted for in their ordering decisions. When the buyer places an order, it will take some time for their supplier to receive, process, and deliver the order to the store. [xxx]

As the orders arrive, the buyer will have to continue to monitor the stock and inflows and outflows carefully in order to be sure that the decisions they made were correct. Invariably, some mistakes will have been made because it is never possible to predict what customers will do with complete certainty. No matter how experienced the systems thinking buyer is, adjustments will continually have to be made, not because the buyer was careless or ignorant, but because, try as they might, there will always be at least a slight delay in the information they receive coupled with physical delivery delays, which will prevent their actions from having an immediate impact on inventory. The systems thinking buyer will have to continue to analyze and adjust the length of the delays in their decision-making process because the length of those delays can play a major role in changing the way a system behaves.

It is crucial to remember that no one store system operates in isolation. In the case of our clothing store example, the orders for additional clothing or reductions in orders also impact production and manufacturing for their suppliers. Many systems are interconnected and interdependent on one another, and each one of them will add their own delays and decisions to the mix. It is

this interconnectedness that causes business cycles to form and impacts the economy. Systems thinking and behavior analysis plays such an integral part.

# Chapter 6: System Errors

As I stated before, I would never tell you that systems thinking was going to be easy, but I would say it was going to be worth it. There is a quote that states, "Anything worth doing, is worth doing well." While there is some debate over who the person was who definitively said it, they, and my mother, who liked to tell me that at least once a day as I was growing up, are all great thinkers and they are right. I am certain that your life experience tells you it is often the most challenging things that bring you the greatest rewards. Systems thinking is no different. It is inherently challenging, which means there are bound to be errors that come with the territory. If you can overcome the errors and difficulties, you will find your way to becoming a strong systems thinker.

**Why do policy changes seem to be stuck at one place?**

Balancing feedback loops are the stabilizing force in systems. When they are at work, you should notice very few changes, and even though outside forces are impacting the system, the typical behavior patterns should still be in place. While there are many examples of when maintaining the status quo is a good thing, unfortunately, there are also times when this is not the case. Much like someone who has had the exact same hairdo since the 1980s and has no desire to ever change it, sometimes the behavior patterns of a system can get stuck in a real rut. This is often called "policy resistance." It happens when, despite efforts to come up with innovative solutions or policy "fixes," the system's behavior patterns remain unchanged. [xxxi]

In the United States, the public education system offers a prime example of policy resistance. As any society would, the United States government hopes to improve its public education system and increase student achievement. The Elementary and Secondary Education Act was signed into law by President Lyndon B. Johnson with the primary goal of adequately funding public education so that all students, regardless of their socioeconomic status, would have access to an excellent education, and schools would need to meet high standards of accountability. In 2001, President George W. Bush signed into law the No Child Left Behind Act, and its primary focus was to use annual assessments in grades 3-8, and once in high school, to ensure that all students were meeting high standards in their academic achievement. School funding became tied to how schools performed on these tests. President Barack Obama signed the Every Student Succeeds Act into law in 2015. This law kept much of the No Child Left Behind Act in place, but shifted some of the control over standards and accountability from the federal government to individual states.

Despite the efforts of multiple presidents, many members of Congress, education policymakers, more school choice, increased testing and accountability, and changes to funding public education, many problems and obstacles still exist in the United States' public education system, and the systemic behavior patterns largely still persist. This is policy resistance at work. Unfortunately, the same can be said as we try to reform the criminal justice system, break people's addiction to drugs, decrease poverty, and provide affordable healthcare for all. Even though a substantial amount of time, effort, and money have been spent trying to resolve these problems, the results that have been hoped for simply have not been attained.

Keep in mind that within each of the systems mentioned, there are many subsystems as well as individual actors which each view the behavior patterns and systemic problems through their own unique lens. Each has their own goals they want to achieve, which may or may not be fully aligned with the system as

a whole. Policy resistance arises when the goals of the subsystems do not match. If the goals are inconsistent, they often end up competing with one another, and the system ends up being pulled in multiple directions as each actor or subsystem tries to get their own needs met instead of uniting behind the common system goal.

When a system is policy resistant, everyone pulls in different directions and works hard to keep the system from moving too far away from their individual goals. What ends up happening is all of that effort keeps the system in a place that no one really wants it to be — motionless, and often stuck with the status quo.

## Policy resistance as a reaction

At times, policy resistance can result in unimaginable tragedy. In 1967, a Communist dictator by the name of Nicolae Ceausescu led the Romanian government as they decided that Romania needed to increase its population. While that conclusion does not seem to be concerning on its own, the approach they took to help them achieve their goal of growing their country's population is both terrifying and heartbreaking.

The Romanian government made it illegal for women under the age of forty-five to have an abortion. The birth rate tripled, but the people of Romania enacted their own form of policy resistance. Even though the government maintained their policy of making contraceptives and abortions illegal, the people of Romania began lowering the birth rate back to its former level. Women, in trying to regain control of their own lives, resorted to getting dangerous, illegal abortions, which resulted in tripling the maternal mortality rate. If women did give birth to children they did not plan to have, or could not financially provide for, they often abandoned those children to orphanages. Romanian families knew they could not adequately take care of the children their government expected them to raise, so they decided to resist the policy at great detriment to

themselves and the generation of children who spent their youth in orphanages. [xxxii]

The policy enforced by the Romanian government and subsequent resistance enacted by its people resulted in heartbreaking, unimaginable tragedy. Thankfully, once this government was removed from power, (quite violently) the first law passed by the new government repealed the ban on abortions and contraceptives, which had proven to be so harmful for Romania. The new law holds true to this day, as it is possible to purchase contraceptives in Romania without a prescription.


