Puddle sculpture by Spanish street artist, Isaac Cordial, unofficially entitled "Politicians discussing Global Warming"

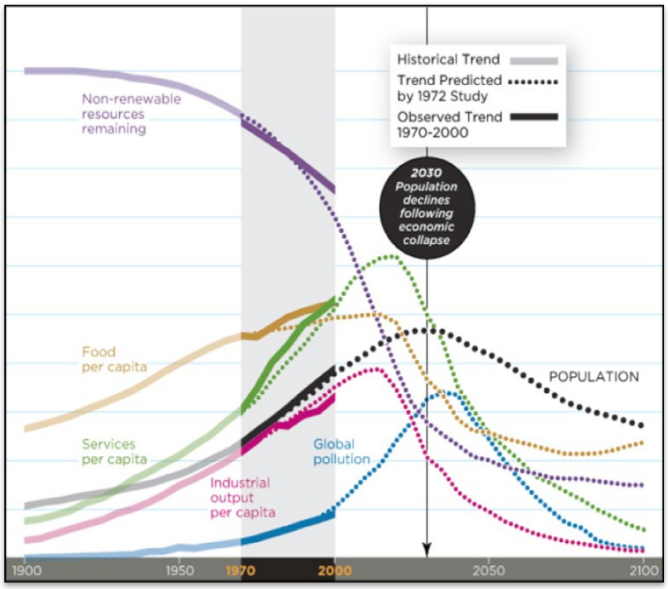
Management in the 21st century: Sustainable development or a narcissistic drowning

"No matter where we hail from or who our parents were,we are descendants from the hardy survivors of unimaginable catastrophes. Each of us is a runner in the longest and most dangerous relay race there ever was, and at this moment, we hold the baton in our hands."
– Cosmos: A Spacetime Odyssey, Episode 9, 2014

LIFE is grand

What do you think of when you hear the word, *sustainability*? Do you think about saving the planet? An astronomical mass of 5.9 sextillion tons that formed around 4.5 billion years ago. Maybe not. It is hard to see how the Earth could be in need of our rescue. What about saving animals or, at least, the cuddly ones? Well, it doesn't get any cuddlier than a waterbear (a.k.a. tardigrade). Tardigrades are eight-legged micro-animals that possess amazing survival skills, like the ability to withstand temperatures from absolute zero to well above boiling andre-animate after 10 years without food or water. They have survived all five mass extinctions over the last 530 million years. If the tardigrade is any example, as much as we may cling to Life, it seems we need Life much more than it needs us. In 1987, the United Nations defined sustainable development as, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." In short – the survival ofthe human race. Unfortunately, unlike tardigrades, we rely on a fairly narrow range of environmental conditions to survive and thrive. The good news is we are living in a cyclical glacial intermission that, if the past is an indication of the future, should last for another 50,000 years. Of course, things have changed since the distant past written in Antarctic ice cores. After taking all of human history for population to reach one billion, we added six billion people in just over 200 years.Despite the dire predictionsof Thomas Malthus in 1798, we have managed to sustain rapid growth AND extend life expectancies. In fact, we currently supply sufficient calories for almost 75% of humanity and only overfeed roughly half of the well-fed {pat on back}.Since the industrial revolution, we've experienced a 100-fold increase in economic output and gained the wealth and comfort of modern life.The only drawback is that we have become a threat to ourselves. Burning fossilized plankton and trees is threatening the uncharacteristically mild and stable temperatures of human memory. Current observations show a dangerous decline in critical aspects of the biosphere - like biodiversity, the nitrogen

cycle, the water cycle, and ocean chemistry. As we said, the Earth will survive whatever we throw at and so will the institution of Life. Even fragile humankind might eek through the population bottleneck of an environmental collapse. Genetic studies suggest that all of us are descendant from 2,000 hardy survivors that lived around 70,000 years ago. That means no matter what havoc we wreak, some of us are bound to get lucky, right? What IS at stake, however, is the survival of the increasingly rich, healthy, and peaceful global civilization we have created in our image.



Surviving in a material world

The late industrialist Ray C. Anderson described his moment of epiphany as a "spear in the chest". In 1994, Anderson (founder and chairman of Interface, Inc. one of the world's largest producers of floorcoverings) was floored by what he read in Paul Hawken's *The Ecology of Commerce*. He arrived at three conclusions, (1) our life support systems are in decline, (2) the biggest culprit in that decline is the Take→Make→Waste industrial system and, (3) the only institution on Earth that is large and powerful enough to reverse the trend is *Business and Industry*. For more on humanity's impact on our planet, check out Johan Rockstrom's talk on planetary boundaries or browse through photos of the Anthropocene here. The material economy, both the supplier and the primary consumer of fossil fuels, is currently operating at 1.5 times the carrying capacity of our planet. A business-as-usual scenario out to the year 2100 (adding 4 billion people and maintaining 2-3% per capita wealth growth per year) would place us in the absurd position of consuming at the rate of something like 5 earths. Of course, the tap may run dry before we get there. In 1972, a think tank called The Club of Rome published a report entitled "The Limits to Growth" based on a forecasting model created by two researchers at the Massachusetts Institute of Technology. The central conclusion was simple and essentially the same that Malthus reached 200 years before. The earth is finite and human growth is exponential. Unchecked growth thus inevitably leads to a chain reaction of scarcities→increasingly onerous capital requirements for extraction →a fall in industrial and agricultural output → and ultimately population decline. The doomsday prognostication was widely lampooned. Unfortunately, researchers at the University of Melbourne recently confirmed the projections, 40 years on, and the horizon for collapse is 15 years. Fifteen years is within the life span of more than 80% of us alive today (i.e. the ones holding the batons).

