Cultivating Complexity

How I Stopped Driving The Innovation Train And Started Planting Seeds In The Community Garden

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September 2017

The next big thing isn't innovation in library technology, spaces or collections—it's reassessing our organizational structure.

The last two decades have ushered transformative change across libraries. We have reimagined collections, revolutionized spaces, introduced numerous technologies, and greatly expanded our service offerings. Yet despite all of these advances, our organizational structures have remained largely the same.

This paper serves as an invitation to explore evolutionary paths for academic and research libraries. I offer my leadership journey as a conversational example, moving from a focus on productivity and serving as a driver of innovation toward a role as facilitator and gardener, helping to nurture the work environment to grow more organically. By rethinking how we interact with our colleagues, we can cultivate a more creative culture that enables us to be more resilient and better situated to tackle the complex and unpredictable nature of the work that lies ahead.

PROLOGUE: KEEPING THE TRAINS RUNNING ON TIME

At the start of World War I, Germany faced an administrative dilemma. They wanted to mobilize quickly to enact a preemptive strike, but like all armies of that era they had to rely on trains. Moving troops required precise planning for weeks, months, and sometimes even years ahead because railroad timetables were fixed. If something went wrong or if they got behind schedule, the result could be an insurmountable setback. Moreover, if the war strategy changed, for example if the Germans wanted to mobilize against Russia instead of France, the planning and execution could take up to six months as they contended with established and often conflicting timetables. By then it could be too late.

When I encountered this historical scenario, detailed in A.J.P. Taylor's provocative thesis *War by Timetable*, I reflected on my own administrative predicaments: trying to mobilize the right resources to the right places at the right times. [1] I often felt like an engineer, conductor, and stationmaster rolled into one. I was driving an innovation train and all the moveable parts had to operate with tight precision. Momentum was everything as we tried quickly to launch new initiatives.

My job involved allocating resources, plotting the course, setting the timetables, and making sure everyone was onboard. Organizational delays could cause major backups down the line. If things didn't go according to plan, services could be interrupted, postponed, or even canceled. Once plans were established they were often inflexible based on a fixed budget cycle, windows of time during the semester, availability of staffing, or other contributing factors. And if someone missed the train they could be left behind.

My work required elaborate calculations and constant recalibration. I was responsible for keeping the trains running on time and making change happen.

OUTLINE

THE EFFICIENCY PROBLEM

How can I use my time more efficiently? I've been obsessed with this question for years. I was convinced that getting just a little more organized would make me so much more productive. I enthusiastically tried many different project management methods, but they always ended in frustration. I felt like I was spending more time managing my task list rather than actually doing the tasks.

I arrived at a breakthrough when I reviewed exactly how I was investing my time. For two weeks I chronicled my life in fifteen-minute increments and came away with two key insights.

First was the realization that I had foolishly thought I was in control of my time. I discovered that my priorities were constantly shifting. Things with a two-week deadline could suddenly be due in two days. Programs that were pressing initiatives one day could evaporate overnight. And whenever changes occurred, unexpected ripples always seemed to require my immediate attention elsewhere. No matter how well I planned I was always playing catch-up in the real world.

The second insight I gained was that the majority of my time was invested in teams.

Planning agendas. Attending meetings. Drafting documents. Writing proposals. Responding to emails. Providing feedback. Brainstorming ideas. Solving problems.

Even when I was working alone it was usually part of a group effort. My interdependence on others raised the level of uncertainty and resulted in continuous change. Precision planning was nearly impossible since the target was always moving.

Efficiency is something to strive for when things are stable and predictable, but my environment was volatile, nonlinear, and increasingly complex. This growing awareness caused me to rethink my objectives. Instead of asking "how do I manage my time better?" I shifted to thinking about how I could help teams succeed more fluidly. Reframing the problem was transformative for me. It helped me to recognize that different teams required different things at different times. Some groups could generate compelling ideas but needed help focusing. Other groups were stuck in a rut and required a creative spark. This revised perspective drew me into the psychology, politics, and mechanics of group dynamics. I needed to get better at understanding how we worked together, not just what we were doing.
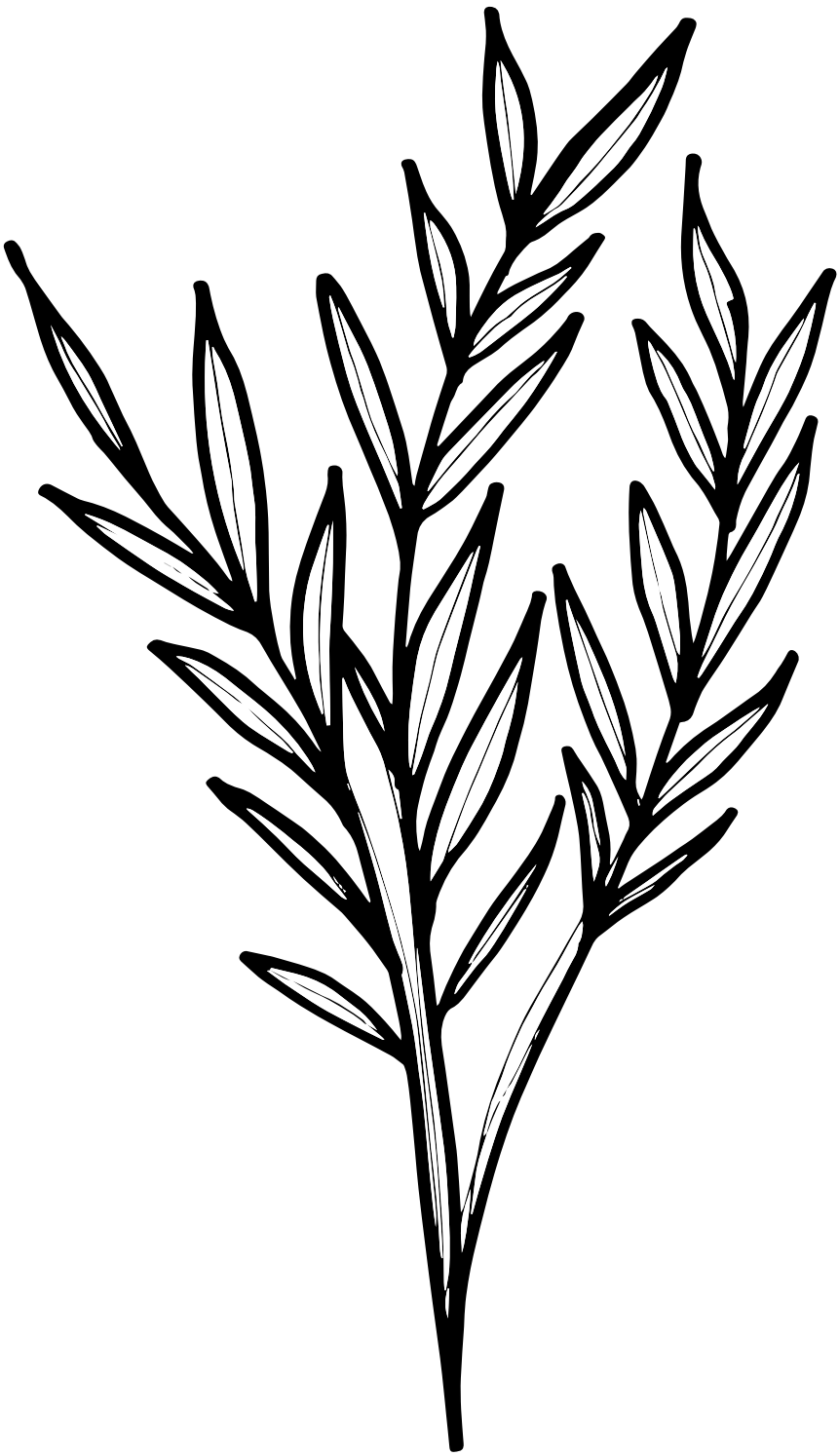
WHAT GAME ARE WE PLAYING?

Some patterns emerge when you start paying close attention to teams and how they operate. This was particularly evident to me while watching the Olympics and observing the different types of teamwork on display. For example, the gymnastics team competes individually and their scores are later combined. Whereas in soccer, the players worked collaboratively over an extended period of time to earn goals.

We often use words like team, group, committee, and taskforce as if they all mean the same thing. But in truth, there is a lot of variance in how they operate. Sometimes we divide all the work that needs to be done and assemble it together in the end. Other times the effort is more integrated and we make decisions together as a project moves forward.

I stumbled upon the book *Game Plans* by Robert Keidel, which expounds upon this idea in a compelling manner.[2] His overarching message is that *structure should follow strategy.* Essentially, we should organize a team and how it functions based upon the ideal degree of engagement. Work requiring a lot of iteration will be performed differently than work that is routine or that only happens once in a while.

Keidel uses baseball, football, and basketball as models for common team structures.

- Baseball is a collection of individual players. The athletes have a lot of autonomy and their actions are situational. While some minimal interaction occurs the accumulation or pooling of independent efforts defines the gameplay.

- Football teams operate as tightly controlled hierarchies. The players have distinct roles and responsibilities, and they are heavily dependent on each other. The emphasis is on comprehensive planning and coordination—and the execution of those plans. Gameplay is sequential, consisting of incremental progress marked by measureable objectives.

