How Sustainability is Disrupting Today's Supply Chain

Jonquil Hackenberg, Partner
Supply Chain Practice, Infosys Consulting

Industry 4.0 is enabling companies to create lasting competitive advantage…sustainably and financially.

The term sustainability burst onto the scene ~10 years ago as the price of oil shot past $100 per barrel and discussion of atmospheric CO2 concentration moved from science labs to living rooms. While increased dialogue on the environmental impacts of business was certainly a healthy development, the truth is that the core tenet of sustainability – optimizing resource usage – has always been fundamental to minimizing costs and therefore maximizing financial performance.

The difference today is that the explosion of data powered by the massive proliferation of smart sensors (i.e. the Internet of Things) has rapidly raised the competitive bar. It is no longer enough for companies to add insulation to their factory walls and plant gardens on their roofs. To win in today's market, they must also embrace big data in a way that stiches together fragmented, custom e-commerce orders with reactive, optimized supply chains and factory production.

Interestingly, the German government, steward to some of the world's most progressive, technologically advanced manufacturers, was an early observer of these trends and in 2010 announced a sweeping initiative dubbed "Industry 4.0". This initiative was dedicated to making Germany the leading provider of cyber -> physical systems and green IT initiatives by 2020, and included components such as prediction of energy requirements based on customer patterns, modularized supply chains to reduce waste and decentralized decision-making through factory floor virtualization.

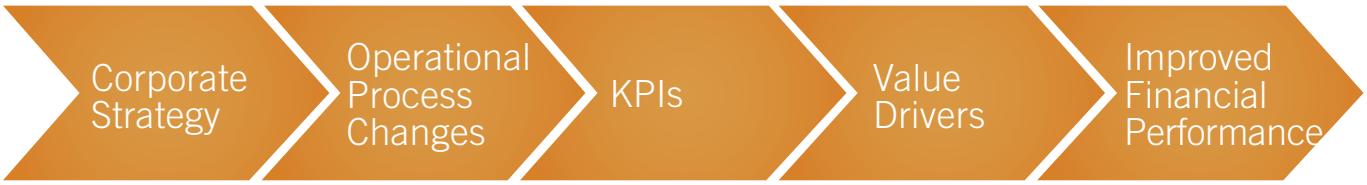
Given the relevance of these concepts to companies across the globe, this article will explore some of the frameworks companies can use to deliver on Industry 4.0 to seize a competitive advantage in today's uber-connected world.

How Large is the Opportunity?

Before we dive into ways companies can leverage data to optimize resource usage, let's quickly examine the financial incentives. By some estimates, 40% ($36 trillion) of the world's revenue is generated by companies that hold energy cost and energy source of strategic importance in their production lifecycles. Of this $36 trillion, 27% is from energy-intensive industries where energy costs account for more than 5% of the production lifecycle.

Given the scale of these numbers, improving energy usage by even a conservative 2% has the potential to remove a whopping $30 - $50 billion from corporate cost structures. Additionally, energy prices are notoriously volatile, giving firms one more reason to reduce this line item and therefore obtain greater margin predictability.

The Infosys Consulting Value Realization Management (VRM™) Framework



Let's take an example. Imagine understanding the cost of making each unit of a product – a light bulb; a car; coal. Monitoring energy usage throughout the entire production lifecycle for a single unit provides data about raw material energy cost.

Surprisingly, very few firms have this knowledge. Yet with such knowledge, it is possible to make more strategic decisions about what time of day to produce the product (when energy consumption is at its cheapest); when to buy additional energy for extra, bulk orders of that product. For example, using integrated weather forecasting tools to understand when to buy additional, cheaper, renewable energy on the energy exchange market when the sun is shining, and; even modularise the production of the product, to maximise the energy potential of a given production line.

As a longer term objective, such knowledge can also drive strategic decisions around investment in own energy production – e.g. through solar, wind or biomass – particularly relevant for highly intensive energy industries, such as mining.

