

TEN PROJECTS. TEN YEARS. A FUTURE OF A DIFFERENT COLOR.



## MAP OF THE DECADE **2014**

**What if we could color the world with a simple palette that reveals, at a glance, when our systems are working well? Or when they're out of balance? Or what they mean to us?**

What if we could use this same palette—this visual toolkit—to plan world-changing projects? To anticipate the new human mythologies they might create? And to anticipate the way those mythologies might ripple through a global social economy of unprecedented scale and complexity?

The 2014 Ten-Year Forecast is more than just a forecast. It's a thought exercise in imagining such bold and audacious projects that have the power to recolor our world.



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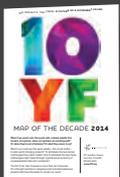
# 10 PROJECTS to RECOLOR the world

**It's a decade of turmoil and invention.  
The dilemmas of the past can wait no longer. They demand resolution.**

Humanity will respond with ingenuity, passion, and audaciousness. Following a decade that has already catapulted us from the dot-com boom into an era of global socialstructuring, the decade to come will crack open our world, revealing seemingly unimaginable new landscapes. It may, quite literally, change our minds.



To explore this world-changing decade, we invite you to **CONTEMPLATE TEN PROJECTS** that, if successfully undertaken today, could change the paradigm in their fields in ten years. These bold projects are already taking shape in the dark underside of the internet, in the underground foundations of our global cities, in the no-man's-land of our prisons, and in the microbes of our bodies and our planet. They are rapidly recoloring our future.



Let's join this global project to design the futures we want. **USE THIS MAP TO SCAN THE HORIZON OF TRANSFORMATION**, from new foundational technologies to the future of our human settlements, our economies, and even our mental maps of the world. Start at the top and read down to see what's driving each of the ten projects and the big shifts they could catalyze. Or start at the bottom to survey the very real signals of change that make us say, "Yes, this is possible."



**THEN TURN THE MAP OVER TO BECOME ACTIVE PARTICIPANTS IN DESIGNING THESE PROJECTS.** Use the color palette of Systems Mythology to add color—or color balance—to a future that is anything but black and white.

## **WHAT IF? TEN PROJECTS COULD START TODAY TO CHANGE OUR BASIC PARADIGMS IN THE NEXT TEN YEARS.**

**THE TIME IS RIGHT** for these bold projects. The drivers of change are unmistakable and urgent. And proposals are already taking shape.

**... FOR BIG IMPACTS** that could recolor our infrastructures, our households, our markets, and our policies—in short, that could recolor our lives.

**... FROM TODAY'S SIGNALS** that already hint at the outlines of a world transformed by cutting-edge voices, experiments, and initiatives.

## NEW FOUNDATIONS

superstruct today's internet to  
create an open, peer-to-peer  
**SECOND CURVE INTERNET**

create a  
**WIKIPEDIA FOR MAKING**  
to spark new patterns of manufacturing

### WHY NOW?

- ▶ **intellectual property claims** extend to the level of molecules in an age of networked matter
- ▶ **personal data aggregation** becomes the backbone of the global economy—and pervasive government surveillance
- ▶ **criminal penetration** of our financial and identity networks grows both on devices and in the cloud
- ▶ **mesh architectures** provide an alternate model—and indeed alternate implementations—for a global internet

### WHY NOW?

- ▶ **makers** remake the way we manufacture and distribute the goods of daily life—worldwide
- ▶ **open online instruction sets** provide hundreds of thousands of recipes for making things
- ▶ **open code libraries** like GitHub are searched for solutions to new problems in a “find-fix-verify” culture
- ▶ **synthetic biology tools** and know-how create massively many local experiments in making living things

### BIG IMPACTS

**easy-on networks**  
allow communities to set  
up nodes and networks without  
a centralized structure of  
domains and domain names

**human-centric supply chains**  
connect people to materials, tools,  
other people, and knowledge  
needed to make anything

**open standards for terms  
and conditions** protect  
both owners and users  
of applications, data,  
objects, and matter

