

INTEGRATING FUTURE NEW TECHNOLOGIES INTO CANADA'S ECONOMY



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President

Following is an address President Adams gave on June 8 to the Indian Institutes of Technology Alumni Canada's PanIIT 2014 Toronto Conference.

Honoured guests, fellow engineers, it is indeed a privilege and a pleasure to have been invited to address your gathering today.

I understand the purpose of your 2014 Toronto conference is to discuss which products and services engineers will be required to provide in 2050 and, further, what education and training he or she must be proficient in

to innovate, integrate and transform these new sciences into practical products and services.

Engineers, by definition, have generally been seen as the individuals who translate the pure science of the future, to the applied science of the present.

Operating on this premise, it behooves us to develop a practical method of determining which of, say, the promising 100 new technologies, have the propensity to serve humankind, while preserving the environment that supports life on this fragile planet Earth.

It is for this very practical reason that I bring a message this morning introducing a calculated method for determining which new technologies will be evaluated, based on their compatibility with current products of Canadian companies.

To complete the picture, this evaluation will also ascertain which additional new technologies as published by *Scientific American*, among others, will promise employment through manufacture in Canada by totally new manufacturers.

When engineer Ravi Gupta, PhD, invited me to speak, he described the Ivy League calibre of the engineers attending today. When I suggested it might be of interest to all of us if we focused on the potential for research and commercial business, which could be developed in Ontario or elsewhere in Canada, from future technologies, he heartily agreed with my subject matter.

Hence, the title of my talk today is: "Integrating future new technologies into Canada's economy."

But first, let me introduce myself. My name is David Adams, professional engineer, president of Professional Engineers Ontario.

While our association of professional engineers has taken the initiative to establish new disciplines in the fields of nanotechnology and bioengineering, a much more comprehensive program of analysis of future new technologies, and the engineers' engagement in them, must be undertaken if engineers are to fulfill our normal role of applying engineering to new scientific development.

However, may I take a few minutes at this point in my address to describe my long-time interest in your native land of India?

I shall begin by telling you that ever since I was a schoolboy, living in the country outside Ottawa, I felt an affinity for all those living within the large, pink-coloured Commonwealth country map displayed in our grade schools. The prominence of India was evident as the largest Commonwealth landmass outside of Canada.

Further to this, I continued to be intrigued by the story of India related in historian Ramachandra Guha's book, *India after Gandhi*, where he points out that many of the independent countries in Asia and Africa have tried to copy the British parliamentary system of government. However, to this day, only India continues to function as a democracy, without a single language or religious faith.

The experiment has failed in Sudan, Pakistan and Burma, among others, resulting, as you are aware, in periods of military rule and instability in those countries. As Ayaz Amir, a Pakistani columnist in Karachi wrote: "India goes to the polls and the world notices, while Pakistan plunges into another exercise in authoritarian management. When will it dawn on us, that it is not India's size, population, tourism or IT industry that is making them look successful, but Indian democracy?"

Once again, India has gone peacefully to the polls, this time giving the BJP [Bharatiya Janata Party] a substantial majority, endorsing the secular ideals of the Indian constitution, testifying to the deep roots that democracy has put down in the soil of India.

Turning to our subject at hand, both countries continue to live in a relatively stable economic environment, with all the same problems of global unemployment and the need for the development of new technologies to replace the old, which brings me to the subject of my remarks today.

In the face of a continuing clamour for government funding in Canada, with the further loss of 28,900 jobs in April of this year, we must diligently seek the employment of surplus engineers and capital by redirecting endeavours to generate

PRESIDENT'S MESSAGE

the income and tax revenue needed to support individuals, as well as finance government and social services.

In these endeavours, future technologies must be reviewed and paired with existing and new companies, just as was done in the production and sale of manufactured goods in years gone by, when furniture, farm machinery, textiles and all manner of goods, were manufactured and sold in neighbouring communities.

What then will be the products and processes that will fill their places within a globalized economy and highly competitive environment? Similarly, what will be the new educational requirements to adequately exploit these new technologies? What new technical accreditation must be developed for our engineering courses, and what will be the time frame in which to accomplish these tasks?

It's clear that a pragmatic, focused future demands driven study to identify the highest potential contributors to GDP [gross domestic product], taxation revenues and employment growth, which are absolutely essential to determine the country's strategic direction.

Then, intermediate and longer-term areas of opportunity can be determined, followed by public and private investment plans.

To plan this demand-side study for Canada or, specifically, Ontario, today I am proposing a study that will provide an overview of related objectives, deliverables and methodology.

An objective study and analysis is required to specifically answer the following questions.

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1. Determine demand and opportunity

Which specific sciences and technologies have the highest assessed propensity for progressing from research stages to deployable status?

Which Canadian and, specifically, Ontario sectors, segments and industries have the highest potential to leverage these new sciences and technologies to accelerate Canadian competitive and economic positioning within the next five to

10 years, in specific terms of growth in GDP, employment and public revenues?

What will be the magnitude, timing and demographics of these opportunities?

What will be the economic consequences of meeting or failing to leverage these opportunities?

What will be the resulting impacts associated with actually realizing these growth potentials in terms of Canada's ability to attract and retain the "best and the brightest" of our engineers?

What will be the impact of these new technologies upon our educational institutions?

2. Findings

The study must consolidate these findings directly into a framework that illustrates:

- nature, timing, magnitude and demographics of determined economic opportunities;
- magnitude and timing of economic and competitive impacts of identified opportunities;
- directly related scientific knowledge, skills demand and timing;
- directly related "in place" supply of specific knowledge and skills, including advanced education availability; and
- assessed demand/supply inconsistencies.

3. The study structure

The study initialization and set-up phase would include a 12-step process to determine the highest potential technology list, to be married to the highest potential sectors and industries available to exploit them.

Assessment of potential firms, by means of a web-based questionnaire and contact with senior executives representing these enterprises, would provide candidates for integrating new technologies. Those enterprises not equipped to commercialize technologies would be subsequently analyzed as start-up ventures.

Recommendations to change public policy, educational policies and priorities, including directly related programs, practices and processes, would be made to take advantage of these new opportunities.

Total project timing and cost would be estimated through contracts using a PERT/CPM [program evaluation and review technique/critical path analysis] format.

In closing, I conclude with the opinion that Canada would benefit immensely on all fronts by determining our best demand-driven strategic direction and capability for the integration of new technologies into our economy. Thank you very much. Σ