

Mayberry Newsletter

The W. E. Mayberry Center for Quality and Performance Excellence

Tennessee Technological University • College of Business • Fall 2006



Mayberry Center
TTU Box 5025
Cookeville, TN 38505

Phone: 931-372-6341
Fax: 931-372-6249
E-mail: quality@tntech.edu
Website: www.tntech.edu/mayberry/

The Mayberry Advisory Board

Jack Swaim, Chairperson
Director, Worldwide Quality
Imaging and Printing Group
Hewlett-Packard Company

Joe Dehler
Vice President
Business Process Improvement
Carlson Companies

Gary D. Floss
Director, Quality Assurance
and Continual Improvement
Marvin Windows and Doors

Steven H. Hoisington
Consultant/Author

David Jones
Operational Excellence Manager
EPIC Technologies

Jean Kinney
Associate Director
Corporate Purchases
The Procter & Gamble Company

Bill Nusbaum
Center Director
Tennessee Manufacturing
Extension Program

Marie Williams
Member Emeritus
Former President
Tennessee Center for Performance
Excellence

Quality and Organizational Performance in Business Education: Convergence via a Focus on Quality

Dr. Curt Reimann

Introduction

Previous articles in this newsletter have addressed a variety of aspects of quality and quality management in relation to business and business education. Topics included variants of quality, spread of practices, types of assessment, quality characteristics and quality evolution. Also addressed were treatment of quality in business education, especially reasons for and barriers to inclusion in business school offerings, and some alternatives for better coverage in curricula and overall business experiences. In this article we further pursue such themes but mainly via a shift in focus—from quality to the more important, broader, and more basic topic of organizational performance. In making this shift we observe that performance, like quality, and perhaps for similar reasons, receives limited comprehensive and integrated coverage in business education. However, in drawing this parallel between quality and performance, we neither equate them nor attempt to link them in some rigid way. Rather, we wish to emphasize performance as an overriding and comprehensive discipline area for which quality and especially quality management provide important components, key concepts and has a history of practices, valuable to the development and teaching of performance. The basic ap-

proach we outline here, then, is one that attempts to call attention to the parallel between quality and performance and to build upon it, seeing it as an early stage in a convergence. The key concepts in this convergence, we argue, could be used to enhance the coverage of performance—and quality—in business curricula and education.

Quality and Performance: Parallels

The rise in interest in quality and quality management over the past 20-25 years is closely paralleled by an increasing interest in the broader subject of organizational performance. During this period there has been a significant growth and sustained high level of popular business literature devoted to performance and to the factors, including quality, that authors attempt to link to the success and failure of businesses. Increasingly, the literature includes other sectors, such as healthcare and education. Although perspectives, factors and definitions of performance and success differ greatly, business books or articles on performance tend to share three important common threads:

- (1) focus on important outcomes and results;
- (2) attribution of results (or a search for attribution) to causative factors, actions and processes;
- (3) prescriptions for improving performance, based on purported connections between factors, ac-

tions, or processes and desired results.

The first two threads—a focus on results and the search for causation—are now widely regarded as “sea changes.” These should now be accepted as key demands facing all organizations in the age of increasing competition and tight budgets. As such, these changes should have increasing influence over curriculum decisions. The third thread—widely ranging performance-enhancing prescriptions—reflect the growing need for, and enhanced interest in, simple pathways to achieve high performance. Some prescriptions—critics call them “fads”—spread quickly, especially when they address problems that are common to many organizations. For example, throughout the 80s and 90s, (and still today) many organizations faced serious quality and productivity demands for which quality management provides important tools and concepts. It is not uncommon for some proponents of quality, or other prescriptions, to overgeneralize their application or to overstate their benefits. This tendency is sometimes described as a “one-size-fits-all” approach. Today, there is growing interest in performance areas such as innovation and organizational agility. Nevertheless, the need to control costs and meet

increasingly stringent quality requirements remains strong. Performance by its nature is multi-dimensional: prescriptions often gloss over key differences among organizations' needs.

Important parallels between quality and performance, from the point of view of business education, are the barriers discussed in our 2005 newsletter article. There we noted that aspects of quality and quality management span across other discipline areas, but that it is unrealistic to expect students to construct a holistic understanding without focus and context which require curriculum design that addresses and integrates these concepts. Moreover, the diffuse treatment of quality likely results in very limited understanding of the central reasons for and methods underlying quality. The fact that organizational performance and success are inherently broader than quality or quality management makes them even more difficult to address via fragmentary treatment within other disciplines. In addition, a performance focus calls upon other business disciplines to be used in different ways. In such cases, it is very difficult (and likely confusing) to place emphasis on performance when the instructor's focus is, and should be, on a core business discipline. The key point we wish to make here regarding the parallels between quality and overall performance is that quality is not only an important component of performance, but that quality's characteristics, concepts and evolution are important to the better integration of both quality and performance in business education. Together, they are inducing changes in how we need to regard, relate and teach business disciplines in order to accommodate a critical requirement and perhaps an emerging business discipline—performance management.

Toward Convergence

The absence of a well-defined, generally accepted and overarching performance theory or discipline, coupled with the marketplace's tendency to spawn, use and misuse competing performance prescriptions, make it difficult to anchor educational offerings around performance. Also, the numbers and types of performance and business context factors that

would need to be taken into account in a general theory make it unlikely that models useful for basic business education will emerge any time soon, despite the growing need to understand and improve performance.

