

THE SUPERSTRUCT HANDBOOK: REORGANIZING FOR THE 21ST CENTURY

SUPERSTRUCT



SUPERSTRUCT—it means to build new structures that extend our reach, expand our capacity, and go beyond the limits of today’s institutions. It means to bridge, to traverse boundaries, not just of organizations, communities, or nations, but also of scale itself. It also means finding new kinds of value in new kinds of social production and new forms of social connectedness. In fact, superstructuring is all about building a new level of sociability into our economic and institutional lives—and into all our projects, from securing food and shelter to governing ourselves. IT’S HOW WE’LL REORGANIZE FOR THE 21ST CENTURY.

● SUPERSTRUCTING SOCIETY: A NEW LEVEL OF ORGANIZATIONAL COMPLEXITY

Superstructuring increases our human capacity for complex organization—but why do we need more complex organizational forms?

We are a planet of 6.8 billion people; by 2050, we may be about 9 billion. We live in diverse landscapes that create lots of different solutions to our common project of survival. But we are also connected, and while our connections sometimes improve our solutions, they often bring them into conflict. In addition, we are facing what may be the largest ecological challenge in modern history. Global climate change demands that we fundamentally change the way we generate and use energy for everything from food to mobility to knowledge.

To survive as a species, we will need to become much more energy efficient. Complexity generally increases efficiency, but it also requires more cooperation and collaboration.

Fortunately, humans seem to be wired for this task, and it appears that we have now exported our “cooperative wiring” into the external world. We have built an extraordinary technological infrastructure to support our sociability. Next we must use this infrastructure to organize beyond our familiar concepts of organization.

● EVOLVING ECOLOGIES: ORGANIZING BEYOND ORGANIZATIONS

For last few centuries, we have experimented with “the organization.” We have become masters of the corporation. But the challenge of the next century is to organize beyond this basic form. Specifically, we must begin to create sustainable ecologies of human activity.

This new assignment is not a license to abandon our organizations. But we do need to find ways to reorient, redesign, and reinvent these organizations to thrive in more complex ecologies. Working within organizations, we need to think beyond them to collaborate at new and extreme scales.

● EXTREME-SCALE COLLABORATION: THE HEART OF THE PRACTICE

This is the heart of superstructuring—collaborating across scales, from the micro to the massive. Superstructuring is not just about big; it’s also about very small contributions by many individuals that add up to something big. We can apply practical strategies to the millions of interactions that make an ecology sustainable. We can work small to create big effects. And we can leverage massive platforms to create very targeted value in select places in the ecology.

That’s what this handbook is all about: how to expand our view of human organization to think in terms of sustainable ecologies and how to design our interactions to support collaboration across scales within these ecologies. Think of it as Superstructuring 101.

—Jane McGonigal and Kathi Vian



INSTITUTE FOR THE FUTURE

TEN-YEAR FORECAST
Perspectives 2009
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SUPERSTRUCT
ECOLOGY

HOW WILL YOU WORK WITH THESE ECOLOGIES?

In the fall of 2008, IFTF conducted the first massively multiplayer forecasting game. We had two goals. First was to get a glimpse of what might happen if thousands of individuals imagined the new superstructures that would be necessary to meet the challenges of health, food, energy, security, and mass migration in the coming decades. Second was to learn something about the process of superstructuring: what works and what doesn't work?

The result? More than 7000 people worldwide created and joined nearly 600 superstructures. As people joined, they created links among the superstructures—which, in turn, created ecologies of superstructures. We have mapped five of these ecologies to depict possible future institutional landscapes:



The Appleseed Ecology

Starting from a game that taps real-life gardens to advance urban farming through “simfarms,” this ecology describes a new infrastructure for securing food, repurposing waste, and creating new forms of exchange.



The Natural Currency Ecology

This ecology re-envisioning our capital systems as tied, not to gold or GDP or other commodities, but to environmental measures, linking sociability to sustainability.



The Community Works Ecology

Recognizing that “large-scale problems do not require large-scale solutions,” this ecology creates superstructures for replicating local solutions across large-scale systems.



