Arranging Cultures of Innovation

By Francisco Gomez, M.S.

For more than 200,000 years, humans have been trending toward technological innovation. We can see a common thread that starts with Paleolithic hunter-gatherers sitting around the hearth, sharing advancements in tool development and controlling fire, to our modern-era technologists brainstorming the next world-changing invention. However, this trajectory hasn't been linear. The path has been marked by ebbs and flows in cultural, technological, and scientific advancements. Just like we can claim the profound cultural and technological advances from the Renaissance, the Industrial Revolution, and the Information Age, we also own the relative stagnation of the European Dark Ages.

"Innovation depends on the environment."

Our history highlights the importance of the environment in producing innovative behavior. The amount of innovation you get from a culture, community, or organization depends on the environment that the innovators work in. Some environments excel in fostering creativity, serving as hotbeds for groundbreaking ideas, while others languish in the status quo. As consumers of products and services, we are not just observers of this phenomenon; we play a critical role. For instance, if you're reading this on your handheld device, it's most likely an iPhone or an Android that you purchased, and it's almost certainly not a Blackberry. This is just one of the many stories about one product becoming an enduring icon of modern technology while another stops short of that because it couldn't adapt.

This article discusses the characteristics commonly found in environments that foster innovation. I will introduce the theory of the adjacent possible, initially proposed by evolutionary biologist Stuart Kauffman and later incorporated by writer Steven Johnson to analyze how creative ideas emerge in organizational systems. Additionally, I will provide ideas that build upon these theories and align them with the science of behavior. Finally, I will conclude by offering suggestions to help you further develop these concepts and encourage more innovation from yourself and your teams.

SURVIVAL AND INNOVATION

Survival—for an organism or organization—requires a range of tactics to cope with challenging environments. A greater diversity in strategy will increase the chances of survival.

The coyote is a great example of that. Before the 1700s, coyotes numbered in the tens of thousands, primarily inhabiting prairies and deserts in Mexico and central North America. Today, their population has grown to millions. They can be found in coastal, mountain, and forest regions, as well as most urban and heavily populated cities like New York, Los Angeles, and Chicago.

They have thrived as a species despite and *because* of the pressures brought about by the transformation of their environment. In finding multiple creative strategies for gathering food and avoiding danger, they have turned the encroachment of human populations into a salad bar of opportunity. They've learned to navigate in traffic, scavenge trash and pet food, hunt domesticated animals, use human-made structures as dens, vary pack size, and alter their social structures. Depending on what's most advantageous, they can be active during the day or night.

In his book, *Antifragile: Things That Gain from Disorder,* Nassim Nicholas Taleb coined the term "antifragile" to describe a quality beyond resilience. He says that an antifragile entity or organization doesn't just adapt to and withstand pressure and volatility. It uses them to grow in strength. The coyote is like a biological Swiss army knife that turns environmental stressors

into resources and tools to become more competitive and thrive.

Human-made systems show us a similar dynamic. Daily, we use the products and services of companies that face disruptive challenges head-on. These are the antifragile companies that, thus far, have used competitive pressures and consumer demand to improve their services. Companies like Google, Netflix, and Biogen consistently evolve through market demands and serve as spearheads of innovation.

Although there are some clear differences between evolutionary adaptation and business innovation, there are some important similarities. Change is as much of a constant and disruptor in economic markets as it is in biological systems. Shifts in the market, technology, and consumer demand come at us at a pace that makes innovation necessary for survival. And here is the key takeaway—like biological systems, **the sources of innovation depend on the diversity of tools, resources, and knowledge available in the organizational environment.**

Sources of innovation depend on tool, resource, and knowledge diversity

With a better understanding of creative behavior and how to motivate it in our organizations, we can increase our adaptability and antifragility by creating environments rich in input for greater innovation.

