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Manufacturing AUTOMATION's editorial advisory board discusses keeping Canada competitive at the first annual roundtable meeting

By Mary Del Ciancio

Manufacturing AUTOMATION recently put together an editorial advisory board consisting of six experts representing different segments of the industrial automation industry in Canada. This summer, we hosted the first editorial advisory board meeting at our office in Aurora, Ont., to discuss trends and challenges in the industrial automation industry. The result was a lively discussion on Canadian productivity, with a laundry list of challenges facing Canadian manufacturers. But there is hope, according to our board members. Before we delve into this deeper, introductions are in order.

Meet the board

Thank you to our editorial advisory board for offering their insights on key industry issues. The board members are: Sherman Lang, group leader of reconfigurable manufacturing at the National Research Council's Integrated Manufacturing Technologies Institute; Donald Mahony, automation business development manager at Schneider Electric Inc.; Bill Valedis, president of Imperial Automation Technologies Inc.; Trevor Jones, president of the Robotic Industries Association, and director of OEM business development for Thermo Electron, Laboratory Automation and Integration; Cheryl Jensen, vice-president of technology, apprenticeship and corporate training at Mohawk College of Applied Arts and Technology; and Duncan Curd, manager, automation business, at Siemens Canada.

A challenging landscape

The board members were first asked to identify the major issues they see plaguing Canada's manufacturing industry. Canadian productivity was a common denominator that emerged from the discussion. The productivity problem encompasses the skilled trades shortage, training and technology challenges, and the Canadian economy.

On the subject of the skilled trades, Jensen identified perception as a key cause of the shortage. "I think that in many cases, certainly in Ontario and in Canada, we have not been fair to our apprentices and the tradespeople. They have not been looked upon as a career with the same reputation as an engineer or technologist," she said. "When really, we know that the trades are becoming so highly sophisticated that we need the best and the brightest to look upon those as a viable career option."

Mahony pointed to the aging workforce as a challenge. "One of the things that concerns me is, if you look at who is maintaining our automation systems, it's the older guys who have learned it. There are not a lot of new people coming into the system. I see that when a machine breaks down, I have to call 'Joe' [because] he's the only one who understands...that machine. And that's a little scary."

"We've been doing some studies at the college system in Ontario," Jensen said, "and technology enrolments have been declining for many years. That should worry industry. And it's largely because technology isn't understood as a career. And we don't do a good job in the colleges of showing the types of really interesting, challenging work that can be done."

Jones said that manufacturers play a large role in the skilled trades shortage. "When it comes to education," he said, "I would say that the manufacturing infrastructure in Canada has let the educational system down because there has to be a pull...Industry has to demand people from the colleges. If there's a decline in enrolment in technical courses and trades and disciplines towards perhaps business or service-oriented [programs], it's only because people are being pulled in that direction."

Speaking specifically about skilled trade programs, Curd said that a major issue is the duration of the co-op programs at many Canadian schools. Curd said that short co-op programs, or even no co-op programs at some schools, is what causes him to look to Europe for his co-op students. "I have guys or girls that will spend all year with us, or term, for their co-op...I think there are a lot of people coming out of school [in Canada] that will never apply what they learned in school, and they certainly haven't been given the exposure to the sorts of things that they should know or need to know."

Curd said that that's because the four-month co-op programs at many Canadian schools are just too short. "They barely know how to make a coffee before they're back in school. And they're certainly not contributing in a meaningful way to the company, which means that there's a lot of resistance to having people come in."

Technology and training issues

A key to remaining productive is applying technology appropriately. But some of our board members voiced concern over manufacturers not doing this.

"I'm coming at this from a vendor standpoint," said Mahony. "And what we see time after time [is] we get this beautiful

automation solution, it's a PLC, it's got fantastic software, you can program it in five different languages, and in order to do this you should use this technique or this technique. And [then] you see [customers] borrowing some 20-year-old ladder logic. They're just not using the product correctly," he said. "Why is that? Unfortunately there's a lack of ownership in the companies in Canada. You get a [foreign] company that owns the Canadian subsidiary. They're not going to put up with them spending a whole bunch of R&D time.

Mahony said that he doesn't know what the solution to this particular problem is since companies don't have the time or resources, or they are not given the time and resources, to fully understand the automation solution and apply it correctly.

Curd agreed that failure to use systems appropriately is an issue. "The experience I've had is that even fairly savvy OEM manufacturers or savvy equipment builders have been really struggling to understand how to apply technology, whether it's a safety PLC [or] a safety relay," he said. "I've seen equipment applied at major manufacturers which is totally inappropriate."

Valedis added to these concerns: "If we don't take the time to understand the solution or apply it correctly, why should we take the time to understand what the training requirements are?"