## Calming down as a reaction [xxxiii]

As we have already seen, one way to combat policy resistance is to attempt to overpower it. That was the approach the Romanian dictator took. Another approach when faced with policy resistance is to give up on the policies that are ineffective and redirect the energy and resources toward new policies.

You may not be getting everything that you want in this scenario, but it's a bit like tug of war. If you calm down a bit and let go of some of the tension, those pulling against you will calm down too. If this can truly be achieved in a system, then you can pause to study the feedbacks of the system and possibly find a win-win solution for all of the actors and subgroups as you steer the system in a more positive direction.

An example of this occurred in Hungary. This country, too, was concerned about its low birth rate. However, Hungary chose to calm down in their approach to solving the problem. They took the time to try to determine what factors may contribute to a lower birth rate in their country. The Hungarian government concluded that cramped housing was one factor that resulted in smaller family size. They enacted a policy that gave larger families more living space. As the size of housing was only one contributing factor to the lower birth rate, the

policy was only partly successful. But it is easy to see how the calming down approach is very different than trying to overpower policy resistance.

**Finding a common goal everybody can identify with**

The most successful way to overcome policy resistance is to find a way to unite the goals of all of the subsystems. A unifying goal that everyone can work toward is a powerful one, indeed.

We have witnessed this many times throughout history as people from around the world put any differences they had aside and came together to volunteer, donate, grieve, and help one another after a natural disaster or tragic terrorist attack. We see it when all of the people in a country band together to do their individual parts to support their troops and economy in times of war.

We can see this in the example of how the Swedish government chose to address its concerns over a low birth rate in the 1930s. The government looked at their goals of raising the birth rate and the goals of its citizens to try to find some common ground. What they found was that while they didn't necessarily agree on the size families should ideally be, they did agree that every child should be wanted and cared for. The Swedish people and government came together to work toward achieving the goals of ensuring every child would have access to excellent education and healthcare.

Despite the low birth rate, the government issued free contraceptives and abortion to ensure that every child in the country was wanted. The Swedish policy also included a greater investment in education and healthcare, increased support for families in need, and free obstetrical care, among other initiatives. While the birth rate in Sweden goes up and down at times, there is more of a sense of trust between the government and its people, because they know they are united in a common purpose and trying to reach a goal for the greater good. They let go of their individual goals and put the good of the entire system as

their first priority.

## Conclusion

Sadly, as human beings and students of history, we can think of too many times when enacting a certain policy to achieve an individual goal led to disastrous results. Take a moment to think of a few examples that you are aware of. Whether it is the lasting, devastating effects of detonating a nuclear weapon, or using chemical weapons in a war which continue to impact subsequent generations with birth defects and disabilities, or even something on a smaller scale with an outcome that is no less painful, please take a moment to reflect upon how focusing on short-sighted, selfish goals can lead to unimaginable tragedy and many unintended consequences.

When individual actors and subsystems lose sight of the guiding goal of the system, or when the system lacks a clear and unifying overarching goal, there will be a power struggle and competition of sorts as everyone tries to pull the stock of the system closer to their own narrow goals. Policy resistance can result as everyone devotes a lot of time and energy to trying to pull the system in multiple directions at once. The outcome is often the system being stuck in a place that no one really likes.

This is a naïve statement to make, but I will do it anyway: If everyone could let go of their own individual goals in order to redirect their efforts and energy toward the larger and more important goals of the system as a whole, great things can be achieved. There is nothing more powerful than being able to unite and support a goal that everyone can believe in and work toward together.

# Chapter 7: The Falling Systems

Systems are not always filled with sunshine and roses. Sometimes systems find themselves stuck in a negative loop that they just can't seem to find their way out of. This chapter is going to examine those negative cycles and try to lay out ways to break free of them.

As a teacher, I was always told to have high expectations for every student, because what I expected of them I would most often get. After years in the classroom, I can unequivocally say that this is true. It seems that this wisdom extends well beyond teaching, as it permeates all aspects of human nature.

To read the headlines in some British newspapers during the recession, one might be filled with despair at the state of the country. The articles were about how the economy continued to be in a constant downward motion, natural disasters were plaguing the country, representatives of trade and industry expressed concern over an inept workforce in general, and a lack of belief that the government and citizens of the country would be able to take the necessary steps to improve the current state of affairs. The overall feeling of the country was certainly not a positive one, and the news being reported was a reflection of that. It became a self-fulfilling prophecy that they were hard pressed to find their way out of.

Some systems don't just resist policy to remain in their typically bad state, but they actually continue to decline and get even worse. This is referred to as a "drift to low performance." [xxxvi] It is a concept that states wherever you set the bar, you will rise or fall to meet it.

Have you ever set a goal to lose weight, but in the back of your mind, you were already convinced that you couldn't? You probably found yourself gaining weight even though you tried to follow a diet. Or perhaps you started a new exercise routine, expecting that it would only last a few weeks before you would no longer continue it. Maybe you worked in a restaurant or store which continuously showed a decline in the quality of customer service, or were part of a business that consistently performed poorly in the stock market as the price of shares continued to drop. These are all examples of systems operating in a state of decline.

