

MANUFACTURING Matters

Customers in the Supply Chain: The Toyota Recall in Rewind



Last year, along with Professor Seshadri from the University of Texas at Austin and Roy Vasher, retired Toyota executive, we wrote a book on “Toyota Supply Chain Management” published by McGraw Hill. Little did we know that 2010 was just around the corner and discussions regarding Toyota would become a topic of intense discussion in many quarters. We have spent some time thinking about how our framework could help understand the issues surrounding Toyota and I thought it may be useful to provide a brief overview.

In the book, we suggest a v4L (Velocity, Variability, Visibility, Variety and Leadership) framework to understand Toyota’s Supply Chain Management. We described all entities in the supply chain, from the supplier down to the dealer and customer and associated flows of information and material. What was missing in our book, and in descriptions of processes we heard, was a conscious system to manage the “voice of the customer”. Please note that we were not privy to any information not already in the press, we just summarize information that is in the public domain. We then contrasted Toyota’s responses to sudden unintended acceleration (SUA) problem with the evolution of the Ford –Firestone tire bursting problem.

Toyota’s approach with the problem was to continue to work with CTS (an Indiana company) to build replacement parts that were used to fix the problem. No reports of complaining about CTS appeared, it seemed as if the supplier whose parts were involved in the recall played a key manufacturing role in supplying the parts that fixed the problem. Recall the acrimony between Firestone and Ford – the difference is stark. In fact, some marketing researchers (see Harvard Business Review blogs) claimed that a significant majority of Toyota’s customers believed the problem had been dealt with effectively.

But consider possible links to the 4 V’s we described earlier. Before the SUA problem, Toyota’s sales were growing rapidly and, thus the company faced increasing velocity. In such a case, would dealers have the incentive or the time to listen to customers and forward their complaints upstream? Or would they be more dismissive of complaints? As new suppliers were added to support global expansion, their new designs would be added to the supply chain. But how were the ramped up volumes distributed across suppliers? Was variability increased as a result? What was the impact on supply chain visibility? One might surmise that the rapid expansion of volumes and suppliers may have decreased visibility to customer feedback. In short – could the customer complaint have pulled an Andon cord to demand attention? Finally, how were the increased variety of parts and associated suppliers incorporated into the supply chain. Variety in many cases is a necessary tool to grow sales, but component variety also means a careful need to separate complaints by component mix to identify issues. As the number of part combinations in cars increases, complaint data, already in short supply, could mask the problem.

So what would we expect to see in the future – reports in the press have already announced Toyota’s initiatives to increase visibility to deal with the voice of the customer. The reported rapid adjustments to customer complaints suggests that the supply chain is evolving a new player – the customer. While Toyota’s sales growth recently has been lower than the competition, the change in the extent of engagement of senior management with Toyota personnel at plants and in the public eye suggests a company that may, once again, kaizen its way to an improved supply chain.

¹For details see the chapter “The Voice of the Customer”, Toyota Supply Chain Management, Iyer, Seshadri, Vasher, McGraw Hill Japan, (in press)



Climate Affects Growth of Wind Industry

By Mark Wolfred, MBA 2010, Center GA



Sara Pryor spoke to a group of faculty, students, and visitors on Thursday, April 8th discussing the implications of global climate change on the wind energy industry.

The session was sponsored by the Energy Center at Purdue Discovery Park. The wind energy industry has seen explosive growth in the last few years, including a 33% increase in global capacity between 2007 and 2008. The United States alone saw 55 new plants and 35 GigaWatts in new capacity. In 2008, the average turbine installed increased to 1.8 MegaWatts, with heights reaching up to 150 meters. With two-thirds of greenhouse gas emissions coming from the energy industry, wind energy represents an opportunity to cut down on one's carbon footprint. In fact, with a 20 year design life on wind turbines, they have the ability to recover the greenhouse emissions of traditional energy sources in three to seven months.

