

# Safely Taking Risks: Complexity and Patient Safety





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*The only way out is through.* Robert Frost

It's clear. Patient safety leadership is a murky journey through a thicket of challenges. Small errors, simple workarounds, slight differences, and little misunderstandings may combine to generate BIG misadventures. Safety leaders are faced with a perfect tangle of simple, complicated and complex tasks.



Each type of challenge calls out for a different kind of facilitation and leadership.

<b>SIMPLE</b> <i>Following a Recipe</i>	<b>COMPLICATED</b> <i>Sending a Rocket to the Moon</i>	<b>COMPLEX</b> <i>Raising a Child</i>	<b>CHAOTIC</b> <i>"Pinning the Tail On The Donkey," then Staunch the Bleeding</i>
			
The recipe is essential	Rigid protocols or formulas are necessary	Protocols have a limited application	Rigid protocols may be counter-productive or misdirect responses
Recipes are tested to assure easy replication of success	Sending one rocket increases assurance of future success; key elements are identical	Raising one child provides experience but no assurance of future success	Experience may help or hinder finding what works to diagnose & abate the crisis
No particular expertise is required (cooking skill can improve the success rate)	High levels of expertise in a variety of fields are necessary for success	Expertise can contribute but is neither necessary nor sufficient to assure success	Rapid action & improvising skills, plus unleashing a network of local on-the-ground know-how can help
Recipes produce standardized, predictable results every time	Rockets are similar and there is a high degree of outcome predictability	Every child is a unique individual with unpredictable "outcomes"	As unknowables recede & blood is staunch, novel patterns may emerge

*[1] Adapted from Brenda Zimmerman, 2006.*

In a single day of leading, you may find yourself saying:

*Just do it! Did we follow the protocol? Find a way to fix the process... for relatively simple tasks;*

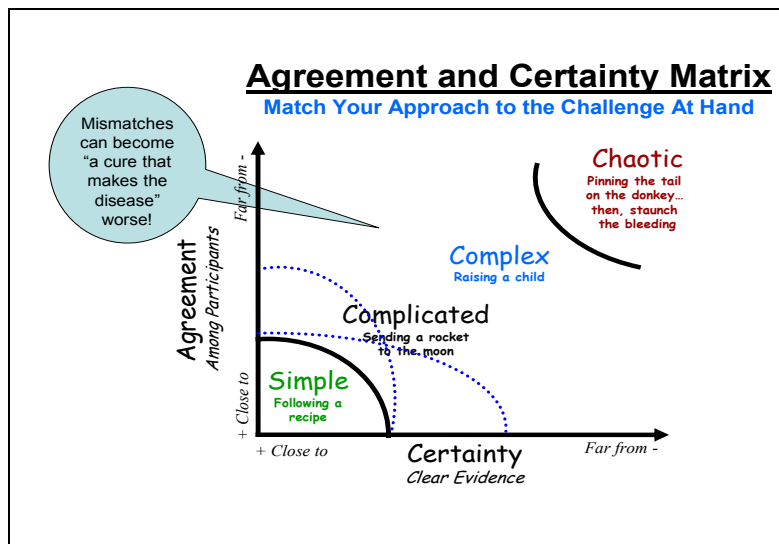
Gather more evidence! Do we have buy-in? Stay the course! What holes in the ‘Swiss cheese’ can we plug or design to be error-free? Let’s reorganize... for complicated problems;

How many courses can we explore at once? Where have we already started to solve the problem? Stir the pot! Is a new pattern emerging? How can we build on our success? Whoa, did anyone see that coming? Whoa, what a nice surprise!... for complex challenges; and,

What is happening? Are we in crisis? Staunch the bleeding — move, move, move! Let’s stay clear until the anarchy dies down!... when pure chaos comes to town.

A wise leader knows how to match a simple, complicated, complex or chaotic approach to the challenge at hand -- when a *recipe*, a *rocket launch*, a *child raising strategy*, or *applying a tourniquet* is appropriate. A mismatch will often make things worse.

One goal of this monograph is to help you discern differences among leadership challenges. Insights are inspired by the emerging field of complex systems science and systems thinking.