The convergence between quality and performance we note here is driven more by necessity, reaction and learning than by formal efforts to bridge them. In simplest terms, it appears that quality, via evolution, captured in quality management concepts, incorporates additional performance dimensions and seeks to define processes and practices for fulfilling performance requirements for such dimensions. In parallel with this broadening via evolution, analysts focusing on performance usually discover that the performance they seek to achieve is derived from "causes" rooted in organizational choices and actions. Perhaps the most visible manifestations of the convergence are uses of terminology such as "metrics", "root causes, and "best practices"—now in wide use in the media and public discourse. In this convergence it appears that quality becomes broader as it seeks to accommodate key performance dimensions, and performance becomes more process oriented as it seeks to understand causation. However, because many factors in success and failure are external to an organization itself, quality approaches often are too "deterministic"—making it appear that good performance is merely a matter of process discipline. In general, organizational business context factors (such as competition) are very difficult to address in process models. Nevertheless, the evolution of quality has sought increasingly to invoke such factors, often via strategic planning.

In assessing the convergence between quality and performance with the intent to construct authentic curricula for business education, it is helpful to summarize the key points of this convergence:

** Quality management inherently focuses on results and causation. It does so via processes, measures and indicators. Some frameworks such as that for the Baldrige Award attempt to identify key performance and process requirements to set the stage for appropriate processes and measures. Usually, requirements are "cross-

functional" ones. This provides strong impetus for educators to address processes and teamwork— somewhat difficult to address within single business disciplines.

** Quality management is increasingly "systems" oriented. As it evolves, it broadens to accommodate more performance dimensions, requirements and business factors. In many cases, such efforts cannot overcome the uncertainties introduced via the broadening, especially external factors.

** Quality management has a process and practices orientation which tends to "spill over" into the performance areas it addresses via evolution. Such tendencies are evident today as organizations seek to strengthen innovation and identify key practices and metrics in support of innovation

** Quality management is an important vehicle for "importing" tools and techniques from other disciplines. Increasingly, these imports are from the "soft sciences" resulting in a blending of such sciences with the more quantitative ones from the technical side of quality. Many of the tools and techniques themselves become more holistic and systems oriented, making them valuable for business curricula or modules for teaching disciplined approaches for improving performance.

In closing, we note that in the discussion of the convergence of quality and performance, greater emphasis was placed on the quality side, which, by its nature, tends to be more operational. This not only reflects what is occurring in the marketplace but supports the most pressing needs for business students. Most students enter the organizational world via operational areas (within the context of a functional specialization) and many remain in such areas throughout their careers. In addition, those who rise to leadership positions find themselves needing to master operations as they seek to achieve high performance for the organizations they lead. For such career requirements, quality management is a good starting point to build the important bridge to performance.

Fast, Lean and Fragile

Dr. R. Nat Natarajan

The Mayberry Newsletter, over the years, has served as a forum to highlight some of the contemporary issues in performance management. Continuing that tradition, this article examines the vulnerabilities in the global production system and their impact on performance of supply chains. Performance has to be addressed at the level of supply chains because increasingly, it is supply chains rather than individual enterprises that are competing. Supply chain management has become a major source of competitive advantage as the performance of supply chain leaders such as Dell, Wal-Mart and Toyota attests. The major factors contributing to this phenomenon are outsourcing and globalization. The value adding activities that were being performed within a firm are now being completed within a complex production network that straddles the globe. While the debate about outsourcing and its impact on workers in the economy rages on there is no denying the fact that some firms e.g., Cisco and their shareholders, have benefited hugely by outsourcing. Global firms like Solectron and Flextronics to whom manufacturing has been contracted out have also been the chief beneficiaries of the boom in outsourcing. Outsourcing has been a driver for growth in China, India, Taiwan and Mexico.

Globalization and outsourcing have been accelerated by a number of other concomitant phenomena. The cost of communicating with outsourcing partners has fallen very rapidly because of innovations like the internet. Transportation costs have also fallen (but not that rapidly) enabling production to be located where it is most advantageous. Digitization of business processes means that skilled cheaper labor in any part of the world can be accessed to perform those processes. In manufacturing, the application of the principles of lean production has created opportunities for all forms of waste—which includes inventory—to be drastically reduced. This has been most manifest in the automotive industry

which has been the leader in lean production but other industries are utilizing them as well. Inventories which provided the slack in the system are being substituted by information. As supply systems have become lean, the effects of any disruption propagate very quickly. Moreover, companies have also restructured and fine tuned their supply chains for a quick response to customer's needs. For instance, Zara, a Spanish fashion retailer and manufacturer, makes twice-a-week deliveries (which are more common in the grocery business but unusual in fashion retailing) to its six hundred stores around the world. And the designs of many of those dresses did not even exist four weeks earlier! The global production networks have indeed become fast and lean, but they have also become more fragile. This fragility, as the examples cited below indicate, can be devastating for companies and entire economies. A study of public companies in 2000 indicated that announcements of supply chain disruptions were accompanied by a decline in the company's stock price on the average of nine percent. Industrial accidents and pandemics have led to the loss of lives and economic output. These disruptions threaten economic growth in countries like China and are making firms reconsider their outsourcing and global sourcing decisions. Fragility is now a legitimate concern being addressed in some company board rooms and in the highest echelons of governments (see article in this newsletter on strategic petroleum reserve). There are many vulnerabilities in the global supply system that can cause disruptions in the flow of goods and services. Here is a small sample. The earthquake in Taiwan in September 1999 cut off exports of high tech goods from that country idling manufacturing facilities in many countries. The west coast employer lockout of 2002 disrupted several global supply chains creating costly chaos. Despite warnings and preparations, by the second week of the lockout it cost the U.S. economy about \$2 billion per day. The dispute that involved the jobs of 10,500 longshoremen put at risk about four million jobs. It clogged railroads and docks in the U.S. and across the Pacific as too many ships waited in ports like Shanghai [2]. Another catastrophic disruption was caused in 2003 by severe acute respiratory syndrome (SARS) which originated in China. It forced the closure of electronics and