THE ADJACENT POSSIBLE

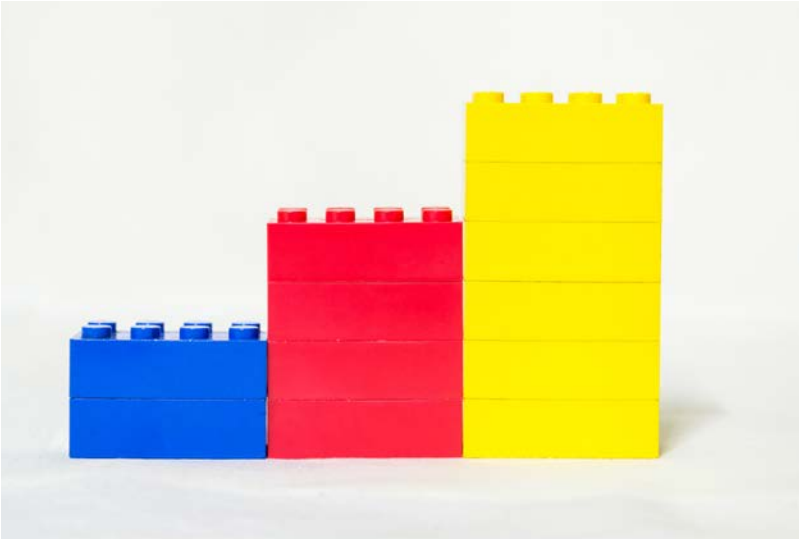
Evolution and innovation occur through a series of progressive steps that rely on each other, much like building blocks. They do not usually arise from giant leaps into distant improvements. The term "adjacent possible" was introduced by theoretical biologist Stewart Kauffman to help us understand the evolutionary process as it occurs in biological systems.

The adjacent possible refers to the reasonably achievable next steps in development, given the available resources and conditions. It defines what you can evolve into, given the available biological "tools."

The adjacent possible refers to reasonably achievable next steps

The definition of the adjacent possible also implies an expansion with each developmental iteration. This is because the organism gathers more resources as it progresses along the evolutionary process, which, in turn, pushes the horizons of the adjacent possible by opening new developmental paths. In simpler terms, the more the entity evolves, the more doors open for further evolution.

A case in point, we didn't see a rhinoceros evolve from the primordial soup. It was a gradual process involving billions of years of evolution and expansion of the adjacent possible. Primitive life forms evolved into more complex ones, each stage creating an outwardly expanding array of possibilities for the next evolutionary step. The complexity of organisms grew with each building block. This incremental progress eventually led from the simple organic molecules in the prebiotic ooze to the existence of the rhinoceros—not to



mention every other organism on the face of the earth, including us.

In his book, *Where Good Ideas Come From: The Natural History of Innovation,* Steven Johnson extended Kauffman's principles and applied them to the cultural and technological context. He states that,

"The history of life and human culture, then, can be told as the story of a gradual but relentless probing of the adjacent possible, each new innovation opening up new paths to explore."

Johnson presents a convincing continuum between the biological and the human-created systems (e.g., culture or the marketplace) by using the same framework as Kauffman. He explains that each technological advancement creates the possibility for the next idea or invention, like a foothold.

To help illustrate, we can track the iPhone and its adjacent possible steps with a simplified timeline. We can start that story with late 19th-century radio technology, which provided the knowledge and resources for early radio wave transmission. WW2 brought about significant advancements in two-way radios, initializing the path toward the miniaturization of components. In 1973, Motorola developed the first handheld mobile phone. Also, in the 1970s, the introduction of Intel's microprocessor allowed for smaller and more powerful devices, characterizing the computers we currently carry in our pockets. The shift from analog to digital networks in the 1990s further enhanced communication capabilities. Finally, the integration of the Internet with phone technology, which began developing in the 1960s and continued through the 90s, was the critical world-changing step that led to the launch of the iPhone in 2007.

Each of these stages represented the adjacent possible at its time, a step that, once reached, provided the resources to move toward the next iteration. Without these incremental advancements, the creation of the iPhone would have been outside the realm of the immediately achievable. It would have been impossible to jump from a 19th-century radio to an iPhone without each step. Each iteration expanded the options of what was possible.

Understanding the adjacent possible should prompt us to recognize and honor the poten-

tial of our current organizational resources, employee skill sets, and knowledge base. Every idea or development has the potential to serve as a doorway to even greater breakthroughs. It should also provide the rationale for opening avenues for greater diversity, networking, and continuous learning in our organizations. Doing so can only broaden the range of resources available for innovation. Reaching the outer edges of the adjacent possible requires an environment that encourages an abundance and cross-pollination of ideas. This brings us to a related principle that Johnson covers in the same book: the recombination of ideas.