The Open Fab Initiative Ecology

The Open Fab Initiative is the starting node for a densely interconnected ecology of superstructures that explicitly link new very small-scale fabrication tools and practices to solving the problems of distressed communities—creating new local material and economic realities.



The Quantum Governance Ecology

Building on the desire to create a new post-Newtonian model of governance, this ecology is thick with superstructures that help citizens make sense of the world—bridging across realities.

You can use these ecologies as scenarios. If they emerge, what role will your organization play in them? What projects will you be called upon to superstruct? And how will you superstruct those projects?



SUPERSTRUCT
ECOLOGY

HOW TO USE THE SUPERSTRUCT ECOLOGY CARDS

Ecology cards are scenarios of possible futures. They each describe a landscape of superstructures—or new kinds of organizations—that suggest an entirely new way of organizing society around its various projects, from food and finance to manufacturing and governance.

Each card has a map—a network diagram of the ecology. A core ecology is highlighted on each map: these are the superstructures that are all connected by first-order links. The other superstructures form the surround for the ecology. In effect, you can assume that these superstructures co-exist for a reason, even if that reason isn't obvious. So if you want to collaborate (or compete) with one of these superstructures, you probably will find yourself interacting with the others, as well.

WHAT TO DO

Read the story on the card:

It summarizes the ecology, highlights the themes that define it, and describes the superstructures that make up its core.

Study the network diagrams:

Each map shows the first- and second-order links among the superstructures, starting from the title superstructure. Ask the ecologist's questions as you study this map: Who's here? Who are they connected to? Why are they occurring together? And how do they improve the energy-efficiency of system they define? (Or do they?)

Develop collaborative strategies:

Study the superstructures in each ecology to see how your team, project, or organization might collaborate with others in this ecology. How would your presence change the ecology? How would your own collaborators interact with the superstructures in these ecologies? How would your presence make it more or less viable? More or less energy efficient?

Develop competitive strategies:

Which of the superstructures in this ecology might compete with you? What would you do to win? Would your winning strategy increase or decrease the overall energy efficiency of the ecology? Might you find yourself competing with the entire ecology?

ECOLOGICAL SCALE: THINKING BIG AND SMALL

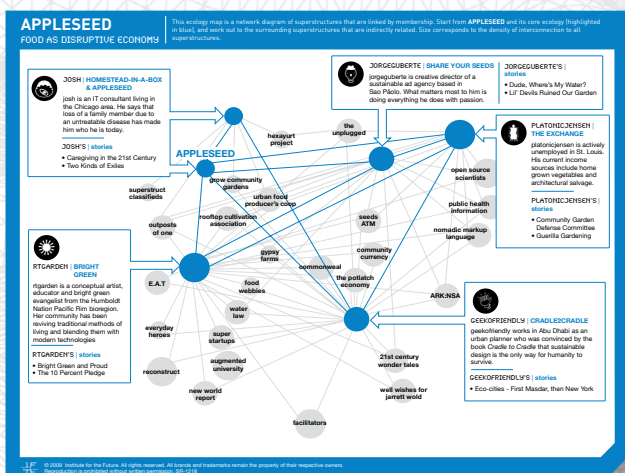
The premise: this is a time of massive reorganization of life on Earth, most especially of human life on Earth. This reorganization will allow us to think of ourselves not just as individuals or families, clans, or corporations, but as complex ecologies in which we must strategically manage vast webs of production, consumption, connection, and evolution without any centralized mechanism of control. This is superstructuring writ large, and it requires new perspectives on the project of organization.

SUPERSTRUCTURING ECOLOGIES: "WRESTLING THE PILOTS"

Humans have reached a threshold where we can no longer rely on a wild nature to take care of itself. Day by day, we find that the global systems we have taken for granted—the self-management of vast ocean fisheries, the self-regulation of the global climate, the self-sustaining cycles of predator/prey relationships—now require our deliberate intervention and care. In fact, some argue that we are entering the Anthropocene, a new era in geologic time in which, as M.O. Andreas has said, “humankind has stepped out of its passenger seat and is wrestling the previous ‘pilots’ for control of the ship.”