**human/software networks**  
match patterns across thousands  
of instruction sets to create new  
things and processes

**decentralized discovery**  
undermines the Google  
model of one big search  
engine for everything

**scale-free manufacturing networks**  
follow the model of the World Wide  
Web, creating new economic actors  
and, indeed, a new economic robustness



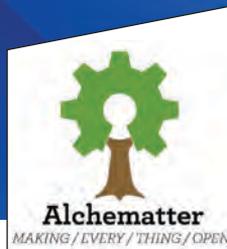
**Pirate Browser** bundles the Tor client, FireFox Portable browser, and custom configurations to circumvent government censorship

Source: [piratebrowser.org](http://piratebrowser.org)



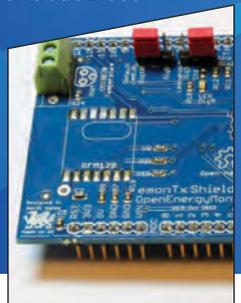
**Free Network Foundation** builds community-based free WiFi systems and offers FreedomStack, a set of tools for building these networks

Source: [connectingforgood.org](http://connectingforgood.org)



**Alchematter** is a platform and a grammar for sharing designs and instructions for making open hardware objects with interchangeable materials and processes

Source: [alchematter.org](http://alchematter.org)



**The Open Source Hardware Documentation Jam**, held in NYC in April 2013, sought to rethink documentation for an open source world

Source: [makezine.com](http://makezine.com)

## HUMAN SETTLEMENTS

rebuild, restore, and recreate  
a failed American city as a living  
**3D-PRINTED CITY**

accelerate the  
**END OF PRISONS**  
with healing, entrepreneurship,  
and restorative justice

### WHY NOW?

- ▶ **climate volatility** creates urban vulnerabilities as old infrastructures fail under new climate conditions
- ▶ **population growth** demands rapid build-out of new infrastructure solutions in cities of all sizes
- ▶ **failed cities** seek recovery outside the traditional industries and institutions that have failed them
- ▶ **3D printing technologies and maker culture** scale to build city-sized structures—from houses to skyscrapers

### WHY NOW?

- ▶ **high rates of imprisonment** and correctional control deplete government funds in prisons and policing
- ▶ **open prison systems** and electronic surveillance offer alternatives to the isolation models of incarceration
- ▶ **punitive approaches** to crime and criminals are widely recognized as failing to prevent crime and reduce victims
- ▶ **race-based incarceration** constitutes a new kind of urban ghetto that produces a criminal class

### BIG IMPACTS

a **3D construction workforce** builds broadly applicable skills in information-intensive design and lab-built organic materials

**crowd-funded urban development** focuses resources on rapid innovation in massively many small-scale experiments

**evolvable cities** pose constant challenges to regulation for everything from zoning to new materials safety to environmental impacts

**trauma-informed care** redefines the roots of criminality and redirects criminal policy from punishment, and even rehabilitation, to new therapeutic models

**restorative justice** frameworks provide a community-based alternative to traditional jury-and-judge systems and even physically redesign prisons and courtrooms

**“fourth-city”** employment models emerge from innovative entrepreneurship and community restoration practices in this new kind of settlement



**Hy-Fi** is a carbon-zero, low-energy demonstration building grown from a hybrid of fungal cells and agricultural waste  
Source: [thelivingnewyork.com](http://thelivingnewyork.com)



**Mark Forged 3D**, of Boston, has introduced a 3D printer that uses carbon fiber to print objects with a greater strain/weight ratio than aluminum  
Source: [markforged.com](http://markforged.com)



**Essays from incarcerated Americans** document efforts to reimagine the country's fourth largest city—the prison system  
Source: Michigan State University Press



**The Prison Entrepreneurship Program** teaches “overachieving underdogs” business skills and moral decision making  
Source: [pep.org](http://pep.org)