The actor in the feedback loop in each of our examples has a goal for the system which is the desired outcome that gets compared to the state the system is currently in. If there is a gap between where the system is and the goal of where it should be, corrective action gets taken. This is a normal balancing feedback loop that typically maintains the system's performance at the desired level.

However, in the case of our examples, there is a difference between how the system is actually performing and the perception of how the system is performing. Human nature tends to believe negative news more than positive news. Often, the most positive results are explained away as being flukes while the more negative results get embedded in our memories, making us perceive things as being worse than they actually are.

Ultimately, the goal and standard a system has set for itself begins to decline based on that negative perception. Often, the actors in a system will respond by saying things like: We did as well as could be expected, given the circumstances. Everyone else is struggling too. Excuses begin to be made, resulting in a self-fulfilling prophecy.

**How the system erodes quicker because of false notions**

The balancing feedback loop that is supposed to keep the system steady as it

performs at a satisfactory level begins to get overpowered by a negative reinforcing feedback loop. The lower the perception of a system's performance, the lower the goal and expectations of how the system is capable of performing drop. Since the gap between perception and expectation is narrowing, there will naturally be less corrective action taken. When less corrective action is taken, the actual performance of the system decreases. If this negative loop continues unbroken, the system will enter a state of perpetual decline.

This drifting toward lower performance and the erosion of goals happens gradually, so it doesn't set off alarms that corrective action is needed right away. As the performance slowly declines, the memory of better times and the belief that they can be achieved again is erased. The result is lower expectations, less effort, and worse performance.


## How to fix them?

There are two ways to combat the erosion of goals and expectations. The first is to maintain standards that are absolute no matter what happens in terms of performance. This reminds me of potty training my children. They had good days and very, very bad days, but my expectations and goals for them never wavered. They would be potty trained one day, and we continued to work tirelessly until that goal was achieved and my expectations were met.

The second way is to set goals that are tied to the best performances from the past. This makes the perception of what is possible in terms of performance more positive. When poor results occur, they are viewed as a temporary setback that the system is able to overcome, allowing it to get back on track to a better performance. Now the reinforcing feedback loop is trending positive and encouraging actors to work harder to achieve better results.

**The same goes for relationship problems.**

If you find yourself constantly fighting with someone you care about instead of talking to one another and trying to get to the root of the problem, the same system error occurs. You have a negative reinforcing feedback loop at work. As a result, you'll have more fights with one another because that is what you have come to expect.

The balancing feedback loop can't keep up and overcome the negative reinforcing feedback loop. If you have ever reached the point where you were afraid to say or do anything at all because you were convinced it would only lead to another fight and make things worse, then you know exactly how this works.

I can remember a time when my in-laws were coming for an extended visit. My wife and I had gotten into an argument about the timing of it all, and it quickly went downhill from there. We argued over plans for keeping them entertained, the sleeping arrangements of the kids to create a more private guest room for them while they visited, the added expense and time needed to prepare all of the meals, *etc.* You name it, we argued about it. Finally, I thought I would try to do something nice and help my wife clean the house, but at that time we were caught in such a negative and powerful reinforcing feedback loop that even that led to another fight, as it was seen as an insult to the way she took care of our house. Needless to say, it wasn't the most enjoyable or productive few days in our household.

We had to take a step back and remember to see the best in each other instead of assuming the worst. Once we realized that we both were trying to solve the problem in our own way, cooler heads prevailed and we got our relationship back on track.

When we allow our standards to be impacted by our past performance and negative perception of it, we are setting our systems up for failure as we allow them to drift toward low performance and take our goals and expectations right

along with them. In order to combat this, we need to keep our standards steadfast despite dips in performance and expect that we will rise to meet them. If we do this, we can flip the script and start drifting toward better performance.

# Chapter 8: Escalation

Merriam-Webster defines escalation as "the increase in extent, volume, number, amount, intensity, or scope." It can be as simple as my kids saying, "You hit me, so I'll hit you back harder," and then one hits back a little harder, and before you know it, someone is in tears. It can also be as complex as a "war of words" between leaders of two nations that leads to a real war with devastating impacts for the world. Like most things in the world, escalation can be positive or negative, helpful or a hindrance, and healthy or unhealthy. No matter where you look, you can find examples of escalation just about anywhere.

In terms of systems, escalation is a reinforcing loop that is created when actors try to compete to get ahead of one another. Escalation can be a good thing when it is connected to achieving a positive goal, like an advancement in technology or finding a cure for cancer. It can speed up the whole system toward reaching the goal.

Unfortunately, escalation can also be a bad thing. If escalation erodes relationships within a system and gives birth to hatred, it can ultimately slow a system down and impede its ability to achieve its goals.

One example of good escalation is the unending pressure on cell phone companies to always come up with the next big advancement or improvement before their competitors. We get better and better phones, thanks to this.

A negative example of escalation can be found in the history books. The United States and USSR were participants in a dangerous escalation during the Cold War. The two countries were trying to compete with one another for dominance.

They tried to outdo one another by increasing their weaponry. Every time one actor would accumulate more weapons, even if they only did it just to protect themselves, the other actor would view it as a threat and then start to accumulate more weapons of their own for protection and deterrence. This would continue in the same fashion with both actors arming up to try to get ahead of each other. When it comes to weapons and threats between countries, escalation has the potential for devastating consequences felt all over the world.

Political campaigns are often a prime example of negative escalation at work. One candidate smears another in an ad, and then the other smears back. This continues until the voters aren't sure that either candidate has any redeeming qualities, or even where they stand on the issues. This can serve to undermine the entire democratic process and have serious and lasting consequences.