Effective approaches to complex and chaotic challenges are the least explored territory. While this ground may seem to be risky because solutions emerge via “improvised” exploration, leadership through this “thicket” can yield dramatic results.

Paradoxically, improved safety calls out for more risk-taking among leaders and followers. Both *letting go* and *letting come* behaviors are useful.

## Clearing A Path Through the Thicket

*If you want to build a ship, don't drum up people to collect wood and don't assign them tasks and work, but rather teach them to long for the endless immensity of the sea. Antoine de Saint-Exupery*

This monograph will touch on the following themes:

- complex systems and sources of complex system error
- principles, conditions, and practices that underlie tipping points and emergence
- looking beyond leadership models that suggest a person can control or find leverage in a system, to a model where you are in charge but not in control
- methods to help leaders-and-followers to *safely take more risks*

Working on safety issues may feel messy because: you are not certain what to do about it; your first efforts may not have worked; diverse groups are fully entangled; nobody seems to be in control; and, things are changing so rapidly that you have to redefine the issues frequently. This seems to be the natural, very rugged territory of patient safety leaders.

### Defining A System From the Ground Up

*When we try to pick up anything by itself,  
we find it hitched to everything else in the universe.*  
John Muir



The word *system* originates from the Greek verb *sunistanai*, meaning to cause to stand

together or to combine. Modern definitions include: a group of interacting, interrelated, or interdependent elements forming a complex whole; and, a functionally related group of elements.

#### Code Swirl!

When the situation gets really messy in a hospital, code-blue, -black, -brown, or -gray may be bypassed! One hospital informally uses **Code Swirl** to describe the frustrating, often fruitless, search for a root cause and certainty.

A mandate or regulation may require an over-simplified cause-and-effect explanation. The search for “the answer” can unleash a maelstrom of 20-20 hindsight bias and unproductive finger pointing. **Code Swirl** is invoked whenever meeting participants notice that many minutes have ticked away, without making progress. It can be unclear what the problem is, unclear what the solution(s) might be, unclear if the solution will fix the problem or make the problem worse, and, unclear what next steps to take.

Calling out the code helps members step back to make sense of the bigger picture and to identify system issues that could potentially harm more patients. Rather than retrospectively “fixing” discrete elements, participants focus on boosting capacity to notice small errors and slight differences and respond in the moment.

Systems are complex because cause and effect relationships are obscured. Delays, multiple locations, and sheer number of details or moving parts make “rational” decision-making ineffective. In complex systems the causes and effects are causes and effects of themselves. Participants are making changes and being changed in the same breath – a simultaneous mutual shaping at play. Causality is not linear but circular. Causes and effects are not separable and therefore not manageable in isolation. Obvious interventions focused on fixing the parts can make the problem worse. Yikes!



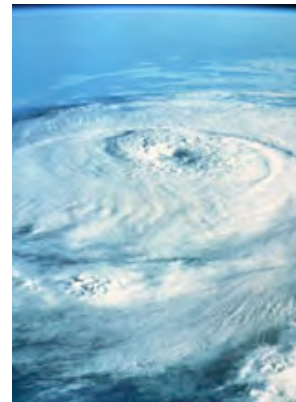
Complexity science focuses on the patterns of relationships among parts of the system, rather than the parts by themselves or the structure (the stuff of conventional management practice). Order and direction emerge from the grass roots up, not from a single or centralized intelligence.

A single rumor or event can make a big difference. Systems move forward and change by examining, responding and building on local patterns of interaction... not unlike the way small errors or events propagate into sentinel events. The same process generates welcome as well as unwelcome surprises.

These systems are called Complex Adaptive Systems (CASs). Examples include stock markets, gardens, human beings, weather systems, and human organizations. Diverse individual agents are massively entangled yet adaptable and resilient. CASs are capable of undergoing spontaneous self-organized leaps in performance.

Systems disciplines transcend traditional approaches and have been a source of new insights in physics, biology, health, geology, psychology economics, and s-l-o-w-l-y in management and leadership. These new disciplines view systems in far-from-equilibrium states rather than at the point of stability or control.

Creative adaptability arises in far-from-equilibrium conditions that include moderate uncertainty and disagreement among individuals in a system. Distributed, from-the-ground-up leadership *co-arises and emerges* in this zone.