## ECONOMIES OF INTERACTION

### develop a NATIONAL SHARING ECONOMY

on a policy infrastructure of open knowledge

### launch a PAY-IT-FORWARD CURRENCY

to jump-start an economy of kindness

### give microworkers a CO-PRESENCE TOOLKIT

for human cooperation at extreme scales

#### WHY NOW?

- ▶ **sharing economy platforms** proliferate, driving new streams of economic value and social exchange
- ▶ **open knowledge platforms** provide a foundation for innovative business models that tap idle capacity
- ▶ **sharing cities** adapt their policies, from zoning to taxation, to support and stimulate the sharing economy
- ▶ **freelance innovators** leverage a Sharing Cities Network to build a “people-powered economy right under everyone’s noses”

#### WHY NOW?

- ▶ **mobile social tools** become increasingly inexpensive, lightweight, wearable, and shareable
- ▶ **visualization tools** offer new and compelling ways to track complex chains of network behavior
- ▶ **acts of kindness** and cooperation are shown in studies to spread virally through a network
- ▶ **pay-it-forward strategies** generate more monetary value than pay-what-it’s-worth strategies

#### WHY NOW?

- ▶ **microtasking** distributes work across (potentially) large networks with short bursts of co-presence
- ▶ **AI-enhanced conversations** add data and graphics for richer-than-face-to-face conversations
- ▶ **machine learning algorithms** add more nuanced perspectives to analysis of conversation streams
- ▶ **personal wearable technologies** create a culture of self-observation and feedback loops
- ▶ **anticipatory technology** and location-based apps deliver information services when and where we need them

#### BIG IMPACTS

**abundance-based business models** shift the default economic assumptions from enclosing what’s mine to sharing what’s ours

**reallocation of government spending** to support open local innovation creates new shared infrastructures of information and production

**maintenance of shared assets** requires innovations in trust management, triggering a larger shift toward designing systems based on trust rather than mistrust

**an economy of generosity** begins to rewrite some of our assumptions about human economic motivation and how to organize services

**acts of generosity,** now visible and recordable, become a critical part of an individual’s reputation and résumé

**nervous systems** respond to increased stimulation of love and well-being centers in the brain, reducing crime and depression and improving public health

#### BIG IMPACTS

**attentional proximity** emerges as a key dimension of microwork (and human interaction, in general), with tools and skillsets designed to monitor and enhance it

**contextual vocabularies,** using gesture, color, form, and sound, evolve to support cognitive performance and emotional well-being in a distributed group work

**context-aware time management** disrupts traditional work calendars, scheduling group tasks to optimize individual alertness, focus, and task readiness



**The FLOK Society Project** is a global network of researchers documenting the shift to a sharing economy in Ecuador as an economic development strategy  
Source: [blog.p2pfoundation.net](http://blog.p2pfoundation.net)



**Farm Hack** is an open-source online community of farmers using open-source tools, tractors, fertilizers, and irrigation systems  
Source: [farmhack.net](http://farmhack.net)



**A 2013 UC Berkeley/ UC San Diego study** found that customers pay more when given an option to pay-it-forward rather than paying what it’s worth  
Source: [nielson.com](http://nielson.com)



**SocialCoin** is a web-connected currency that can be passed from hand to hand to track acts of kindness  
Source: [socialcoin.org](http://socialcoin.org)



**MindMeld** is an app that listens in on conversations to share related content in real-time  
Source: [expectlabs.com](http://expectlabs.com)



**us+** uses facial recognition and speech analysis to provide real-time feedback on conversational skills  
Source: [lauren-mccarthy.com](http://lauren-mccarthy.com)

## KNOWLEDGE MAPS

build a  
**GLOBAL MICROBIAL MAP**  
across scales, from the human body  
to the planet