Escalation is present in the economy too. Sometimes businesses try to corner the market by selling a product at a low price. Imagine that there are four hot dog vendors on Elm Street. Three of them sell their hot dogs for $2, but the fourth one lowers the price to $1.50. The vendor with the lowest price will get the majority of the customers until the other three vendors drop their prices. If the fourth vendor wants to keep his competitive advantage, he will have to lower his price again. He has to be careful, though, because there is a limit to how far he can drop his price. If he drops the price lower than what it costs him to produce the hot dog, he won't be able to make a profit and will suffer a loss.

Other times businesses try to gain an advantage not by setting lower prices, but instead by selling a premium product. For example, Apple wants to differentiate its iPhones from the other smartphones on the market. It works to make innovative updates to its product and then charges more for the iPhone than any other cell phone currently on sale. Apple tries to distinguish its premium smartphone from the others, but the consequence is that its competitors are also increasing their prices and racing to try to outdo Apple.

Escalation can have a positive impact on a society if kindness, volunteering, and a sense of community spread.

The bodybuilding industry has its share of escalation within it as well. Products are constantly being developed to help men and women build more muscles and improve their strength and physique. Since Arnold Schwarzenegger, the industry has enjoyed a full-blown Renaissance.

No matter the situation, when escalation is involved, it's not just about keeping up with the Joneses, but rather getting ahead of the Joneses.

**When is it the end?**

Escalation is a reinforcing feedback loop. Competition can reach extreme levels very quickly and, unless the loop is broken, it will often result in one or both of the actors reaching their breaking point. The exponential growth reinforcing feedback loops' supply can't be maintained until the bitter end, after all.

One way to break free of the escalation loop is to intentionally reduce your system's stock or performance and trying to influence your competitor to do the same. This can be risky, as the competitor may opt to not follow suit, but it can be effective if you can withstand the advantage your competitor will have in the short run.

The other way to end the escalation is to negotiate a disarmament with your competitor. This requires a big change in the structure and design of your system, as you need to create new balancing controlling loops that will help to keep our competitor in check. Disarmament agreements aren't easy to come by, and they come with their own set of challenges for both actors, but in the long run, they are definitely better than being stuck in the escalation loop. [xxxvii]

Take a few moments to think of your own examples of times when escalation has been at play in your life. Perhaps it has been a part of your relationships,

your health routines, or your workplace. Also think about other examples of escalation you have witnessed in the world or studied as part of history.

When one actor's performance is determined by trying to surpass the performance of another actor, a reinforcing feedback loop is created. The escalation will either drive the system forward and get it closer to achieving its goal, or cause negativity and result in impeding the system's progress. It is impossible to maintain an escalating exponential growth forever and, if the loop isn't broken, it will likely end with one or both of the actors reaching their breaking point.

The best way out of this trap is not to step into it in the first place. But if you find yourself caught in an escalating system, you can take yourself out of the competition by unilaterally disarming and breaking the reinforcing loop, or by negotiating a new system.

Reflect upon those examples of the escalations you identified in your own life earlier. Can you now find ways to break free from your own escalation loops and end the cycles before they become destructive?

# Chapter 9: Why Do the Rich Get Richer?

If you are anything close to being an average human being on the planet, the question of "Why do the rich get richer?" has undoubtedly crossed your mind on more than one occasion. This chapter will dive into this age-old question and see if we can find some answers to satisfy our curiosity.

Those who are financially well-off often use the wealth and privilege that they have to get insider information, special or additional knowledge which in turn helps them to generate more of that money, privilege, and closed-group information for themselves. Competitive exclusion is a system trap. What happens when someone wins a competition? He or she gets a reward. This reward — monetary, equipment, granted access — gives our winner the ability to compete even better or easier next time. This forms a reinforcing feedback loop, which increases the likelihood that the winners will keep winning and the losers will keep losing.

How does Monopoly — the board game — evolve? Each player begins the game on a level playing field, but as soon as a player begins to accumulate properties on the game board, all of that changes. When a player has control of a property, they can start to build hotels and charge the other players rent when they land on their properties. That player can then take the money they receive from the other players and use it to buy more properties and put more hotels on the game board. This makes it next to impossible for the other players to catch up, and greatly increases the likelihood that the hotel-owning player will win the game.

Now consider college football teams in the United States. There is a playoff system which determines the national champion each year. The final four teams

play against each other in the playoff. For the past few years, it seems there is becoming a sort of dynasty established by a few teams as the same 2-3 teams have been consistently playing in the playoff. As college football teams begin winning games, they are given a reward of more access to television time. This increased time on television allows them to increase their fan bases, bring more revenue into their programs, and attract more recruits to their teams. As the teams are more visible, they can generate more money through ticket sales and booster donations. This allows them to hire the best coaches and build the best facilities at their schools. All of these things in turn entice the best players to join their football programs, which increases the likelihood that they will continue to win and be successful. The reinforcing feedback loop has now become created and entrenched in their systems.