**Complexity Litmus Test**

Is your organization or leadership challenge a good place to apply complexity-science inspired approaches? Some thoughtful questions to ponder and to test-the-fit include:

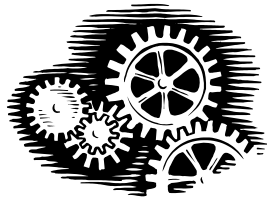
- Does it feel like “herding cats” when the individual players are gathered together?
- Do the key players in the system have unequal levels of information & power?
- Are very diverse types of people & professions (with different mental models) required to accomplish goals?
- Are formal links among the players loose or weak in many cases?
- Does the intangible quality of what is produced (e.g., health or learning) create multiple different understandings of aims?
- Does making the parts more efficient or effective at a local level often fail to improve system performance at higher levels?
- Although organizational structure is well established, do “best practices” spread unevenly (or not at all) from local applications to other parts of the system?
- Have gaps and time lags in your operating environment (that may have permitted a more deliberate or linear approach) evaporated, reducing opportunities “to figure it out” or “get it right” as leaders?
- Does order unexpectedly emerge from the mess, despite what could be predicted by conventional requirements for tight control, coordination, and alignment?

For many leaders, a substantial portion of their work fits this profile. If you have answered “yes” to most of these questions, complexity-inspired management approaches may fit you and your situation.

**Two Powerful Approaches: Complexity Science and Systems Thinking**

*“Seek simplicity but distrust it.”* Alfred North Whitehead

In this monograph, systems thinking and complexity science are explored. While both offer insights into non-linear change, there are significant differences. The differences have much to do with their origins: systems dynamics theory comes out of physics and engineering science; and, complexity theory from biology and other life sciences.



As patient safety leaders, discerning the differences will help you match leadership approaches to specific challenges. The following generalizations may help.

Systems thinkers often begin with the question: *How can we design or align a system toward an aim or vision?* Whereas, complexity practitioners often begin with the question: *How can we create the conditions for purposeful growth or leaps in performance to emerge?*

More differences between complexity and systems thinking include the following. In complexity-inspired leadership and facilitation, there is:

- Less emphasis on leverage points (and other mechanical metaphors) and more on emergence from local interaction among people and groups in the system
- Less emphasis on the leader's influence and more on creating the conditions for self-organization (e.g., collectively and mindfully catching very small errors earlier, at the front line)
- Less emphasis on articulating a clear, shared vision and more on multiple actions inspired by a good-enough vision (e.g., initiating a set of safety initiatives and practices before the formal strategic plan or vision or all the evidence is in place)
- Less emphasis on individual intention and knowledge and more on creative adaptability among people and work processes on a unit (e.g., engaging everyone's expertise in responding to and preventing medical errors, without regard to rank)
- Less emphasis on changing the formal structure of organizations and more on informal communities of practice (e.g., encouraging an inquiring culture in which everyone starts to talk openly about accidents)
- Less emphasis on knowing-in-advance and more on "tuning" to the environment, sense-making and building on "what works" (e.g., "Good Catch Logs" of successful prevention practices or events)
- Less emphasis on competency-building or gap-closing and more on appreciating attractor patterns, increasing information flow, working with serendipity, and shifting boundaries (e.g., sharing information about how full disclosure with patients and families can be a successful risk-reduction strategy... and the right thing to do).



On one hand, complexity-science inspired approaches are more challenging because "letting go of control" is more complete. A leader's role as facilitator or just as "a powerful participant" in the change process is emphasized. At times, it seems that **some people would rather live with a problem they can't solve than with a solution that they can't fully understand or control.**



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On the other hand, complexity-inspired leaders often feel relieved that order can arise in complex settings by unleashing self-organization. The experience has been likened to “hugging a cloud.”

In general, complicated challenges call for the application of systems thinking (e.g., causal loop diagramming or archetypes, stock-and-flow simulations, team learning, alignment around shared vision and the search for leverage points). Think *sending a rocket to the moon*.



In general, complex challenges call for application of complexity-inspired management (e.g., good-enough vision, multiple actions, minimum specifications, seeking out paradox, and building on emergent direction). Think strategies for *raising a teenager*.

Both offer fresh and practical approaches to leadership challenges.

