

Mayberry Newsletter

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

Tennessee Technological University • College of Business • Fall 2005



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
Senior VP of Organizational Excellence and Quality, Exel Limited

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 in Business Education

Dr. Curt Reimann

Over the past 20-25 years, quality concepts and tools have received broad, continuing and evolving applications in businesses of all types, and increasing use in all sectors in the U.S. and abroad. Moreover, during this period quality requirements have become important parts of international trade. Despite these trends, the subject of quality receives unpredictable and often marginal coverage in business education. A factor in this coverage, no doubt, is that many business educators view quality as just one of a number of offerings that might potentially “squeeze out” existing offerings at a time when visible requirements such as globalization and business ethics also demand more coverage and when pressures mount to streamline curricula. In addition, business education faces other demands: achieving better integration of knowledge across disciplines; improving students’ preparation for teamwork; and improving the overall relevance of business education and research.

Although we argue here the importance of quality to business education, we acknowledge that beyond the general limitations to any curriculum additions, quality faces other barriers—perhaps of its own making. These barriers are ones

associated with quality’s uncertain and/or unclear scope and marketplace positions—factors that might actually be as important to inhibiting its wider adoption in business education as the general curriculum pressures noted above. So it is quite unrealistic to simply urge the inclusion of quality because it is important. It is our view that understanding these barriers is critical to understanding quality’s characteristics and importance and to devising a variety of ways to incorporate quality concepts to enrich the business curriculum.

The purpose of this article is to outline some key characteristics of quality that tend to create barriers to its understanding and that bear upon its specific value and manner of potential inclusion in business education. The article does not suggest a “one-best-way” approach in either content or delivery. Rather it emphasizes that curriculum design would benefit directly from wider inclusion of quality, including helping business schools to address the other key demands on business education, noted above.

Educators’ Dilemma: Differing Meanings of Quality

Interestingly, the characteristics of quality that most

practitioners regard as quality’s main strengths often create barriers to its wider coverage in business education. For example, practitioners are likely to cite quality’s broad technical and non-technical characteristics as important to business education. These include:

** general management principles and systems and their relationships;

** business processes and systems;

** customer analysis and systems;

** teamwork and other human resource systems; and

** business improvement concepts and methods.

This broad array of concepts and practices is often referred to as “quality management.”

On the other hand, business educators often view quality as narrow, technical, specialized, and most clearly and appropriately applied to manufacturing, especially to product and production characteristics. So viewed, quality appears to be adequately covered in operations management, or perhaps, more appropriately included in industrial engi-

neering. The fact that the U.S. economy is increasingly service oriented is then also a factor in quality's minimal inclusion in business education. From an academic point of view, it is likely that many educators perceive only the technical core of quality as a well-defined body of knowledge or discipline. The aspects of quality that lie outside the technical core are not yet linked in clear and predictable ways to the technical core. In addition, the aspects of quality outside of the technical core include concepts and practices that many business educators tend to view as too ill-defined, broad, and variable to be accepted and taught as a coherent discipline or covered effectively in a single offering.

If we turn to the marketplace for guidance in curriculum decisions, we note that the marketplace itself has contributed to the confusion. There we see that quality and quality management take many forms and labels. Moreover, the forms and labels change frequently and labeled quality initiatives often move from organization to organization much like fads, often doctrinaire, with associated jargon. Variants of quality initiatives, even some with similar labels, might actually be quite different in some important detail. Indeed, often quality practitioners' skill sets have only small overlaps.

Although the marketplace packaging, labeling, and "morphing" are often bewildering, these characteristics reflect utility, learning, evolution, and adaptation in real time and in real-world application, responding to business dynamics and competitive pressures. Understanding these dynamics and pressures is also an important part of business education. In the marketplace, learning and evolution occur in part via accretion and adaptation of concepts from other disciplines, as well as from successes and failures in use. In simplest terms, some of the confusion with the quality body of knowledge and tool sets are that they are open ended—more so than perhaps traditional business disciplines.

Quality Management: Broader than Technical Quality

Despite a lack of clear, stable, and universally accepted boundaries that define a unique quality management discipline or body of knowledge, there are a number of core purposes and elements that tend to be part of most quality initiatives. Key examples include:

** focus on organizational performance, performance comparisons, and performance management, including use of an integrated set of performance metrics and comparisons;

** focus on customer and stakeholder requirements which include market dynamics, competition, and public responsibilities;

** business processes that fulfill the requirements of the organization and hence connect these requirements to inputs, outputs and outcomes. Because these processes respond to purposes and requirements, they tend to cross organizational and discipline boundaries and must be built upon the organization's specific business model;

** reliance on teamwork and problem solving within and across organizational units, especially for performance improvement.

Aspects of these topics, of course, often arise within existing curricula. However, it is very difficult to achieve the appropriate context and depth for these critical topics within other offerings. It is also quite unrealistic to expect students to synthesize a holistic understanding of these important topics based upon exposure to partial and perhaps inconsistent treatments that might not be part of some overall integrated curriculum design.

Quality in the Curriculum: Some Options

Even if business educators accept the potential value of quality management to general business education, the challenge remains of how to accommodate it in the curriculum. As emphasized in the introduction, we see no "one best

way." Rather, a variety of alternatives might be devised to cover the critical quality purposes and methods. Alternatives or combinations include:

** quality concepts covered across the curriculum via integrated design, to cover and reinforce the overall concepts;

** special coverage as a visible part of general management concepts, especially organizational performance;

** capstone experiences, such as internships and special projects;

** participation in state quality award programs;

** use of quality award or other quality case studies; and

** core offerings and elective ("special topics") offerings.

As indicated at the outset of this article, over the past two decades, quality has become a very important instrument in businesses and other organizations. Its increasing use parallels the growth in competition, changing business models, and market segmentation. These trends should merit enhanced coverage in business education. In addition to their inherent value, quality concepts provide other benefits, such as:

** application to all organizations' requirements, thus supporting students' better understanding of organizational purposes and dynamics and students' preparation for employment across the economy;

** a vehicle to address the other demands upon business education, including performance-driven teamwork and cross-discipline knowledge;

** a vehicle for use in curriculum design itself.

Power of Productivity

Dr. R. Nat Natarajan

The Power of Productivity: Wealth, Poverty, and the Threat to Global Stability by William W. Lewis. University of Chicago Press, 2004.

Why does productivity in retailing, and housing construction sectors in Japan lag woefully behind its automotive and steel industries? Why does Russia, with a better education system, have lower per capita GDP than Brazil? In his book, whose ambitious scope is indicated by its subtitle, Lewis has the answers. He is the founding and now emeritus director of McKinsey Global Institute (MGI), and has held several policy making positions at the U.S. Departments of Defense and Energy. The author has a deeper goal. He wants to examine the re-

lationship between productivity, economic performance, and poverty in countries. Productivity has always been considered a very important dimension of business performance and its improvement remains a major objective of businesses but its impact on a country's well-being is not obvious and needs elaboration. Lewis and his colleagues at MGI use a new methodology to do just that. He reaches conclusions that policy makers and business leaders will find both surprising and controversial. Here is a sample (in italics).

"Trainability is not the same as education. Uneducated workers can achieve best practice when educated workers do not." "In Houston, Texas, illiterate agricultural workers from not speaking any English are achieving best practice labor productivity in housing construction." (p. 245). According to his evidence there is no direct link between education levels and productivity. This may be true if productivity is interpret-

ed narrowly as it applies to farms and factories. This ignores, for instance, external effects on children's health and nutrition due to improved women's literacy. It also does not consider the vital role higher education plays in fostering innovation.

"The truth of the matter is that regardless of institutional educational level, workers around the world can be trained on the job for high productivity." (p. ix). Will this really happen? Multinationals like Toyota can train U.S. educated workers and achieve world class productivity in its U.S. transplants but does the typical firm have the incentive to spend money on training when its trained workers can be poached? Moreover, the time and cost of training will increase if the educational levels are low to begin with.

For poor countries he offers the following. *"The solution does not start with more capital. The*



Left to Right: Front Row: Bill Nusbaum, Jack Swaim, Jean Kinney, and David Jones
Back Row: Marie Williams, Dr. Curt Reimann, and Dr. R. Nat Natarajan

solution is in the way it organizes and deploys both its capital and labor. If poor countries improved productivity and balanced their budgets, they would have plenty of capital for growth from domestic savers and foreign investors.” (p. x)

“Big governments demand big taxation. When part of the economy is informal and untaxed the burden falls on the legitimate businesses. This is a burden today’s rich countries did not have when they were poor. The elites are responsible for big governments. Particularly in the poorer countries, the elites license business activity, control international financial and material flows, promote unaffordable social welfare systems, and favor government owned businesses. Too often, the elites reward themselves richly.” (p. x)

“Direct investments by the more productive companies from the rich countries would raise the poor countries’ productivity and growth rates far more effectively than sending money. Poor countries have the potential to grow much faster than most people realize.” (p. x) Lewis points out that foreign direct investment has done wonders for retailing in Brazil, and auto industries in India and the U.S.

