The Exploration of Attributes Aligning Supply Chain Strategy & Resilience Execution

By: Alexander Cope and Liqing Yuan  
Thesis Advisor: James Blayney Rice, Jr.

Summary: Our research aims to characterize the resilience of an organization by studying its collective employees in an effort to quantify differences between executive strategy and tactical execution. Hierarchical, functional and geographical segments are analyzed across the manufacturing and supply chain organizations of a multinational agriculture chemicals company (DAS). Results demonstrate a 7% difference in responses between strategic and tactical roles, uncovering opportunities to increase alignment by evolving management practices and decision making processes. Further, findings suggest that there is no common “blueprint” of a resilient employee, giving rise to the validation of a leading corporate-social theory: that on-the-job performance and motivation are intrinsic attributes of an individual, qualities not easily measured extrinsically (Pink, 2009).

Alexander Cope holds a B.S. in Mechanical Engineering from the Oregon Institute of Technology and is completing a M.S. in Mechanical Engineering from Portland State University. Prior to joining the SCM program, Alex worked at Intel Corporation for 8 years. After SCM Alex will be joining Microsoft as a Senior NPI Product Manager.

Liqing Yuan holds a Bachelor’s degree in Management Science from Shanghai Jiao Tong University. Prior to the SCM program, she worked as an operations supervisor in the tobacco industry for 5 years.

KEY INSIGHTS

1. A person’s cultural background affects how they may plan or react to a situation. However, corporate culture can overcome social cultures through strategy, training, and execution.

2. Disruptions to product supply are not always from unanticipated [negative] disasters such as storms, earthquakes or political instability. A significant demand increase due to a product’s unexpected success can prove to be as, if not more significant than any aforementioned disruption.

3. Employees that feel valued in their roles place significantly more focus on planning ahead and being prepared to respond to unexpected product supply disruptions.

Introduction:

The complexity of global product supply continues to increase as a function of globalization and horizontal integration; because of this, managing supply risk has never been more important. Designing and implementing a supply chain organization that balances cost and risk exposure effectively is a fundamental building block in being able to deliver the right product to the right place at the right time, all while keeping costs under control. Research conducted through the World Economic Forum in early 2013 finds that a company’s market capitalization can drop up to 7% immediately after a significant product supply disruption and often takes longer than 90 days to recover, if it does at all. The culture of an organization and the makeup of its people are important elements of a reliable and resilient supply chain. Our research works to characterize the alignment of the operations
Collecting Data on the Attributes of Resilience:
Individual and organizational attributes which were hypothesized to foster a culture of resilience were identified and measured. Attributes of interest were aggregated into three categories that include the following:

1. Employees’ Perceptions & Attitudes towards Their Employer – Attributes of interest include an individual’s perception of their value to the organization and the employee’s satisfaction with his / her employer.

2. Corporate Leadership Structure & Communication Efficacy – This topic explores the level of alignment between corporate leaders who establish a strategy and those who are employed to execute the strategy. Attributes explored include communication, career opportunities and decision making processes.

3. Corporate Culture, Proactivity versus Reactivity & Employee Accountability – Attributes include the assessment of corporate culture, prevention versus response, and employee control and influence (accountability).

Data in the aforementioned categories was collected through telephone interviews of 10 supply chain professionals and a web-based survey of the entire manufacturing and supply chain organizations. The survey received 228 responses, a response rate of 60%.

The Prevention-Response Continuum:
Among the most interesting findings is the comparison of expected prevention results mapped against the results of a 70+ company, 1,500 response survey administered by MIT’s Center for Transportation and Logistics (Arntzen, 2010). Results in Figure 1 show that DAS’s product supply organizations are much more focused on disruption prevention than other companies across all countries reported. Prevention expectations for North America and Brazil, important geographies for DAS, are significantly higher by an average of more than 40%. We expect that this increased rating is due to the highly regulated nature of DAS’s business, and in general an organization’s location on the prevention-response continuum can be an indicator of the business, operational structure, and industry in which they compete.

![Figure 1](image.png)

**FIGURE 1** – Expected Product Supply Disruption Prevention versus Response
The Most Important Risk – Upstream Suppliers:
As a part of the survey, respondents were asked to rate their opinions of DAS’s most critical risks to product supply. After analyzing results, it was found that upstream raw material suppliers and external contract manufacturers are believed to represent over 26% of all risks to product supply. While it is not surprising that these risks were rated as being important to plan for, the relative rating against less likely but much more impactful disruptions were unexpected. For example, raw material shortage was rated to be more than twice as important as weather related disasters; however, even a slight shift in weather patterns has the ability to cripple DAS’s business. While humans are not able to alter or control weather patterns, developing contingency plans in anticipation of impactful events is a critical element of a sound operating strategy.

Communication and the Impact of Disruptions:
Counter to expectations, communication effectiveness was found to have no correlation with the impact of a disruption. An impact-threshold was defined establishing a basis for classifying a disruption; individuals were then asked to report the frequency of disruptions observed at their facility, these results are presented on the x-axis of Figure 3. We initially expected there to be a direct relationship such that as communication effectiveness increased the frequency (and therefore the impact) of disruptions would decrease; however, this hypothesis was not proven and results of this analysis are shown in Figure 3. Interestingly, despite the lack of correlation between disruption frequency and communication effectiveness, when analyzing disruption frequency results across levels within the organization, there was unexpected alignment in response with only an 8.6% difference observed between high-level and low-level employees.

FIGURE 2 – Most Important Product Supply Risks

FIGURE 3 – Disruption Frequency versus Communication Efficacy
Conclusions & Wrap-Up:
Managing an increasingly complex network of material sourcing, product manufacturing, finished goods transportation and the multitude of processes in between requires an organization with a focus on product supply. At the center of a well-oiled supply chain organization are its operating strategy and those who execute it; alignment between the two is critical. Engaging and aligning corporate culture with personal values has become an increasingly important mechanism used to cultivate, motivate and retain talented individuals, individuals that when working in concert, maintain supply continuity through challenging situations. Supply chains of the 21st century expand outside traditional bounds, working collaboratively with and affecting nearly every corner of a business. As organizational structures evolve to accommodate the advancement of today’s supply chains, so too must management philosophies and strategies used to achieve supply optimization founded in the principles of risk management.

Cited Sources:
