Challenges Facing the Manufacturing Industry and Taking the First Steps toward the Revitalization of Manufacturing

President Barack Obama has a plan to revive U.S. manufacturing, the anchor of the economic blueprint he sketched out during his State of the Union address in January 2012. The President promised to breathe new life into this sector of the economy, which has been declining for decades.

Unfortunately, nearly six million manufacturing jobs were lost in the United States from January 2000 to December 2009, for an average of approximately 54,000 per month. From January 2010 through January 2011, the U.S. added a total of 152,000 manufacturing jobs at an average rate of 11,800 per month, according to the U.S. Department of Commerce and U.S. Department of Labor.

Manufacturing is very critical to economic growth, prosperity and a higher standard of living. Part of the reason for that is its multiplier effect. More than any other sector in the economy, manufacturing creates the most wealth. Manufacturing pays higher wages and provides greater benefits, on average, than other industries. It performs almost two-thirds of private sector research and development, creates the highest number of jobs to support the industry while serving the surrounding communities, and contributes to more than 50 percent of the country's total exports.

Manufacturers and policy-makers are realizing how dependent Canada, Mexico and the United States are on each other. The top two North American markets for U.S. exports are Canada and Mexico, making "Made in North America" a priority.

The Challenges

America has a huge problem. It faces four major challenges on which its future depends and has been failing to meet them. In *That Used to Be Us, How America Fell Behind in the World It Invented and How We Can Come Back* by Thomas L. Friedman and Michael Mandelbaum, the authors analyze those challenges—globalization, the revolution in information technology, the nation's chronic deficits and its pattern of energy consumption.

In addition, the authors point out how America's educational system has not adapted to changed priorities around the world—the critical need for more math, physics, engineering and technical knowledge and skills in economic development. This has caused Americans to rapidly lose jobs, while more emphasis on these subjects in China, India and other countries has made America's competitors gain employment in manufacturing.

The National Association of Manufacturers' (NAM) Manufacturing Institute 2011 Skills Gap study states that 82 percent of manufacturers have a moderate or serious shortage of skilled production workers, and 5 percent of all manufacturing jobs—or 600,000 jobs—are open because there is no qualified talent. In addition, 2.7 million manufacturing employees are 55 years of age or older and likely to leave the labor force over the next 10 years. The growing shortage of skilled workers needed for North American manufacturers to sustain and grow the business are compounded by a 20 percent structural cost burden compared to our key trading partners as reflected in the Structural Cost of Manufacturing study.

To participate fully in society and the workplace, citizens will need powerful literacy abilities that until now have been achieved by only a small percentage of the population. Having a steady supply of highly skilled workers, scientists, researchers and engineers is seen as the top driver of the manufacturing competitiveness of nations and the standard of living of their people.

Students in the United States are trailing other industrialized nations as reported in the 2009 report of the Program for International Student Assessment. These results show America as being average in reading and science, and below average in math. America's high school graduation rate ranks 19th in the world, while 40 years ago, we were number one.

Other factors contributed to the current situation and future of manufacturing jobs, and much can be attributed to laws and regulations that make it more difficult for manufacturers to meet foreign competition on level ground. Every new expense, whether it is to comply with new regulations, to fund government programs or to defend lawsuits and pay unwarranted claims, is a loss to the high-quality, job-generating capacity of manufacturing.

Breathing New Life into Manufacturing

The public and private sectors must come together to build on the NAM study, *A Manufacturing Renaissance: Four Goals for Economic Growth*, to revitalize the industry and grow the economy. The strategy calls for putting people, schools, businesses and the government to work; producing literate career-ready citizens capable of joining the workforce; and enabling manufacturers to once again lead the designing, building and exporting of quality products and services around the globe. The top three priorities for revitalizing manufacturing proposed by National Council For Advanced Manufacturing and its alliance partners are:

- Build a better educated and trained workforce
- Promote product and process innovation, as well as research and development
- Improve global competitiveness for companies

Each priority contains elements that must be considered in developing public policies that support the revitalization of the manufacturing sector, and policy-makers must consider these elements in shaping future public policy and legislation. Their goal should be to help public school systems and companies transform themselves to compete in more knowledge-intensive and information-fueled innovative processes, leading to more competitiveness by putting people back to work building things at home.