- Basketball involves continuous movement and constant adjustment. Players adapt to unforeseen conditions with a high level of interdependence. The action is reciprocal and the gameplay features a lot of back and forth movement and bursts of spontaneity.
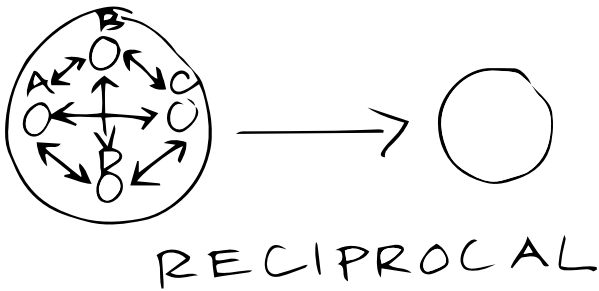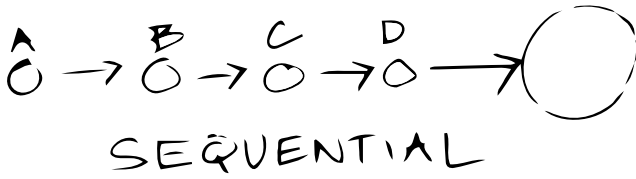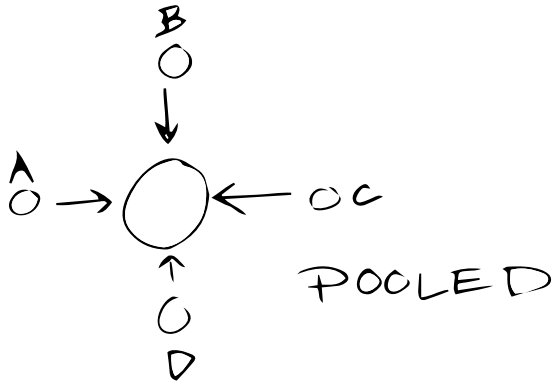
three forms of
team interaction

BASEBALL (pooled)

FOOTBALL (sequential)

BASKETBALL (reciprocal)

based on Game Plans, Keidel

B

A → ○ ← ○ C

D

POOLED

A → B → C → D → ○

SEQUENTIAL

RECIPROCAL
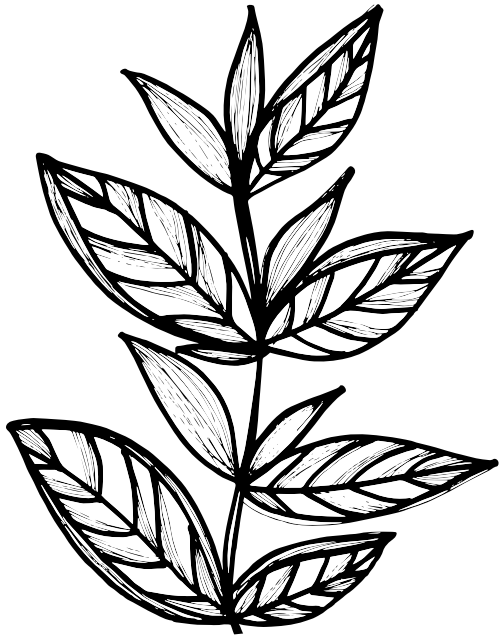
To help teams be successful I first needed to figure out what type of game was being played. Was the group structured in the best way to achieve the intended outcomes? For example, if individuals were accustomed to operating very independently and were now given a group task requiring cohesive collaboration or a more formal hierarchical arrangement, they might struggle to move forward. This would be similar to baseball players starting to play basketball or football without any practice or proper coaching.

This insight encouraged me to think more about what we were trying to accomplish on a project. Were we launching something new or on improving an existing model? Was our purpose to scope out an opportunity or to fix a problem? Were we generating ideas, evaluating possibilities, sharing updates, or making a decision? The structure of a team's dynamics had a direct impact on what we were trying to do and how we did it. Accordingly, when things didn't go well in a group it was often because of misalignment. Teammates might actually be playing different games. Imagine a gathering of baseball, football, and basketball players assembled with no clear guidelines other than to score points and win the game. But what sport are they playing? What are the rules? What does the field look like?

Undoubtedly there would be misunderstandings and much confusion. I've participated in teams that operated with this type of chaos as well as ones with champion stride. Perhaps you can relate as well? I've realized that the structure of our interactions is probably the most important part of the group experience.

WHEN THE MACHINE BECOMES OBSOLETE

I used to think that being an administrator was similar to assembling a puzzle. You had all these interlocking pieces to shuffle around. *Job descriptions. Reporting lines. Performance reviews. Pay bands. Merit increases. Budget allocations. Offices.* I saw my job as creating an inspiring vision, the big picture, and then persuading everyone to help me put it all together. Occasionally there were disagreements of opinion on how certain pieces aligned, and sometimes even different views on what the big picture ultimately looked like.
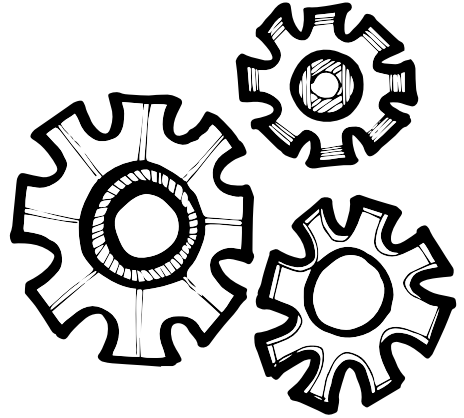
I started reading about this topic and learned that this approach is considered "organization as machine."[3] Managers resemble mechanics overseeing the infrastructure, and their employees are human resources that keep everything running. Everyone fits into classifications within a formalized structure. The objective is to provide a degree of order to maximize efficiency with all the various pieces fitting together like a well-oiled machine or a perfectly assembled puzzle.

In this environment, administrators formulate the overall strategic direction, and an accompanying series of goals, metrics, and milestones cascade down the line.

For the most part, libraries impose this command and control structure with a barrage of ranks and titles including deans, directors, managers, unit heads, team leads, and various coordinators. It can feel like a factory, and introducing performance-based budgets and responsibility-centered management funding models further lends an industrialized impression to our work and how we perform it.

The danger here is the presence of a mechanistic mindset, which assumes that everything fits together like clockwork. This system promotes a reductionist perspective, the belief that all work can be broken down into the most basic elements and measured accordingly.

In this context, employees are assigned and trained to do a few discrete specialized tasks, and individuals are treated as interchangeable. My concern is that this leads to tunnel vision: people no longer perceive how they are contributing to a larger mission and instead only focus on completing the tasks they are given. This approach, while great for efficiently, hinders creativity, autonomy, engagement, sharing, and participation.

While the mechanist mindset is ideal for delivering faster output and incremental improvements, it doesn't work well in a dynamic environment that demands constant change and reconfiguration. If you have an automotive factory and want to shift from producing Car A to Car B, that might require some slight modifications. But it would be a different story if you intended to change the factory into a garden, a hospital, or a zoo. The workflows and environment required are completely different and the formerly essential machinery is now incompatible.

Perhaps another way to view this is to imagine organizational structure as a computer operating system. [4]

Occasional small updates need to be installed, but for the most part those are unnoticeable. On the other hand, every once in a while entirely new systems revolutionize everything. Think about the evolution from MS DOS to Windows 3 and the change from Windows XP to Windows 7. The look and feel between those systems is drastically different. Profound changes impacted nearly every aspect of the user experience, from speed and storage, to interfaces, range of applications, interoperability, and the overall ease of use. I could probably find a way to run an early version of Windows on my iPhone, but why would I want to? That's how I'm starting to feel about legacy organizational structures in libraries: we are running an obsolete operating system.
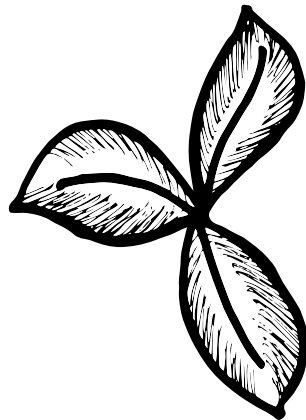
SEARCHING FOR COMPLEXITY

I knew I wanted to see organizational change, but what should it look like? I put a lot of thought into the type of culture I wanted to cultivate: one that fostered creativity, autonomy, collaboration, and productive risk-taking. Colleagues I spoke with about these values seemed excited. But in practice change was much harder to achieve. It become evident to me that a hierarchical organizational structure was an inhibitor rather than an incubator of the qualities I wanted to promote.

A traditional hierarchy is based on predictability, yet our work is becoming much more dynamic. Similar to the word "teams," I found that we were using "complex" to describe many situations. But what does that really mean? Complexity is one of those amorphous words that has different associations for everyone. I dove into the literature and quickly landed amidst mathematical formulas and abstract theorems.[5] But when I stepped back I noticed several overarching themes that started to give shape to my understanding of complexity:

- Multitudinous (a large number of interacting parts)
- Non-linear (activities occurring in a non-sequential manner)
- Dynamic (constant change)
- Emergent (things arising unexpectedly)

Weather, war zones, viral outbreaks, traffic, stock markets, and ecological systems are often given as examples of complex phenomenon. So, do libraries meet these criteria? When I look across the organizational chart at my institution I see a handful of software engineers, systems developers, and web programmers. We employ data curators, data analysts, data informaticists, and data visual designers. One of my teams has an exhibit curator, an engineer, a learning space assessment specialist, an applied technologist, an ethnomusicologist, and a special events coordinator. This composition of skills and abilities illustrates how the roles and boundaries of our organizations are expanding and morphing. The complexity arises not just from what we are doing but also from the nature of the relationships and interrelatedness between new directions and the emerging service models that are unfolding.