### WHY NOW?

- ▶ **mapping of the human microbiome** connects the dots between human health and our microbial ecosystems
- ▶ **microbial flows** can be geographically mapped from high-resolution data drawn from repeated sampling
- ▶ **autonomous sensor networks** enable automatic sampling on public surfaces, in waterways, and in homes
- ▶ **crowdsourced microbiome samples** drive new services and new knowledge—think “23 trillion and me”

create a  
**SIMULATION CORPUS**  
to simulate reality from the bottom up

### WHY NOW?

- ▶ **big data and computational power** overcome many of the past problems of modeling large-scale systems
- ▶ **machine learning algorithms** correct for false or incomplete assumptions embedded in models
- ▶ **multi-variate sources** of data from satellites, sensor webs, and even live humans reveal actual behaviors
- ▶ **urgent complex problems**, such as pandemic viruses like the H1N1 bird flu, demand more robust models

articulate a  
**MAGNA CORTICA**  
of cognitive liberties in an era of  
augmented minds

### WHY NOW?

- ▶ **human neurome mapping** improves cognition and treatment of cancer and drug addiction
- ▶ **mood- and cognition-enhancing drugs** find growing “gray markets” for emotional and cognitive enhancement
- ▶ **cognitive enhancement techniques** such as transcranial magnetic stimulation boost cortical plasticity
- ▶ **neuro-infomatics** map brain behaviors into machine-readable data, effectively allowing mind reading

## BIG IMPACTS

**agricultural microbiomes**  
inform farming, helping to optimize the microbiome as a means of improving yields, nutrient mix, and even food flavors

**urban microbiomes**  
shape urban planning and redevelopment as maps identify healthy locations and areas in need of remediation

**forensic science** gets a boost from the ability to track individuals by their microbial footprint more easily than by DNA

**simulations-as-reality**  
catalyze material and behavioral innovations in the real world as a direct product of the simulation process

**global governance models**  
emerge to connect the dots at different geographic scales, linking global problem-solving to hyper-local actions

**temporal frameworks**  
shift as future simulations inform present decisions in real-time to get ahead of emerging issues

**cognitive interfaces**  
emerge as a frontier for innovation in learning, business processes, and human-machine interaction

**greater neuro-diversity**  
engenders new political identities built around new clusters of cognitive capacity and sensory experience

**cognitive liberty** becomes a political banner for everything from the right to neuro-expression (what and how I think) to neuro-privacy (who knows what and how I think)



**The American Gut Project** is a crowdsourcing project to sample the microbial communities in the human gut across American communities

Source: humanfoodproject.com



**The Earth Microbiome Project** is a massively multidisciplinary project to map microbial communities worldwide

Source: University of Chicago



**FuturICT** is building a Living Earth Simulator for scenario-based simulation, visualization, and participation in decision making

Source: futurict.eu



**The MoBS Lab** is developing tools for modeling large complex biological and socio-technical systems

Source: mobs-lab.org



**The Human Connectome Project** provides a visual interface to graphically navigate neural data

Source: humanconnectomeproject.org



**Cognitive functioning in Rhesus monkeys** was enhanced through neuro-prosthesis in a 2012 study

Source: wikimedia.org

# SYSTEMS MYTHOLOGY

a colorful approach to designing complex systems



During the next decade, the projects we undertake will shock the underlying structures of the complex systems that organize our daily lives: education, work, health and government. These transformations will not only change our experience of the world, they will change the very *meanings* of these systems in our lives. They will fracture our guiding *mythologies* and create new ones.

While we have decades of system science to help us understand the mechanics of these now-vulnerable systems, we don't have reliable tools for anticipating how emerging systems—3D-printed buildings, autonomous drone fleets, socialstructured networks—will rework the mythologies that give meaning to our work and play, and show us how to thrive and prosper.

Systems Mythology is designed to fill this gap. It offers a simple vocabulary—four colors—for describing our intuitive experience of the systems that interpenetrate our lives. For everything from darknets to manufacturing grammars, from a sharing economy to a post-human mind, Systems Mythology helps us not only understand how systems work, but how they *feel* when we interact with them. Its color vocabulary quickly becomes a design language. *Put some blue structure here. Balance with green so humans will engage with it. Add some red incentives. Explore the purple possibilities.* From four colors, we can better understand how the design decisions we make today shape the world we'll face tomorrow.