Limits to growth

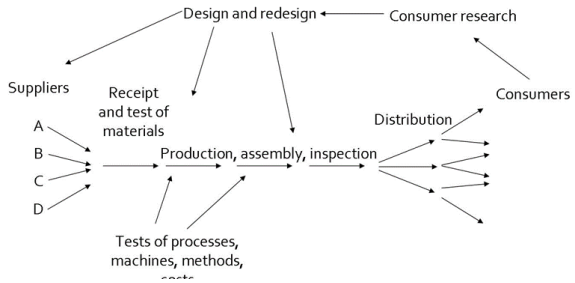
Results of Interface's transformation (1996 – 2008)	
Sales	↑ 66%
Earnings	↑ 2x
Greenhouse gas emissions (absolute tons)	↓ 71%
GHG intensity (relative to sales)	↓ 82%
Fossil fuel consumption / per sq. yd. of carpet	↓ 60%

Chart Sources: Meadows, D.H., Meadows, D.L., Randers, J. and Behrens III, W.W. (1972) (Linda Eckstein)

Alternatively, a radical decoupling of economic growth from consumption of non-renewable resources (including fossil fuels) could allow us to put the ghost of Malthus to rest for another 200 years. For example, if we can reduce CO^2 emissions by a factor of eight in relation to per capita wealth, we might be able to stave off the worst of global warming. In addition, decoupling would create the basic conditions to lift our remaining 1 billion brothers and sisters out of extreme poverty by 2030 and set us on the path to support a peak population of 11 billion by 2100. The Circular Economy is a vision for this kind of decoupling. It describes a second industrial revolution, from today's linear "Take→Make→Waste" model to one that is regenerative by design.This is the same vision that Ray C. Anderson had in 1994. At the time of his epiphany, Interface was the same as any other carpet company, as he put it, "...so oil intensive you could think of it as an extension of the petrochemical industry". As a self-indicted plunderer of the Earth, he devoted the remaining 17 years of his life to turning Interface into a leading example for the transformation of industry.

Leadership means doing the right things

There are those that believe that the sole purpose of business is to make money. It is hard to for me to see how that is a satisfactory goal for humanity's mostpervasive endeavor. The former U.S. presidential candidate, Al Gore, once said, "More money is allocated by markets around the world in *one hour* than by all the governments on the planet in a full year." Whether or not that is true (or inconvenient), it is clear we live in a society dominated by markets. A society where the question, "What is possible?" is based not only on human capability but also filtered through an analysis of costs and returns. Systemic management theorist Russel L. Ackoff had a few thoughts on how to decide what is worth doing. He said, "Doing the *wrong* thing *right* is not nearly as good as doing the *right* thing *wrong*." His supporting example was the Japanese automobile industry:



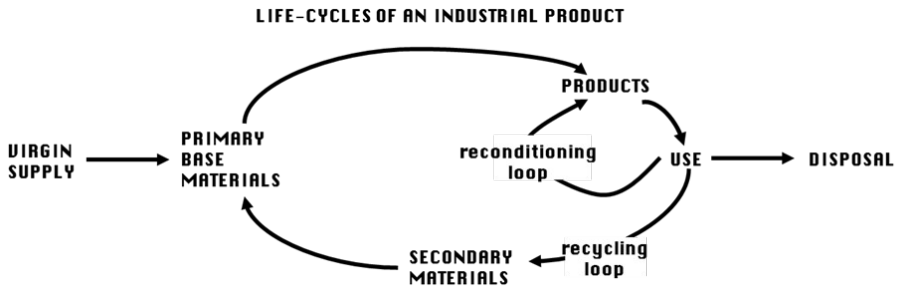
Production viewed as a System, W. Edwards Deming, Japan (1950)

"The Japanese are doing things right but they are doing the wrong thing…You see, the automobile is destroying urban life around the world. Just visit…any of those major cities where…children…are not allowed to walk out of doors because the driving!"

Ackoff went on to discuss the difference between efficiency and effectiveness. The legacy of the industrial revolution up to the present time is an enormous success of improved efficiency. Unfortunately, most of theefficiency improvement has been focused on a renewable resource with growing and potentially excessive supply – human labor. I believe *Business and Industry* need to do more than just be efficient. We need effectiveness, now more than ever, in a world of increasing environmental strain where businesses are the key players in an interconnected global system. W. Edwards Deming revolutionized the thinking of Japanese engineers in the 1950's by showing them that their fragmented organization of people, managers, and departments was actually a system.

In 1976, Walter Stahel and Geneviève Reday-Mulvey published a seminal work on the Circular Economy describing their vision for an "economy in loops".

The vision of a supply chain as a system-in-loops should look familiar to those who were inspired by Deming's image of an organization. I also believe that the techniques developed to help organizations overcome the "deadly diseases of management" and drive systemic thinking could be put to better use if they were tied to the higher purpose of creating a sustainable form of industry. The message of "Quality doesn't cost, it pays" is to the 1950's what "Sustainability doesn't cost, it pays" is to the 21st century. Another giant in the field of Systemic Management, Eliyahu Goldratt, defined his management philosophy, the Theory of Constraints, in one word: Focus. He further defined focus as "doing what should be done". The question I ask to the reader is - Are you using your knowledge of systemic management to lead industry towards doing what should be done?" If not, never fear, at least there's an



Stahel and Reday-Mulvey, 'The Potential for Substituting Manpower for Energy' (1976)

army of cost accountants working to slow the cancerous growth of industry while the rest of us struggle to keep businesses afloat and help them “make more money now and in the future”.