“Only one force can stand up to producer interests—consumer interests. Most poor countries are a long way from a consumption mindset and consumer rights. As a result they are poor.” (p. x). Lewis argues that in the U.S., historically, consumer is the king. Its political tradition supports consumer consciousness. Lewis quotes John Kennedy from 1960, “The consumer is the only man in the economy without a high-powered lobbyist. I intend to be that lobbyist” (p. 301). The snag is that free market competitive capitalism—that Lewis advocates as a solution—takes care of owners’ not consumers’ interests. In the book, Lewis does not address that contradiction.

The study includes two rich countries, Japan and the U.S., one rich region,

Europe, and one middle income country, South Korea, and three large poor countries, Brazil, India and Russia. China is a glaring omission. Nor are any of the 54 countries from the continent of Africa represented in the study. In a later interview, Lewis contends that already a strong pattern has emerged in his findings and additional data collection — which is a daunting challenge in itself — is not likely to enhance the insights that have been gleaned. The study was conducted over 12 years.

Productivity and the factors affecting it have been studied by economists at the macroeconomic level and by management scholars at the organizational level. Lewis, a physicist by training, considers industry as the unit of analysis and focuses on the particular microeconomic conditions that affect productivity in an industry. This was prompted by a paradox he observed with respect to Japan. In the 1990s the main story was that Japanese manufacturing industries, through trade, were wiping out auto, steel, and consumer electronics industry in the U.S. But the GDP per capita numbers at purchasing power parity exchange rates showed that GDP per capita in Japan was roughly 30% below that of the U.S. He was convinced that the only way to understand that paradox was to look at the productivity of individual industries in Japan. He found that Japan had a “dual economy.” True, Japan does have some industries with the highest productivity in the world that are globally very competitive but looking only at the traded sectors of an economy is misleading because that is generally a small percentage of the GDP. Non-traded sectors like retailing and housing construction in Japan (productivity in those sectors were about 50% of the respective levels in the U.S.) determine the overall productivity which is the average of productivities of the individual sectors.

The productivities (of labor and capital) in selected sectors of each country are estimated by data gathered in the field and through

published statistics. They are compared with the U.S. benchmark in the same industry. The results show that barring very few industries, the U.S. has the highest productivity levels. Lewis credits this to the pro-consumer, pro-competition policies historically followed in the U.S. Significantly, the poorer the country, the lower the productivity levels in sector after sector. According to Lewis, the connection between standard of living measured by GDP per capita and labor productivity is straightforward. Average labor productivity is output divided by number of workers. This equals output (GDP) per capita multiplied by the fraction of population employed. Lewis makes the assumption — which is questionable — that the latter fraction does not vary much from country to country. Thus lower labor productivity implies lower standard of living.

Retailing and housing construction industries are studied in every country in the sample. Lewis singles them out for special mention because he thinks they do not get the attention they deserve. Retailing and house construction accounts for 11% and 2% of employment in the U.S. and 12% and 4% in Japan respectively—a lot more than manufacturing industries. Retailing has influence outside its boundaries. Because of its position in the value chain — closest to the customers — it has market knowledge that influences productivity in the entire chain all the way to the farmers. He attributes much of productivity acceleration in the U.S. from 1995 to 2000 to the innovations of Big Box retailers like Wal-Mart. Information technology played a lesser role. Housing construction is among the most local of businesses without any global or large national firms. Therefore, it is difficult to establish benchmarks and conditions for productivity improvement. It is also very sensitive to macroeconomic conditions such as mortgage rates and laws regarding zoning and land use.

Lewis traces the causes of the observed disparities between productivities within the sectors in the same country and the even greater divide between that of rich and poor nations to the microeconomic policies. The particular causes are the distortions in the product markets and anti-competitive policies. The more the distortion, the worse the productivity. These policies are in place for reasons such as: to support special interests of producers; to favor incumbent, small, and informal businesses against competition; and to meet social objectives. Lewis argues that too much attention has been paid to the so-called "Washington Consensus": if a country has a regime of flexible exchange rates, openness to trade, and governmental fiscal discipline, then it is on a path to economic development. MGI study leads him to conclude that creating fair and intense competition is the key. And both its importance and the difficulties of achieving it—especially in poor economies—have been profoundly underestimated. Stable macroeconomic conditions are necessary but not sufficient. Policymakers focus on labor and capital market reforms but not on product markets. This is because the issue has to be addressed sector by sector and it is hard work.