In fact, he said that lack of formalized training in Canada is a major issue, particularly where safety is concerned. "We have done a terrible job, I think, here in North America in general, in formalizing training," said Valedis. "It appears that we have no standards. Although there are standards, we don't follow them. We don't pay attention to prerequisites. We misapply training...In the process of becoming more productive and increasing our capacity and lean production, I think we short-circuit the system of safety."

He said that many companies believe that their responsibility ends after installing a safety device, and that many are unaware of ongoing safety requirements and regulations that stipulate modifications to equipment.
Jones agreed that training has not been made a priority in Canada. "You've got to pay yourselves, you've got to pay the bank and you've got to deliver the product on time. And it's very tough to put training as a proactive development in your corporate agenda," he said.

Economic woes
When the board members were asked what the outlook for 2007 and beyond is for the manufacturing industry, Mahony said that there will continue to be a lot of activity out west, but for Ontario and Quebec, the outlook is "pretty bleak" thanks to the rising dollar, global competition and rising costs.

Not surprisingly, the board members pointed to the volatile Canadian economy as a hindrance to the country's productivity.

"I certainly see that the landscape of manufacturing is rapidly changing in Canada," said Lang. "And it's not one single or two single factors, but a lot of different things that are big challenges for manufacturing because of the complexity of manufacturing in a global age where you have to really integrate globally with your customers, suppliers [and] the entire supply chain.

"I think in the short-term," he said, "probably the big challenge is the sudden rise in the Canadian dollar relative to the U.S., which puts a lot of pressure on industry exporting to the U.S...That, coupled with energy prices, I think these are probably the two big short-term challenges for Canadian manufacturers.

"The other factor is increasing capabilities of low-cost countries to design and produce advanced and sophisticated high value-added products," Lang added. "Finally, we know that domestic consumption may experience slow growth due to the baby-boomer demographics, but it is not clear what the buying patterns of the boomers will become as they retire."

Lang believes that not having a good idea of the types of products that will be in demand, and the level they will be in demand, makes it difficult to plan capital investments and formulate product development plans.

A glimmer of hope
After discussing challenges, the board members discussed solutions to Canada's productivity issues.

On the topic of the economy, Lang said that there are a number of fundamental things that manufacturers should be concentrating on. "Certainly investments that provide flexibility to allow manufacturers to adjust production processes will reduce risk, while providing greater ability to take advantage of market opportunities that arise. Very few manufacturers produce the entire product alone any more," he said, adding that co-operation and collaboration are needed to design and produce a winning product.

In addition, said Lang, "To stay ahead of the changes in consumer demand and [the] ability of low-cost countries to satisfy the demand, manufacturers need to be able to develop innovative product and processes quickly. Coming up with desirable products and delivering them to market before a competitor is what will drive profits and growth."

Valedis said that he sees a lot of growth in the retrofitting area. "People are rethinking how to make this process produce better quality parts or more parts in an eight-hour shift."

Curd pointed to manufacturing execution systems, or manufacturing intelligence, as an essential element in addressing productivity issues. "If we cannot be low-cost producers locally, Canadian industry must rely on high productivity, coupled with high quality standards and the ability to be flexible and responsive to customer requirements. Modularity and flexibility are essential elements in lower total cost of ownership and reducing lifecycle costs, but only if you are producing compliant product and delivering on time."

When it comes to the skilled trades shortage, the board members have several suggestions.

"I've been spending a lot of my time making sure the quality of our programs are there," said Jensen. "[I've been] talking to industry about what's happening, what the trends are, so that we can make sure our programs are meeting industry's needs, and also working with young people to show them that technical careers and technology careers and apprenticeships are viable career options."

Jensen said that all levels of education must work more closely together so that the graduates are equipped with the skills that industry wants. "I think there are too many silos between different educational institutions and different levels of education."

In Hamilton, Ont., Mohawk College and McMaster University are trying to break down those silos by partnering in engineering. "But we have to see more of that," she said. "And I think we have to be better at partnering very closely with industry so that even though we don't have the newest technology, we have the people who can help us to make sure we're keeping abreast with it as best we can and providing those skills."

Jensen added that students need to be exposed to the skilled trades at an earlier age. "The high schools and the elementary schools don't have the resources. They were cut back in the mid '90s, so it's rare to find a well-equipped shop in the high school," she said. "Let's try and make a pathway from high school to college, where if they take a certain type of course, we'll help them to succeed in a technical program, whether it's at a university or college."

Where a local high school doesn't have a shop, she would like to see students brought to a college with shops, so that they can get the exposure they need. "Those programs are starting and springing up in different places, and they're now being integrated into the funding," said Jensen.