semiconductor plants in Japan and the U.S., not to mention the huge losses of income in the tourism industry in China and elsewhere. In 2000, a small fire caused by lightning led to the shutting down of the clean room in the Philips Electronics semiconductor plant in New Mexico. The cell phone industry was transformed by this fire. Its impact on rival cell phone makers Nokia and Ericsson—which were supplied by that plant—and how they responded, has now become a classic business school case study. Ericsson, which was slow in responding and did not have a "Plan B" had to quit manufacturing cell phones while the more nimble Nokia actually gained market share! In 2001, a military stand-off between nuclear powers India and Pakistan ensued following the killings by terrorists near the Indian parliament. It was a close call for companies like GE which have operations in India [1]. The vulnerabilities can emanate from nowhere. In 2000, a contractor laying cables in Iowa mistakenly cut a communication cable carrying internet traffic. It grounded the flights of Northwest and KLM airlines worldwide [2]! It was like the proverbial butterfly fluttering its wings in a rain forest causing tidal waves half way around the world.

How can firms respond to such disasters whose causes can range from terrorist acts, to natural calamities, pandemics, industrial accidents, power blackouts and intentional sabotage? Yossi Sheffi, a professor at MIT, offers a framework and many useful guidelines [2]. They include first figuring out what could go wrong, then estimating the likelihood of those adverse events and the severity of the consequences. A risk index which is the product of the likelihood and the severity can be calculated to help in developing priorities for risk management. What about high impact/low likelihood events like earthquakes/major hurricanes which will have low value of this risk index? Sheffi argues that rare events do cast their shadow before they occur and the firms should set up monitoring systems to track these warning signs [2]. In light of these warnings, the event cannot be considered as rare and its likelihood has to be revised upwards. Analysis of close calls and

near misses can also yield valuable information. Such analysis is now standard practice in the aviation industry. Frequent near misses usually signal a imminent disaster.

The firms in the U.S. seem quite unprepared for managing supply chain risks. According to the research firm Aberdeen Group, in their survey of 150 firms, 82 percent of respondents indicated that their senior executives said supply chain resiliency is a concern, but only 11 percent are actively managing risk and 18 percent are not concerned about risk. Establishing a process for the purpose of gathering intelligence to assess the vulnerabilities and their likelihood and to develop risk management strategies is a necessary first step. Data that already exists can be adapted for this purpose. For example, the bill of material listing all the parts can be used to develop a vulnerability map describing what could go wrong with the supply of each part and what are the chances of that happening. Risk management strategies have to be tailored to the types of vulnerability. For instance, malicious or intentional disruptions like tampering with bottles of Tylenol tend to adapt to the countermeasures that are taken. Identifying the perpetrators and simulating their intentions and behaviors becomes part of the risk mitigation strategy. Risks can be avoided, reduced, shared or transferred. The choice has to be made by carefully balancing the costs and benefits of each alternative. For instance, having back up information systems will reduce the probability of the entire system failing but this redundancy comes at a cost. Risks can be shared by having multiple suppliers but at the expense of lower costs due to the scale economies of a single supplier. Companies seem to put too much effort on managing the risks posed by outliers – and like generals getting ready to fight the last war they were in – the most recent outlier they have experienced. After the 9/11 attacks companies built back-up information centers 50-100 miles from Manhattan. Then came the power outages in the Northeast and companies responded by having back-up power supplies. Yet, according to a study, internal causes are the leading causes accounting for more than 30% of the

disruptions. Not enough attention is paid to the smaller risks e.g., equipment breakdowns, the enterprise faces every day. These risks can all add up to a catastrophe. Companies may also get their priorities wrong e.g., in preparing for natural disasters focusing on supply disruptions while the real danger is demand disruption i.e., not having enough customers! In complex systems detecting the disruption is not easy. Not being able to detect an abnormal situation when one exists e.g., a toxic gas leak, itself constitutes a serious risk. Statistical process control charts can be used to detect outliers. The detection of such disruptions has to be followed up by actions such as collecting additional data or notifying a superior.

Since there is a myriad of risks and not all risks can be avoided, diversified or reduced, organizations should develop a recovery plan. But being able to put that plan in action quickly is equally critical. Procter and Gamble (P&G) was able to do this after Katrina submerged its Folgers coffee making plant. Displaced employees had to be contacted and brought together - a huge communication and logistical challenge - and many were moved to the plant site which served as temporary housing. After three weeks, the plant was back in production and by the fourth week, using other production facilities P&G was able to restore about 85% of its coffee supply. Katrina had affected about 40% of consumption of coffee in the U.S. In the days leading up to Katrina, P&G kept updating its recovery plan. During normal times such plans cannot be gathering dust. They have to be tested and fine tuned by running simulations of various scenarios. For instance, consider a training exercise of Wal-Mart in which without warning, a supply chain executive tells his operations and administrative staff to pretend that a particular distribution facility had burned to the ground. They had until the end of the day to figure out how to service Wal-Mart's stores without depending on the impaired facility or its displaced staff.