As part of her research, Sara looks at weather patterns throughout different geographic regions and relates these patterns to wind energy. Europe has traditionally been known as an area of high wind density. Yet the source of this wind effect has largely due to transient phenomena. The question remains, will factors such as storm dynamics change wind patterns over time? And how will these changes affect wind speeds? The media has been quick

to point that out average wind speeds will change over time. However, as Sara pointed out, the 50th percentile of wind speed contributes to less than 10% of the power generated by wind turbines. Instead, the 90th percentile wind speeds contribute significantly to the wind power generated by the turbines, making this percentage

“At John Deere Renewables we are following the scientific debate about potential impacts of climate change on wind speed characteristics and wind energy yield. Changes in seasonal wind patterns or strength could materially affect our business because the electricity generated from wind is a function of the cube of the wind speed. Thus far, the scientific literature appears to be inconclusive in predicting performance changes during the service life of a wind farm. We are keenly interested in research work of atmospheric scientists and climatologists that addresses this important issue. In our view, Professor Sara Pryor is one of the foremost experts in this field.”



Dr. Karl-Heinz Mertins
Director Technologies & Operations
John Deere Renewables

point a more relevant research topic.

Sara's research on changes in the 90th percentile wind speed showed both positive and negative effects, depending on the model used. Thus, at this point in time, there is not a reliable prediction of how wind speeds will look at the end of this century. However, all models did state that the wind energy sector has been conservative in its design specifications.

Whether it's for wind shear, speed, or gust, turbines in the field today have the ability

All of this analysis does point to a promising, yet uncertain future for the wind energy industry. What remains certain is the need for further research on climate change in order to best position our wind turbines for success.

Sara C. Pryor is Provost Professor of Atmospheric Science at Indiana University, and also a visiting distinguished professor at the Atmospheric Environment Institute at the University of Aarhus in Denmark, and in the Department of Wind Energy and Atmospheric Physics at the Risø National Renewable Energy Laboratory in Denmark.

Krannert Students Take the Lead: Creating and Enhancing their International Peers' Experience



Participants in the 1st 2010 Spring Break International Exchange at Boeing (WA)



Ben Crockett
MBA 2011

At a school where innovation is in almost every part of the curriculum, it should come as no surprise that Krannert MBA Student Ben Crockett, created, planned and executed a reverse international MBA classmates.

Ben was troubled when he heard many of his international classmates were discouraged about the not obtaining internships and full-time work in the United States. Instead of complaining or saying it wasn't his problem. Ben contacted friends and alumni in the Washington State area to arrange plant visits

and other cultural exchanges. Students visited MicroSoft headquarters, Boeing and the Seattle Mariners, while also building lifelong relationships and creating vivid memories of their MBA experience in the United States. Thanks to Ben, the Krannert Graduate School Staff and other domestic students who assisted him--like Center Graduate Assistant Jenny Tvedt (MBA 2011), the participating the students have experienced amazing new points of reference on which they can view their academic and professional future.



Jenny Tvedt
MBA 2011



What Should Global Business Managers Learn from the Toyota Recall?

By Jennifer Tvedt, MBA 2011, Center GA



On April 19th, 2010, Purdue University and the Center for International Business Education and Research (CIBER) welcomed Dr. Toshi Amino to speak with students about the lessons one can learn from the ongoing crisis at Toyota Motor Corporation concerning its recall, or lack thereof, of vehicles susceptible to acceleration and brake problems. As 8.4 million vehicles comprising several different Toyota models flood dealerships for repair, Toyota's once great reputation continues to be tarnished by the media, the U.S. Department of Transportation, numerous civil suits, and stories of lives being lost in Toyota vehicles.

Dr. Toshi Amino spoke to students about the risks associated with isolating quality issues to specific departments within global enterprises and the importance of creating intelligence capabilities with cross-cultural sensitivity to meet the challenges of doing business overseas. According to Dr. Toshi, "Toyota did not have a quality-thinking mind and quality practices," which was exacerbated by Toyota's rapid expansion overseas, its silo organizational structure, and poor control over supplier quality. In an industry where consumer choices are driven largely by brand-trust, Toyota's brand – traditionally symbolizing reliable, high-quality products – has certainly been damaged, although the long-term impact remains unknown.