We also see this at play in nature. The competitive exclusion principle tells us that it is impossible to have two different species living in exactly the same ecological niche, competing with one another for exactly the same food and resources. When two species are different, one of the species will either be able to reproduce faster or be more effective in using resources than the other species. This will serve to give that species an advantage over the other one as it will begin to increase its population and continue to be dominant over the other species. The dominant species does not need to fight the other species. By using up all of the available resources, it means there are none left for the weaker competitor. This will force that species to either move away, adapt by using different resources, or become extinct. [xxxviii]

**A warning from the "other side"**

Karl Marx, a German economist and philosopher who developed the idea of communism in response to problems he witnessed in capitalism, believed that competition in the marketplace actually eliminates competition in the

marketplace, if left unchecked. He was very critical of capitalism as he pointed out that when there are two competing businesses, one will invariably gain an advantage over the other by being more efficient, having better technology, or making wise investment choices. That advantage would generate more money, which could then be reinvested in the company and its facilities and technology. This reinforcing feedback loop, if it goes on without government protections, will make the dominant business rapidly able to corner the market and eliminate all competition.

We have seen Marx's prediction at work in the United States. Automobile manufacturers have been reduced to three (antitrust laws have kept it from dropping to one), many big cities have only one newspaper, and so on. Television, internet, and telecommunications providers continue to merge with the government, keeping a watchful eye to prevent any one company from becoming so big and powerful that it drives all of its competitors out of business.


The other side is true as well; the poor also get poorer. Poor kids usually have access to the worst education, and thus the worst jobs and income levels. Their poverty is reinforced at each stage of life. People who do not have a lot of money are either unable to qualify for loans, or must pay a disproportionately high interest rate to the well-off — who collect the money. This keeps the poor from being able to make investments and improve their futures like the wealthy can. People with low incomes often are unable to own their own homes. They pay rent to those who can afford to own property. Tenants supply landlords, whether with a stable income source or enough to buy a new flat for more people to rent. Real life Monopoly, folks.

The poor tend to pay a greater percentage of their income to taxes and healthcare. Wealthy individuals and corporations have access to attorneys who can help them find loopholes in the tax code and avoid paying a comparable

amount of their income in taxes. They are also able to lobby government more to have their interests represented and to receive tax breaks.

Often people are able to receive discounts when they purchase items in bulk. Because the poor are unable to afford these large purchases, they often have to pay higher, per piece prices. As the poor often suffer from pollution and disease before the rest of the population, and often have no other choice than to take a dangerous, low-paying job or live in an area with a high crime rate, the reinforcing feedback loop grows ever stronger, and the cycle remains entrenched in society generation after generation.

**How do you break out of the trap of "success to the successful?"**

Sometimes it is possible to move, adapt, or evolve in order to escape competitive exclusion. Businesses can diversify themselves with a new product or service. It is possible to keep the "rich get richer" phenomenon in check if there are other feedback loops in place (like antitrust laws) that keep any one business from completely taking over the marketplace and driving out all competition.

Pushing the reset button and rearranging the playground or the rules can be an option to stop the cycle. In golf, for example weaker players are given a handicap. In Monopoly, a new game is a fresh start where all players can begin as equals again. School choice and scholarships for disadvantaged students can provide some with equal access to the best schools — for a lucky few. Having the wealthy pay a higher tax rate than the poor, people making donations to charitable organizations, the public welfare system, unions in the workplace, and assistance in attaining healthcare and scholarships are a few of the measures many societies have in place to combat this system trap.

Diversification can offer an opportunity to change the game and allow those who are losing to possibly be able to become competitive once again. Having antitrust laws in place to keep businesses from completely eliminating all

competition. Finding ways to limit some of the advantages of those with power and giving them to those without through unions, scholarships, or financial assistance; and offering rewards to winning competitors that will not impact future successes in the competition, are all possible solutions to breaking free from the system trap called "success to the successful."

# Chapter 10: Systems Thinking in Relationships

Now that we understand the basics of systems thinking, it is clear that relationships, especially romantic ones, can't be reduced to a simple cause and effect analysis. What happens in our relationships is much more complex. Using the knowledge we got from the previous chapters, I will help you analyze, and hopefully solve, your problems for real, not just treat the symptoms.

While we have learned that there are times when cause and effect thinking is helpful, when we're dealing with relationships, it can have terrible results. In relationships, when we think in terms of cause and effect, we will see something that we don't really like and look for a cause. It is all too easy to point the finger at our significant other as being to blame when things don't go the way we would like. This can cause us to feel contempt for our loved one as we start blaming them for being the root of our problems.

It is human nature to try to attribute multiple events to the same cause. It's just easier that way. We may wonder why our children don't behave better, why we struggle to make ends meet financially, and why our lives aren't as carefree and enjoyable as they used to be. Thankfully, if we change our cause and effect thinking to systems thinking, we can overcome the tendency to look for victims and villains.

We know in systems thinking that there is always more than one cause at play. While event A may cause B, there is something that also caused A. Often, there is a reinforcing feedback loop that might show us that B even did something to contribute to causing A as well. Systems thinking isn't easy, but the complex thinking required can help us to better navigate our complex relationships. When

we arbitrarily assign blame to people or things, our felling of contempt for them grows.

Dr. John Gottman, a professor emeritus in psychology who is renowned for his research into marital stability and ability to predict future divorce with at least 90% accuracy, warns that contempt is one of the four emotions that relationships can't survive.

## The four horsemen

Dr. Gottman uses the metaphor of the Four Horsemen of the Apocalypse, who symbolize the end of times in the New Testament, in his analysis of marriages that are headed for divorce. The four horsemen represent conquest, war, hunger, and death. In the case of relationships, Dr. Gottman uses the metaphor to demonstrate the four communication styles he attributes to bringing about divorce or the ending of relationships. [xxxix]

The first horseman is criticism. Criticism goes beyond raising a concern, offering a complaint, or giving a critique. It goes to the core of who your partner is and often leaves them feeling attacked and rejected, leading to deeply hurt feelings. If criticism grows in number and strength, it opens the door for the other, even more problematic horsemen to enter.