### **Illustration: The Paradoxical Work of Patient Safety Leaders**

Complexity approaches help you to hold two opposed ideas in mind at the same time... while still maintaining the ability to function. The challenges often lie in the heart of paradox – a statement or situation that is seemingly self-contradictory or impossible, yet expressing truth. For example, the paradoxical work of leaders includes:

- Designing an efficient, evidence-based process that minimizes what might go wrong... while creatively adapting to whatever surprises might unfold
- Successfully advancing high-tech clinical capabilities with complex patients... while knowing that it creates more risk and raised expectations for error-free performance in mundane day-to-day operations
- Knowing that the safest systems are those that accept error and reward people that report unexpected events... while it is difficult to accept the suggestion of any error whatsoever in health care
- Working with regulators that need to identify poor performance and discipline sub-standard practitioners... while knowing that accidents and surprises are a normal, inevitable part of any complex system
- Trying to develop reciprocal or shared accountability for improved outcomes among patients, families, regulators and providers... while many current initiatives have a singular focus on holding providers accountable

When leaders hold a paradox – not sweeping it under the rug NOR taking on all the responsibility for it – it creates an opportunity for everyone to reframe the challenge in way that creates positive movement forward. Leaning into paradox is a group activity that knocks people out of their comfort zones.

Paradoxes are absurd at times... but both sides of issue are valid. The challenge is to learn how to address both sides in an integrated manner. Inspired leadership *co-arises and emerges* as a leader and a group addresses both sides of the paradox at the same time. More wicked questions posed by safety leaders offer great examples:

- How can we “stop the line” and keep it going?
- How can you remove “the wrong people on the bus” in a blame-free culture?
- How can we improve surgical outcomes when we are already the best?
- How can we maintain autonomy and build toward standardization?



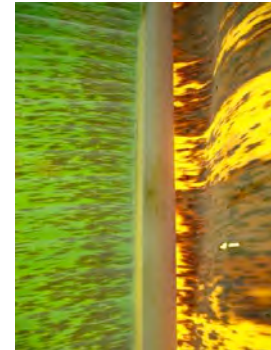
As Albert Einstein suggests, “make everything as simple as possible, but not simpler.”



**Leadership and Facilitation to Match Your Challenges**

*It is not because things are difficult that we do not dare;  
it is because we do not dare that they are difficult. Seneca*

*I suspect that by not merely accepting an unforeseeable future,  
but by building it into my life, I may come closer to living a true life  
than those who struggle against it. E.B. White*



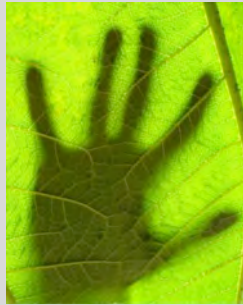
The table below contrasts and simplifies responses to diverse tasks facing leaders. In work settings, the dynamic movement from simple-to-complicated-to-complex and complex-to-complicated-to-simple is far less clear. Nonetheless, it can be helpful to make these distinctions in a learning process.

<b>Simple-To-Complicated Tasks</b>	<b>Complex Tasks</b>
<u>role defining</u> – specify job and task descriptions	<u>relationship building</u> – illuminate and work with patterns of interaction
<u>conflict management</u> – restore order in each part	<u>uncovering paradox</u> – work with conflict and tension as source of creativity
<u>tight structuring</u> – use chain of command and formal structure	<u>loose coupling</u> – make informal connections & link communities of practice
<u>simplifying</u> – prioritize or limit simple actions	<u>complicating</u> – add more degrees of freedom and take multiple actions
<u>socializing</u> – seek homogeneous values & ideas	<u>diversifying</u> – draw out positive deviance & exploit difference
<u>decision making</u> – find the “best” choice	<u>sense making</u> – seek collective interpretation that fits local context (many right answers)
<u>knowing</u> – decide & tell others what to do	<u>learning</u> – act/learn/plan at the same time... acting your way into new thinking
<u>controlling</u> – tightly managed execution guided by maximum specs	<u>improvising</u> – acting in an instant guided by minimum specs
<u>planning via forecasting</u> – predict, plan , & then roll out	<u>creating robust adaptive strategies</u> – co-evolve, patch together and hedge strategies
<u>staying the course</u> – align & maintain focus	<u>noticing emergent direction</u> – expect surprise, build on what works, quickly stop what doesn’t

*Adapted from Ruth Anderson & Reuben McDaniel, Jr. by Keith McCandless*

**Illustration: Min Specs**

In contrast to maximum specifications, minimum specifications (Min Specs) can draw out creative adaptability in people and organizations. This is a powerful lesson for leaders.



