INDIA, INC., AND SIX SIGMA: If Dabbawallahs can do it, you can too!

The fascinating story of Mumbai's Dabbawallas is an inspiration to all organizations aspiring to compete in the global market place.

Pradeep B. Deshpande
President, Six Sigma and Advanced Controls, Inc. and Professor of Chemical Engineering, University of Louisville, Louisville, KY 40292

The author was on a short visit to India recently to presented talks on "**Six Sigma for Global Competitiveness**" to the Chairmen and senior executive management of several large Indian corporate houses, Chief secretaries of the Government of Maharashtra, and the Federation of Indian Chambers of Commerce and Industry (FICCI) in Mumbai,. This brief note is prompted by reports in the Indian press about the competition that Indian products and services are facing or will likely face from abroad including China (e.g., see "Stop Crying, tap China Properly: Maran", Financial Express, August 3, 2001). Actually, there is a systematic methodology now available to achieve global competitive positions and it is six sigma.

Six sigma could not have arrived at a more opportune time for India. Opening of the economy and the need to compete in the global marketplace, membership in international bodies such as GATT and WTO have created tremendous opportunities as well as challenges. The author's own investigations point to the rise of China and India (see papers on six sigma and on the rise and decline of cultures, science and spirituality and six sigma, on the scriptural notion of varna, and on India's rise, at the website link www.sixsigmaquality.com/sixsigma_papers.html). It gives an immense sense of joy to note that six sigma is an American innovation made possible by an ancient Indian concept, the notion of cause and effect (karma).

Six sigma is a highly structured approach to delivering very high levels of customer satisfaction through disciplined use of data and statistical analysis for maximizing and sustaining business success. The insistence of six sigma to rely on data rather than gut feel for decision making means that counter-intuitive solutions are often found. *The* goal of six sigma is to achieve very high levels of (internal and external) customer satisfaction. Better bottom-line performance, higher market share, and globally competitive positions result as a side benefit. Six sigma applies to *all* processes wherever work gets done, manufacturing or transactional, static or dynamic, linear or nonlinear, whether the work processes are in a university, in a Government department, or in the private sector.

A six sigma process or transaction generates very low defect levels (3.45 per million opportunities for a single-sided specification). A defect is anything that results in customer dissatisfaction. Six sigma is, however a journey and not a destination meaning that defect rates will start coming down soon after embarking on six sigma although it will take many years to reach the six sigma defect levels. Really, six sigma is for life and so all must work and live the six sigma way.

The six sigma approach, briefly summarized, is to articulate the problem, validate measurement systems, measure to determine current performance, determine the vital causes of variation, work on them to reduce defects, and monitor all variables so that problems once identified and fixed, stay fixed. This is accomplished in five phases: Scope, Measure, Analyze, Improve, and Control.

Six sigma has been embraced by a large number of corporations in diverse areas including Motorola, General Electric, Du Pont, CITIBANK, Dow Chemical, Conseco Financial Services, Sony, and many others.

*Copyright 2001. Six Sigma and Advanced Controls, Inc.

Six sigma is spreading like wildfire across the entire American corporate landscape.

Consider the ramifications of following and not following six sigma practices. General Electric reported annual benefits of over $2 billion from six sigma last year against a net income of $10 billion. Du Pont and Dow Chemical which embarked on the six sigma journey a couple of years ago expect the benefits from six sigma to reach $ 1 billion by 2003. It is interesting too that senior level executives who left GE to take over as CEOs of other corporations in recent years (McNearnery to 3M, Wendt to Conseco Financial, and Nordelli to Home Depot), all are said to have deployed six sigma at their new organization as one of their first acts. Once you see the light, you will never be the same person, no matter what activity you are engaged in. Now consider the negative ramifications of not following six sigma practices.

One example is the November 2000 Presidential elections in Florida. The process is as follows: A voter walks into a polling booth and fills out a ballot paper. A machine interprets the intentions, which are then recorded. The response variable is the " recorded result "and the vital cause is "voter intention". There is natural variability in the response variable since not all voters would vote for a single candidate. However, if the voter intended to vote for say Mr. Bush, and that vote is given to Mr.Gore, then there is defect, giving rise to customer dissatisfaction. We would want the variability in the response variable (recorded result) to solely arise due to the vital cause, namely voter intent, not from errors in the measurement systems (ballot paper design and the machines that read them). This is especially important when the margin of victory is narrow relative to the errors in the measurement systems, not true here giving rise to extreme customer dissatisfaction. It created ill feelings among candidates, got the courts involved, and a host of undesirable outcomes. Before you in India begin to chuckle, one can name tons of examples in India where six sigma practices are not being followed.

An interesting example of six sigma process in India is the Dabbawallahs of Mumbai. These folks have received international acclaim for their defect-free handling of lunch boxes for clients. Forbes rates their performance on par with Motorola's, the pioneer of six sigma.

From a six sigma perspective, the Dabbawallahs must contend with two CTQ's (critical-to-quality parameters): (1) lunch boxes must be delivered on time, and (2) recipients must receive their own lunch boxes and not some one else's. The response variables therefore are (1) arrival time, (2) correct box delivered (yes/no)? Out-of-tolerance response variables lead to defects and to customer dissatisfaction. A process map, if prepared, would have revealed what steps the Dabbawallahs would have to follow from pick up to delivery. The process map would also show the areas for data collection. Collecting and analyzing data would have allowed for the isolation of vital few causes of variation in the response variables. Working on the vital causes would have led to defect-reduction. Finally, the response variables would have to be regularly monitored so that the problems once fixed stay fixed. To achieve the desired performance goals, the Dabbawallahs adopted a coding system for each lunch box, which told them where to pick up the lunch box, and where to deliver it. Needless to say, it takes an army of dedicated workers to turn the six sigma process into reality.

According to what has been reported in the Indian press, every lunch box has marked on it a circle or a flower of a specific color and a digital identity number. The example reported is "K-BO-10-19/A/15", where K is the identity letter of the Dabbawallah, BO stands for the area from where the lunch box is to be collected, (Borivali), The number 10 refers to Nariman point area and 19/A/15 refers to the 19th Building and the 15th floor in Nariman point area where the box is to be delivered. The remarkable performance of Dabbawallahs for over hundred years is especially commendable since the workers are from the villages and are not even high school graduates.

The intention of drawing a parallel of the Dabbawallah's process or that matter the election process to emphasize to six sigma is that six sigma is applicable to any process or transaction. In the world of business, processes and transactions are invariably more complex requiring comprehensive analysis and a tool set available in six sigma. This said, one cannot help but observe, if Dabbawallah can do it, India, Inc. can too.

Pradeep B. Deshpande.

Pradeep B. Deshpande is a former Chairman and Professor of Chemical Engineering at the University of Louisville. He is also President of Simulation and Advanced Controls (SAC) Inc., a Louisville-based company specializing in six sigma

& advanced control products and services for monitoring and optimization of manufacturing (continuous, batch, and discrete parts-manufacturing) and transactional processes. Pradeep has twenty-eight years of academic and full-time industrial experience. Dr. Deshpande is an author or coauthor of five books in process control. He has also developed a number of control algorithms and technologies and has one hundred refereed papers and presentations to his credit. Dr. Deshpande has supervised seventeen Ph.D. graduates and over forty master's graduates. Pradeep has received several awards for his work including the 1990 Donald P. Eckman Award in process control education given by ISA. Pradeep offers continuing education courses in several countries. He is a member of AIChE and the instructor of the recently introduced AIChE short course, "Six Sigma for Global Competitiveness", and a Fellow of ISA.