Effective recovery depends on more than the speedy implementation of a business continuity plan. According to Sheffi, it depends ultimately on the resilience of the enterprise and the entire supply chain [2]. In order to develop this resili-

ence he recommends emulating the practices of firms (e.g., Dell, Zara) and supply chains (e.g., electronics, fashion goods, computers) which operate in an environment of high uncertainty of supply and/or demand. These practices include postponing the creation of the final identity of the product until the last minute, modular product design, part and platform commonality, increased use of standard rather than special parts and processes and flexible contracts with suppliers. Flexibility is embedded in their organizational culture. Effective collaboration - internally with the employees, between the functional silos and externally with the customers and suppliers - is another characteristic of such supply chains. Information about demand, processes and flow of products is shared with the suppliers and the carriers which provide logistical services. Collaboration helps in learning about the weak links in the supply chain and addressing those vulnerabilities jointly. In 1997, there was a fire in the plant of Aisin Seiki which was the only supplier to Toyota of proportioning valves used in brakes. Toyota and Aisin were able to recover quickly because of the cooperation and quick response of a large number of other suppliers. As the lead firm in the supply chain, Toyota, through its deep relationships with suppliers—which elicited such cooperation—had helped them become resilient. Resilience should be viewed as a source of competitive advantage not just another cost item.

Collaboration at the industry level has resulted in the development of security standards. Intel and other high tech companies founded the non-profit Technology Asset Protection Association (TAPA) to develop freight security standards and share knowledge about cargo security [2]. Over 450 companies are members of TAPA. But collaboration can and must go further. In the context of homeland security, it is imperative that firms collaborate with government authorities. Private firms hold valuable data on movement of goods across the borders. Securing the supply chains which move millions of shipments and containers through ports and airports, in trucks and trains can only

strengthen homeland security. The customs-trade partnership against terrorism program (C-TPAT) is an example of public-private collaboration [2]. C-TPAT focuses on the security of each company and that of its suppliers. The imports of C-TPAT certified companies and carriers spend less time going through customs inspection. Through such partnerships, the public sector can learn from the private sector about disaster response as well. According to a report from the Department of Homeland Security released in June 2006, only ten states (Tennessee is one of them) have adequate disaster readiness plans and a majority of city and local governments do not have adequate plans. Meanwhile, we are already into a new hurricane season and the Avian Flu pandemic is a real concern. In the immediate aftermath of Katrina, Wal-Mart's efficient logistics and disaster planning allowed it to quickly deliver staples such as water, fuel, and toilet paper to thousands of evacuees. Within days it raised \$20 million in cash donations, 1,500 truckloads of free merchandise and food for 100,000 meals and promised a job for every one of its displaced workers.

According to Barry Lynn, the government has to recognize and take on another important responsibility [1]. His line of reasoning is as follows.

Individual firms seeking cost savings are pushing the risk on to outsourcing partners and are not concerned about what it does to the vulnerability of the system of which they are a part. For instance, IBM's outsourcing of its production was accompanied by a drastic reduction of its risk management staff. But in reality nobody is in charge of controlling the systemic risks. Globalization exacerbates the vulnerabilities. System wide fragility can lead to frequent cascading economic catastrophes. Lynn therefore argues for public policy and regulation for safe operation of the economy and the global industrial system. He thinks that despite the high degree of integration of the U.S. economy with the rest of the world certain policies can be enacted unilaterally by the U.S. They include: using antitrust power to ensure that no global lead firm controls more than a quarter of the U.S. market; requiring managers to make public their sourcing and supply chain relationships to enable investors to shy away from firms that take unnecessary risk [1]. While all this is thought provoking and merits further discussion and debate it is a matter of judgment whether things have gone so far out of hand with regard to fragility that public welfare is threatened and government intervention is necessary. In the near term, steps to improve national resilience through education and training, better disaster preparedness and public and private partnerships like C-TPAT, are

better alternatives for the government to pursue.

For ages, businesses have faced risks of all sorts and the institution of insurance was created to hedge against these risks. But the burden fell on individual firms. Now due to the mix of globalization, outsourcing and just-in-time production and delivery, the risks are much greater and the exposure is system wide. Not all of these risks can be insured. Further, insurance where available can only cover the financial loss but not the loss of reputation, customers or their confidence. Companies have to look beyond their boundaries to consider the risks that affect them. They also have to look beyond next quarter's earnings and allocate resources to develop strategies and processes for risk management and recovery. It is in their own interest and in the collective interest of their supply network to do so. To paraphrase Ben Franklin, they better hang together or they will certainly hang separately!

1. *End of the Line: The rise and coming fall of the global corporation.* Barry C. Lynn, Doubleday, New York, NY: 2005

2. *The Resilient Enterprise: Overcoming vulnerability for competitive advantage.* Yossi Sheffi, The MIT Press, Cambridge, MA: 2005



Dr. Stuart Wells makes a presentation on computer forensics to the Mayberry Advisory Board.