In the book, examples of market distortions abound. In India, the market for land does not function properly because of unclear land titles. Lewis points out that because of such distortions there is no incentive to use even wheelbarrows—a very basic tool—in construction! Lewis is not impressed by the global success of India's software industry because it contributes to less than one percent of India's GDP. Moreover, its productivity—though much higher than other sectors in India—is only about 50% of the level in U.S. Fears of loss of IT jobs to India can be put to rest by the fact that even if India does all the IT work for the rest of the world it will employ only 7 million workers! (To

put things in perspective, the U.S. economy alone has about 140 million jobs.) If productivity improves, it will employ even fewer. This is dwarfed by the 25 million Indians working in retailing (mostly mom-and-pop and cubbyhole retailers) and 50 million in dairy farming. Compared to the U.S., these sectors have abysmal relative productivities of 6% and 0.6% respectively. Over 800 products are reserved for small scale sector which does not usually pay taxes. This means Indian apparel and textile plants cannot compete with China's in apparel exports because they lack the scale economies.

In Brazil, as in India, there is a huge informal economy. One would think that street vendors and counter stores that employ informal labor will be displaced by more productive, formal and bigger businesses. But this does not happen in Brazil because the formal sector pays taxes on employment value added, sales, and profits while the informal enterprises do not! The entire tax burden falls on the 50% of workers in the formal enterprises and the enterprises themselves. Its constitution, framed in 1988, has enshrined economic rights such as pension and healthcare to all citizens. It already has a bloated government sector. Brazil simply cannot afford such social spending without rapid productivity growth.

Informality takes a different form in Russia. It was created by the government—a legacy of central planning. Many firms do not have to pay taxes and electricity and gas are not shut off when they do not pay the bills. Some of these are steel companies that employ over two thousand workers. It is difficult to compete with local domestic producers who sell smuggled goods, on which they had not paid the import tariffs. Foreign retailers like Carrefour shy away from Russia because they see no prospects for making money when the playing field is so uneven. Thus global best practices in retailing do not get transferred to Russia. Lewis points out that in poor countries like Brazil, India or Russia the modern sector has to grow and be more productive and cre-

ate wealth and job opportunities elsewhere in the economy for labor in the less productive sectors. That is how productivity becomes an engine for growth. This cannot happen when the competition is not fair.

South Korea is a recent example of a country that has broken out of the ranks of poor countries. It has followed the Japanese model for growth. According to Lewis, it is also an example illustrating the perils of such a strategy. It has fallen into the same trap as Japan with over investment. Its firms seem to have forgotten that only increasing the inputs without caring for the output side is counterproductive. At the stage of development South Korea is in, further growth comes from innovation not by just working longer hours.

The book provides a wealth of statistical information, delving into impressive levels of details like the durability of drill bits in Russia and method of house construction in Japan. It questions the prevailing wisdom about economic growth backed by cogent arguments, clarity of thought and writing. It is a very useful read for policy makers, global business leaders, students and scholars of international business. But it is often repetitive and the main conclusions are eerily similar to those reached in another tome with a similar title, written over two hundred years ago by another non-economist, actually a moral philosopher. It was Adam Smith who first expounded on the power of productivity, championed the cause of consumers, and railed against producers' special interests. After reading Lewis's book, it seems, not much has changed in the global economy since Smith's time!

Activities and Accomplishments 2004-2005

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 Assistants **Matt Roberts** and **Ryan Swor** have contributed to this mission during the past year. Activities carried out include:

****In February 2005, TTU President Robert R. Bell was honored by the Tennessee Center for Performance Excellence (TNCPE) as the first recipient of its Ned R. McWherter Leadership Award. It is named for former Tennessee Governor Ned McWherter, under whom the Tennessee Center for Performance Excellence (formerly the Tennessee Quality Award) was created in 1993. "Some of the reasons our board of directors selected Dr. Bell for this honor include his outstanding leadership at TTU and the Tennessee Board of Regents, the way in which he incorporates business excellence principles at the university, and his use of the Baldrige framework on the campus," Katie Rawls, President of TNCPE, said.**

****Dr. Reimann made the following presentation: "University Strategy and Leadership: Integrating TNCPE and Accreditation Requirements" (with President Robert Bell, Dean Susan Elkins and Dr. Barry Stein) at the Excellence in Tennessee Conference organized by TNCPE in Nashville, TN, on February 18, 2005.**

****Dr. Reimann serves on the advisory board of the TTU School of Inter-**



Mayberry Board members listening to a presentation on TTU's Governor's School for Information Technology Leadership

disciplinary 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. Nat Natarajan, the Mayberry Professor of Management, attended in November 2004 the annual meeting of the Decision Sciences Institute at Boston, MA, and presented the papers "Six Sigma in Services" (co-authored with Mr. Jason Morse) and "A Framework for Adoption and Diffusion of IT in Health Care" (co-authored with Dr. Purnendu Mandal). These papers were published in the conference proceedings.**

****Dr. Reimann has been appointed to the Veterans' Advisory Board on Dose Reconstruction by the Defense Threat Reduction Agency, U.S. Dept. of Defense.**

****Katie Rawls, the President of Tennessee Center for Performance Excellence, visited the College of Business (COB) in April 2005. The visit resulted in the arrangement between COB and**

TNCPE to award academic credits to MBA students who serve on the TNCPE Board of Examiners.