Besides the evolving workforce, our physical environments are changing,

with many new partnerships taking shape. If I walk through the main library at Virginia Tech I encounter a Writing Center (Department of English), a Communications Lab (Department of Communications), an Assistive Technologies Service (Campus IT), a Scale-Up Classroom (College of Science), a Digital Humanities Classroom (College of Liberal Arts and Human Sciences), and two Interactive Sound and Intermedia Studios (Institute for Creativity, Arts, and Technology).

Additionally, we are in the planning stages for a data theatre, an innovation and entrepreneurship cluster, a digital literacy classroom, an Internet of Things studio, and an immersive simulation laboratory. These new partnerships align with our current network of studios, which include spaces for 3D design and printing; data visualization; virtual and augmented reality; learning and instructional design; digital media; and undergraduate research. In addition to these programs, a handful of pop-up services emerge throughout the year, including IT support, career and resume assistance, statistical advising, intellectual property consultation, academia integrity sessions, and a host of tutoring services. Managing across this environment is complex, not just because of the wide range of expertise,

but also because of varying objectives and perspectives. Our campus partners have diverse motivations, outcomes, metrics, workflows, priorities, communication styles, service models, and funding streams. There are also different cultures at play: some focus on compliance (getting things done in a certain way) while others are more grounded in exploration (self-discovery, experimentation). Some are very transactional (quick and routine), and others are relationship-bound (ongoing progress).

DESIGNED FOR THIS
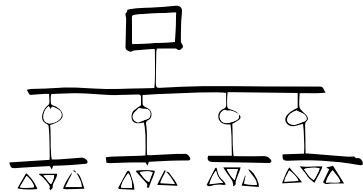
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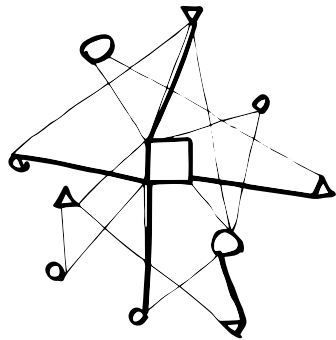
based on Team of Teams, McChrystal

As I embarked on my journey into the nature of complexity, my objective was to uncover techniques that would enable me to be a better leader, not just a train conductor, and help my teams succeed in this unpredictable environment. Below are a few frameworks that I found useful.

A concept that struck a chord was **"the edge of chaos."** Think about the boundary between order (things operating smoothly) and chaos (things are wildly unpredictable). Along that line is a figurative edge that I always felt I was tiptoeing across.

When operating in a mechanistic hierarchy with a top-down management style, your job is to keep things in order and to squash chaos. But if you are trying to innovate, then occasionally you have to cross the frontier intentionally and operate within chaos for a period to expand the boundary.

You can't avoid chaos, but what do you do when it emerges? Do you ignore it? Do you minimize it? Do you embrace it? To operate successfully in a complex environment we must accept that chaos is present and work to develop resilience, allowing it to propel us in seemingly unexpected directions.
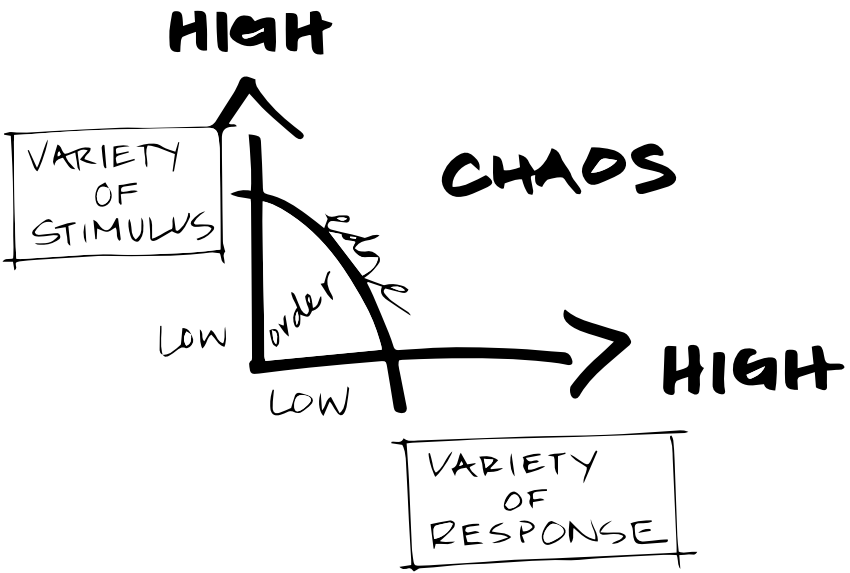
Another concept I found helpful was **VUCA**.[7] It developed during the post-Cold War era to reflect the confusing relationship between the United States and Russia. It has since been adopted more widely to describe the ever-changing circumstances across the global landscape.

VUCA stands for:

- Volatility (a high rate of change for an unknown duration)
- Uncertainty (lack of clarity about present and future circumstances)
- Complexity (multiple factors impacting key decisions)
- Ambiguity (fluctuating interpretations about the meaning of events)

VUCA

My Learning Environments team recently faced a VUCA situation one summer when preparing to open three new studios. Each location required a different type of renovation and had different contractors on various schedules. The studios each needed a different assortment of equipment, technology, software, and furniture, which had to be purchased across two fiscal budget cycles and outfitted by a handful of different vendors, each with their own processes, procedures, and timetables. The team had to recruit, hire, and train nearly twenty student assistants, and develop workflows, policies, marketing plans, service models, and assessment metrics.

All of this had to happen quickly and without a clear sense of how the studios would operate or define success. A number of professors were counting on these services being available for their students. On top of all this we had a very small budget -- in fact, we only had enough student wage money to cover half the year and therefore we needed to acquire additional funding to keep the doors open.

The VUCA model helped us because it provided a common vocabulary to express our concerns, frustrations, and the atmosphere under which we were operating. More often than not, our studio team didn't find clear answers to the questions we posed; yet we still had to move forward.
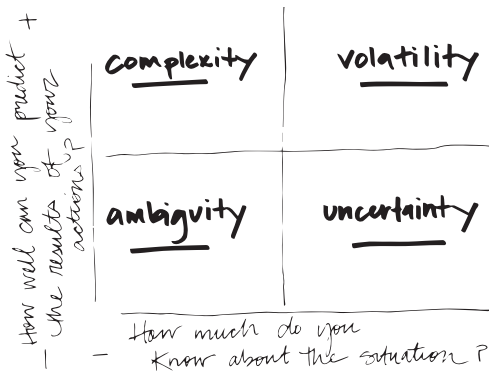
It was very much a bootstrapping "wait and see" situation, since many aspects were constantly shifting in non-linear fashion. But, by acknowledging what we were up against, we could communicate more effectively and adapt with greater ease. The spirit of "attempting the impossible" became a motivating factor and built camaraderie during an extraordinarily stressful set of circumstances.

Different situations call for different leadership approaches, and the **Stacey Matrix** is a useful tool for determining the type of problem you are facing.[8] This framework helps to distinguish between "complicated," "complex," and "chaotic" conditions, offering advice on the nuances of each scenario. The horizontal axis measures the range of certainty, while the vertical one measures the level of agreement among teammates. As you move further away from agreement and certainty the more complex the situation becomes.
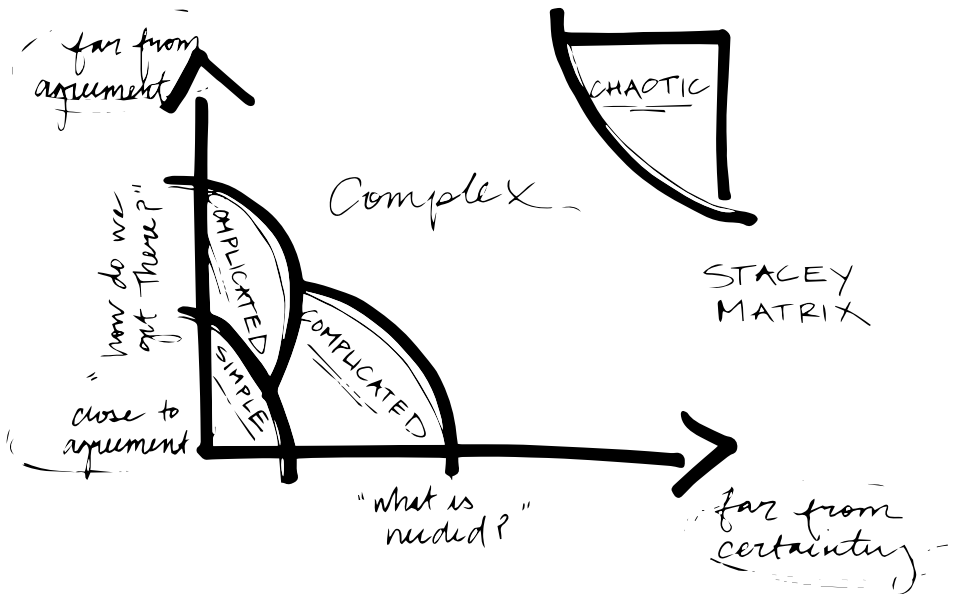
The Stacey Matrix encourages us to get to the root cause of conflict arising from disagreement. Is there a difference of opinion on what needs to be done (the outcome or program), or is the disagreement centered on the best way to go about achieving a shared goal? Comparing notes with your teammates helps pinpoint where divergence lays.