Curd toyed with the idea of mandatory shop courses for elementary and secondary school students. "Kids in Europe are exposed to [the trades] at a pre-secondary school level. When you're 11 years old, you're busy soldering and you're busy filing metal work pieces, and that's mandatory," he said. "Maybe people [in Canada] should be forced to be exposed to basic shop courses, be it electrical, be it woodwork, be it metal work. Perhaps it should be a requirement to help build an understanding."

Jones said that innovation may be the key to solving the skilled trades shortage, and he pointed to other countries as examples. "In Europe I think [the skilled trades shortage] has been a hot topic for about eight years and that's one of the reasons why Europe has, in terms of robots per worker, a ratio higher than North America, because they realize that they're in a staffing crunch. And in Japan, where the statistics are very alarming, they've actually known about this for quite some time and responded with a degree of investment in automation and techniques that's staggering compared to the rest of the world," he said. "That's why you see humanoid robots being built in Japan. No one else in the world can understand why. They think it's novel and cute. But they're not investing millions in it because they think it's novel and cute. They see it as a cultural reality that they have to face. They're proposing a solution and they're investing in it."

Moving forward

Based on the discussion, it appears that Canada has some work to do to remain competitive in the global marketplace. As manufacturers struggle to come up with solutions, Jones suggested that communication is a good place to start.

"I don't know what the solutions are, but I think that there are certain characteristics that perhaps through our discussions and our ability to communicate [we can] put certain mindsets into people to maximize the opportunity for success."

Lang agreed. "Manufacturers certainly need to voice their needs so that public policy and investments can be made appropriately."

A closer look at our board members

Bill Valedis is an automation specialist and founder of Imperial Automation Technologies, an automation training company based in Fergus, Ont. For more than 30 years, he has provided guidance as a systems

consultant, application development consultant and technology instructor. Prior to starting his own automation training firm, Valedis was national service manager for AEG, specializing in providing field service and training to meet the support needs of various installations throughout their life cycle. He previously worked as service manager with a number of different machine and system builders, OEMs and end-users responsible for control system design, installation, training and service. Valedis holds a diploma in electrical technology, an electronics engineering technician diploma, and has attended Ryerson Polytechnic Institute as part of a three-year undergraduate study in the electronics engineering technology department.

Trevor Jones is the president of the Robotic Industries Association, and director of OEM business development for Thermo Electron, Laboratory Auto-mation and Integration (formerly CRS Robotics) of Burlington, Ont. After graduating from McMaster University in 1981 with an honours degree in engineering and management, Jones co-founded CRS Robotics, which was acquired by Boston, Mass.-based Thermo Electron Corporation in 2002.

Donald Mahony is a business development manager for Schneider Electric Inc., specializing in industrial control automation solutions. He has been with the Schneider Electric group of companies for more than 36 years, holding various sales and marketing positions. Mahony received a bachelor of applied science degree in mechanical engineering from the University of Toronto in 1969 and is a registered professional engineer with the Professional Engineers of Ontario. He is also a member of the Toronto ISA chapter, and is the current chairman of the Industrial Controls section of the Electrical Equipment Manufacturers Association of Canada.

Cheryl Jensen is the vice-president of technology, apprenticeship and corporate training at Mohawk College of Applied Arts and Technology in Hamilton, Ont. She holds an honours degree in chemistry from McMaster University and a master of education in organizational and administrative studies from Brock University. Jensen worked at Procter and Gamble as a product development chemist and at Stelco Inc. as an analytical chemist before joining Mohawk College in 1983 as a faculty member in the chemical and environmental technology department. Since then she has held a variety of positions such as administrative co-ordinator, acting chair, Technology Transfer Institute co-ordinator, chair of electrotechnology and chemical and environmental technology, and executive dean in the faculty of engineering technology.

Duncan Curd is the manager of the automation business at Siemens Canada. He is responsible for launching automotive and food and beverage programs in Canada, and training in the automation and drives department. Curd has been with Siemens for 10 years, but has more than 20 years of experience in the automation and control fields. He graduated from the University of Toronto with a bachelor of science degree.

Sherman Lang is a senior research officer with the National Research Council of Canada's (NRC) Integrated Manufacturing Technologies Institute, located in London, Ont. He is also the group leader of the Reconfigurable Manufacturing Group. He has a bachelor of science, masters of science and a Ph.D. in systems design engineering from the University of Waterloo. Lang has held positions with the Laboratory for Biomedical Engineering and the Autonomous Systems Laboratory at the NRC's Institute for Information Technology, and the department of manufacturing engineering and engineering management at the City University of Hong Kong. He also serves on the board of directors of the London District Science and Technology Fair.