THE RECOMBINATION OF IDEAS

During my graduate studies in behavior analysis, I researched how to reinforce novel behavior with a dog. Specifically, I wanted to figure out if I could train a dog to be more creative and show me behaviors she'd never done before. The short answer is yes. I found that the dog's creative behaviors during our training were mixtures of previously learned behaviors rearranged in novel ways. That insight has greatly influenced my perspective on what produces human creativity.

To summarize the research, I started by teaching a Border Collie named Rush to interact with various objects, including a plastic cube, a hula hoop, a wall, and a baby gate. She would earn a treat for any interaction with these objects, whether it was biting, picking them up, or pawing at them.

Once Rush had learned several of these interactions, I changed the criteria for earning a treat. Now, she would only get a reward for displaying a behavior she hadn't shown in that same session. Repeated behaviors were ignored.

Initially, Rush seemed to struggle with this change. However, after a few confused and treat-less rounds, she switched strategies and started combining the behaviors. Here's an example of what that looked like: she would paw at the wall with her right paw to get a treat, then do the same with her left paw for another one. When she repeated them, I ignored the behavior. In response to her behaviors being ignored, she stood on her hind legs and pawed at the wall with both paws at once, a behavior I'd never seen her do before, even outside of this training context (Rush was my dog). By the end of the experiment, Rush had put together close to 300 new interactions with the objects.

If you're interested in the research details and don't mind academic language, here's the link.

It turns out that the finding was not all that original or new. Various fields, including neuroscience, have run into the same or similar learnings. For example, neuroscientists describe creativity as a recombination of neural networks. Their research has shown that our brain, which is made up of billions of neurons that are interconnected, can reorganize these networks in response to learning. These reorganizations, or recombinations, are associated with new ideas.

Back to Johnson's analysis of innovation and the adjacent possible, he states:

"…innovative environments are better at helping their inhabitants explore the adjacent possible because they expose a wide and diverse sample of spare parts—mechanical or conceptual—and they encourage novel ways of recombining those parts."

Johnson explains that great and novel ideas are created by the cobbling together of other ideas in the environment. That environment could be a single brain. However, the resources for innovation will be more abundant within the "outside" environment of a community, social group, or workplace. Two or more heads are better than one. In that sense, innovation is more likely to happen as a collaborative process rather than single moments of inspiration occurring to lone innovators.

LEADERSHIP'S ROLE IN INSPIRING INNOVATION

The recombination of ideas, tools, and existing solutions is the launch pad for an organization to push the boundaries of the adjacent possible.

This means that, as leaders, we are responsible for arranging environments that encourage people to explore beyond their comfort zones, contribute to the wellspring of innovation, and collaborate with one another.

Below are some activities leaders can take to achieve this.

ESTABLISH INNOVATION AS A TEAM/ CORPORATE VALUE

Converting a corporate value into observable behavior requires focused leadership activity. Leaders need to do three key things to operationalize a value: talk about it, represent it, and reinforce it.

Talk about it: The things that leaders talk about the most convey to the workforce what is most important to the organization. If innovation is a value for the organization or team, then it should be talked about often. This could be in all-hands meetings, stand-up meetings, sprint planning meetings, production meetings, start-of-shift meetings, etc.

Represent it: Modeling the behaviors that support innovation is also critical to encourage them from others. Demonstrating creativity, curiosity, collaboration, and continuous learning are all ways to set an example for team members, colleagues, and direct reports.

Reinforce it: Identify (pinpoint) the behaviors that support innovation in your organization and arrange sources of reinforcement for them. This can be done with coaching and feedback as well as incentives. Aubrey Daniels said, "Behavior goes where reinforcement flows." If it's innovation you want more of, then make sure you arrange sources of reinforcement for it.

BREAK DOWN SILOS

Increasing innovation can be added to an extensive list of reasons why you should break

down silos in your organization. Actively dismantling barriers between departments or teams is critical for innovation because it produces the free flow of information. Free-flowing information produces a more extensive breadth of input to recombine ideas and build novel solutions.

As is the case with values, if you want more collaboration, then talk about it, represent it, and reinforce it. How you talk about your cross-functional peers and how you interact with them will model the right behaviors for your team. If you want them to communicate and work collaboratively with others, then you should be consistent in setting the example.

Make sure you actively look for and reinforce instances of collaboration from your teams and peers. If you see collaboration in action, take the time to provide positive feedback. Coach your direct reports on how to achieve business objectives collaboratively.