The next horseman, according to Gottman, is contempt. Communicating with contempt is mean-spirited and can leave the person on the receiving end feeling unloved and unvalued. It may involve cruel sarcasm or mocking, and it is very hurtful. Dr. Gottman believes contempt is the biggest factor in predicting divorce, as it signals long-festering negative feelings that surface and cause one member of the relationship to feel superior over the other, and it must be eradicated.

The third horseman is defensiveness. We get defensive when we feel like we are being unfairly attacked by our significant other. We come up with reasons and

excuses to get them to back off. It often has the opposite effect than what we intended, though, as the other party sees it as a dismissal of their concerns and a way of shifting the blame to them. This only serves to further entrench the cycle of negativity.

The last horseman is stonewalling. Stonewalling happens when one partner shuts themselves off from the other, refusing to listen or engage in the interaction anymore. This makes communication impossible. It is essential to get rid of these four terrible communication styles and replace them with more positive ones in order for our relationships to thrive.

**Systems thinking to the rescue**

Systems thinking allows us to stop feeling helpless and hopeless when it comes to our relationships. Simplistic cause and effect thinking can leave us believing that our relationships are on the brink of ending as soon as we begin to fight and disagree with one another. We are troubled by increased fighting and start to look for causes as we wonder if our partner has found someone else, no longer finds us attractive, or has fallen out of love with us. This leads to a feeling of hopelessness, especially if we try to make extra efforts that our significant other doesn't seem to notice or appreciate. This, in turn, leads to more fights and feelings of disappointment.

When we stop and look at things from a systems perspective, we take our power back and begin to feel hopeful again. Thinking of our relationship as a system and stock means that both partners are feedback loops. We look for any changes that may have happened recently and analyze whether the system dynamics have changed.

Often, one partner puts in more work than the other in a relationship. Ideally, these roles change so when one partner is feeling down, the other one will be there to lift them up and support them. In terms of systems thinking, one partner

is in the dominant feedback loop, and that dominance will shift back and forth between the two.

The goal is to look at the relationship logically and decide if there was a shift in dominance. Perhaps there is an additional external feedback loop that is impacting the system. Maybe there are problems at work, or difficulties in communicating.

Both relationships and systems change over time. This change is inevitable. We may not always recognize it as it is happening, and the effects of the change may not always be immediately obvious to us. In healthy relationships, both parties understand that change happens and neither person will be exactly the same as they were at the beginning of the relationship. The tricky part is being accepting of those changes while still maintaining the dynamics of your own personal feedback loop.

If those dynamics change and become negative, your partner will feel unsupported and misunderstood and conflicts will begin. There will be a gap between how much you really understand them and how much they expect to be understood. It is crucial to recognize that gap and close it. Otherwise, it will only grow with each fight, and your reinforcing feedback loop will keep focusing on the negative. The relationship will suffer and begin to fall apart.

**The timeline of the relationship**

Your body releases different chemicals and pheromones at different points in the relationship. The stage that your relationship is in can become a contributing factor when times get tough. Sometimes just the fact that they honeymoon phase is over can cause its own set of problems.

Systems thinking is being able to really look at the whole complex picture of yourself and your relationship. It is recognizing that there is more to your relationship than just two feedback loops impacting the stock of the relationship.

Many feedback loops are at work at the same time, and all of them affect your stock. Increasing your awareness of all of these loops and the roles they play increases your ability to see things objectively and understand what's happening in your relationship.

Some of these influential factors disappear as the relationship ages. After the honeymoon period ends, you will need to find things to replace it so that it doesn't leave behind a gap in your relationship. Intentionally creating opportunities for reinforcing your commitment and intimacy with each other, like having date nights, can help.

When you approach your relationship from a systems perspective, there is much less of an opportunity and inclination to take things personally and assign negativity and blame. You realize that your partner is not to blame for everything that goes wrong. Many little changes in the dynamics of the system are at work.

Being able to take personal feelings out of the equation means that we can be more efficient in our quest to find solutions. We are better equipped to spot gaps in the relationship dynamics and fill in those gaps. We can search for the true underlying problems and fix them instead of just the systems. We can keep ourselves from automatically assuming the worse and jumping to incorrect conclusions.

Keep in mind that no one partner is to blame for everything that goes wrong, including yourself. Try to cultivate a relationship that is resilient and can weather any storm. This is so much more helpful than just a stable relationship, as we know that there is only one thing certain in life, and that is change.

**Everything runs on three different categories: physical, mental, and emotional.**

Internal and external factors are always at work, impacting our lives and ourselves. Internally, physical factors include our health, nutrition, and exercise. Externally, physical factors may involve the physical environment around us, like pollution or access to healthy foods. In our relationships, we want to ensure that both partners' physical needs are met and nurtured.

Emotionally in our relationships, we need to look at how we speak to one another, whether we interact positively with one another, if we are making an effort to meet each other's love language needs, and if we are trying to make the relationship a priority by devoting time and energy to things like scheduling date nights. External emotional factors at work in our relationship may include our relationships with other people around us like in-laws, friends, children, siblings, and coworkers.