Imagine that you are planning a new digital scholarship center: is the emphasis on supporting research endeavors or educational initiatives? Is it an open commons or a closed office space? Is it a classroom setting or a digital project workspace? Do we offer consulting or is it a partnership model? Are we teaching people how to use software or are we a full service shop offering to do the design and coding for them? Is our primary audience the digital humanities or do we cater to other disciplines as well? Is the furniture flexible or fixed? Can faculty and students drop in or should they make appointments? Do we have a cost recovery model or is it free for everyone? Is our success measured by the number of users helped, by the depth of projects supported, or by the amount of grant funding acquired? Does one library department run this service or is it managed by a cross-functional team?

Obviously, there are many more questions to explore in shaping such a program and its related operational policies. From this scholarship center example you can see how disagreements and assumptions could emerge. Team members could plot this type of situation on the Stacey Matrix and determine how close they are to being on the same page.

Here's another way to think about this: let's say you're taking a family vacation. Are you in agreement about where you're going? Beach? City? Campsite? Resort? Museum? Mega Mall? Is your mode of transportation flying, driving, or riding a train? Upon arrival are you renting a car, walking, biking, or using rideshare options?

If you don't yet have a shared sense of where you are going and how to get there, then the situation is considerably complex, perhaps even chaotic. The interplay among all the variables is unpredictable, and traditional planning is pointless. Instead of trying to control the entire activity upfront, the leader is encouraged to use an iterative process. By taking a series of small, incremental steps, the group determines if it is moving in the right direction. Are we getting hot or cold? Returning to the vacation scenario, your family might start heading toward a particular destination, figuring out on each leg of the journey what each person wants to get out of the experience and navigating accordingly.
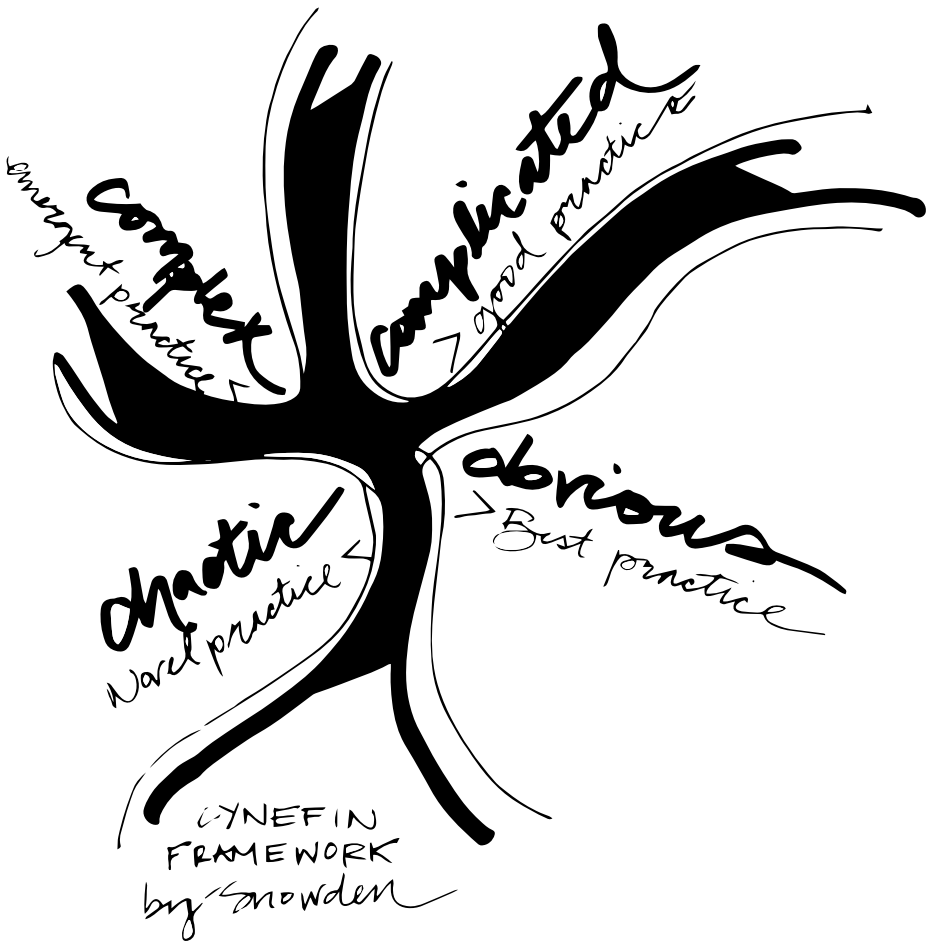
The final framework under consideration is **Cynefin**.[9] This Welsh word signifies that multiple factors in our environment influence us in ways we can never understand. It is similar to the Stacey Matrix in terms of offering different classifications of situations:

- An activity is obvious when the problem is well understood and has an established solution. In this case, you would diagnose the situation, categorize the problem, and respond with a best practice or other prescribed process.
- An activity is complicated when diagnosing the problem and finding a good solution requires expert knowledge. Here you need to get a sense of the situation, analyze the problem, and respond by determining and applying a plan of action.
- An activity is complex when both the problem and solution are mostly unknown. The best approach is to probe the environment, analyze the feedback, and respond with another experiment until you uncover a workable solution.

An activity is chaotic when both the problem and the solution are completely unknown. Your best option is to take immediate action by quickly prioritizing and solving a part of the problem, analyzing the situation, and moving on to the next prioritized issue or to a previously undetected demand.

Exploring the complexity landscape was helpful in my leadership development. These frameworks enabled me to better assess situations and determine more suitable strategies. Complexity became something to cultivate, not fear. The critical takeaway for me was that I had to be okay not being in control, that is, not always setting the agenda, making decisions, or delivering the answers. Likewise, I could not expect my colleagues to figure out everything themselves or to know what I was thinking.

When operating in a complex scenario, we can't always rely on past experiences or benchmarking to guide us. In these situations, top-down mechanistic structures only impede our progress. Circumstances often place us well beyond the edge of chaos, and all we can do is probe for answers together and allow the circumstances to unfold before us. Our challenge now is to create a structure that allows these interactions to happen more naturally.

complex
emergent practice

complicated
→ good practice

chaotic
Novel practice

obvious
→ Best practice

CYNEFIN
FRAMEWORK
by Snowden

ORGANIC EVOLUTIONARY ECOSYSTEMS

If the current operating system is inadequate for the work emerging across libraries, what's the alternative? I tinkered with elements from other systems, ranging from self-directed teams and consensus-driven decision-making, to extremely flat structures. I tried agile processes and even ample amounts of self-management. But something was missing. Nothing worked the way I had hoped.

Looking back, it was like searching for the Holy Grail: a brilliant blueprint offering the perfect solution. But as I continued along this quest, I realized I was doing the very thing that I wished to avoid: attempting to design a system to perform the way I wanted it to run. I fell back into the classic top-down mechanistic thinking. I was trying to recalibrate the machine by tweaking the algorithms. In short, I focused on imposing a solution rather than letting one develop naturally as should have been evident to me as the best course of action from reviewing the complexity literature.

Rather than an efficient machine-like structure, I needed something more like an environmental ecosystem.[10] Changing one factor in an ecosystem – increased or decreased rainfall, for example – causes a ripple effect of ramifications. But in these settings, there isn't just one factor at play, but a multitude of them happening simultaneously. These living habitats are in a constant state of adaptation and are resourcefully improvising to environmental changes in creative ways.

Just as natural systems vary (forests, grasslands, deserts, and marine environments) so do libraries. We have unique user populations, geographical locations, curriculum, research agendas, school traditions and cultures, budget allocations, programmatic priorities, and so forth.

> Successful changes in one library won't necessarily have the same result in another, just as a tropical environment has different conditions and patterns than does an arctic tundra.

I'm intrigued by this metaphor and the intentionality of letting things happen organically. Imagine an organization that didn't try to predict and control everything, but instead was well situated for spontaneity and rapid response. Rather than being bound by static job descriptions, strict reporting lines, and the territorial nature of functional units, employees can be free to act upon emerging situations.[11] I discovered that it wasn't an organizational structure that I was seeking, but rather a habitat with the ability to expand and contract accordingly, moving with the ebb and flow of surrounding opportunities.
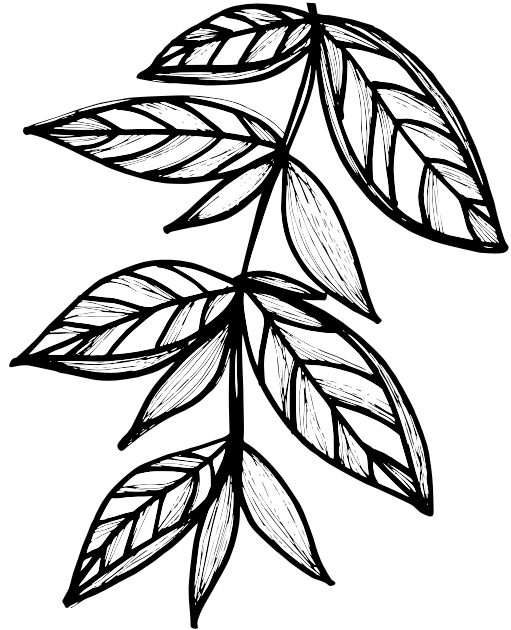
MELTING POTS

As I read about approaches that different types of organizations took to restructure their work, I noticed a pattern that I believe helps move us closer to "ecosystem" thinking. Here are examples that illustrate how four organizations redrew traditional barriers and set off on new directions.