At the organizational level, making sure your processes and systems are supportive of cross-functional collaboration is critical. Your KPIs should lead to collaborative behavior instead of misalignment and internal competition. Don't let the optimization of one function's business objectives suboptimize another's.

For example, if your Sales team's primary KPIs and incentive programs consist exclusively of the number of new accounts opened, and your Development team's incentive programs rely entirely on the number of new features developed, you might be creating too narrow a focus within each department. The sales team might make promises that the development team can't keep. And the development team might produce features that don't align with customer demand. Under this system, there is also little to no source of motivation for these departments to collaborate, or to brainstorm novel ideas to bring value to the customer.

Build metrics and incentives that require collaboration

Instead, build metrics and incentives that require collaboration. For instance, holding both departments accountable for customer satisfaction scores and the successful implementation of client feedback into the solution would contribute to greater collaboration, innovation, and the quality of the product/solution.

Encouraging cross-departmental projects and meetings and using digital communication platforms (like Slack) that connect different parts of the organization can also help.

The goal is to ensure a free flow of information across all levels and areas of the business by fostering a more integrated and collaborative environment.

This article goes into more depth with respect to breaking down silos.

AVOID PUNISHING MISTAKES

Leadership practices that reframe mistakes as learning opportunities instead of something to punish are essential for increasing innovation. When errors occur, the focus should be

on lessons learned and what to do differently going forward. Punitive environments restrict the flow of ideas in an organization because they bring about inhibition, self-doubt, and suppress exploration. Remember that innovation requires a diverse and ample reservoir of ideas. Leaders should avoid placing blame and instead encourage employees to explore new possibilities without fear of repercussion.

ENCOURAGE CONTINUOUS LEARNING AND DIVERSITY IN SKILL SET

Whether it's through staffing and/or learning and development efforts, diversity in background, knowledge, experience, and areas of expertise expands the number of options available for novel ideas. A great source of new ideas happens when skill sets overlap. For the same reasons that you want diversity in a team—including people from different backgrounds and areas of expertise—you want to encourage it with individual performers. Encouraging continuous and diverse learning contributes to people "thinking outside of the box" as well as increasing variety in the organizational idea repository.

ENABLE SHARED SPACES WHERE PEOPLE CAN INTERACT AND SHARE IDEAS

Enabling physical and virtual spaces that facilitate spontaneous interactions and brainstorming can help ideas come together to recombine and build upon one another. This could include open spaces, communal lounges, online chat rooms, and digital collaboration platforms. The goal is to create environments where information and ideas can be exchanged fluidly and spontaneously.

ASK MORE QUESTIONS

Curiosity can drive innovation. Make a habit of being curious and asking employees to share their opinions, insights, and ideas for improvement. It demonstrates that you value their experience and skills, and it helps you gather a broader range of perspectives. See this article for a more detailed description of how to use questions in a leadership and coaching context.

ARRANGING CULTURES OF INNOVATION WITH THE SCIENCE OF BEHAVIOR

A culture is defined by the patterns of behavior that are encouraged or discouraged by people, processes, or systems. That definition tells us that culture can be changed and directed through the powers of motivation. A culture of innovation is one in which leadership practices, processes, and systems align to encourage patterns of exploration and collaboration.

The science of behavior offers a toolkit to help us significantly improve these motivational skills. Using empirically validated principles, it provides a framework to help us understand how our actions affect other people. It explains why people do what they do and what factors influence those choices. Ultimately, it provides us with a set of resources that can help us convert our vision of a culture of innovation into tangible, measurable behavior.

REFERENCES

1) Kauffman, Stuart A. "At Home in the Universe: The Search for the Laws of Self-Organization and Complexity." Oxford University Press, 1995.
2) Johnson, Steven. "Where Good Ideas Come From: The Natural History of Innovation." Riverhead Books, 2010.

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With a career that has encompassed performance management consulting for multiple industrial sectors across the globe, as well as executive positions in the tech industry, Francisco consolidates this experience to generate results and bring value to his customers.

Francisco is a board member for industrial as well as a nonprofit organizations and serves as public speaker and columnist on behavioral science and performance management. He and his family currently reside in Asheville, North Carolina. In his free time, he enjoys spending time in the North Carolina mountains and playing music.

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