## YOU CAN EMPLOY SYSTEMS MYTHOLOGY TO:

### BUILD YOUR SYSTEMS INTUITION

Uncover hidden preferences and unexamined biases, and develop a shorthand for quickly communicating why a system feels imbalanced. Use the color exercises to intuit how a system's design might motivate or deter different behaviors or activities.

### DESIGN SYSTEMIC STRATEGIES

Choose a color as your dominant strategy. You may want a blue strategy to bring control to a messy problem. Or you may set out with a green strategy to take advantage of the enlivening and unpredictable features of emergent systems. Or you might want to use all of the colors to help make a system feel more balanced.

### FLIP YOUR BIASES

Get to know the many faces of each color so that you can question your own limited perspective and create a richer palette of solutions for yourself, your organizations, and our human world.

### TELL COLOR STORIES

Most important, use the mythic archetypes of the colors to help you tell stories about what your system means in the context of our lives. Each color is deeply connected to the powerful mythologies of how things begin, how they change, and how they transform. Draw on these mythologies to find the right stories to express your insight about systems, to make new systems comprehensible, and to bring deep meaning to the future.

**FOR MORE INFORMATION** on how to use **Systems Mythology** and to view the toolkit, visit [www.iftf.org/systemsmythology](http://www.iftf.org/systemsmythology)

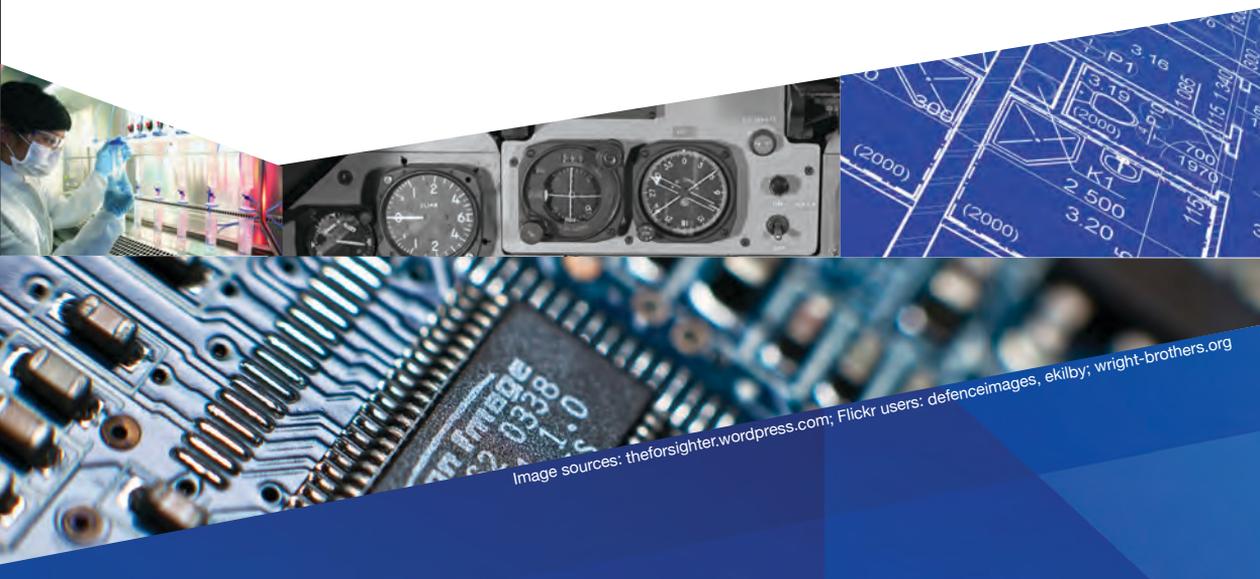
# BLUE MEASURING, MODELING, SIMPLIFYING

**BLUE IS THE COLOR OF RATIONALITY.** It observes and monitors. It finds the most efficient path to the optimum outcome. It provides the simplest interfaces for interacting with complexity. You can take a blue approach to any problem by asking questions such as:

- ▶ What is the desired outcome of the project, the product, the process, the organization?
- ▶ How do you define the goals and what metrics will you use to measure your progress?
- ▶ What process can you use to evaluate the metrics?
- ▶ How will you diagram the system?
- ▶ How can you turn this process into an algorithm?
- ▶ How can you automate part or all of the project?