Minimum Specs foster innovative solutions. Less is more. The Specs provide simultaneous direction and freedom (e.g., the 10 Commandments, *First, do no harm.*). Creativity within -- and stimulated by -- simple boundaries.

The Min Specs below, developed by a group led by Julie Morath at Children's Hospitals and Clinics in Minneapolis, are designed to encourage distributed control and creative adaptability at the front line.

- Fix what you can
- Tell what you fixed
- Find someone to fix what you cannot

While min specs seem simple, they are developed through ongoing conversations among people directly involved in the work.

The group of people that developed these min specs wanted to reduce the number of potentially unsafe "workarounds" and increase communication regarding safety practices-in-progress.

**Illustration: Discovery & Action Dialogue**

Hospitals have used Discovery and Action Dialogue to improve individual and collective mindfulness to small errors and differences. The following questions, used on hospital units, have helped unleash grass-roots-up self-discovery. Safe practices emerge directly from people taking action on the units. As a result, the new behaviors are self-sustaining. There is no resistance to change when it is discovered and vetted within your own unit by peers!



The questions used on units include:

1. How do you know or recognize when MRSA is present?
2. How do YOU protect yourself and others from MRSA transmissions?
3. What prevents you from doing this or taking these actions all the time?
4. Is there anyone you know who is able to frequently and "effortlessly" prevent transmissions?
5. Do you have any ideas?
6. What needs to be done to make it happen? Any volunteers?
7. Who else needs to be involved?

Dialogue facilitators learn to let go of pre-determined aims, relying on members of the unit to generate and take responsibility for their own solutions. Self discovery and ownership trump buy-in!

The Plexus Institute ( [www.plexusinstitute.org](http://www.plexusinstitute.org) ) has sponsored this effort in collaboration with the Positive Deviance Initiative and the Centers for Disease Control. Early results show a 35% annual decrease in incidence of MRSA in 5 beta site hospitals using the approach! [2]

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## Leader As Explorer: Into the Thicket You Go

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... those who can most truly be accounted brave are those who best know the meaning of what is sweet in life and what is terrible, and then go out undeterred, to meet what is to come. Pericles

'I am very brave generally,' he went on in a low voice: 'only today I happen to have a headache.' Tweedledum in Through the Looking Glass, Lewis Carroll

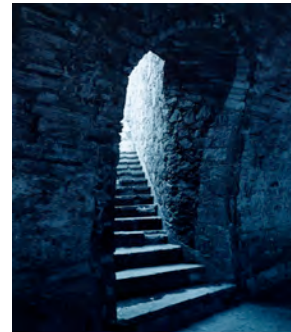


So, into the leadership thicket you go: challenged by the inner tangle of knowing yourself and the outer tangle of organizational life. Leadership calls out for strength, humility, and firm resolve in the face of the unknowable. Complexity is not for the light-hearted. It calls for, and inspires, leaders and followers to *safely take risks!*

Organizations seem to gravitate toward leader-as-shepherd, leader-as-warrior, or leader-as-fortune-teller. Many people seem willing to entertain flimsy promises of certainty and smooth sailing ahead... given no alternatives. Protection from harsh reality has been elevated over skillful exploration of the unknowable, the unquestioned, and the unimagined territory that lies in front of leaders.

Caring deeply enough to risk changing the order of things – while not knowing in advance what direction will emerge – takes tremendous courage. It also calls for deep trust in the creative adaptability and collective imagination of people. It is a “no holds barred” path to greatness; a path toward a new way of organizing and leading safely while taking more risks.

Few people ask to go on a journey in which the destination is not clearly known... even less when the path hugs a precarious edge between what is known and what is barely-imagined and yet-to-be. It is best explored collectively and mindfully. This is a challenge in which no one person – no one leader – is smart enough, but everyone together is.