When it comes to the mental factors that can impact our relationships, we need to be sure we don't take out all of our frustrations on our significant other. We have to find the real root of the problems so we can come up with long-term solutions. Keep in mind that our beliefs, self-awareness, frame of mind, personality type, life experience, political affiliations, and ability to self-reflect all influence our relationship in one way or another. Our own individual system must be working well before our collective relationship system ever can be.

Take a few minutes to write down the things that are impacting you on a physical, mental, and emotional level, both internal and external forces. Reflect upon how you think you're doing in all of these areas. If you are struggling in any area, try to figure out why. Just blaming your partner is disingenuous and unfair. Go through the systems thinking process. It's your opportunity to design your life and go after the things you really want.

Learn from the example of my brother and sister-in-law. They went through a very rough patch years ago. He worked so many hours that she came to resent it and blamed him for not being physically and emotionally available for her and

their three sons. He just wanted to unwind when he got home, and blamed her for what he saw as ungrateful and incessant nagging and taking away the joy and carefree nature that was present in their marriage when it began. They got to the point where they forgot what they loved about each other in the first place and got divorced. After a few years apart where they did some self-reflection, they decided that the blame game was counterproductive and there were plenty of things that contributed to their dissatisfaction with their marriage. They went through counseling as they tried to get to the real root of their problems. They took things slowly and ultimately decided to give their relationship another try. They have now been happily remarried for years.

Problems in a relationship do not have to mean that it is doomed to fail. In fact, they may be opportunities for a new beginning in disguise. We only need to take the time to find long-term solutions for them.

# Chapter 11: Key Takeaways from Systems Thinking

Systems thinking is a whole new way for us to look at ourselves, our businesses, our relationships, and the world around us. It is such a paradigm shift from our more traditional ways of thinking that it becomes a guiding philosophy for the way we approach and analyze so many parts of our lives. It involves being aware that the choices we make may have unintended consequences, so they deserve careful and deliberate thought.

Systems thinking at its core starts with observing data and events, looking for patterns in behavior that occur over time, uncovering the structures that are the driving forces behind the behavior, studying and changing the structures that are no longer helpful, using our curiosity to be open to a variety of possible solutions to a problem, and ultimately being brave enough to choose the best possible long-term solution rather than an easy fix, or just the one that is the most popular.

**Why use systems thinking?**

Knowledge is power. When we know better, we do better. Systems thinking expands our thinking and opens us up to many possible solutions as we look at problems in new ways. We can make more informed choices, knowing that there is no such thing as a perfect solution and every choice we make will impact other parts of the system because it is all interconnected. Systems thinking allows us to be aware of the impact of our choices and to do everything in our power to limit any negative consequences that may arise from them.

**When should we use systems thinking?**

Systems thinking is very effective in helping to solve a variety of complex problems. If the concern is important, the problem has occurred repeatedly and has a history that can be studied and analyzed, and people have tried to solve the problem in the past with little or no success, it is a prime candidate for a systems thinking approach.

**How do you use systems thinking? [xl]**

Begin by asking new questions. People are naturally inclined to want to assign blame for a problem. It is a quick and easy "fix" and it makes us feel better. It has been said that "the definition of insanity is doing the same thing over and over and expecting a different result." While there is some debate over the origin of this quote, it offers us important insight into systems thinking. We need to break free from the blame game and instead be willing to ask the tougher questions like, "What is it that we are missing?" or "What don't we understand about the problem?"

When you begin your systems thinking analysis, it is entirely possible that the data and information before you will just be the tip of the iceberg. There is so much more that you can discover beneath the surface by examining not just events that occur, but also patterns of behavior and the structure in place responsible for driving those behavior patterns over time.

Be sure to speak with everyone in the system so that all of their viewpoints are represented. In the beginning, everyone will see the problem through a different lens. It is only by being willing to listen to all perspectives that you can truly get to the heart of the problem. Once you have gathered all of the information you need, then you will ultimately update everyone as to your findings so that is

possible to all be on the same page moving forward.

When you begin laying out visual representations of the problem so that you can look at it in a new way, start with causal loop diagrams. Start out small and keep things simple. You can always add more elements to the loop as you need them. Keep the story broken into small, digestible parts for as long as possible without trying to overcomplicate the loops with too many details (especially if the details are about things totally beyond your control or inconsequential to the problem before you). It is hoped that the causal loops will reveal connections between parts of the system that may have gone previously unnoticed. Try not to get hung up on whether the loop you are creating is right or wrong. If it accurately shows the group's current perception of reality, then it is doing what it is designed to do.

**Lessons we can learn from systems thinking**

There are many lessons to be learned from systems thinking. Incorporating even a few of these lessons into your daily life might impact your life pleasantly in unexpected ways.

Often we think systems are failing just because they aren't performing in the ways we think they should. In fact, the system might be performing exactly as it should. We need to look at what the system is doing well and then see how it was designed for that. Then, if we want the system to behave differently, we can simply change the design to help it meet its new purpose. In our lives, if we interview for a job and don't get it, we think we have failed. Instead, we could look at the interview we had as a means of improving ourselves and our skills, so that we will be better prepared in the future when the right job for us comes along.

When we try to solve problems, we often make the mistake of assuming that they occur in isolation. In reality, problems are usually just as interconnected as

systems are. For example, if the vegetables in a garden won't grow to their full potential, we may assume that it is because they did not receive enough water. That may very well be just one reason and we may find that the real cause could be any of a number of, or a combination of, possibilities, such as the quality of the soil, not receiving the proper amount of sunlight, the quality of the seeds that were planted, the length of the growing season, average temperature, insects, and elevation, among many others. Being open to a variety of possible solutions can help us persevere when we are faced with the most daunting or frustrating problems.