**Blue solutions are planned, calculated, all-encompassing strategies** for creating the right sets of knobs, levers, and algorithms to understand and control a complex problem. With real-time data analysis and powerful software interfaces, blue strategies seek to simplify the complex, to make it easy to interact with a problem at the whole systems level. For blue systems, there is always a right answer, and it's usually cool.

The ideals of blue systems exist in a vacuum, which often makes for an aesthetically perfect blueprint but doesn't always translate into a livable human environment. Blue systems are clean and efficient, but often at the cost of feeling cold and detached, inhospitable to the ambiguities and messiness of real life. The archetype of blue views all of time and space as equal, and optimizes everything it touches for the zen-like beauty of mathematical perfection, order, and understanding.



# GREEN

## IMPROVISING, LEARNING, GROWING

### GREEN IS THE COLOR OF AN OPEN ECOSYSTEM THAT GROWS ORGANICALLY.

According to rules that evolve over time—think open-source software and mutant DNA—it's fertile and messy and inherently uncontrollable. As we design or encounter green systems, we're invited to ask these kinds of questions:

- ▶ Will the project, product, process, or organization have a life of its own?
- ▶ Is the community or ecosystem actually empowered to make its own decisions?
- ▶ How does the system express its personality? What is its temperament?
- ▶ How do we create the conditions for a green system to thrive and grow? How does it learn?
- ▶ How does the system stay protected from outside efforts to control it?
- ▶ What does this system want to be when it grows up?

**Green solutions are patient, long-term plays** with no preconceived timeline or outcomes other than evolutionary diversity and an appreciation for the wisdom of serendipity. This color is all about creating the conditions where life, or lifelike systems, can grow. It's about creating an irresistible blank canvas and being genuinely open to what ends up in the painting. It may take multiple generations for the ecosystem to “find itself,” but when it does, it will do so on a solid, sustainable footing.

Just as green is the color of life, it is also the color of decay and chaos. While they are thriving, green systems feel the most playful and natural, but they don't always scale well or follow directions. They can live in the moment, but they must also come to terms with the inevitable decline and death of everything. The archetype of green ensures that, for a sufficiently long time horizon, all of destiny is entropy. The mythologies of green are thus often stories about the cycles of birth, death, and renewal.



# RED

## WINNING, LOSING, COMPETING

**RED IS THE COLOR OF COMPETITION.** Red interactions are acts of contest, of aggression and defense, even of mediated violence. Red opens the door to competition. There are winners and losers—and very real consequences. Sides are drawn, and when two enter the fight, only one leaves with the glory. Not everyone has the bravery (or resources) to engage in red, but those who do will have stories written about them for generations to come. When we want to design a system from the perspective of red, we pursue the following questions:

- ▶ What will we win if we get this project, product, process, or organization right?
- ▶ What do we stand to lose?
- ▶ Who or what is the competition?
- ▶ How will we know if the system has won? How is winning defined?
- ▶ What will the system do better than everything else? How will it stand out?
- ▶ How can we repeat our wins over and over?

**Red systems invite multiple players to enter the game,** knowing that the best solutions carry with them a worthy prize. Red solutions frame the problem specifically as a game to win, an opponent to be beaten, a grand challenge to be dominated, or even a blood sport to be survived. All-out war is the ultimate red solution to a problem, but shades of red can also permeate our learning institutions, our commercial marketplaces, and even our concepts of disease and health.