At the same time, we are encountering our own species’ limitations to grasp the complexity of the very systems we must now restructure. We see three clear paths emerging. On the first path, we scramble to amplify our cognitive abilities, restructuring our own nervous systems with drugs, digital enhancements, and potentially, with genetic interventions. On the second, we engage the services of supercomputers to evolve their own systems of “understanding” the world and managing it, perhaps beyond our capacity to fathom what they’re doing. On the third, we turn to our social structures, drawing on evidence that, collectively, we can act with intelligence that none of us could individually bring to bear.

All of these are superstructuring. And all of them challenge us to work at both larger and smaller scales than our current skills allow. But regardless of whether we choose to pursue the first or second paths, we cannot avoid the third. The institutional landscape of the past century is inadequate to the tasks of the next. Superstructuring our institutions is the fastest way to reorganize ourselves for the challenges we face.



ECOLOGICAL COMMUNITIES: THE ECOLOGIST'S QUESTIONS

There are two kinds of evolution: genetic evolution and ecological evolution. Genetic evolution tends to be slow; it happens on the timeframe of generations. Ecological evolution can be very rapid, as species compete and cooperate to make the most of their shared niches in the environment. At the heart of ecological evolution is the notion of community: “the distribution, abundance, demography, and interactions of co-existing populations.”

As ecologists look at communities of species, they ask questions like: What are the forms that appear here? How frequently do they occur? What other forms do they occur with? Why do they occur together? And perhaps most importantly, how does this particular configuration of populations improve the energy efficiency of the ecology?

IMAGINED ECOLOGIES: SUPERSTRUCTURING OUR VISION

This, then, is how we begin to superstruct: we imagine new ecologies of structures and practices and try to understand how certain forms might co-exist to increase the overall energy efficiency of the system. We can imagine these ecologies at the scale of large institutions that currently have (sometimes unproductive) silos of activity; we can imagine them at the scale of networks of institutions that could be reorganized as superstructures. And we can imagine them at the scale of landscapes of superstructures that themselves may be superstructured.

At IFTF, we began this experiment in imagination with the Superstruct massively multiplayer forecasting game. This gave us an experimental ecology—or more accurately, many nested ecologies—to analyze. We can use the ecologist’s questions to probe the individual superstructures that have been proposed; we can also analyze the way the various structures became linked (by membership) to form ecologies of superstructures. We can describe the ecology of superstructures that emerged to superstruct the others. And we can use these imagined ecologies to “stress test” existing organizational forms and activities in what may be a superstructured landscape of the future.

And then what? We cultivate seven Superstruct Strategies that will change the way we participate in these new human ecologies.



SUPERSTRUCT
STRATEGY

HOW WILL YOU SUPERSTRUCT?

The Superstruct game is not only a forecasting game designed to anticipate new kinds of superstructures. It's also an experiment in superstructuring. Out of the experiences of both the designers—the IFTF team—and the people who have played the game, seven basic strategies for superstructuring have emerged:



Evolvability:

Nurture genomic diversity and generational differences



Extreme Scale:

Layer micro and massive scales for rapid adaptation



Ambient Collaboration:

Leverage stigmergy with environmental feedback



Reverse Scarcity:

Use renewable and diverse resources as rewards



Amplified Optimism:

Link amplified individuals at massive scales



Adaptive Emotions:

Confer evolutionary advantage with awe, appreciation, and wonder



Playtests:

Challenge everything and everyone in fun, fierce bursts

These strategies are surprising in both their language and the scales at which they apply. For managers who think organizationally, they may seem to miss the mark of organizational strategy and scale. And yet, for building superstructures that are both smaller and larger than traditional organizations, they operate at exactly the scales that are necessary to reinvent our communities, our economies, and our species for the next century. They challenge us to change our strategic language as we rethink what it means to organize for participation rather than production.



SUPERSTRUCT
STRATEGY

HOW TO USE

THE SUPERSTRUCT STRATEGY CARDS

The Superstruct Strategy cards define seven new ways to construct strategies that will lead to successful superstructuring. You can use these cards to create, test, or enhance strategies at all levels of your organizations—and, of course, beyond.

WHAT TO DO

Create new kinds of strategies:

Strategies usually start from goals. As a starting place for strategy, use the cards to create seven strategies for each goal. What new kinds of strategies emerge when you start by superstructuring from the outset? The strategies may seem a little strange and unfamiliar at first, but trust them to help you build new and innovative paths to your goals.