****Matt Roberts, Mayberry Graduate Assistant, served on the 2004 Board of Examiners of the Tennessee Center for Performance Excellence (TNCPE).**

****Ryan Swor, Mayberry Graduate Assistant, is serving on the 2005 Board of Examiners of the TNCPE.**

Mayberry Advisory Board

The Mayberry Advisory Board met on October 26, 2004. Board members visited classes as guest speakers. They attended a presentation on TTU's Governor's School for Technological Leadership made by Dr. Curtis Armstrong, the Director of the program. They also participated in a panel discussion organized by the MBA students. Earlier they interacted with students during the reception and dinner on October 25.

Activities and Accomplishments 2004-2005 (cont'd)

The Mayberry Lectures

On November 4, 2004, Mr. Jim Zurn, Senior Manager, Corporate Operational Excellence Program, Intel Corporation, delivered the Fall 2004 Mayberry Lecture titled "Intel: Driving Ever Harder to Meet Global Challenges."

On April 7, 2005, Mr. Steven Hoisington, VP of Organizational Excellence at Exel, Inc., delivered the Spring 2005 Mayberry Lecture titled "Performance Initiatives: Show Me The Money."

The summaries of these lectures appear on pages 8-11 in this newsletter.

For excerpts from the panel discussion please visit TTU Leadership Library at <http://iweb.tntech.edu/ll/>

MBA Program Offers More!

TTU MBA Program will be offering three new concentrations. All of them will be available as distance based opportunities. In the Performance Management track you can become a certified Six Sigma Black Belt or Green Belt and/or serve as an examiner for the TNCPE Quality Award program. You will be earning academic credits for them. The other tracks are in Risk Man-

agement and Insurance and International Business.

The Distance MBA is a 30 credit hour program (10 courses). It was started three years ago with zero students and now 130 are enrolled in it. Many have graduated without setting foot on campus until they are at commencement to receive their diploma.

For more information
call 931-372-3600

or

e-mail MBAstudies@tntech.edu.



Where Are They Now? An Update From Brian Bowman!

Recently we heard from Brian Bowman, one of our former Mayberry Graduate Assistants. He was one of the very first Mayberry GAs during 1996-97.

"I learned a great deal about leadership, quality, and performance excellence during my time as a Mayberry GA – the experience has definitely provided me with an edge in the business world.

Upon graduation from TTU, I accepted a position in the Business Consulting practice of Arthur Andersen in Charlotte, NC. I was part of the same practice for almost seven years including the movement of my practice to PwC Consulting and ultimately the acquisition of my practice by IBM Business Consulting. During my time in consulting, I was fortunate

to have the opportunity to lead a number of engagements that spanned management and information technology consulting. Most of my projects focused on business strategy, process reengineering, and implementation of ERP systems.

Rebecca (my wife) and I decided to move to Nashville in 2003. I made the difficult decision to leave IBM last year and accepted a position as a Director of Information Technology with AIM Healthcare Services in Franklin, TN. At AIM I have responsibility for project management, business analysis, and quality assurance as well as leadership of a 9-person team of developers and integration specialists charged with the transformation of client data for our data mining operations.

In addition to being able to apply my knowledge of the Baldrige Quality Award, in my career I have also found practical application for almost everything I learned at TTU. Since graduating, I have continued my professional development by becoming CPIM certified by APICS. I am currently preparing for the Project Management Professional certification exam through PMI.

Today, Rebecca and I live in Nashville with our dog Ginger. Who knows what opportunities the future holds? Regardless of the future direction, I will always cherish my time as a Mayberry GA. My sincere thanks to the Mayberry Center!"

We wish Brian all the best in his future endeavors.