Activities and Accomplishments 2005-2006

The Mayberry Center's purpose is to increase awareness and enhance development of performance excellence related practices in business and education on a local, state and national level. This is achieved by conducting and disseminating research, implementing projects and activities, conducting workshops for practitioners and instructing students in undergraduate and graduate classes. The Mayberry team, consisting of Chairholder **Curt W. Reimann**, President **Robert Bell**, Dean **Bob Niebuhr**, Mayberry Professor of Management **R. Nat Natarajan** and Mayberry Graduate Assistant **Ryan Swor** have contributed to this mission during the past year. Activities carried out include:

- Dr. Reimann, the chair holder of the Mayberry Chair of Excellence, President Bell and Dr. Susan Elkins presented the paper, "University Strategy and Balanced Scorecard Development: Role of a Strategic Business Unit," at the Excellence in Tennessee Conference, Tennessee Center for Performance Excellence (TNCPE), Nashville TN, February 23, 2006.
- Dr. Reimann serves on the advisory board of the TTU School of Interdisciplinary Studies and Extended Education (ISEE).
- Dr. Reimann serves on the Technical Committee for the Juran Center for Leadership in Quality, Carlson School of Management, University of Minnesota.
- Dr. Reimann serves on the Veterans' Advisory Board on Dose Reconstruction by the Defense Threat Reduction Agency, U.S. Dept. of Defense.
- In August 2006, Dr. Reimann was invited to write an article for the occasion celebrating the tenth anniversary of Japan Quality Award Council.
- Dr. Nat Natarajan, the Mayberry Professor of Management attended the annual meeting of the Decision Sciences Institute in San Francisco, CA, in November 2005 and presented the paper, "Transfer of Management Systems and Processes: Issues and Challenges." The paper was published in the conference proceedings.
- Dr. Nat Natarajan's article, "China and Global Manufacturing," was published in Focus: The International Journal of Management.
- In January 2006, Dr. Nat Natarajan visited the Management Development Institute in New Delhi, India and accompanied the College of Business (COB) students on a study tour of Singapore.
- Ryan Swor, Mayberry Graduate Assistant, served on the

2005 Board of Examiners of the Tennessee Center for Performance Excellence (TNCPE). In April 2006, he attended the Quest for Excellence conference in Washington, D.C.

- Brad Leimer, a former Mayberry Graduate Assistant, is serving on the 2006 Board of Examiners of the Baldrige National Quality Award.

Mayberry Advisory Board

The Mayberry Advisory Board met on November 1, 2005. Board members visited classes as guest speakers. They also participated in a panel discussion organized by the MBA students. Earlier, they interacted with College of Business students during the reception and dinner on October 31.

The Mayberry Lecture

On March 28, 2006, **Mr. Patrick Townsend**, an internationally acclaimed author and speaker on the topic of leadership, delivered the Spring 2006 Mayberry Lecture titled "Quality and Performance Excellence Through Leadership."

Where Are They Now? An Update From Dan Cooper!

Recently we heard from Dan Cooper, one of our former Mayberry Graduate Assistants.

I served as a Mayberry Graduate Assistant between 1998 and 2000. Since that time, I have held several rewarding positions in my career. Upon graduating, I was excited to begin my (second) career with the Chattanooga office of the Arthur Andersen public accounting firm (I had earned my undergraduate degree while serving six years in the US Navy before enrolling in the MBA program at TTU).

As a staff auditor at Andersen I gained invaluable experience and confidence. I learned how accounting and business concepts were practically applied and applied differently among clients based on the type of business, industry and company culture. At Andersen I also gained an understanding of basic business processes and management best practices. It's easy now to take those things for granted, but they served as the foundation on which I continue to build knowledge and gain experience. My experience at Andersen was unlike any other organization in which I have ever worked. The loyalty of the employees to the firm was (and still is) indescribable. The much publicized dissolution of Andersen, as a result of the indictment by the Justice Department, began

after I had been there for about two years. Soon, however, the remaining Andersen employees within the Chattanooga office merged with the Chattanooga office of Ernst & Young. For me, being employed by Ernst & Young was ironic. Of the large number of campus interviews I had as a prospective graduate, the one with Ernst & Young was my worst. My time at Ernst & Young is where I was first exposed to and became comfortable with managing others and being in charge of audits rather than pieces of audits.

The increase in work resulting from the reallocation of clients and talent among the remaining "Big 4" and the requirements of the Sarbanes-Oxley Act put a bigger strain on an already burdened work-life balance. My need for family time grew with the addition of my daughter Aria. After being with Ernst & Young for about two years, I accepted a position in the Internal Audit Department of Shaw Industries (located in Dalton, GA). Shaw is the largest carpet manufacturer in the world and had been my largest and favorite client while at Andersen. In this position I became exposed to the detailed requirement of Sarbanes-Oxley and gained a more thorough understanding of best practices related to internal controls.

My time at Shaw was short lived because I was offered a position to be in charge of the Internal Audit Department at the Electric Power Board (EPB) of Chattanooga. I am now the Manager of the Internal Audit and Process Improvement Departments. EPB is a great place to work, significantly different from the perceptions of public utilities that I had. EPB's focus is to: 1) keep internal costs low to continue to provide low cost electric power; and 2) provide excellent customer service, including power reliability.

My wife, Sonya, and I live in Ringgold, GA (just outside Chattanooga) and are blessed with two wonderful children, Aria (will be four in October) and Coda (will be one in December).

I look back on my time as a Mayberry Graduate Assistant fondly. It helped provide me with a base of knowledge and concepts that I use daily. As a Mayberry Graduate Assistant I had many great experiences and met some wonderful and interesting people. Thanks Dr. Bell, Dr. Nat and Dr. Reimann for giving me such a great opportunity.