Red systems have little tolerance for rules or paradoxes. Once sides have been drawn, it's effectively a fight to the death. That said, red is also the color of true passion and romantic love. It's the color of heroes and valor, and it's the color that most often incentivizes us to mobilize for action. Great human achievements such as the moon landing and the build-out of the Internet required the catalyst of red to gather the requisite resources and talent necessary to achieve these out-sized goals.

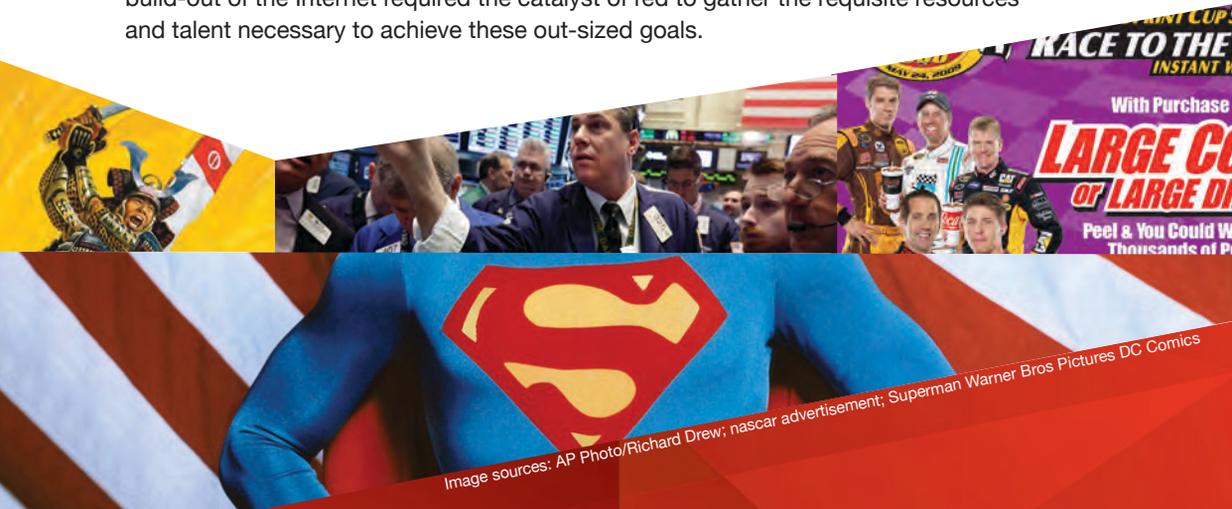


Image sources: AP Photo/Richard Drew; nascar advertisement; Superman Warner Bros Pictures DC Comics

# PURPLE

## REFRAMING, TRANSFORMING, TRANSCENDING

**PURPLE IS THE COLOR THE UNKNOWN.** It's the other, a rip in our familiar narrative fabric where electromagnetic storms, an errant wormhole, or Cthulian magic has opened a portal to another dimension, an alien world with no regard for our Newtonian cause-and-effect. To see the solution space through a purple lens, we might best ask these questions:

- ▶ What is our wildest hope for this project, product, process, or organization?
- ▶ What is our worst fear of the Frankenstein's monster it might become?
- ▶ What is the hidden nature of the problem space or the secret purpose of the solution?
- ▶ What is the underlying truth about our project that no one wants to talk about?
- ▶ How can we approach this problem from a new or unfamiliar paradigm?
- ▶ How do we extend our tools and understanding beyond the limits of our current reality?

**Purple solutions require stepping outside the box**—outside any metaphor involving boxes, in fact. Purple invites us to reframe the problem and what constitutes a solution. By turning the system around and viewing it from a completely unfamiliar angle, we reconceive constraints as features and obstacles as opportunities. But be prepared: The stories we tell will be strange indeed, and we may not come back from the journey as the same people who first set out.

As alien as purple solutions appear, they may represent the only path forward in the face of intractable dilemmas. Only through exploring the purple do we come to understand the limits of our understanding and the edges of our map. The signals of purple guarantee the existence of new frontiers, and when there is no more purple, we will know for sure that there is nothing left to discover.

