



Global Supply Chain

BY MARY E. FRITH

DR. ZUBAIR MOHAMED'S RESEARCH INTO THE INTERWORKINGS OF THE GLOBAL SUPPLY CHAIN HAS THE POTENTIAL TO CHANGE THE WORLD — THE BUSINESS WORLD, THAT IS. MOHAMED, PROFESSOR OF MANAGEMENT AND INFORMATION SYSTEMS IN THE GORDON FORD COLLEGE OF BUSINESS, HAS BEEN RESEARCHING THE GLOBAL SUPPLY CHAIN SINCE 1996. HIS RESEARCH FOCUSES UPON THE EXAMINATION OF SYSTEMS AND THE DETERMINATION OF HOW THOSE SYSTEMS CAN BE ADJUSTED TO SAVE COMPANIES MONEY.

For example, how does Ford make cars? It makes some components and buys many components and subassemblies from its suppliers, and assembles them into cars and relies on its distributor network to sell them to the final customer. Ford's suppliers in turn depend on their suppliers, and this interdependency is repeated to form a supply chain. About half of the cost that goes into the making of a product comes from the components and subassemblies bought from suppliers. This figure is likely to increase. The competitive importance is apparent for optimizing the functioning of the supply chain.

Dr. Mohamed's research is based upon the idea that the relationship between customer and supplier has become more of a partnership. This occurs when organiza-

tions readily share information and thus share ways of saving money.

The former nature of business included no guarantee of continuing relationships with vendors from one year to the following year. However, Dr. Mohamed suggests that in today's business world the lack of relationship building with vendors *will cost money*. For example, if a business can contract with a supplier for 10 to 15 years, savings can be shared and more money can be put into the development of the organization. The development of one organization may potentially lead to the development of its partner organizations, which poses a maximized situation for everyone in the supply chain.



Dr. Zubair Mohamed

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Mohamed has developed mathematical models that allow manufacturers and their coordinating global supply chain to maximize efficiency by making decisions that positively affect all partners. His models encourage businesses to take an active role in improving both internal and external processes related to their organization. Dr. Mohamed's models also allow businesses to visualize what actions to take to get the desired result. The models are easy to understand and are spreadsheet based so that today's manager can easily use them to optimize the performance of the function they oversee.

The models encourage the businesses to ask questions

such as "What would be the savings to us and our partners if we allowed our first and second tier suppliers to make decisions on their own instead of providing strict guidelines to them?" and "What would be the effect of using local vendors versus foreign vendors?"

When working to determine vendors, many companies closely examine exchange rates and use local currency as a tool for profit. Dr. Mohamed's research has encouraged other scholars to further examine how exchange rates closely affect vendor selection. He proposes that even though revenue is often fixed, companies can look at innovative outsourcing methods to reduce cost. Again, Dr. Mohamed's models can be used to assist companies in making just these types of decisions.

"We are not working in isolation. We are interacting with other people, other countries. It's all borderless," Dr. Mohamed said. Organizations across the globe agree that Dr. Mohamed's research plans include methods very applicable to businesses.

Dr. Mohamed's plans include the examination of the links between the customers and suppliers throughout the global supply chain. "The chain is only as strong as its weakest link," he said. Basing the research on his previous findings that relationships among suppliers and buyers are crucial to success and maximization of profits, Dr. Mohamed plans to identify a commonality among weakest links in global supply chains.

Also, he plans to examine systems within the chain to find the point at which push systems and pull systems combine. The push system and the pull systems are opposite systems. With the push system, inventories are higher and the material is pushed into the system at the starting point.

The material progresses through all subsequent stations and, as Dr. Mohamed says, "we may end up producing more than what was demanded of the final product." The businesses at the bottom of the chain like raw material manufacturers will be working with push systems. A steel manufacturer is an example of a supplier at the bottom end working with the push system because it has to have huge raw materials to fire up its furnaces to produce steel in the most cost efficient way. In a supply chain, some partners will be working with pull systems, especially those close to the finished product. The pull system keeps the inventories to a minimum level. Toyota is an example of a manufacturer working at the upper end of the supply chain with the pull system.

In today's business environment, companies look at economic information, make decisions, and share that information with their suppliers. There is always some capacity of "push" built into the chain. Other areas further down the supply chain work on just-in-time systems, which "pull" in order to meet demand. However, everyone cannot work on one system. So, where do the push and pull systems meet in the global supply chain? What are the implications when they do meet? And, how does their interaction affect the overall supply chain?

Dr. Mohamed is a 1979 graduate of Bangalore University in India. He earned his Master of Science and doctoral degrees at the University of Kentucky in 1988 and 1991, respectively. He began contributing to the academic environment of Western Kentucky University when he joined the faculty in 1989. A widely published author, Mohamed is currently serving as a project co-director of a grant from the U.S. Department of Education that will allow the "internationalization" of the business curriculum at Western Kentucky University.