*Front Row L-R: David Jones, Jack Swaim, Jean Kinney and Joe Dehler
Back Row: L-R: Dr. Curt Reimann, Steven Hoisington and Dr. Nat Natarajan*

Strategic Petroleum Reserve and Performance Excellence

Ryan Swor*

The Strategic Petroleum Reserve (SPR) is a very important energy asset of the Department of Energy (DOE) of the United States Government. Since its inception in 1977, the SPR has maintained the capability to rapidly drawdown and sell oil to refineries during times of crude oil supply disruptions. This is very important due to the heavy reliance of the United States economy on petroleum-based energy end products, ranging from gasoline and jet fuel to plastics and industrial chemicals. Through the use of caverns created in natural salt domes at four sites near the Gulf Coast of Texas and Louisiana, the SPR currently has capacity for approximately 727 million barrels of oil.

The United States Government does not directly operate the SPR. Instead, a company holds a maintenance and operations (M&O) contract to operate the facilities. Since 1993, the M&O contractor has been DynMcDermott Petroleum Operations, a privately-held Louisiana company. DynMcDermott had a 2006 budget of \$113 million and a little over 500 employees. In 2005, DynMcDermott was able to weather both hurricanes Katrina and Rita, and the company was able to provide oil from the SPR to refiners within five days of Katrina coming ashore on the Gulf Coast. DynMcDermott was a recipient of the 2005 Malcolm Baldrige National Quality Award and a three-time winner of the Louisiana Performance Excellence Award. Representatives of the company were present at The Quest for Excellence XVIII Conference, sponsored by the National Institute of Standards and Technology (NIST) in Washington, D.C., April 23-26, 2006. This article describes some of the company's processes in relation to the Malcolm

Baldrige National Quality Award (MBNQA) criteria categories.

Strategic Planning DynMcDermott understands the importance of continuous improvement and strategic planning. At the core of the company's strategic planning process, pragmatic answers to six key areas are addressed: values, mission, customer, processes, performance metrics and planning/feedback. A strategic planning system is employed with multiple organizational levels participating to identify strategies and formulate action plans. Multiple quality tools are used, ranging from simple brainstorming to affinity diagrams, balanced scorecards and Quality Function Deployment (QFD). Metrics are very important for both the company and the DOE to measure performance of the SPR. Of 17 critical performance measures (CPM's), the company was able to meet 16 in 2005. Storage volume is steadily increasing over time as the capacity of the SPR is increased. The important goal of a 13-day drawdown period (from Presidential order to sell oil until full flow rate is achieved) was met in 2005. The storage cost in dollars per barrel is currently \$0.20 for the SPR, compared with \$1.60 for the European stockpile, \$2.40 average for U.S. industry storage and \$3.00 for Japanese oil reserves. The company also monitors support of key communities and has a stated 100% success rate of outreach. The stated mission of DynMcDermott: "Our Mission is to excel at delivering safe, secure, environmentally responsible and cost effective SPR operational readiness."

Customer and Market Focus Customer and market focus is unique at DynMcDermott, as the company has only one customer, the DOE. The

company must structure its customer relations to align with the organizational structure of the DOE. Two-way communication is very important, and this is carried out through a variety of means, from informal face-to-face meetings to formalized annual work authorization directives (WAD's). Multiple metrics are monitored, including a customer satisfaction index, a dissatisfaction index, award fee score, drawdown readiness and a cost benchmark.

Measurement, Analysis and Knowledge Management

Both DynMcDermott and the DOE make heavy use of performance metrics to monitor operations of the SPR. The company has a "Performance Measurement System" which is a valuable tool for compiling information for both internal use and the DOE. A hierarchical view is employed showing metric "owners" and textual information. Information and knowledge management is important for the operation of the SPR, and a long-range (5 yr) plan is updated every year. Retaining and propagating organizational knowledge is important to DynMcDermott, especially with an average employee age of 51. With the heavy use of technology, every employee has a need to use a PC. To transition from "worker" to "knowledge worker," DynMcDermott has used a progressive path from basic computer training, to SAP training, then to document management training. Many management initiatives such as ISO 9000, ISO 14000, etc. have now found their way to the employee level. Across the SPR, computer networks and equipment enable over 2500 points of telemetry data to be monitored daily, and there are also 1200 points of business process measurements. Data security is strategic for the company and the SPR, and hacker attacks are frequently experienced. Of some 619,540 attacks in FY 2005, 100% of the intru-

sions were blocked. Also, of 1,721,916 e-mails handled in FY 2005, some 978,233 spam e-mails were detected.

Human Resource Focus DynMcDermott has refined human resource processes in place to meet its operating challenges. Skills identification, employee recruitment and retention, affirmative action and succession planning are all important parts of hiring and career progression. Some 25 Six Sigma Black Belts are leaders in performance improvement and education/training for employees is provided in part through web-based training and webcasting. The company values diversity, ethical businesses practices, management/leadership development and workplace safety for its employees. Individual development plans (IDP's) are utilized for evaluation, motivation and career development for employees. Employee satisfaction and well-being are assessed by DynMcDermott and the numbers are promising: in 2005, 84% of employees were "proud to be associated with DynMcDermott," and employee retention was at 97%. Some 95% of employees responded that they felt "expected to maintain a high standard of ethics," 81% felt they had sufficient authority to do their jobs and 93% of employees responded that performance improvement is a priority for them.