How can Toyota make a comeback and build on the short-term momentum in its recently reported monthly sales to ensure its long-term success? Toyota must reconstruct its brand image by returning its focus to the core values that made the company successful to begin with – building safe, reliable vehicles that appeal to consumer tastes and maintain high resale values.

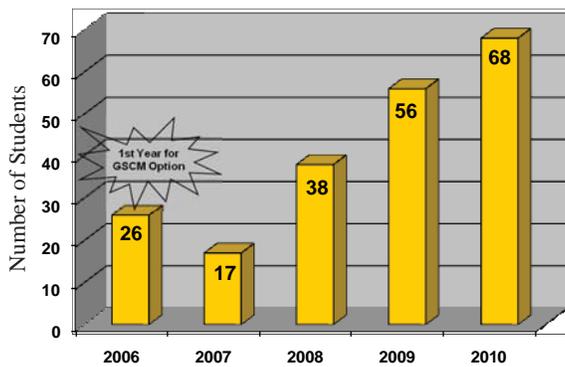
Although it may sound simple, this may prove challenging given stronger competition from the improved reputation of domestic and Korean autos. By extending warranties, offering swift fixes to existing owners, and improving the transparency of its internal activities, Toyota may reassure consumers that their vehicles are safe to drive. If Toyota fails to regain consumer trust or its competitors successfully capitalize on the continuing turmoil, a difficult and more challenging journey lies ahead in the company's attempt to salvage its position as the leading global automobile manufacturer. The consumer and court of public opinion will serve as the final arbitrators in determining Toyota's future success; let the race begin...

Students Enhance their MBA Experience by Earning MTM/GSCM Option Certificates

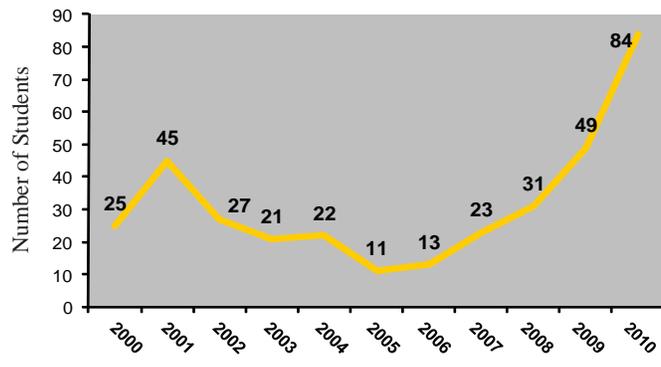
MBA students who are interested in operations or supply chain can enroll in courses which lead them to an option area certificate in manufacturing technology management or global supply chain management. This option allows students to learn how the network of suppliers, manufacturing facilities, distribution centers and customers located around the world work together to ensure that the right product arrives at the right place at the right time for the right price.

As the focus of corporate leaders is increasingly shifting towards innovation, high-value and high-margin products in new and evolving industries, students must be well prepared to succeed in today's highly competitive world of manufacturing. Departing the Krannert MBA Program with a MTM or GSCM certificate allows the students to differentiate themselves from their peers.

MBA Student Graduating with GSCM Option



MBA Student Graduating with MTM Option



This year, new *record highs* in certificate attainment have been reached, with 68 GSCM Certificates and 84 MTM Certificates, and 49 students achieved both certificates.





Congratulations 2010 Graduates

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Global Supply Chain Management (GSCM) Option Certificates

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Michael Bolen	Nathan Gross	Qing Sheng
Patrick Eugene Boyle	Brendan Hackett	Jong Hoon Son
Chun Yi Chang	Brandon Tyler Hicks	Kousthub Srinivasa Raghavan
Yun-Ching Chang	Eric Kennedy	Mei-Lin Teng
Joshua Cox	Nikolaus Ladisch	Thomas Thigpen
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