Mayberry Lecture Fall 2004

Dr. R. Nat Natarajan

On November 4, 2004, Jim Zurn from Intel delivered the Mayberry Lecture titled "Intel—Driving Ever Harder to Meet Global Challenges." He is Senior Manager of Corporate Operational Excellence for Intel Corporation with over 27 years' experience in quality, reliability and design engineering with Intel, Storage Technology, Xerox, AT&T and Fujitsu Ltd. Jim is a Senior Member of ASQ, SME and IEEE and is an ASQ Certified Quality Engineer and Certified Reliability Engineer. He is serving his eleventh year on the Board of Examiners of the Malcolm Baldrige National Quality Award as an Alumni Examiner, and is the founding chair of the Arizona Governor's Award for Quality program. Additionally, he was a Lead Examiner in the U.S. Army's Centurion Quality Award program and a Senior Examiner in the U.S. Dept. of Labor Workforce Excellence program. He is a member of the editorial review boards of Quality Progress, Quality Press, and the Journal of Technology Transfer. Mr. Zurn is widely published in journals such as IEEE Transactions on Engineering Management and Quality and Reliability Engineering. The following is a summary of his talk.

Here is a high tech company which is a market leader with dominant market share, leading edge innovations in computing, highly skilled workforce, a global presence and brand — a comfortable situation one may think. Not necessarily, according to Jim Zurn, senior manager of corporate operational excellence for Intel Corporation, who was the Fall 2004 Mayberry Lecture speaker. In his talk, Zurn provided very interesting insights and

perspectives on the strategy, culture, the workings, the accomplishments, and the challenges facing one of the world's leading high technology companies.

Zurn elaborated on the company's six core values – customer orientation, discipline, quality, risk taking, great place to work, and results orientation. These values drive everything Intel employees do, they are even evaluated on how they incorporate these values into their everyday work.

Intel is a company that supports diversity. It's management believes that diversity brings value to Intel, including diversity in thinking as well as cultural differences. Intel wants its employees to "think outside the box." And that was part of Zurn's advice to students; by doing so they can increase their value to potential employers. Intel puts much emphasis on intercultural training. Zurn spoke of a dictionary being developed that will contain culture-sensitive words. He said "to survive internationally you must be sensitive to other cultures and respond appropriately." Mr. Zurn has personally trained employees for China and Israel operations.

Presence in the global market is very important to Intel. A total of 73% of sales were outside the United States in the first quarter of 2004. Intel has operated internationally since 1969, when offices were opened in Geneva, Switzerland, and Brussels, Belgium. Intel has had international manufacturing operations since 1974 when a facility was opened in Manila in the Philippines.

Intel is now making investments in global markets to better serve them and to tap a deeper pool of talent. Intel values highly trained people and promotes the theme "knowledge is power." Mr. Zurn mentioned Intel

locating facilities outside the United States for access to talent and skills which are cheaper. There are R&D facilities in India, China, and Russia. The average hourly salary in Shanghai for someone with a college education is \$2.50.

He remarked that globalization has helped Intel improve productivity by moving production to where the cost is lowest. For example, Intel has located factories in Russia to help save on labor cost. What was interesting was that Intel has a factory in a country that has a lot of political instability, but even with this, the benefits of the cost reduction offset the risk of the factory being damaged.

Through fascinating anecdotes he brought out the extraordinary aspects of running a global business. He was referring to an Intel plant in Israel. This plant was close to Gaza, a hotbed of conflict. The issue when building the factory was not the bombs and warfare, but the helicopters that were flying over. Their vibrations caused turbulence that disrupted the calibration of the equipment. He had to meet with the Israeli leaders and get a no fly zone over the plant. He also told us of different customs and mannerisms in Israel. For instance, it is customary when trying to get your point across to get really close to a person's face when talking. This is not acceptable here in the U.S. but it was perfectly OK to "get in one's face" over there.

Intel promotes "a culture of equals" and meritocracy. This includes such things as having open offices, and no special parking spaces; the CEO sits in a cubicle like everyone else. And all ideas are valued whereas titles are not. Employees are encouraged and expected to speak out; they are

valued for their ideas and expected to go beyond their particular area of discipline. Employees are encouraged to have a “win and have fun” involvement with their managers and engage them in constructive confrontations. Mr. Zurn told a story about a senior manager making a bet with a factory supervisor. The supervisor won the bet (by meeting the senior manager’s production target) and the senior manager had to serve the entire factory staff in a hula skirt. Being paranoid is a plus at Intel. A lot of attention is given to thinking about and anticipating what could go wrong.

Scale, agility, and operational excellence are the three keys to Intel’s leadership in manufacturing. There is little room for error in its production processes. The chips are made in rooms ten times cleaner than a hospital room. In the past Intel’s factories would produce one kind of product. This meant limited flexibility. Now Intel is better able to adjust production based on demand and its equipment can easily be dismantled and moved when it is not needed. If demand for a chip goes down, Intel does a warm shutdown that allows the factory line to slow down enough to avoid shutting down lines, which would cost a lot of money.