Ford [12] In the 1970s the automaker was struggling. Customer preferences had changed, oil prices were soaring, and Ford couldn't keep up with foreign competition. A major problem they experienced was structural: work was divvied up across several rigid hierarchies, and groups often didn't communicate, much less collaborate. For instance, one department handled the design of exteriors and another oversaw the interiors. The completely separated efforts often resulted in stylistic mismatches and other incompatibilities.

Desperate and nearing bankruptcy, Ford made a radical change by pulling together an all-encompassing team that included product planners, designers, engineers, manufacturers, safety experts, and marketers. Rather than imposing an assembly-line approach, employees worked collectively, continuously testing ideas, features, and prototypes rather than waiting until the car shipped to make any necessary changes. The group, dubbed Team Taurus, went on to build one of the most successful cars in automotive history.

What I find most inspiring about this story is less about the success of the Ford Taurus and more with how the team functioned. They developed a transparent learning process enabling all members to see what others were working on, which afforded them the ability to respond accordingly in real time. They were committed to a single purpose rather than just a limited process.

U.S. Military The Army might not be the first place you look for radical new organizational structures, but they adopted an ecosystem approach similar to Ford's. General Stanley McChrystal, former Commander of Joint Special Operations in the Middle East, outlined his approach in *Team of Teams* [13]. He expressed frustration with hierarchy in that by the time a plan was developed and approved, the battlefield for which it was devised would often have changed,

making it irrelevant. General McChrystal rearranged the flow of information and decision-making. He brought together intelligence analysts, operations experts, logistical specialists, military liaisons, surveillance and reconnaissance operators, airpower controllers, engineers, lawyers, and medical staff all into one physical space. Everyone had top-secret clearance and could present, discuss, and debate ideas openly across the floor.

This approach was extended to teams operating in the field. In practice, soldiers often defined success as completing a specific mission or finishing a project, rather than focusing on the overarching goal of defeating an enemy or winning a war. They focused on where they fit within the organizational chart, frequently to the exclusion of broader initiatives. Military groups often acted at cross-purposes, pitted against each other as rivals with virtually no communication or cooperation. Although the Navy Seals were outstanding at seaborne operations, Air Force Rangers excelled at airfield seizures, and Army Special Forces were unparalleled at hostage rescue, they acted independently and often competed for resources[14]. General McChrystal envisioned a new approach called Team of Teams, which brought about more cohesive coordination, enabling soldiers to understand the broader context and identify natural opportunities for partnerships.
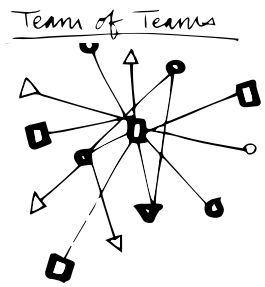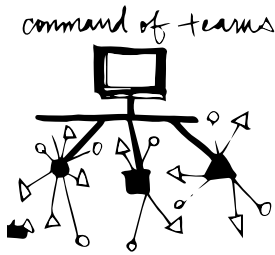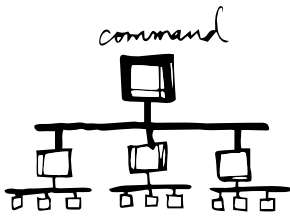
Apple[15] Steve Jobs may be remembered as an autocratic leader,

but he pushed Apple to utilize "deep collaboration" and "concurrent engineering." Similar to Ford and General McChrystal, Jobs advocated a team approach to explore the future of digital music that pulled together people with different areas of expertise, including hardware engineers, interface designers, and user experience specialists. Rather than restricting development in certain categories, the team worked across boundaries and markets to produce a series of product ideas. Their joint efforts led to the creation of the iPod, iTunes Store, and new file formats, among other related products. None of these were part of a grand sequenced plan; they emerged spontaneously and naturally as needs and opportunities arose. The result is that Apple evolved from a niche computer company into one of the largest designers and producers of digital platforms and electronics in the world.

Cleveland Clinic Toby Cosgrove, CEO of the Cleveland Clinic, also used a blended approach when reconceiving how a hospital is organized. Traditionally, numerous departments divide doctors and staff by their professional rank and classification. For example, all surgeons would be grouped together even though they specialize on different parts of the anatomy.

Cosgrove wanted to shake things up. He created a series of thematic multidisciplinary institutes: cancer, respiratory, genomics, and digestive disease to name a few. Like Ford, Apple, and the US Military, this change enabled a variety of experts to look across the totality of a medical condition, not just at discrete parts.

In the *Cleveland Clinic Way,* Cosgrove outlines this model when talking about the spine: "people have been working on the spine for many years in separate departments like psychiatry, psychology, imaging, orthopedic surgery, rheumatology, and so on. But we thought it made more sense to put all these people together."[16] This team-based approach enables doctors, nurses, and other specialists to exchange ideas faster, partner on providing care, and avoids much of the bureaucracy that plagues the traditional healthcare system. An integrated structure enables members to react quickly as situations warrant, instead of passing people back and forth between departments. Today, the Cleveland Clinic is considered one of the premier hospitals in the United States.

I offer these four vignettes to further illustrate the ecosystem concept. It's interesting to see how these *melting pot* approaches succeed across different environments: commercial, medical, and military.

Imagine the different ways that a library could bring together its staff.

Instead of assigning individuals to limited mechanistic roles, we could develop a more holistic strategy that reaches out across the wider teaching, learning, and research enterprises.

This shift places greater emphasis on discovering the activities of our communities and positioning ourselves to engage through multifaceted interactions.
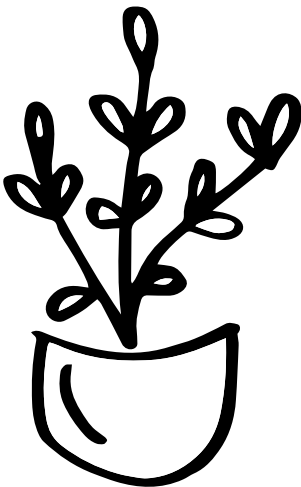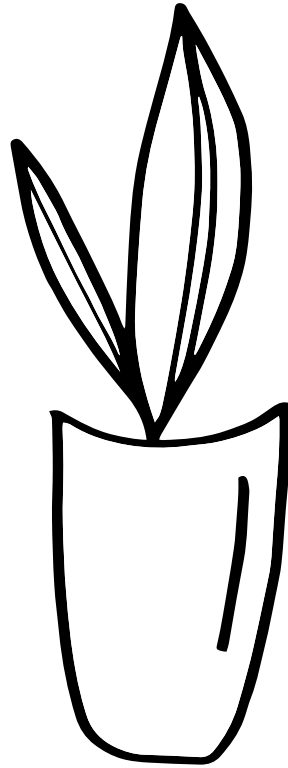
EIGHT CONVERSATION STARTERS

A question I often get is: "How do you make these types of changes happen?" It doesn't occur overnight. In fact, you can't really direct it. Organizational transformation isn't like a piece of software you can download, install, and run. The emphasis is on shaping the social and psychological environment where the flow of energy and a sense of working toward building something together are your best tools. Personal ownership, engagement, and momentum: these are the organizational qualities that matter most. When people feel invested in their work, amazing things tend to happen, far beyond preconceived expectations. I find this approach is more effective than being managed by someone else's objectives and outcomes.

Here are eight topics that can serve as conversation starters for exploring a suitable ecosystem for your organization.

1. *Lateral Thinking*[17]

Lateral Thinking is the cornerstone for this type of change. I don't think you can thrive in a complex environment without it. The basic tenet holds that we often have a particular way of looking at a situation when in truth there are a multitude of perspectives we could take. Lateral Thinking is both a methodology and a mindset, inviting us to consider a wider spectrum of possibilities beyond the obvious ones. A key requirement is the willingness to explore unlikely solutions, the notion being that they might enable us to discover something unimagined.