Process Management Identification and management of processes is an important part of operation of the SPR. The drawdown requirement of the SPR requires processes and contingency plans to be in place in case of a supply disruption or national emergency. As a result, DynMcDermott has a 9-step design process with feedback loop for its rather unique processes. Key value creation processes are defined as the crude oil acquisition (fill) and drawdown processes and others such as va-

por pressure, crude oil quality, maintenance, cavern integrity, emergency preparedness, environmental protection, and security. Key support processes include leadership development, strategic and action planning, performance improvement, project control, contracts and procurement, quality assurance, inventory management and crude oil accountability. Stated milestone completion and budget formulation metrics for 2005 were respectively at 94% and 99.2%, both above goal for the year. Also, from 1999 to 2005, DynMcDermott had zero cited environmental violations. Crude oil quality and quantity must be monitored closely for this important national strategic asset. A difference of greater than 0.4% in quantity between off-loading and filling must be explained and reconciled. The accountability metric was at 100% from 2001 to 2005.

MBNQA DynMcDermott chose the Baldrige process, as it provides an organizational focus, allows the use of multiple tools and is low cost compared to the benefits gained. The award process fit the stated "roadmap" of the company, transitioning from TQM in 1993, to Continuous Quality Improvement in 2003, to a Performance Improvement Culture in 2005, to a planned Integrated Performance Improvement Culture in

2008. Representatives of DynMcDermott gave some advice for others interested in the Baldrige criteria. Major points included preparing for resistance to change in organizations, the need to use state quality programs, the need to have process owners trained as examiners, the need for quality "gurus," using a cross-functional approach to application writing and using project management techniques for the application process. Organization for writing the application is very important and responsibilities and timelines must be clearly defined. Thorough preparation for site visits, and honest, frank interaction with the examiners was recommended, as well as using feedback to "sustain strengths and mitigate opportunities for improvement." DynMcDermott is a believer in the criteria, as it recommended to "use the MBNQA Criteria day-to-day to assess and stretch your organization."

Sources

DynMcDermott presentations at the 2006 Quest for Excellence Conference, Washington, D.C.

www.quality.nist.gov/PDF_files/DynMcDermott_Application_Summary.pdf

* Mayberry Graduate Assistant



Provost Dr. Barker and Board member Jean Kinney talking to students at the reception for the Mayberry Advisory Board.

Mayberry Lecture : Focus on Leadership

Ryan Swor*

Mr. Patrick L. Townsend delivered the Spring 2006 Mayberry Lecture at Tennessee Tech. Mr. Townsend is an acknowledged business performance expert, with a strong background and understanding in human resources and leadership issues. He has been author or co-author of seven books on the topic. He received his Bachelor of Science in Mathematics at Marquette and received his Master's Degree in Computer Science from the U.S. Naval Postgraduate School. He served in the U.S. Marine Corps for some 20 years in a variety of roles from combat and teaching, to being commanding officer in a refugee camp. Mr. Townsend had an important role in the formation of the Malcolm Baldrige National Quality Award at NIST in the late 1980's. Also, he has experience addressing performance excellence in the insurance industry. He was Chief Quality Officer for UICI Insurance Center in Fort Worth, Texas from 2000 to 2004. A summary of Mr. Townsend's lecture entitled "Quality and Performance Excellence Through Leadership" is presented in this article. Mr. Townsend believes that leadership is a large piece of what has been variously called quality, continuous improvement and now performance excellence.

Mr. Townsend first gave a brief summary of the history of the Baldrige program. The Baldrige program had its roots in a sort of panic in American business in response to foreign competition. Following a decline period in American business through the 1970's and 1980's, the Baldrige program enabled companies to assess and improve their overall operations, and it introduced a vocabulary allowing companies to transfer knowledge and teach best practices to other companies. Mr. Townsend calls the annual Quest for Excellence Conference in Washington, D.C., "the best business conference in America year after year." Attendees have the opportunity to hear speakers from award winning companies over a three day period and have the chance to personally interact and ask questions. At the conference one can hear different conversations and many points of view regarding topics in performance excellence.

Mr. Townsend states that his goal in the lecture is to describe his two efforts at service organizations to "do" leadership-based quality and performance excellence. He calls this a "Complete Quality Process" or CQP. It is called "complete" as it involves every person in the company and makes use of all tools available (Six Sigma, Lean, and so on). At his second effort, at UICI, CQP was able to achieve around \$50 million in savings over five years. This amounted to a 9-to-1 return on the cost of the CQP effort. There are seven components of the CQP concept. Mr. Townsend calls the components "formalized common sense," and the challenge is that all seven components must be done at once. The components are as follows:

- Top Management Commitment
- Leadership
- 100% Employee Involvement - with a structure
- Communications
- Training
- Measurement
- Recognition, Gratitude and Celebration

Mr. Townsend comments that without top management commitment, and their personal stake in the effort, CQP will fail. Also, he states that the idea that "leaders are born and not made" is unacceptable. Good leaders take their natural skills and then acquire and refine skills to achieve success.

Communication must be through every possible way, as there are many different ways to communicate. Measurement may get a large amount of publicity, one must remember that it is only one piece of these seven components. Finally, Mr. Townsend states that humans are both rational and emotional and leaders must deal with them in both ways.