President Obama praised companies that are bringing manufacturing jobs back to the United States from abroad at a White House conference where he met with leaders of firms investing in South Carolina and other states. "I don't want the next generation of manufacturing jobs taking root in countries like China or Germany," President Obama said. "I want them taking root in places like Michigan and Ohio and Virginia and North Carolina."

The Association for Manufacturing Excellence (AME) has been leading the "Revitalization of Manufacturing" initiative, where AME, along with other organizations, has been reaching out to policy-makers nationwide, and encouraging them to join or develop efforts focusing on local and state job creation. It is imperative that policy-makers recognize the importance of an industry that has been the backbone of the North American economy. To date, AME has received more than 400 signatures of support from state and federal policy-makers, industry trade associations and operations executives representing manufacturers across North America.

Virginia was the first state to pledge its support for AME's initiative, and is also the top state named in CNBC's *Special Report: America's Top States for Business 2011*. The Commonwealth and its businesses have been actively engaged in promoting manufacturing excellence.

For example, the Virginia Economic Development Partnership conducts advanced manufacturing tours to showcase how the Commonwealth's business climate facilitates the industry's success. Highlights of the tour this year include Newport News Shipbuilding (NNS) and Germane Systems, both of which are active participants in supporting AME initiatives by opening their doors to share best practices during plant tours.

These companies also strive to individually foster a robust manufacturing environment within Virginia. Germane Systems, for instance, was selected as a tour site for AME's Annual International Conference in 2010. The company has been such an advocate for manufacturing excellence that the Virginia Deputy Secretary of Commerce and Trade, Carrie Cantrell, presented a letter from Governor Robert McDonnell that praised the company for its support of the revitalization of manufacturing within the state.

Over the years, NNS has benefited from its relationship with AME by sharing and adopting industry best practices, which accelerate its journey to achieve operational excellence. Even as the Navy, one of NNS' biggest customers, contemplates possible cuts to ship orders, NNS continues to move full-speed ahead with plans to hire thousands of workers in the next five years. By maintaining a highly skilled workforce and utilizing best practices, NNS can grow its business.

The Commonwealth recognizes that manufacturing drives technology, productivity and innovation across all industry sectors, and Governor McDonnell endorses the "Revitalization of Manufacturing" initiative, through which the collaborative sharing of best practices to make organizations more competitive will lead to the creation of countless new jobs.

AME is joining with its corporate members and other leading learning organizations to adopt these top three priorities for revitalizing manufacturing by engaging in reforming public education to produce career-ready citizens; establishing consortiums to help sustain and grow businesses through sharing technology and innovative ideas; reshoring (insourcing); and redeploying Training Within Industry (TWI) programs to train or retrain workers who have the ability to work in advanced manufacturing jobs, which will ultimately revitalize manufacturing and re-energize the economy.

Reforming Public Education

There are a number of ongoing initiatives by manufacturing organizations to help reform public education. The Manufacturing Institute's Roadmap to Education Reform for Manufacturing is a comprehensive blueprint for education reform. The public education system needs to provide a lifelong learning environment to nurture and sustain students and workers capable of new ways of thinking and learning to quickly adopt and master new skills. Schools and colleges need to provide a relevant curriculum and teaching styles to help students learn the basics and engage them in actively participating and learning.

To help address the public schools challenges, the American Productivity and Quality Center's (APQC) Education North Star program was launched in 1996 with the vision of utilizing the same strategies that had transformed businesses to enhance the U.S. education system. APQC helps school districts do more with less by transforming education through process and performance management, benchmarking and best practices to empower school districts to improve efficiency and effectiveness.