When I talk with colleagues I often frame this concept as journeying into multiple universes. *What if we did this? Or that? Or: here's something that might sound strange but...* Rather than mechanically following a well-worn path we should allow ourselves to scout along the fringes. Think of this as improvisational theatre: seeing the many directions an idea might take you. Lateral Thinking helps us generate new concepts and go even further by exploring and shaping those possibilities. The process affords us the freedom to challenge established patterns of thought and to rearrange information from diverse points

STRUCTURED | ACTIVE
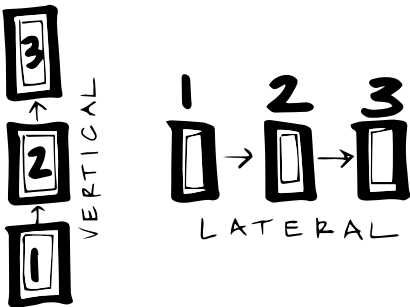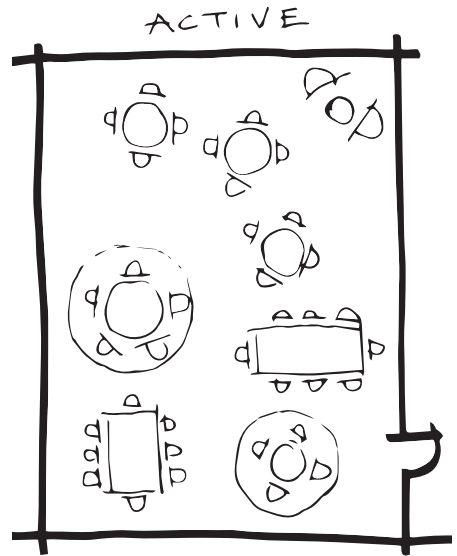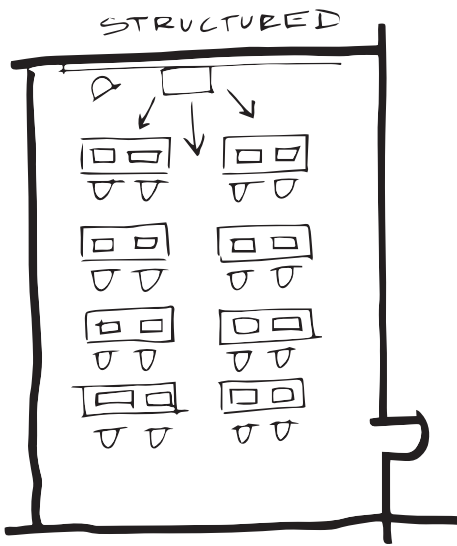
Here is a tangible example. Near the end of each fiscal year we would often consider incremental improvements for our library classrooms. *Could we purchase faster computers? Additional software? More comfortable chairs? A new projector?* But when we stepped back and asked "What if we could start over?" an entirely new conversation emerged. We removed our stationary rows of desktop computers and reimagined our classrooms to support multiple pedagogies and learning preferences. We purchased flexible tables and seating, a cart of laptops, mobile whiteboards, and several large wall–mounted monitors. When we freed ourselves from thinking solely about what we currently had, we could imagine a totally new concept that better aligned with our actual needs.

2. *Mosaic Landscapes & Webs of Inclusion*[18]

Striving to be more like an ecosystem means that we have to reconceive our organizational structure. This doesn't mean complete disorder. Rather, it challenges us to rethink the relationships between employees and the work that needs to get done. Perhaps the best way to visualize these relationships is with the consulting term MECE (pronounced me-see), which stands for "mutually exclusive and collectively exhaustive." It stems from the basic idea that in a traditional hierarchical system we tend to divide things up into discrete buckets and assign tasks accordingly. Functional units typically have complete control and responsibility for a particular portion of work. And it is usually very clear who does what, with little or no overlap between units.

MECE   **non-MECE**
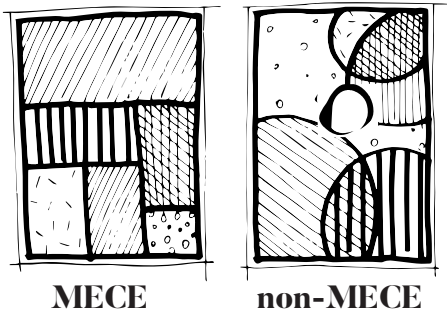
MECE arranges things into nice, neat, tidy categories. And this can be helpful in establishing clear boundaries so that everyone understands their obligations. But the problem is that as librarianship becomes more complex the model is unsustainable. Take liaisonship for example: one person simply cannot address all the needs of an academic department. When you consider the foundation of reference, instruction, and collection management and add in newer programs such as scholarly communication, digital publishing, data management, digital pedagogies, instructional design, grant support, impact metrics, and so forth, it is impossible for an individual to cover everything. A danger that could emerge is that these niche areas could splinter into silos across the organization, each with a different emphasis and sense of priority,

competing instead of cooperating. In a MECE environment territorial skirmishes develop along the boundaries. A non-MECE setting keeps the lines intentionally blurred so as to invite more natural collaboration. Instead of borders we can strive for a more integrated melting pot approach. We can conceive of our organizations as a mosaic landscape or as a web of inclusion that connects and crisscrosses around the work we aspire to accomplish. The value of being non-MECE, as observed in the four vignettes I offered earlier, is that we can blend specialization, accelerate sharing, and look holistically at teaching, learning, and research across entire lifecycles.

3. Dynamic Steering[19]

Most of us use some type of strategic planning process. We speculate about what things could look like in five years and then create a short-term plan to move us toward that projected destination. This effort assumes that we can predict and control the future. But that's an illusion in a complex environment.

While strategic planning can be helpful in unifying an organization and establishing priorities, my concern is that it encourages tunnel vision. If we only invest time and resources into things deemed "mission critical" or the highest priorities today, then we miss out on numerous opportunities that we could not anticipate.

Here is an example from my own experience. In the breadth of one year my team was asked to take on several new major initiatives. These included developing a campus-wide framework to integrate digital literacy across the curriculum. We were also challenged to launch a university-wide ePortfolio program. Concurrently, we were preparing a digital media studio that was transferred to us from campus IT. And lastly, we become a stakeholder of a new classroom building with the charge of developing an active learning curation program. None of these four items were listed on our existing strategic plan. In fact, they were not even on our radar as possibilities. If we had adhered to our plan, we would have missed out on four excellent opportunities to advance our mission.

So what's the alternative? One concept that inspired me is dynamic steering. Instead of trying to predict and control everything, we sense and respond. This approach encourages us to accept that we live in a complex environment where perfect planning is too elusive. It doesn't imply that we move ahead directionless, but on the contrary, that we are guided by a purpose instead of a static plan.

In this context we aim not for the best possible solution but rather for a workable solution that could be implemented quickly and revisited as new information becomes available.

Dynamic steering focuses us on making fast iterations to figure out the feasibility of an idea and then deciding how best to continue moving forward or, alternately, letting it go completely. By staying open to the unexpected, different futures than the one that seemed obvious could emerge.

4. *Liberating Conversations*

Most of our work conversations take one of five forms: the presentation, the managed discussion, the status report, the open discussion, and the brainstorm. These conventional approaches tend to provide either too much control of content or too little structure to include everyone in shaping the conversation. Through a collection of thirty-three techniques Henri Lipmanowicz and Keith McCandless describe as "liberating structures" we can open up communications to foster better idea sharing and decision-making[20].

This framework addresses a handful of questions that many managers and leaders experience. *How do we get employees more involved? How can we encourage participation? How can we empower people to take greater ownership? How do we break silos and reach across boundaries? How do we get more buy-in?*

The answer to these questions is getting diverse clusters of people together to talk over a period of time about a boundless range of topics like Apple did in looking holistically at digital music. *Liberating Structures* guides you through the process. You can explore new possibilities by using a handful of the techniques in different sequences, including: blue-sky thinking, finding actionable solutions, and understanding group pressure points. The authors contend that small changes can generate big results and that simply by shifting our routine patterns of interaction and conversation more people become engaged in solving problems together, driving innovation, and achieving unexpected outcomes.

5. *Co-Discovery & Co-Development*

The best organizational transformation advice I ever encountered is that employees being asked to implement change should be involved in shaping what it looks like. I know that when I'm being asked to do something I put in a greater effort if I understand why I'm doing it and can influence decision-making and development.

Over the years I've been involved with several reorganizations, when employees are moved around because of new strategic directions. These efforts are always difficult. Implementation can be challenging because people are caught off guard.

Even with a logical explanation of why changes are being made, there is always some degree of resistance if the changes are decreed via a top-down process. I have had better success when I didn't impose a new scheme or direction but let it emerge or I gently guided it. This approach generates more buy-in when employees are the ones who detect and recognize an opportunity instead of it being forced upon them.

For example, several years ago I wanted to introduce 3D printing to our suite of library services. I assembled a group and asked them to explore the possibilities and then to implement the service. I had envisioned that it would be free for our patrons and that it would operate like a self-service sandbox. We would provide the hardware, software, tools, and filament, and anyone could come in and dabble with the technology at their own pace.

After experimenting with the technology and conducting a campus environmental scan, the group strongly disagreed with my vision (except for providing the service free of charge) and developed a different approach. I let them run with it, since they would be the ones managing the space and they had far greater technical knowledge and better intuition than I did. They devised a service model, a curriculum, a training program, and
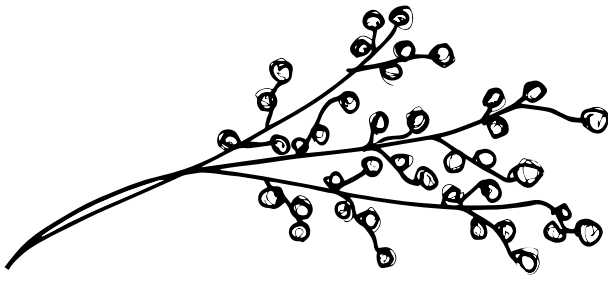
an entire philosophy. They made it their own and, thankfully, I listened. The studio has been a great success. I easily could have insisted upon my concept but I let their enthusiasm and insightfulness guide us forward.