Zurn highlighted some of Intel’s achievements. By 2005, five new plants will churn out chips using 12-inch wafers the size of a dinner plate, printed with 90-nanometer circuit lines just 0.1% the width of a human hair. Each plant will slash chip costs in half by producing 2.5 times more product than older-generation fabrication plants. That gives Intel the ability to produce 1.25 million processors a day — a staggering 375 million a year!

Intel spends \$4 billion in research and development, has about 7,000

scientists in 70 labs, has a \$500 million communications fund, and over 250 Intel sponsored research engagements with universities. Its Environment, Health, and Safety (E.H.S) programs have received 50 awards since 1998. Intel is also a committed corporate citizen playing an important role in education. It has created a foundation that has donated more than \$100 million worth of technological products and services to kindergarten through college level education.

When Mr. Zurn talked about the challenges and strategic inflection points faced by Intel, he mentioned that instead of just thinking as a chip making company, it has to act as a ‘platform’ (which bundles processor and ancillary chips, networking components and software all together) company. He mentioned that the older employees who have worked in the company for a long time had trouble adapting to this switch. However, thinking about the whole product will help the company identify what parts

of its process need to be improved. Asked if Moore’s law — the law formulated by Gordon E. Moore, one of the founders of Intel, according to which the processor power doubles every 18 months — has run its course, Zurn opined that it will be upheld for a few more years.

Zurn said the most important things to remember when working in a big company like Intel are: be confident in your core competencies, be prepared (do your homework), be open-minded (accept diversity), build relationships up, and learn to work in matrix environments.



Left to Right: Dr. Curt Reimann, Dr. Bonita Barger, Dr. Ken Wiant, and Mr. Jim Zurn

Mayberry Lecture Spring 2005

Ryan Swor*

*On April 7, 2005, Mr. Steven H. Hoisington, senior vice president of organizational excellence and quality for Exel, Ltd., delivered the Spring Mayberry lecture. Exel, Ltd., is a British-based organization with 109,000 employees and 120 locations worldwide and about £6.7 billion (\$11 billion) in revenue. The key services of the organization are contract logistics services and freight shipment. He worked at IBM for twenty years, serving in roles such as worldwide manufacturing operations director, plant manager, and finally director of quality. He also served Johnson Controls as vice president of quality, and was an examiner with the Malcolm Baldrige National Quality Award program for an unprecedented twelve years, and has been involved with other quality programs in the United States, India, and New Zealand. He has co-authored two books, *Customer Centered Six Sigma* and *Implementing Strategic Change*. He is currently writing a third book, which addresses customer loyalty. Mr. Hoisington states that he is not a "parochial quality guru," a "know-it-all," or a "technology weenie," but rather is flexible and is willing to use a variety of quality tools. Following is a summary of his lecture, entitled "Performance Initiatives: Show me the Money."*

In the Spring Mayberry lecture, Mr. Steven Hoisington addressed the economic case for quality, the relationship of performance measurements, financial payback on non-financial measurements and results, using customer data for improvement, and Six Sigma. He stressed that what is most important for organizations in the end is results. Expectations of the stakeholders of the organization — customers, shareholders, etc. — must be met.

He emphasized that Total Quality Management (TQM) is not a fad. It has led to the improvement of the bottom line in many organizations. He presented the findings of a recent 5-year study, in which a group of 600 companies adopting Total Quality Management practices performed significantly better (2-to-1) than a control group in terms of percent increase in stock price, operating income, sales, and total assets. Within the companies achieving quality awards, small firms (less than \$600 million) have been found to outperform larger firms 3-to-1. Premier companies renowned for quality have been listed in the "Q-100" index, and the Q-100 has consistently outperformed the S&P 500 index. Quality helps to differentiate organizations, and make them more effective.

He presented the findings of a number of studies relating financial and non-financial performance measures. One of them was the model of relationships between organizational performance measures modeled by Earl Naumann and Frank Reichold. In this model, product quality, service quality, and price, lead to customer value. Then customer satisfaction and loyalty attributes follow, which influence company revenues, costs, and profits. These, in turn, directly affect shareholder value and company image. IBM performed a study looking at 10 years of data and 54 different performance measurements: IBM was able to develop a statistical model directly relating customer satisfaction to cost of quality, productivity, and employee satisfaction. The results of this study supported a more holistic view of company performance, especially for two key areas. First, companies cannot just focus on financial performance alone but must also consider the underlying drivers of performance. Second, companies cannot

view functional changes on an individual basis but must understand the impact of changes on the organization as a whole.

