

## Systems Thinking for Transformation

GE EVOLVES FOR THE DIGITAL INDUSTRIAL ERA

CASE STUDY NO. 2 • FEBRUARY 2018



"General Electric Co. is a technology and financial services company that develops and manufactures products for the generation, transmission, distribution, control and utilization of electricity. Its products and services include aircraft engines, power generation, water processing, security technology, medical imaging, business and consumer financing, media content and industrial products."<sup>1</sup>

Size: 295,000+ employees.

Valuation (Market Cap): \$261.2B

**Need** Anticipating disruptive shifts in additive manufacturing, GE's CEO Jeff Immelt focused on moving GE from an industrial powerhouse to a digital industrial leader. His first efforts were to train leaders and employees to think differently—or more specifically, to think *systemically*. This precipitated an organization-wide cultural initiative around systems thinking.

**Solution** Through training courses for leadership, an online MOOC training, individual scoring on the systems thinking and metacognitive inventory (STMI), and application of the Plectica systems modeling software, Drs. Cabrera trained GE managers in systems thinking skills (DSRP) featuring customized GE content.

**Benefits** GE's adoption of systems thinking has given its professionals a set of shared practices to more effectively embody and support GE's transformation into an integrated digital industrial technology company. DSRP provided GE leaders with a common problem solving and systems analysis process and language that could be used across departments and sectors to solve difficult problems within the organization.

Keywords: organizational learning; systems thinking; systems leadership; cultural initiative; DSRP

## Need

**GEC** set its vision to lead the digital industrial era. CEO Jeff Immelt explained that, "the investments we are making to become a Digital Industrial [company] and in additive manufacturing will unleash productivity and create new models of growth."<sup>2</sup> GE's success with the LEAP jet engines that power the Boeing 737 MAX plane included 3D printed components. But this early success in digital industrial needed to be replicated not only across their engineering function but company-wide, including human resources, innovation, training and development, all across its eight primary segments. This would require not only sweeping changes in GE's technology and processes but a cultural transformation of the company itself through its organization-wide systems thinking initiative.

We don't develop enough good systems thinkers. We tend to develop people who are very good at finance or very good at marketing or very good in specific industries. The real challenges now are going to be driven by systems thinking.<sup>3</sup> - JEFF IMMELT, GE CEO

This cultural shift required creating more systems thinkers in GE's ranks. GE approached Cornell University's Executive Education Program faculty Derek and Laura Cabrera to implement the ideas outlined in their groundbreaking book, *Systems Thinking Made Simple: New Hope for Solving Wicked Problems* (STMS). GE needed a multi-pronged approach to training in systems thinking and systems modeling that would resonate as much with engineers as it would with human resources.

## Solution

From Dubai to Crotonville, Drs. Derek and Laura Cabrera provided one and two day trainings to GE executives and rising leaders across many departments and divisions. These trainings familiarize participants with the background of systems thinking as a field, providing a common definition of this particular approach to Systems Thinking, with emphasis on its multiple applications. Next, participants learned the four simple dynamical rules



of distinction-making, organizing systems, recognizing relationships and taking perspectives that are combined and recombined to bring about more systemic thinking about any problem or topic.

GE participants reported that the preparatory work ahead of training increased their engagement during the trainings. That included: short videos, readings from the [STMS] book, calculation of personal results on a validated systems thinking and metacognition inventory (STMI), and application of DSRP to a custom written GE Case Study on additive manufacturing. Participants were able to consult their personalized STMI results during the training and use them as a springboard to activities that were more personalized and relevant relative to their pre-work scores.



Figure 1: Individual STMI Scores personalize the training

The GE Case Study provided rich discussion and opportunities for systems modelling activities using <u>Plectica</u> <u>modeling software</u> developed in the Cabrera's research lab. Throughout the trainings, participants focused on how to apply DSRP to their work *after* the training. The unique systems thinking and modeling software environment provided an invaluable tool to not only develop systems thinking skills but also a means to continue their application after the training ended. Internally, GE now offers the Cabrera's Systems Thinking 101 training through an online Massive Open Online Course (MOOC) available to 55,000 of GE's employees. The online training was customized to feature GE case studies. The Systems Thinking course for executives is now a regularly scheduled course for executives at GE's Management Development Institute at Crotonville.

## Benefits

DSRP provided GE with a common problem solving and systems analysis process and language that could be used across departments and sectors.

The benefit of a platform solution for training that includes powerful pre-work, the right balance between off-the-shelf content and customizable content, and a multitude of dynamic delivery mechanisms (including in-person and online), provided GE with a powerful way to begin their organization-wide initiative in systems thinking. GE's executives (the participants in the trainings) gave it high ratings.



Figure 2: GE's executives gave the training high ratings

The expertise and dynamism of the Cabrera's systems thinking models and methods provided both the accessibility and fidelity required for cross-purpose and cross-functional teams. The scaleable power of Plectica dynamic modeling software provided a learning experience that continues long after the training.



End Notes <sup>1</sup> https://www.forbes.com/companies/general-electric/

<sup>2</sup> https://www.ge.com/reports/2017-immelt-annual-letter/

 $^3$  http://knowledge.wharton.upenn.edu/article/ges-jeff-immelt-on-leadership-global-risk-and-growth/





**To cite this work:** Cabrera, D., Cabrera, L. (2018). Systems Thinking for Transformation, GE Evolves for the Digital Industrial Era. Plectica Publishing. New York.

For further info about these offerings contact Erik William Michielsen: **ewm64@cornell.edu**