Test possible strategies:

If you have existing strategies, use the Superstruct Strategies as a checklist to see if your strategies pass the Superstruct test: Are they evolvable? Do they layer scales of engagement? Do they leverage environmental information for ambient collaboration? Do they reverse scarcity? Do they amplify optimism? Do they tap or conjure adaptive emotions? Do they include opportunities for playtesting? To pass the test, every strategy should speak to at least one Superstruct Strategy.

Enhance existing strategies:

If your existing strategies don't leverage any of the Superstruct Strategies, see if you can enhance them. For example, turn an existing strategy into a goal and do the process outlined above for creating new kinds of strategies. In effect, you'll be superstructuring your existing strategies.

Turn your team into SEHIs:

SEHIs are super-empower hopeful individuals—and what makes them hopeful is seeing how superstructuring can build their potential to succeed at all their goals. Assign a Superstruct Strategy to everyone on your team, and ask each of them to become experts in how to apply their individual strategies. Call on them to represent their respective strategies in all the projects they engage in. Reward them for their knowledge and success in integrating the strategies into team practice.

SCALES OF COLLABORATION: THE "PARTICIPATION" IMPERATIVE

At the heart of superstructuring is participation. Over the coming decades, participation will replace production as a primary measure of human well-being. It will become the organizing principle that drives the growth of wealth and the resilience of social communities. Already, the outlines of new superstructures that optimize participation are beginning to appear. Over the next decade, these first experiments will grow exponentially. Every kind of group, from large corporations and small startups to grassroots, nonprofit activists and entertainment media and artists, will be reinvented for this new phase of human society—an era of extreme-scale collaboration.



PARTICIPATORY SUPERSTRUCTURES: ENGAGING THE WHOLE WIDE WORLD

Wikipedia is perhaps the landmark experiment that has altered the direction of human organization. In their 2006 book *Wikinomics*, Don Tapscott and Anthony D. Williams famously implored: "We must 'collaborate or perish'—across borders, cultures, disciplines, and firms, and increasingly with masses of people at one time."

The world has quickly responded with all kinds of experiments in mass collaboration:

- **Peer-to-peer translation networks** like DotSub provide an online platform for crowdsourced translation and subtitling of digital videos.
- **Social news systems**, such as Current TV's online "news game," invite viewers to help create online programming 24 hours a day, 7 days a week.
- **Citizen science projects** like the stardust@home project invite volunteers to search for interstellar dust through virtual microscopes. FoldIt! creates a collaborative and amateur-friendly protein-folding platform.
- **Crowdsourced art**, such as PostSecret, an ongoing community art project which curates a collection of anonymous postcards, engaging people in sharing their most private secrets.
- **Open-source search engine development environments**, such as Wikia Search and Mahalo, use social networks and human filtering to improve search results.
- **Crowdsourced artificial intelligence training systems** like Games with a Purpose (GAWP) engage people in playing mini-games designed to improve AI algorithms for things like audio music genre recognition.
- **Participatory marketing campaigns** ask consumers to create enthusiastic videos, wikis, and other Web 2.0 content to promote products to the rest of the world—with examples like NBC's Official Wiki for its television series *Heroes*.



PARTICIPATORY SCALE: FROM THOUSANDS TO MILLIONS

Participatory networks are also pushing the limits of scale. We're now looking at the possibility of mobilizing millions of people with minimal organizational hierarchy—outsizing the largest corporations and competing with the scale of national governments. Where size was once a competitive advantage in itself, the ability to engage mass participation is becoming the organizational frontier of the 21st century.

Technologically, mesh networks provide the defining model for how networks can grow exponentially from the edges, without any centralized management. But what happens when you begin to connect one mesh network to another, linking collaboration on AI algorithms to citizen science networks to social news systems and collaborative 3D animation environments? What are the growth—or engagement—patterns that emerge in such mesh-to-mesh networks?

Then there's the question of extreme-scale strategy. Strategy is, by definition, about long-term goals. But the meaning of long-term shifts as we shift collaborative scales. Extreme-scale collaboration offers the opportunity to set extreme-scale goals on a much longer timeline than strategy usually addresses. In fact, it almost demands that we lengthen our time horizon and focus on much larger goals.