*I can never be what I ought to be until you are what you ought to be, and you can never be what you ought to be until I am what I ought to be.*  
This is the inter-related structure of reality. Rev. Martin Luther King, Jr

~ end ~

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[1] Brenda Zimmerman, Frances Westley, Michael Quinn Patton, "Getting to Maybe (2006). Random House Canada.

[2] Unpublished data compiled by the CDC for 5 hospitals in a RWJF grant to the Plexus Institute.

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Additional articles in a complexity-science-inspired series by Keith McCandless (available @ [www.liberatingstructures.com](http://www.liberatingstructures.com) )

**“Mastering the Art of Innovating: A Funny, Wonderful Thing Happened on the Way to My Deliverable!”** (2006) with Linda DeWolf. Illuminating the interplay of make-it-happen and let-it-happen innovation strategies among nine innovation grantees.

**“Working Confidently Without A Script: Layers of Letting Go and Letting Come,”** Keith McCandless, 2006. Exploring how to be in-charge-but-not-in-control and work confidently without a script.

**“Oil, Water, Apples, Oranges: Bootstrapping Innovation with Social Networks,”** (2005) with Linda DeWolf. Creating a vibrant learning network and community-of-practice to advance innovation practice among grantees of the VHA Health Foundation.

**“Surprise & Serendipity At Work: Managing the Unknowable Future,”** (2002) with Jim Smith. Scenario-planning insights with a complexity twist at Group Health Cooperative.

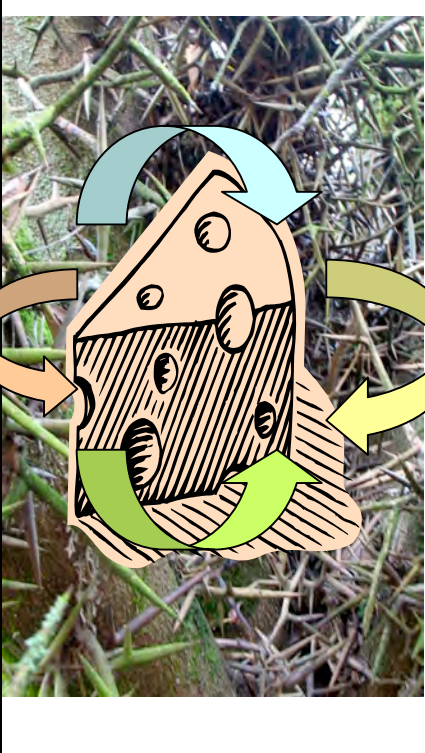
**“Conversation As A Creative Advance Into Novelty; A Collaborative Hunch-In-Progress,”** (2002). Exploring how dialogue unleashes creative adaptability and resilience via Seattle’s public Conversation Café movement.

**“Reliability, Resilience and Results in Operations: Designed Autopilot and Collective Mindfulness At Work,”** (2002). Exploring behaviors that help people collectively and mindfully respond to surprise and complexity.

**“Integrated-Autonomy: From Shilly-Shallying to Unleashing System Vitality,”** (2002). Reflecting on the paradoxical development of distributed systems, moving beyond “bi-polar swings” between decentralized and centralized strategies.

**Bonus Material**

**CONNECTING THE FULLY DISTRIBUTED “DOTS”**

<b>Latent and Nascent Errors</b>		<b>Latent &amp; Nascent Solutions</b>
<p>Common Sources... <i>Fully Distributed &amp; Interacting Across the Organization</i></p> <p>small, isolated variations and surprises</p> <p>simple workarounds</p> <p>slight differences... may not travel across silos</p> <p>subtle misunderstanding, often unnoticed</p>		<p>Common Sources... <i>Fully Distributed &amp; Interacting Across the Organization</i></p> <p>taking responsibility, owning problems, sense-making</p> <p>self-organized solutions at the front line &amp; in units</p> <p>sharing information freely across units &amp; functions</p> <p>collective mindfulness &amp; responding in the moment</p>

□ Safety challenges are often more entangled and distributed than Reason’s “Swiss cheese” model suggests. The good news: latent and nascent solutions emerge when people are fully engaged at the front lines. **The massively entangled “source” is also where solutions arise.**