APQC Chairman C. Jackson Grayson, Jr. said he has a simple but difficult mission—to transform the entire education system—including state and federal governments, higher education and private schools. Grayson said there are two fundamental reasons for the long stagnation in public K-12 education. One, there exists an almost total focus on inputs and outcomes, and no focus on processes; and two, there is a failure to link accountability with improvement through processes. Their program continues to address public school challenges, keeping these two challenges in mind.

Another program, Career Pathways, is a proven way to reach out to public schools. This program encourages students to consider a career in manufacturing, and help prepare them, by using the Manufacturing Pathway Map. Career Pathways provides career readiness skills and more advanced knowledge of the same science, technology, engineering and math skills needed for college or jobs in advance manufacturing.

One organization, the International Dyslexia Association (IDA), helps students develop reading, language and writing abilities that are central to an education and allow individuals to be successful in today's global economy. In particular, IDA supports the newly developed Literacy Education for All, Results for the Nation (LEARN) Act. The LEARN Act benefits all students who are risk for literacy failure, and ultimately allows all students to become the educated, skilled workers needed for North America to become the world's leading manufacturing powerhouse.

Consortiums

Consortiums, or a group of like-minded individuals with the same mission, can help to breathe new life into manufacturing. Harvard Business School professor Michael Porter suggests that these industry "clusters" affect competition in three broad ways: "First, by increasing the productivity of companies based in the area; second, by driving the direction and pace of innovation, which underpins future productivity growth; and third, by stimulating the formation of new businesses, which expand and strengthen the cluster itself."

Consortium members participate in resolving problems such as the lack of a trained workforce, regulations and infrastructure for growing or having access to needed resources. Local companies, academic institutions, government agencies, and labor and learning organizations can band together to become more competitive and reap the benefits of learning about new technology and innovative ideas.

In the future, consortium members will need to become vigorous learning enterprises and embrace a new organizational model. They will need to learn how to deal with economic and ecological survivability, and there will be a need for a new way of thinking called "compression"—learning how to continue improving human quality of life while greatly reducing our consumption of energy and virgin raw material, and releasing no toxic chemicals into either air or water.

AME is a leading supporter of developing an industry network of consortiums. AME Northern Kentucky/Cincinnati Consortium is the first building block of the AME Consortia network, and the organizations plans to deploy at least 10 more in 2012. AME also has alliance partners, like the Virginia Business Excellence Consortium, whose mission is to achieve business excellence through shared learning. Every year, AME bring consortiums from across North American together to share best practices, assist members in accelerating their collective learning and help launch new consortiums.

Reshoring

After years of rapid globalization, companies are beginning to see the disadvantages of offshore production, including shipping costs, supply chain issues and inferior quality. A growing trend, known as onshoring, reshoring or insourcing, is gaining acceptance as a weak dollar and surging wage rates in low-labor-cost countries make it more costly to import products from overseas.

President Obama recently highlighted the "insourcing" of jobs back to America. Companies are choosing to invest in the one country with the most productive workers, best universities, and most creative and innovative entrepreneurs in the world. "I don't want America to be a nation known for financial speculation and racking up debt buying stuff from other nations," Obama said. "I want us to be known for making and selling products all over the world stamped with three proud words: 'Made in America.'"

Harry Moser is the founder of the Reshoring Initiative. He is collaborating with AME to promote reshoring as part of the "Revitalization of Manufacturing" initiative. AME recommends companies use a Total Cost of Ownership (TCO) analysis tool to effectively compare total cost of local and offshore sources, enabling them to make informed business decisions. "We are committed to changing the sourcing paradigm from 'off-shored is cheaper' to 'local reduces the total cost of ownership,'" said Moser.