Here is another simpler example. We recently added five new group rooms to our main building. My facilities crew asked my preferences about trashcans: should we put small ones in each room or two large ones outside of the suite?

Instead of giving them a direct answer, I asked them to consider the pros and cons of each scenario. Would the smaller ones get filled faster and require more frequent removal? Would the bigger ones be invisible and therefore result in garbage left in the rooms? I encouraged them to experiment since we already had an ample supply of receptacles: try it one way for a few weeks, then try the other way to see what happens. We ended up putting smaller ones in each room and one large one in the adjoining hallway. This anecdote isn't really about trashcans -- it's about giving people agency, no matter the size of the task.

In a complex environment it is impossible for anyone to have all the answers, especially managers and administrators who are often removed from the daily operations. My guiding tactic has been to engage the people closest to the work in identifying problems and opportunities. *Is there something we're doing that's not working right? Is something missing? Are students asking something that they didn't ask about before? What are faculty wanting this semester?* These types of conversations can yield new areas for exploration. By inviting employees into this discovery mindset to help shape improvements, we not only melt resistance and boost morale but also uncover things we never could have imagined.

6. *Roles*[21]

An intriguing aspect that comes from the domain of self-organizing systems is the notion that instead of having *jobs* people have *roles.* In this sense, roles represent a function of work that can be picked up and exchanged fluidly. This viewpoint acknowledges that we often wear different hats throughout the day, and instead of being locked into a single unit with static set of duties, we can freely move across the organization as opportunities emerge.

Maybe you're interested in digital preservation, assessment, instruction, web development, metadata, emerging technologies, or multiple pursuits simultaneously. A role-based structure provides you with the permission, encouragement, and structured processes to delve into new domains and to continuously learn, grow, and contribute.

Another way of thinking about this idea is that individuals often have a set of skills that they excel at. For example, some people are proficient at implementation and logistics, while others have a great capacity for brainstorming and generating interesting ideas. Some people are very gregarious and good at teambuilding, whereas others are highly analytical and can offer expert evaluations and insight.

We need a workforce with diverse abilities and perspectives, but oftentimes people aren't given enough opportunities to apply their best skills when they are confined to a single department or division within the organization. Roles enable us to deploy talent more strategically and more widely, making better use of strengths, passions, and interests.

Another beneficial aspect of roles is that they can help us develop a greater culture of accountability. Individuals readily comprehend their personal commitment to a project, service, or program and likewise can derive clear expectations of their colleagues' contributions as well. Meredith Belbin's *Team Roles at Work* provides an outstanding framework outlining some common roles such as implementer, shaper, coordinator, innovator, and finisher[22]. When everyone on the team understands the network of roles, they gain a better understanding of how their individual involvement impacts the big picture and improves the odds for success.
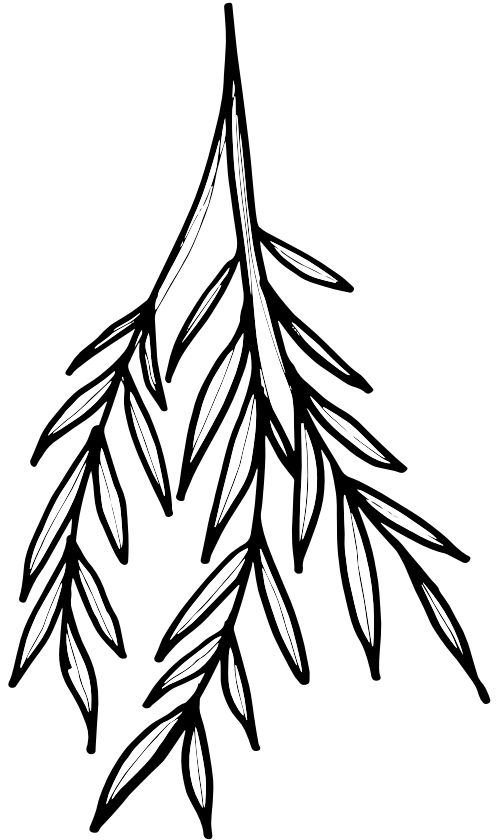
When frustration emerges among team members, misalignment is often to blame. Individuals might assume someone isn't pulling their weight or that someone has overstepped the boundaries of their role. These grievances become increasingly more common within a complex environment because new ventures can unexpectedly sprout up from anywhere. When an emerging possibility carries a lot of ambiguity and doesn't fit neatly in an existing org chart, it crosses the edge of chaos, and competition and confusion can arise.
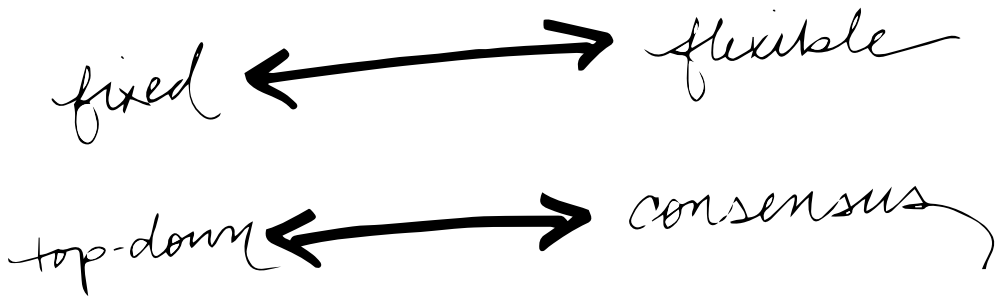
If we are on the same cross-functional team, maybe you and I are both interested in leading a particular part of a project or program, but without clear boundaries (who does what?) our individual contributions can be difficult to navigate. Our anxiety and distrust may become even more pronounced if we have different bosses, funding streams, expectations, timelines, and priorities. A roles approach could alleviate some of the pressure that builds along the seams of new ideas. The approach enables individuals to stake a claim and co-develop directions during the early exploratory stages. Boundaries can become more formalized later, once the concept gets off the ground and begins to take shape.

7. Decision Making

The last key element that I want to present is decision-making.

As an administrator, I often find myself in a position where I am asked to make a final decision or to be an arbitrator. Increasingly, I have started to resist this expectation because I feel that the employees closest to the action (those impacted by the decision) should be deeply involved as co-developers of the path forward. Employees, understandably, can feel a degree of resistance when a decision is made for them, so I often push against the hierarchical impulse that the boss should call all the shots.

So, what does decision making look like in an ecosystem? An interesting *Harvard Business Review* article by Erin Meyer titled, "Being the Boss in Brussels, Boston, and Beijing," outlines two key attributes that vary greatly around the world[23]. The first is *who* makes the decision: is it top-down or is based on group consensus? The second is how *fixed* a decision is once it gets made: is it final or is it adjustable?

fixed ⟷ *flexible*

top-down ⟷ *consensus*

Here's a thought: over the course of a day, take note of all the decisions being made around you. Which ones do you have control over and which do you just have to roll with? Which ones are important and which are no big deal? Sometimes you might be making a decision that you have to live with for a long time, such as selecting new furniture for a library commons. Other times, decisions are more flexible, such as the particular arrangement of the furniture in the commons.

My advice is to become more conscious of the decisions you are making. *Who is being impacted? Who was consulted? Do we have enough information? What don't we know?* For a long time I considered myself very logical, and I based my decision-making on what I felt would enable my library to achieve key goals. I was always driving the train forward. It is only more recently that I honed into the emotional landscape to a greater degree and started questioning how people *feel* about a particular decision. Is there anxiety? Is this a territorial matter? What do the best-case / worst-case outcomes look like? Is this a win-win or zero sum situation? How might this decision impact someone's career or their feelings about the library and colleagues? How might students and faculty feel about the change?

Operating in a complex environment requires us to remain flexible[24]. The boss cannot always have the answers, much less all of the information and nuances to make a wise guess. It seems that an ecosystem structure leans toward consensus decision making with the leader taking on a facilitator role to ensure things keep moving. All decisions remain malleable. This can be unsettling for people more accustomed to a top-down approach, but as new information becomes available or circumstances change (introducing a new provost, new dean, new partner, new budget, new building code, etc.) we have to adapt and be resilient.

One final nugget from the U.S. Military: General McChrystal described the intense competition among different military units for limited resources[25]. Tanks, troops, and airplanes were always in high demand and any decision to reallocate assets was filled with contention. Mangers each felt more deserving of those resources above everyone else: their mission was the most critical one.