In Mr. Hoisington's experiences at Johnson Controls and IBM, it was found that there was a direct relationship between customer satisfaction and financial performance. Improvement in customer satisfaction improves revenue, increases renewals, decreases lost sales, increases business volume, and increases stock price. By raising customer satisfaction a single percentage point, Johnson Controls was able to see an additional \$13 million in revenue, and IBM could earn \$257 million more. At Johnson Controls, retention rates of satisfied and very satisfied customers ranged from 80 to 97%, while neutral customers had rates of 60-65%, and dissatisfied and very dissatisfied customers had rates of 0-20%. Also, very satisfied and satisfied customers comprised 91% of all customer renewals, and average contract prices increased by 25% per level moving from dissatisfied through very satisfied customers. Through satisfying customers, IBM saw significant improvement in customer loyalty and business earned. Also, a 3-to-1 improvement was noted comparing very satisfied and satisfied customers. Looking at American Customer Satisfaction Index (ACSI) scores for companies, a direct correlation is noted between ACSI and the Dow Jones Industrial Average (DJIA). Moreover, high scoring companies have outperformed low scoring companies with respect to stock price. IBM, Nortel, and Johnson Controls have all noted a strong correlation between customer satisfaction and stock price. AT&T has noted the correlation between customer satisfaction and market share. However,

it is important to make an economic case for quality, to put the costs and benefits in terms of “dollars and cents” for managers in organizations.

According to Hoisington, customer dissatisfaction has a great impact on organizations, based on various studies by IBM, Coca Cola, and Sears. Dissatisfied customers spend less or nothing further with the company, and make it more difficult to gain new customers. While satisfied customers may recommend products or services to three others, dissatisfied customers will tell about their bad experiences to nine others. Furthermore, compared to maintaining a satisfied customer, it costs twice as much to maintain a dissatisfied customer, five times as much to gain a new customer, and twelve times as much to win one back. Companies must take care not to erode their customer base and must resolve customer complaints. At IBM, the 69% of customers who experienced no problems had repurchase intent of 89%. This contrasts with customers with unresolved problems, who had repurchase intent of 23% (complained) or 47% (did not complain). However, customers who had problems and had their complaints resolved had repurchase intent of 96%. In short, customers expect an organization to be responsible for the products and services that it sells.

Mr. Hoisington had experience in implementing Six Sigma at Johnson Controls. In a company, he thinks it is important to make the case to managers for Six Sigma in terms of potential financial results rather than in its connotation of statistical process control. Then, the intricacies and implementation of Six Sigma should be left to the trained Black Belts. Results should be seen in both the income statement “top line” (customer satisfaction) and “bottom line” (reflecting operations performance). Six Sigma must be



From Left to Right: Dr. R. Nat Natarajan, Ryan Swor, Steve Hoisington, and Dr. Curt Reimann

made part of building customer value and the culture of the company. The goal is to make core processes, services, and products better, faster, and at lower cost. At Johnson Controls, implementation of Six Sigma had a very positive impact on the organization. Over \$500 million in waste reduction and improvements were realized over about four years. Warranty expenses, customer satisfaction, performance contracts, and building needs were all improved. Johnson Controls was able to meet and exceed world class levels of outgoing quality level, warranty costs, and customer satisfaction.

Results are very important for organizations. This can be noted in the Malcolm Baldrige criteria where business results are worth 450 out of 1000 total points. To improve overall financial results, organizations should focus on a balanced set of relevant key measurements demonstrating current levels, trends, and comparisons. Diverse areas such as social responsibility, operations, human resources, finance, products and

services, and customer satisfaction must all be measured and considered. Kaplan and Norton suggest a “balanced scorecard” in which vision and strategy drive performance for customers, financials, business processes, and internal learning and growth. Such a scorecard was put in place at IBM, and Mr. Hoisington is currently engaged in a similar scorecard implementation at Exel.

At the conclusion of the lecture Mr. Hoisington provided some advice. He wanted students to note that everyone should do his or her best in life, but that results matter more than effort. Organizations are driven by financial performance, so actions and results must be related to the financial impacts. He feels that an academic degree only opens the door, and it is up to the individual to make the most of his or her opportunities. Goal-setting is important for a successful career. Finally, everyone should be certain to deliver on commitments and deliver results.

* Mayberry Graduate Assistant

TTU President Robert Bell Honored



In February 2005, TTU President Dr. Robert R. Bell was honored by The Tennessee Center for Performance Excellence (TNCPE) as the first recipient of its Ned R. McWherter Leadership Award. (see Activities and Accomplishments section in this newsletter for details).

*From Left to Right:
Former Tennessee Governor
Ned R. McWherter, Katie
Rawls, President of TNCPE,
and President Robert Bell*

Newsletter prepared by Melissa Scott, 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