

**Great Lakes Manufacturing Forum
Toronto, Ontario, Canada
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Comments by Stan Liberty, President of Kettering University

Good morning. I am flattered to be invited to participate in this forum. Although I have no particular expertise in manufacturing, I am the chief executive officer of a university with long standing ties to the manufacturing sector, and one that is highly regarded for supplying this region's manufacturing industry with outstanding talent and leadership ever since 1919. The institution, now known as Kettering University, was for about six decades part of General Motors. It is located in Flint, Michigan, and was formerly called General Motors Institute. Our alumni run companies that range from Merrill Lynch in New York City; to Gibson Guitar in Nashville; to Harley Davidson in Wisconsin. Our alumni populate many of the executive suites at General Motors and many hold executive leadership positions in the expanding biomedical field.

I read this forum’s strategic premises on the region and the future, as well as the overview of your action plan outlining the four key regional issues. I think you are right on target with all four (although I won’t say anything related to borders and logistics). I also applaud the spirit of this organization which is rooted in the philosophy of regional collaboration. I think this is a key to a bright socio-economic future for the region but it is also a significant challenge. I have lived in seven different regions of the United States and in all of these regions I have experienced significant barriers to progress stemming from geo-politics, zero-sum-game thinking in economic development, and cultural barriers leading to destructive competition or parochial isolationism.

I came to this region less than two years ago, and you can’t imagine how many folks questioned my wisdom in making such a move – not just people I knew elsewhere, but people from this region who questioned if I had done my homework, and then, when finding out I had, would ask “and you came anyway?”

Well, I am optimistic... because I have a secret weapon. Every day, as president of an institution that is preeminent in operating a full

professional cooperative education program, I observe students who are integrating work-based learning with classroom and laboratory learning, and rapidly developing the skills and knowledge essential to the infusion of innovation into the products and processes that will sustain our competitiveness in the knowledge economy.

Yes, manufacturing is changing but it's not all going away. Our concepts of products and systems have been moving from mass production to mass customization for some time now. Demand is increasing for more specialized and tailored products at a time when constraints on products are increasing due to customer needs and more regulations. Manufacturing today faces shorter runs of less homogeneous products. The implications on technological needs in the plant and on the skills of the workforce are obvious.

“Touch labor” – the tradition of North American manufacturing – is fading away. We all know that manufacturing in North America is going to be less labor intensive, more automated, and consist of ever increasing high “value-added” activity conducted by a highly trained and educated workforce.

Additionally there are products and processes out there in the not too distant future that we haven't yet imagined. In fact there are future products and devices that you won't be able to see without the assistance of a scanning electron microscope. We in higher education have to prepare our students for jobs that don't yet exist and to manage processes and design products that haven't yet been conceptualized.

Consider this. Here in Canada, at the University of Alberta, the Canadian and Alberta Governments, in partnership with the University, fund a National Institute for Nanotechnology. On the institute's website it says that researchers there are focused on the integration of nano-scale devices and materials into complex nanosystems that are connected to the outside world. And they also have the ultimate objective of discovering "design rules" for nanotechnology, and developing platforms for building nanosystems and materials that can be constructed and programmed for a particular application. Talk about design for manufacturability!

How do we prepare students to work in the manufacture of nano-scale devices, materials and systems? By, exposing them to atomic force microscopy and the study of materials science at the nano-scale level.

Many manufacturing organizations today are facing a classic three-pronged workforce dilemma.

- 1. They have excess employees**
- 2. However, they also have a shortage of skills**
- 3. And finally, they have poor distribution of talent, given the global manufacturing “footprint” of their operations.**

As you know, GM has downsized its manufacturing operations considerably in North America over the past few years. Yet it is also experiencing unprecedented shortages of the workforce skills necessary to carry out its product strategy globally; especially in different parts of the world.

Such downsizing coupled with the offshore movement of low-skilled jobs have created a tremendous public misconception in North America

that manufacturing and the scientific and engineering fields that underpin it are not good areas of intellectual and career pursuit. So, even though my optimism is stimulated by the young people I see on my campus every day, there aren't enough of them at Kettering or in general across North America.

There's a cruel irony in this. Kettering has about 700 corporate partners participating in its co-operative education program. And even as GM has downsized to address part of its dilemma, it continues to be the largest Kettering undergraduate co-op employer and remains committed to training and educating its work force in technical and manufacturing areas of need. Additionally, at the graduate level, Kettering is currently the largest educational supplier to GM, with 283 GM employees in our MS in Manufacturing Operations program.

Now, some might say that the forces of supply and demand will naturally overcome the problem of shortages in a properly trained and educated workforce, and the capability should be there shouldn't it? After all, do you know a youngster who can't program a modern electronic device or operate a modern game? Young people are un-

intimidated by technology. While I'm reading the directions (if there are any) my nine-year old grandson is intuitively getting whatever new toy or gadget he has to work, or even the navigation system in my car.

But consider another challenge that is of crisis proportion in the United States. Today's college graduate entered the sixth grade over a decade ago. In the US, large numbers of students moving into the middle school years of their education are having terrible experiences in math and science education. These experiences are either turning them off, about the science and engineering fields that lie ahead, or they feel so inadequately prepared they fear failure in such fields and steer away from them. Besides, society has projected images of easier paths to prosperity. Consequently, for several years now, we have seen a steep monotonic decline in the number of high school seniors in the United States that have indicated engineering as a professional field of interest. There is also a decline (though not as great) in expressed interest in the sciences.

There are a number of efforts to provide youth with structured experiences that can facilitate the development of these interests. Some

of the most popular are FIRST robotics for high school students and LEGO League for middle schoolers; and they are joined by innovative curricular programs like Project Lead the Way and others. Hopefully these programs will make a difference. But as you can see much more has to be done. So, I applaud you for focusing strategically on addressing the issue of image both of manufacturing and the region.

In closing these remarks I want to emphasize my belief that the successful construction of a new economy in this region is going to be based substantially on a strong commitment, with an accompanying shift in the culture of the region, to science and technology based entrepreneurship. A key to accelerating this phenomenon is to find ways to increase technology transfer from higher education to the private sector and from within current industry. The annual expenditures on research and development in this region are very substantial, and you know that there is a lot of protected Intellectual Property being generated within that R&D machine that is not related to core business objectives. That IP should not sit on the shelf. It should be the basis for spin-out companies that will attract investment, create jobs and diversify the regional economy.

The region is also rich in higher educational assets with large quantities of intellectual capital and scientific and technological infrastructure.

But these assets historically have underperformed when it comes to technology transfer and business enterprise formation. That can and I believe will change. But it won't happen at the pace we desire and need without a lot of collaborative effort and partnering among government, industry and education.

Again I applaud you for your efforts in this regard and I commit my institution to working with you and to bringing its assets to bear on the tasks at hand as we face this challenge.

Thank you