As General McChrystal moved toward a team of teams approach, things began to change. Unit leaders were able to look across the regional battlefield context, far beyond their local situation. They began to understand the daily and weekly workflows of others, the wide range of concurrent operations, and the ever-shifting priorities. If one unit received an influx of artillery, for example, other unit leaders understood the justification, because making decisions become more transparent. Interestingly, the General mentioned that as leaders began communicating more frequently, they started sharing strategic and tactical information -- and even their limited physical resources. In short, they became more unified once they had a shared purpose and greater autonomy.
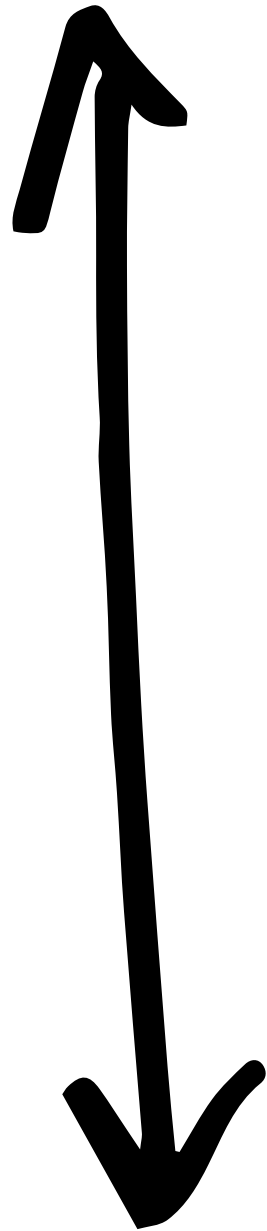
CONCLUSION: FROM TRAIN CONDUCTOR TO COMMUNITY GARDENER

I began this paper by describing my frustration with time management systems. No matter how much effort I put in, nothing ever seemed to go according to plan. And the irony was that I often felt more hurried, rushed, impatient, and disappointed because I was always trying to recalibrate.

I offered this example because I think my experience is a microcosm of what's happening across our library organizations. We do our best to predict, plan, implement, direct, and measure. This gives us a sense of control over the future, but things rarely turn out the way we anticipate. An emphasis on efficiency, accountability, and optimization may actually be holding us back and doing harm in an era that requires an unprecedented amount of creativity, collaboration, irregularity, and variance.

When I talk with colleagues from around the country it seems that many are facing similar challenges. The heart of the matter is that our work is changing so rapidly that we cannot keep pace. Libraries are being pulled and stretched in so many different directions while we lack the necessary social, political, and technical infrastructures to adapt. The scope of change we are facing is enormous and overwhelming, and yet at the same time quite exciting. We are guiding our profession into a new frontier and much remains to be discovered and settled. I used to think it was my job to help drive the "innovation train" -- the pursuit of modernizing library services. I proudly wore a conductor's hat, setting the course and getting everyone on board. Some people jumped at the opportunity, while others required a little more persuasion. And a few elected to stay at the station.

Today I use a different approach, viewing myself more as a gardener[26]. My emphasis is on creating an environment in which people, projects, programs, and relationships can flourish. I've shifted away from trying to control, design, engineer, optimize, or recalibrate the organization and instead focus on nurturing it. *What does it want to become? What does it need right now? How might it grow in the future?*

This past summer I volunteered at a community garden. It was an eye-opening experience to be surrounded by such a great variety of food and flowers. Every day gardeners tended the plants: watering, pruning, weeding, and mulching -- and a few even whispered words of

encouragement to the fruits and vegetables. They closely examined each vine, stalk, and bed with great care and consideration. A gardener, I've learned, is a master facilitator.

But something that stood out to me more than anything else was the camaraderie. The community was filled with laugher, stories, courteousness, and generosity. I observed mentoring and connection—both with nature and one another.

I developed a great appreciation for gardeners who are constantly subjected to the vagaries of an unknown future: climate change, weather threats, pests and invasive species, soil conditions, blight and disease, and other elements constantly generate unpredictable demands. And yet there are happy little surprises – a fruitful bounty, success from experimenting with a new technique, or the offer of a helping hand from a fellow gardener.

Just by being around them, I felt a pervasive sense of accomplishment; each day I volunteered was hard work but also a celebration. This is how I wanted my library environment to feel as well. The aim of this paper is to bring more attention to the fact that libraries today are operating with more complexity. We are living with more gray and less black and white. The habitats we occupy are morphing as library buildings and online environments continue to push in new directions. The larger ecosystem around us (our partners, students, and faculty -- and higher education itself) continues to evolve as well. Our legacy organizational structures are incompatible with this change. Ranganathan's fifth law famously states that the library is a growing organism. Perhaps it's time we explore a living model better suited for the dynamic environment upon us!

CULTIVATING COMPLEXITY: QUICK START GUIDE

1. Is it VUCA?
(If so, how much?)
Look at the situation. Talk with teammates. Talk with people outside of your team. Take note of the speed and timeline. Examine the threads of complexity and try to understand the multiple pieces at play. Explore the ambiguity and uncertainty: figure out what you know and don't know and how you might be able to close that gap. Remember that unanticipated things will emerge: build in slack.

2. What's the team interaction style?
Is the group arranged for independent work (baseball), sequential work (football), or deep collaboration (basketball)? What's the best configuration for the task at hand? Will the style need to change as the project advances across different phases? Is everyone following the same rules and playing the same game?

3. Who makes the decisions?
It is top-down, consensus, or some hybrid agreement? And once a decision is made, is it final or flexible? Make sure everyone is on the same page with these two factors.

4. Plot your situation.
Use the Stacey Matrix to plot the degree of uncertainty about your situation. Does your team have agreement on what you're doing and how you're going to do it? If not, you should plan to iterate and forge a path forward.

5. Incorporate co-discovery and co-development techniques.
Engage your team, partners, and any stakeholders, including users, who will be impacted by changes or new services. Use lateral thinking exercises and liberating structures activities to probe possible directions and co-create workable solutions.

6. Be a gardener.
What does the group need right now to move forward: more structure or more autonomy? Are all the right players at the table? Is there a plan to reduce uncertainty and explore ambiguities? What's the group's emotional chemistry like, and does it require some facilitation? Do we agree on what success looks like? How will we handle distractions, disruptions, disagreements, and other unanticipated surprises that we will encounter along the way?

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[3] Morgan, G. (2014). *Images of organization.* Thousand Oaks: Sage Publications.

[4] Robertson, B. J. (2015). Holacracy: *The new management system for a rapidly changing world.* New York: Henry Holt and Company.

[5] These three readings provide a great overview:
- Heinrich, S. & Jamsin E. What Is Complexity? An Introduction For Educators. Macarthur Foundation: https://www.ellenmacarthurfoundation.org/assets/downloads/What-is-complexity_Ed-version.pdf
- Snowden, D. J., & Boone, M. E. (January 01, 2007). "A Leader's Framework for Decision Making." Harvard Business Review, 85, 11, 68-77.
- Zimmerman, B., Lindberg, C., & Plsek, P. E. (2001). Edgeware: Insights from complexity science for health care leaders. Irving, Tex: VHA Inc.

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Allen, P., Maguire, S., & McKelvey, B. (2013). The SAGE *handbook of complexity and management.* The whole book is informative but start with Chapter 16: "Complexity and Organization–Environment Relations: Revisiting Ashby's Law of Requisite Variety" by Boisot & McKelvey.

[7] Mack, O. (2016). *Managing in a VUCA world.* Cham: Springer.

[8] There are many resources that outline the Stacey Matrix. Here are two I found most helpful:
- Lipmanowicz, H., & McCandless, K. (2016). *The surprising power of liberating structures: Simple rules to unleash a culture of innovation.* Seattle, WA : Liberating Structures Press.
- Zimmerman, B., Lindberg, C., & Plsek, P. E. (2001). Edgeware: *Insights from complexity science for health care leaders.* Irving, Tex: VHA Inc.

[9] Snowden, D. J., & Boone, M. E. (January 01, 2007). "A Leader's Framework for Decision Making." *Harvard Business Review*, 85, 11, 68-77.

[10] Here is a primer for this type of thinking: Wolfe, N. (2011). *The living organization: Transforming business to create extraordinary results.* United States: Quantum Leaders. Publishing.

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[12] Taub, E. (1991). *Taurus: The making of the car that saved Ford.* New York, N.Y., U.S.A: Dutton.

[13] McChrystal, S. A., Collins, T., Silverman, D., & Fussell, C. (2015). *Team of teams: New rules of engagement for a complex world.* New York: Portfolio/Penguin.

[14] General frames this well in *Team of Teams.*

[15] Levy, S. (2007). *The perfect thing.* London: Ebury.
Tett, G. (2016). *The silo effect: The peril of expertise and the promise of breaking down barriers.* New York: Simon & Schuster.

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[19] Lipmanowicz, H., & McCandless, K. (2016). *The surprising power of liberating structures: Simple rules to unleash a culture of innovation.* Seattle, WA : Liberating Structures Press.

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Robertson, B. J. (2015). *Holacracy: The new management system for a rapidly changing world.* New York: Henry Holt and Company

[22] Belbin, R. M. (2010). *Team roles at work.* Amsterdam: Elsevier.

[23] Meyer, E. (January 01, 2017). *Being the Boss in Brussels, Boston, and Beijing.* Harvard Business Review, 95, 4, 70-70.

[24] This builds on the idea of "Requisite Variety" – I suggest: Allen, P., Maguire, S., & McKelvey, B. (2013). *The SAGE handbook of complexity and management.* But specifically suggest: Chapter 16: "Complexity and Organization–Environment Relations: Revisiting Ashby's Law of Requisite Variety" by Boisot & McKelvey.

[25] McChrystal, S. A., Collins, T., Silverman, D., & Fussell, C. (2015). *Team of teams: New rules of engagement for a complex world.* New York: Portfolio/Penguin.

[26] The gardener theme emerges often in organization development books, but *Team of Teams* probably had the most influence on my thinking.

Graphic Credits

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