Where Firms Are Today

With the Industry 4.0 initiative now well underway, Infosys Consulting was asked by the German Institute for Industrial Management to help gauge company adoption. Their results were somewhat surprising: on the positive side, 85% of firms acknowledged the potential benefits of energy optimization. But only 15% had actionable strategic initiatives in place to realize these benefits. Predictably, these are the same firms setting themselves up to win in the coming business cycle.

Observing this gap, our organization has now started helping firms apply an internal framework to capitalize on the significant opportunity in front of them.

VRM™ is a framework based on the concept of translating corporate strategy into actionable changes that can be measured and valued.

To implement VRM™, firms first define change initiatives that align with corporate strategy. Once the change initiatives are defined, they are mapped to operational process changes that can trigger the desired change (i.e. operational levers). These process changes are attached to KPIs to measure overall impact. Ultimately, these operational KPIs are then translated into value drivers to quantify the contribution of these changes to financial performance.

To take an example, let's consider the German organization Osram. In February 2017, Dr. Olaf Berlien (Osram CEO) noted in his address at the annual general meeting the company wanted to leverage innovation to open new lines of business in support of energy efficient smart cities. This aspirational statement nicely serves as the strategy component of the VRM™-framework.

Translating this strategy into process changes, one would then envision:

- **Supply chain modularization and the goal of energy efficiency within both the end product and within the production thereof, which impacts:**
  - **Supply chain planning**
  - **Production planning**
  - **Procurement**
  - **Installation of predictive analytics on equipment downtime**

The corresponding operational KPIs to measure these process changes would be:

- **Lead-time between first client contract and first order completion**
- **Asset downtime**
- **Planning accuracy (%) of production lifecycle**

Translating these KPIs into value levers, one would quantify increased capacity utilization and operational cost reduction, which would impact company financials through increased product margin and a reduction in both cost of sales and SG & A. It would also support the sustainability strategic agenda which translates into a triple bottom line: reduced costs, increased margin, and decreased carbon footprint. By following this framework, companies can measure relative progress at each step of the journey and incrementally course-correct as needed.

Where Sustainable Supply Chains are Headed

At their core, many Industry 4.0 advances are being powered by the Internet of Things. Specifically, the fact that physical systems contain connected sensors that share data. This dynamic, in which factory "command centers" are tethered to the cloud, enables real-time monitoring as well as demand-driven configuration. Additionally, supply chains can flexibly optimize themselves based on changes in demand or production capacity.

These concepts, which would have seemed the stuff of science fiction just a decade ago, have become required table stakes in a world where virtual shopping for customized objects has become the norm. Under this paradigm, it's no longer enough for companies to produce thousands of the same widget. Shoppers now expect personalization, which in some ways is a reversion to manufacturing's roots – akin to a blacksmith crafting a plow blade for a farmer whose equipment he knows intimately – but at massive scale and in near real-time.

To serve the demanding customer of tomorrow, firms must harness their data in ways that allow them to not only keep up with orders, but to optimize their use of resources to keep the costs of personalization in line with their margin expectations. Those that do will not only help the environment through decreased energy usage, but will also please shareholders via expanding enterprise value – economically and sustainably.

About the Author

Jonquil Hackenberg
Partner – Supply Chain Practice, Infosys Consulting

As partner and UK supply chain practice head, Jonquil defines the go-to-market strategy for digitally-focused market offerings – and leads strategic change and complex supply chain transformation programs for the CPG and manufacturing industries. She is passionate about people, ardent about leadership and about developing high-performing teams with a sense of purpose. As an educationist, she is committed to learning and growth – reflected in her part-time role as a lecturer at Beuth University, Berlin, and in her authorship on sustainability and renewables in Industry 4.0. She possesses an MBA from Beuth University and is fluent in German, English and Spanish.

For more information, contact consulting@infosys.com

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