As companies analyzed the results of the TCO assessment, they identified gaps in performance limiting their capabilities to compete globally. With its alliance partners, AME will provide assistance in closing

those gaps through training, kaizen events, plant tours and additional assessments to pinpoint and apply counter-measurements dealing with people, processes and performance.

An example of a proven approach was developed by the Virginia Manufacturing Extension Partnership in conjunction with Newport News Shipbuilding. This program demonstrated how a public sector and private sector partnership can be effectively applied to small- and medium-sized businesses.

Training Within Industry

TWI programs will help businesses rebuild their workforce, a necessity once demand for skilled workers increases as an aging workforce begins to retire. TWI programs were created during a time of crisis (World War II) to replace workers who left the factories and went off to war. Now organizations are turning to TWI again. Using this methodology, companies can quickly train unskilled workers to build equipment and machinery with consistent quality. Its multiple components address skills training, respect for people, continuous improvement and safety, but the heart of the person-to-person training is the transfer of knowledge in a minimalist format from trainer to student. Each worker, in turn, is trained to make full use of his or her best skills. These principles can be applied in today's classrooms and workplaces, as experienced workers and teachers transfer their job knowledge to the next generation of skilled workers.

NNS was one of original adopters of TWI Programs during WW II. They, along with others, are once again using Job Instruction (JI) to train workers to quickly remember how to perform jobs and are achieving first time quality. To help redeploy this initiative, NNS held a joint session with VBEC, the GENEDGE ALLIANCE and Virginia's Manufacturing Extension Partnership to share best practices to help develop more skilled workers in Virginia for advanced manufacturing jobs.

A Call for Action

Policy-makers, industry professionals and academic leaders play critical roles in revitalizing the economy through the rebirth of manufacturing jobs. They need to ensure the supply of high-quality inputs such as educated citizens, physical infrastructure and a favorable tax and regulatory framework to foster increased collaboration between public and private sector partners.

Businesses need to grow a culture that achieves results through engaging their people. They need to foster rapid advancement of technology and innovation by establishing regional consortiums to help bring jobs back home. There is a need to develop pragmatic, working-level leaders who can pull it all together.

Parents, teachers and business leaders need to recognize the reality that other high-achieving nations are both out-educating us and out-competing us. Our educational system has a long way to go to fulfill the American promise of education as the great equalizer.

To remedy these situation the public and private sectors must come together to build an integrated plan supportive of these initiatives, especially NAM's Manufacturing Strategy for Jobs and Competitiveness and Roadmap to Education Reform for Manufacturing; the LEARN Act; and the Reshoring Initiative. These will ultimately revitalize the industry and grow the economy.

At its 2012 national board meeting, AME reaffirmed its commitment to helping small- and medium-sized businesses create more manufacturing jobs, and the organization's strategic plans address the challenges facing manufacturing by formulating counter-measurements to address them with its public and private alliance partners.

AME has been leading these initiatives aimed at expanding the manufacturing base, engaging lean leaders, increasing exports and boosting research and development. These actions will enable businesses to have the skilled workers needed to design, produce and export quality goods and services, again.

The goal is to forge a community of leaders, manufacturers, academics, practitioners and policy-makers focused on breathing new life into revitalizing manufacturing while improving the standard of living of all our citizens—making “Made in North America” an economic reality.

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About the Association for Manufacturing Excellence

The Association for Manufacturing Excellence (AME) is the premier not-for-profit organization dedicated to the journey of continuous improvement and enterprise excellence. AME’s membership is composed of a trusted network of volunteers who are committed to leveraging the practitioner-to-practitioner and company-to-company shared-learning experience. Through engaging workshops, seminars and plant tours, and industry-leading conferences, AME members are continually discovering and implementing new continuous improvement strategies and best practices. AME offers its members a multitude of valuable resources to help them stay abreast of current industry developments, and improve the skills, competitiveness, and overall success of their organizations. Join AME in leading the “*Revitalization of Manufacturing*.” For more information, visit www.ame.org or email info@ame.org.