

Sustainability and Innovation

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Sustainability

- Sustainability is often used in two different contexts in Entrepreneurship and Innovation.
 - Is the organization sustainable as an organization –based upon its business model and business execution?
 - Do the actions of the organization contribute toward a world that is environmentally sustainable.
- The two are actually linked in the sense that an organization that is not a sustainable organization will be unlikely to contribute to its mission over the long term.
- A organization that is not contributing to an environmentally sustainable future, may not be able to remain a sustainable organization due to both business and regulatory pressures.

- As Wikipedia notes:
 - “Healthy ecosystems and environments are necessary to the survival of humans and other organisms. Ways of reducing negative human impact are environmentally-friendly chemical engineering, environmental resources management and environmental protection. Information is gained from green chemistry, earth science, environmental science and conservation biology. Ecological economics studies the fields of academic research that aim to address human economies and natural ecosystems.”
 - “Moving towards sustainability is also a social challenge that entails international and national law, urban planning and transport, local and individual lifestyles and ethical consumerism. Ways of living more sustainably can take many forms from reorganizing living conditions (e.g., ecovillages, eco-municipalities and sustainable cities), reappraising economic sectors (permaculture, green building, sustainable agriculture), or work practices (sustainable architecture), using science to develop new technologies (green technologies, renewable energy and sustainable fission and fusion power), or designing systems in a flexible and reversible manner,[4][5] and adjusting individual lifestyles that conserve natural resources.”

Opportunities in Sustainability

- Many entrepreneurs, both social and financial, have found opportunities in creating sustainable alternatives to less sustainable practices.
 - For example, in Massachusetts, solar and wind companies have been given tax incentives and regulatory help (forcing utilities to buy their power).
- Note also that many of the “green” actions reduce the inputs of energy and materials used in industry. This can reduce cost and make companies more profitable.
- As a former Dean who was planning the renovation of the Chemistry building, I was acutely aware that you paid for all the Chemicals we used TWICE –once to acquire them and then to dispose of the waste through hoods, air handling units, vent stacks, water treatment, and chemical disposal companies. A small reduction had a huge impact on cost.
- Sustainability is now seen as one of innovations new frontiers.

Cradle to Cradle

- At one time, innovators were encouraged to look at the product life cycle from beginning to end –or from “cradle to grave.”
- Product design now must take into account recycling and reuse. This is often termed “cradle to cradle.”
- Eco-Efficiency refers to improvements to products and services which improve upon some aspect of their ecological impact.

Key events and organizations in history

- The Club of Rome published “The Limits to Growth” in 1972.
 - It tried to take a look at how exponential growth would affect the world over time.
 - Remains a subject of debate to today.
- The World Wildlife Fund and Greenpeace emerged and remain influential voices on environmental issues to this day.
- At first the focus was on regulation and compliance, and many companies viewed this as an unwelcome intrusion. While that response has lessened, it continues to exist to the present.
- Many companies moved from compliance toward taking on “social responsibility” and hoping to gain competitive credit for doing so.
- Interestingly, the text asserts that it began with social responsibility and THEN moved toward compliance. In the US, at least, it has begun first with regulation, but it is certainly true that regulatory pressures will continue to increase.
- **Operational optimization-** companies often begin by complying with regulations and optimizing performance and efficiency.
- **Operational Transformation-** can occur when radically new business models and disruptive products and services are created.

World Business Council for Sustainable Development

- Vision 2050
 - <http://www.wbcsd.org/vision2050.aspx>
- Sets out a vision for Sustainable Business Development
- Must haves:
 - Incorporating the costs of externalities, starting with carbon, ecosystem services and water, into the structure of the marketplace;
 - Doubling agricultural output without increasing the amount of land or water used;
 - Halting deforestation and increasing yields from planted forests;
 - Halving carbon emissions worldwide (based on 2005 levels) by 2050 through a shift to low-carbon energy systems;
 - Improved demand-side energy efficiency, and providing universal access to low-carbon mobility.
- There will be many business opportunities in this vision.

- **The 5 Stages for Achieving Innovation Through Sustainability**
 - <http://www.triplepundit.com/2009/09/the-5-stages-for-achieving-innovation-through-sustainability/#>
- **1. Viewing Compliance as Opportunity** – Most companies start with compliance. All must comply with legal regulations that can vary based on region. And in addition, some choose to follow voluntary, sector-specific codes of conduct. Rather than viewing compliance as a burden and doing as little as possible, the authors suggest complying with the most stringent rules and doing so before they become mandatory. This first-mover approach provides a competitive advantage as well as efficiencies of scale. Staying ahead of regulation can also put companies in a position to shape future legislation.
- **2. Making Value Chains Sustainable** – Keeping pace with regulation makes companies more environmentally aware and more attentive to their resource consumption habits. They will look inward to reduce consumption and waste in their operations and workplace environments; and then outward to their supply chain and other external partners to drive efficiency through every link in the value chain. This forces companies to become more adept with new tools like life cycle assessments, energy footprint calculators and carbon management protocols that can lead to future innovation especially in the design of new products and businesses. Driving sustainability through the supply chain compounds the positive effect by requiring suppliers, typically small to medium businesses, to improve their environmental and labor practices.
- **3. Designing Sustainable Products and Services** – With an increased focus on efficiency and newly acquired skills like life cycle assessments, companies can redesign their offerings and tap into growing consumer demand for more eco-friendly products and packaging. But this is more than just a PR exercise. Through this process, management also learns how to scale new sources of supply and distribution, as well as gain expertise in new manufacturing techniques. The skills learned today provide the foundation for developing tomorrow's products.
- **4. Developing New Business Models** – As companies view current business models through the lens of sustainability, they will inevitably rethink these models, especially with the advent of new technologies and the shifting landscape of customer expectations. New models have already started to emerge emphasizing the delivery of value through services rather than products, and the combination of digital with physical infrastructures.
- **5. Creating Next-Practice Platforms** – A sustainability focus also allows companies to build on their existing competencies to develop next-practice platforms and new paradigms. Can we imagine products like waterless detergents, or crops that grow without water, or biodegradable packaging that plants seeds as it decomposes? Can we imagine a national energy system that uses digital technology to manage power generation, transmission, distribution and consumer demand all via the Internet? Innovators like Cisco, HP, Dell and IBM can. They call it the smart grid.

The Trade-Off

- Innovation can be part of the problem and/or part of the solution.
- Problem:
 - DDT was created to control disease carrying pests, but then was found to have terrible environmental effects.
 - Thalidomide was created as an anti-nausea drug, but it caused severe birth defects that left children disabled for life.
 - Mortgage based derivatives were created to help finance the home ownership dreams of the middle class. Flaws in their design led to the Great Recession of 2008.
 - Fracking was developed to be able to extract oil from oil fields that were otherwise uneconomic. It turned the United States in the worlds leading producer of oil and gas, reduced our dependence on middle eastern oil, reduced costs, allowed natural gas to replace coal -resulting in the greatest reduction of greenhouse gases in history, BUT, environmentalists have pointed out that there are costs to doing this in water pollution, land use, and even earthquakes.
- **Responsible Innovation** -This is why innovators are now encouraged to explore potential negative impacts earlier in the process.