

# FUNKTIONEERING

MAGAZINE

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**The true heart of sustainability is thinking and acting in the long-term. Foresight thinking provides a way to see into the future, anticipate positive changes that might occur, and acting on that knowledge today.**

Foresight thinking at Stanford began with two eminent 20th century polymaths, engineering professor John Arnold and inventor Buckminster Fuller. Together they developed the model of Comprehensive Design Thinking that combined analytical and creative abilities. Working closely with American industry, they then delivered a series of courses at MIT and Stanford. Their aim to “turn out creative engineers who would be both analytical and imaginative and who would be equipped to perform a real service to society.” Comprehensive Design Thinking became the foundation of design at Stanford University today.

You’ll find similar threads in the work of other forward-looking thinkers from that time. For example, few people realize that famed management guru Peter Drucker began his career provoking business executives to develop long-range plans for “America’s Next Twenty Years” (published 1957). Austrian Friedrich von Hayek introduced a provocative theory of complex phenomena that required integrating past knowledge with future needs. And as noted by urban historian Jane Jacobs, Dr. Warren Weaver discussed the challenge of solving big problems, such as cities, that had “two billion variables.” These were timely conversations in America. The 1950s saw the start of the space age and the incipient rise of the information society. Industry leaders had to deal not just with today or tomorrow, but the speed of change that required them to face a complex and highly ambiguous future. And not simply understand that future, but to build it.

Industry’s need for foresight never disappeared. The Foresight and Innovation program, which I pioneered at Stanford University starting in 2000, was established in response to industry’s call to develop leaders in long-range innovation. Part of the Foresight program develops new curriculum for students at Stanford and around the world. Starting with our earliest course that taught students how to identify and innovate with emerging technologies, our classes draw a diverse mix of students from across the Stanford campus. That first course focused on forthcoming “NBIC” innovations (an acronym for Nanotechnology, Biotechnology, Information Technology, and Cognitive Science), connecting the students with NBIC topic experts, many of whom sat just down the hall from our lab. Students were pushed far beyond their experience and expectations, and

they loved it. One student reported later, “This class made my brain hurt in a good way!”

Along with the students, the teaching team and I learned a lot. One of the biggest lessons was how exciting it was for students to go beyond traditional engineering and design courses. Their passion surprised me. The advanced students craved learning “how to think ahead” with foresight, and then “how to start” using the foresight methods in their lives – and in their future careers.

From the experiences with students, industry partners, and other research efforts, my team has developed a new foresight model that helps companies to design tomorrow’s innovations. Our industry partners asked us to help them address not just today’s product and service design needs, nor simply tell them stories about the future, but to help them discover and capture their future opportunities. These are important distinctions.

They asked us how they could better understand the different possible futures that lie ahead, develop measurable opportunities, and begin working on the most promising paths to create their companies’ future solutions. In other words, industry wanted to move from Foresight to Research to Anticipatory design.

These three steps provide the core framework to our program, and the fourth step ties the system together.

#### I. FORESIGHT

The first step is developing a long-term perspective. What is the big picture today and how did we arrive here? In this initial step, the goal is to understand deeply the state of society, technology, and today that will become a complex tomorrow.

#### II. RESEARCH

The second step is finding new innovation opportunities. Working from what we know and what we can understand about the future, what sort of opportunities can we envision?

#### III. ANTICIPATORY DESIGN

The third step transitions you to future solutions, during which realizable, actionable paths to the future are developed along with actual next steps that can be pursued today.

#### IV. INTEGRATION

The final step is integration. Successful long-term innovation is predicated on connecting all of these tools and methods into a coherent process.

As you can see, the foresight model is shown in the adjacent graphic. It provides an effective way for people to see the connections across the near-, mid-, and far-term time horizons. When we were invited to teach our foresight methods in India – with Tata, Kirloskar Brothers, Mahindra, and other globally leading companies – we used this foresight model to explore potential disruptive innovations. At the end of our program, my team and I were incredibly impressed by the employees’ desire to inject long-range foresight, opportunity research, and hands-on future prototyping insight into every stage of their research and development processes.

One of the participants told us later, “The framework is great for getting new ideas adopted by R&D teams. This helps us to get the key thinking of future products functionality in synergy with surrounding reality.”

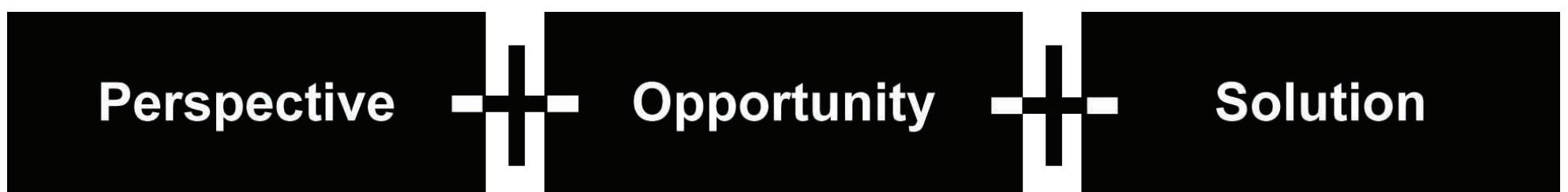
Since then, we’ve led programs in foresight thinking with all types of organizations, most recently with Microsoft (who specialize in software and services) to Volvo Aero (known for advanced rocket engines). Across all efforts, our underlying goal is to introduce students of all ages to foresight thinking. We want to help them understand how one comprehensive model of foresight can stimulate long-range innovation in their own daily work – and for foresight leaders, within their business, as well as within other organizations across the globe.

Foresight is not a special way of seeing. Like any ability, foresight thinking can be taught, nurtured, and encouraged. I can state this outcome with absolute certainty having watched the students at Stanford and our academic and industry partners in our global foresight network.

The French novelist Charles Victor Cherbuliez put foresight thinking in perspective when he stated: “What helps luck is a habit of watching for opportunities, of having a patient, but restless mind, of sacrificing one’s ease or vanity, of uniting a love of detail to foresight, and of passing through hard times bravely and cheerfully.” This is good advice for us today, as we face new challenges in our time’s own complex and highly ambiguous future.

Simply put, we are responsible for understanding our future ahead, and ultimately, to build it. And with the right foresight thinking, we can begin turning our ideas into foresight doing.

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**“Foresight is not a special way of seeing. Like any ability, foresight thinking can be taught, nurtured, and encouraged.”**

**BECOMING A  
FORESIGHT  
THINKER**

**William Cockayne**  
Stanford University

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**FUNKTIONEERING** has little to do with legendary architect Frank Lloyd Wright's notion of 'functioneering' as "*putting the architecture on the outside*".

On the contrary, funktioneering is much more about delivering content than putting up a facade. Customers in a wide variety of markets are increasingly asking for 'services' rather than 'products', for 'experiences' rather than 'things' and to meet these demands, product developing companies need to rise to the occasion by putting careful attention to how such functions could be developed to meet these needs to the highest possible degree.

Funktioneering is the art and science of understanding which functions customers really need, and designing and engineering the function-carrying components of such 'total' product offers.

What about the 'funk'? Well, just like the music genre, funktioneering needs to draw its inspiration from an eclectic mix of people, domains, and skills - and yet deliver a seamless and well-composed user experience.