CQP requires 100% employee involvement, with a structure. Mr. Townsend interpreted the critical question, asked by most organizations beginning their performance excellence effort: "Who should we include in this effort to improve everything we do?" This can be re-

phrased as: "Who do we have on the payroll who we think is smart enough to contribute to our efforts to improve everything we do?" Taking this further, Mr. Townsend states that this implies, "Who do we think is too stupid to contribute?" or "Who will never have an original idea?" Company management must tell some employees that their ideas aren't needed. The better question is, "Who can we afford to exclude from the effort to improve everything we do?" The answer is "Nobody." A key part of CQP is to create an environment that encourages everybody to take part in the process. According to Mr. Townsend, very few companies in America start their performance excellence process with 100% employee involvement, which "is a shame."

Mr. Townsend began the CQP process at UICI in February 2000. He began by going door-to-door in the company and talking from 5 to 30 minutes with every manager and above in the company. The effort was made to share ideas about how such a process should take place, but the primary motivation was to get all the managers involved and convince them that they should be personally invested. This was followed in March with four half-day classes on leadership participation, measurement and "How do we do this?" for managers and above. Halfway through the fourth class, the newly named president of the company asked how many managers actually want to go through the CQP effort. A "unanimous" raise of hands by the company's managers in attendance at the class ensured a "public" commitment to move CQP forward at UICI.

Next, there were three-day leadership classes for supervisors and above between April and August 2000. This was the first "high-powered," off-site class for many in the company, and it demonstrated the commitment of the company to the effort. It was also the first leadership class or training for many in the group. Then followed the definition and design of CQP. The CQP effort was the responsibility of a Quality Department (which expanded from

just Mr. Townsend to four people by the end of his five-year tenure) and a Quality Steering Committee (made up of a collection of senior managers throughout the company). The department and committee led a CQP effort for a company with 650 people at the start and over 1200 people today. Official launch of "Quality First" came on September 14, 2000. Mr. Townsend related some experiences from his 12 years on the lecture circuit following his first CQP effort from 1983 to 1987. When asked how long it should take from the start of a quality process to the first systematic implementation involving every employee, private industry representatives would say 5 to 7 years and government representatives would say 7 years to "infinity." In actuality, such an effort should take 6 to 8 months, as was done at UICI.

Mr. Townsend gives the following 17 word definition for leadership: "The creation of an environment in which others can self-actualize in the process of doing the job." He notes that "self-actualize" refers to the emotional part of people that must be addressed by leadership.

The structure for 100% participation at UICI put every person on a Quality Team. Mr. Townsend wished to ensure that no employee was left outside of the process, and that every employee was defined as thinking and having ideas. Team leaders were trained, and a computerized tracking program and database was used to efficiently collect information.

According to Mr. Townsend, communication has two parts - transmission and reception. The more important part is the reception by the listener. At UICI, communication included a bi-weekly quality newsletter, regular e-mail updates and references to Quality First at all employee gatherings.

The pre-launch training was in the form of Quality Team Leader training, leadership training and one-on-one mentoring of the team leaders by the Quality Department. Pre-launch



Board Member Steven Hoisington was a guest speaker in a COB class.

measurement efforts included a quality idea tracking program and training in basic quality statistics for team leaders. It is important to measure progress well in the CQP effort and to build credibility in the savings that the CQP effort is producing.

Recognition is a very important part of CQP, with recognition linked to certified ideas and with annual and periodic celebrations in the company. Mr. Townsend states that while the idea of giving "thank you's" is hard to peddle to senior management, they are important nevertheless for two reasons: the employee deserves the thanks, and the employee needs to know that his or her work is appreciated (to ensure future participation of the employee). Giving "thank you's" in multiple ways ensures that more people will hear the message, as people respond in different ways to different methods of showing gratitude. He added that another part of successful CQP is ensuring empowerment, where "authority is equal to responsibility" and team leaders were empowered to bring forth ideas."

The 2000 to 2005 financial results given in the presentation showed a total of about \$50 million in savings, as stated previously. The savings are divided into two categories: "hard dollars" and "soft dollars." "Hard dollars" are defined as budgeted money not spent for its original

purpose and saved or re-allocated for better use. "Soft dollars" are defined as an increase in work capacity with no perceptible bottom line impact.

Benefits of CQP at UICI were many. It was a factor in the increase of revenues from \$300 million to \$900 million with only a 40% increase in staff, and an increase in the stock price from \$5 to \$36. Employee morale increased in all 12 areas measured, and turnover rate reduced from 30% to 11.7%.

What is the bottom line? Mr. Townsend states that, "CQP satisfies the requirements of the Baldrige in a rational, replicable manner." Organizations can start with CQP and transition into the Baldrige criteria over time. Also, CQP "offers a way to convince folks that quality is achievable--as long as there is robust leadership."

* Mayberry Graduate Assistant



From Left to Right: Dr. Marvin Barker, Dr. Curt Reimann, Mr. Patrick Townsend, Dr. Robert Bell, Dr. Robert Niebuhr, Dr. Nat Natarajan, Dr. Virginia Moore and Dr. Gary Pickett. Mr. Townsend was the speaker for the Spring 2006 Mayberry Lecture.

*U.S. News & World Report ranks TTU one of the “Top Public Schools in the South”
To learn more visit www.tntech.edu*

Newsletter prepared by Melissa Scott, Judy Hees, Ryan Swor, Dr. Nat Natarajan and Dr. Reimann. It is also available on the Mayberry website: www.tntech.edu/mayberry/ Your comments are welcome.

NON PROFIT ORG.
US POSTAGE
PAID
COOKEVILLE, TN
PERMIT NO. 101