Finally, the basic principles of extreme-scale engagement are beginning to emerge from the fields of game design and social network research where fun economists and fun engineers are laying out new rules of thumb for 21st century organizations. Here we already see that the drivers are less economic and more concerned with the pleasures of accomplishment and feeling capable. The desire to do a good thing and the opportunity to do meaningful work are key motivations, and the best reward is often a positive emotional payoff. Perhaps most important is working the participation pyramid: not everyone will participate equally but everyone has something to offer.

The infographic is titled "EXTREME SCALE: LASER MICRO AND MASSIVE SCALES FOR RAPID ADAPTATION". It features a central graphic of a pyramid with three levels, labeled "HOW TO LOOK: EXTREME SCALE". The pyramid has a blue top section, a yellow middle section, and a green bottom section. To the left of the pyramid, there is a quote: "Collaborate or perish" has become one of the defining calls to action of the 21st century. But one boundary that has proven particularly resistant for collaboration is the boundary between different scales of action. Superstructuring works both up and down the scale. Crowdsourcing is a catch-all term for reaching across the scale. It outsources tasks traditionally done by a few designated experts to a large, dispersed and open community. Crowdsourcing harnesses the activities and ideas of people and links them to smaller local activities—for example, translating Google Earth data into local visions of the future. Both crowdsourcing and superstructuring engineer participation opportunities at two different extreme scales simultaneously—micro and massive. In both cases, each individual actor is making a micro-scale contribution that many other individuals or groups will also be capable of understanding successfully on their own. These micro-scale contributions add up to a massive-scale collaboration results: collective outcomes that are much larger than any single group or organization could previously have produced.

Below the pyramid, there are several sections of text:

- Push both up and down the scale of scale.** These activities are done at both smaller and larger scales and then pass the baton to participants in your project.
- Other 10 activities:** Crowdsourcing: Society-wide, we are identifying a task we want to contribute to a larger goal. Technology, including the social, has been resource or capabilities. As one Superstruct player notes, "Superstruct is for people who can actually contribute to their own project process to create of contribution to someone who would otherwise have the opportunity to engage?"
- Optimize participation boundaries.** Participants benefit from participating because they are able to contribute to one or more participatory networks or projects. Change participation at different scales. Once an individual actor may have one participatory network to offer, but have resources or capabilities. Optimize of entirely and create.
- Should carefully apply the participation pyramid.** "If you find potential ideas, make a list of them. If you can see a path to the participation pyramid, then others participation benefits should be added."

At the bottom, there is a "TEN-YEAR FORECAST" section with a bar chart showing growth from 2009 to 2019. The chart shows a significant increase in participation, with a peak around 2015-2016 and a slight dip in 2017-2018, followed by a rise again in 2019.

METHODOLOGICAL NOTE:

The Superstruct Ecologies presented in this handbook were constructed from an analysis of the density of connections of members among superstructures. Superstruct players could sign up to be members of as many superstructures as they wanted.

If a superstruct had one member that belonged to one other superstructure, it had a connection density of 1; as the number of shared members and the number of member-linked superstructures grew, so did the connection density. The maximum density was 342.

To create an ecology, we selected a single superstructure as a starting place. We then set a threshold of density to define the ecology. For the smaller ecologies, the threshold was as low as two shared members. For some of the more densely connected ecologies, the threshold was as high as five shared members. Adjusting the density threshold allowed us to maximize the visibility of connections. Too low a threshold would show everything as connected; too high would leave out important connections and only reveal a familiar set of the most highly connected superstructures.

First-order and second-order connections were identified. Thus, in addition to the core superstructures, which were all connected to one another, other superstructures emerged from the intersections of two or more of the superstructures. In some cases, where second-order connections were numerous, we have chosen simply to list some of the more widespread connections rather than portray them in the diagram.

A tool was developed to support this analysis and could be used to analyze any ecology, starting from any of the 500+ superstructures. We chose the five ecologies here for their content relevance to our forecasts, the clarity of the landscapes they reveal, and compelling innovations they represent.

RESOURCES

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SUPERSTRUCT



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