Feedback from systems can provide us with invaluable learning opportunities. We should always seek to gain knowledge from every life experience. It will serve to improve our analytical skills and sense of awareness, making us better equipped to make evaluations and judgments or the systems we encounter.

It is important to keep in mind that there are always delays once we apply feedback to a system. We can't expect the results to happen instantly. In fact, if we don't take into account that there will inevitably be delays, we may make the mistake of incorrectly thinking additional interventions are needed when the ones we have implemented just need time for them to take hold and produce results. We should avoid getting discouraged and giving up in favor of letting things play out. After all, the best things come to those who wait.

When we try to solve complex problems without a systems thinking approach, it may make a difficult situation even worse. When we rush to find a cause of the problem without looking carefully at the systems behavior patterns and interconnected parts, we may find ourselves only addressing the symptoms instead of getting to the root of the problem. This can lead to us missing some of the unintended consequences that may arise from the decisions we make. A systems thinking approach can help us to minimize those negative unintended consequences or avoid them altogether.

We have all heard our parents at one point in time tell us that they would rather we learn from their mistakes rather than repeating them. Systems are similar in that often, the problems and behavior patterns we witness today have already been present in multiple systems throughout time. By looking at the similar patterns of feedback cycles and delays that have been seen over and over again (called systems archetypes), we are able to more quickly spot dominant behavior patterns in our own current systems. Being aware of how current events in our lives compare to those we have already faced in our past gives us strength and knowledge as we deal with them, because we realize we already have some experience to back us up.

The most effective place to act in a system in order to achieve the best results often couldn't be further away from where we expect it to be. They key to dealing with systems thinking in both our personal and professional lives is to keep an open mind. If we are truly open to all possibilities, the best solution is bound to find its way in.

**An example of systems thinking at its finest**

Every system that involves human beings is bound to include errors, as there is no such thing as a perfect person who never makes mistakes. The healthcare system is no different. The National Institute of Health issued a report "To Err is Human" that looks into errors in the field of healthcare. The following findings were a part of this report.

The healthcare system has always studied why medical professionals made mistakes. Until the last few decades, the focus was on the individual who made the error. Blame was assigned to the doctor or nurse who made the mistake, and a punishment was issued in the hopes that it might prevent errors from occurring in the future.

More recently, there was a shift in thinking when it came to analyzing medical

mistakes. Instead of only looking at an individual as being solely responsible, the healthcare system found that evaluating the failures in the systems that led to the error was much more helpful in preventing similar errors in the future. Assigning blame was not given as much importance as finding ways to improve systems and make proactive decisions to prevent potentially life threatening errors from happening again.

When an error was made, everything in the system was analyzed from the way medication was labeled, to whether the staff was overworked with too many patients or hours on their schedule, to whether the order issued by the doctor was able to be clearly and easily understood, and many more influencing factors. It was often discovered that an error had happened well in advance of when it actually manifested itself.

The healthcare system had confidence that its employees wanted to help the patient above all else, but also understood that they were human, so mistakes would be made. They made the decision to encourage their employees to be honest about reporting errors by creating a safer and more blame-free environment in which they could do so. They believed that learning from mistakes and improving systems was more important than issuing punishments. As a result, systems thinking has helped to make things like systems for reporting errors, checklists that must be followed for procedures, and guidelines for patient safety standard practice in healthcare.

Systems thinking is a powerful way of thinking that has great potential to impact our lives in so many ways, if we are open to all of the benefits and lessons it has to offer.

# Conclusion

Systems thinking is a major paradigm shift from the more traditional ways of thinking that we are so familiar with, and may have grown too comfortable and complacent in exclusively relying upon, throughout our lives. There are so many important lessons we have learned that it will serve us well to review a few of the highlights as we begin our journey into implanting systems thinking into our lives.

- In a system, everything is interconnected. It is all about how the relationships and connections between the parts impact the system as a whole. Changing one part of a system will impact the entire system.
- Every action and decision will have unintended consequences, so taking the time to analyze a system carefully, instead of rushing to find a "quick and easy fix," is key.
- If you want to change a system, it is more efficient and impactful to change the interconnections and purpose or function than it is to change the elements. Changing the rules and relationships can often create a "whole new system."
- Looking at problems deeply and from a multitude of perspectives with an open mind will increase the likelihood of finding a lasting positive solution.
- Taking the time to look at an event, and then examining the behavior patterns of a system in the quest for deeper understanding

by asking new questions, is important if we are interested in finding the best possible solutions to the complex problems we face today.

- To systems thinkers, there is no final, definitive answer. An answer is often the beginning to a new question.

Systems thinking is a whole new way for us to look at ourselves, our businesses, our relationships, and the world around us. It involves being aware that the choices we make may have unintended consequences, so they deserve careful and deliberate thought.

Knowledge is power. When we know better, we do better. Systems thinking expands our cognition and opens us up to many possible solutions as we look at problems in new ways. We can make more informed choices knowing that there is no such thing as a perfect solution, and every choice we make will impact other parts of the system because it is all interconnected.

Systems thinking is not what human nature is automatically inclined to do. It will not come easily to us or happen immediately, but with time and practice, we can become systems thinkers. I don't promise that it will be easy, but it will be worth it.

I wish you much success as you take your systems thinking approach and set out to conquer the world one complex problem at a time.

Steven

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