



WEALTH THROUGH TECHNOLOGICAL ENTREPRENEURSHIP

The Canadian Academy of Engineering, recognizing the significant impact of technological entrepreneurship on new business creation and global competitiveness, has undertaken a review of the status of technological entrepreneurship in Canada and issued a challenge to engineers to expand this activity for the benefit of the Canadian economy.

BACKGROUND

For many decades, Canadians have enjoyed economic prosperity, a high standard of living and a quality of life envied by many nations. But there is a growing perception that these benefits are diminishing. Contributing factors are weakening resource exports, global trade, competition from low cost imports, and rising internal costs, accompanied by a continuous improvement in the quality of life for most Canadians. **Wealth creation in Canada has not kept pace with our rising expectations.** In two decades, our national debt has ballooned to the highest per capita level in the world among the industrialized countries.

One counter to this negative trend is the growth of technological entrepreneurship — the formation of new enterprises based on innovative technology in response to market needs. But technological entrepreneurship is growing slowly in Canada. Recognizing this, and recognizing the lead role played by engineers, the Academy has taken an initiative to encourage all sectors of Canadian society to join in measures to speed up the growth of this vital activity.

The first step taken by the Academy has been to prepare a background report on *Technological Entrepreneurship and Engineering in Canada* (ref. 1). This was published in September 1997, with financial assistance from Industry Canada, the National Research Council and the Natural Science and Engineering Research Council. It was compiled by a task force chaired by Dr. Roger Blais, professor emeritus at École Polytechnique de Montreal, who has long been an outspoken champion of technological entrepreneurship and the role of engineers in its success.

Later in 1997, workshops were held in Calgary, Halifax, Montreal, Toronto and Vancouver to review the findings of the background report, identify key issues and make recommendations for action. Based on the output from

these workshops, as well as the background report, the Academy has just published a second report — *Wealth Through Technological Entrepreneurship* (ref. 2). This report summarizes the **issues** identified at the workshops, makes a number of **recommendations**, and proposes a **plan of action**.

ISSUES

The background report shows that a major “innovation gap” has persisted for some time, highlighted by Canada’s relatively low production of high-technology goods and services. There are also deficiencies in Canada’s capacity to develop and adopt new technology, and a fundamental problem of inadequate understanding of science and technology in general.

Canada requires a coherent strategy that will make it more competitive in the New Economy. Technological entrepreneurship is an essential element of any successful strategy.

Entrepreneurs have the skills and instincts required for success without government assistance. However, governments must be important contributors to shaping an environment that stimulates technological entrepreneurship.

Governments must act as an effective and consistent catalyst in the advancement of technological entrepreneurship.

The environment for innovation in Canada is fragmented between governments, industry and universities. Small- and medium-sized enterprises (SME’s) contribute to growth and exports, but financing their start-ups is often difficult.

Innovation is fostered by education, environment and opportunities. Canada must improve its performance in all three categories. It must also improve the links between venture capital and technological start-ups.

The new, knowledge-based economy requires different skills and attitudes.

Canadian engineers are not yet adequately prepared to participate effectively In the New Economy.

Finally, the background report discusses the traits of successful entrepreneurs and finds that engineers are well prepared technically. Nevertheless, appropriate education and access to relevant information can greatly increase the probability of their success as entrepreneurs. Although most engineering faculties now offer optional courses in entrepreneurship, they lack general support and are not required by the Canadian Engineering Accreditation Board.

If engineers are to be encouraged in technological entrepreneurship, basic changes are needed in the way engineering is taught, and in programs accredited for admission to professional practice.

KEY RECOMMENDATIONS

- empower every student in Canadian schools with literacy in maths and science, including more effective programs that prepare teachers to teach these subjects successfully and motivate students to learn them.
- ensure that every engineering student is provided with effective orientation in entrepreneurship skills related to commercial applications of technology.
- establish a Canada-wide Internet-based network to motivate and assist emerging engineer-entrepreneurs.
- encourage Canadian universities to establish campus-wide entrepreneurship centres and ask engineering and business schools to establish joint programs in technological entrepreneurship.
- set up one or more innovation and technological entrepreneurship centres (ITEC's) in each province to stimulate technological entrepreneurship start-ups.
- improve productive communication between technological entrepreneurs and sources of financing.
- establish and support a broadly-based cooperative effort to expand technological entrepreneurship in Canada, involving the engineering profession, business leaders, governments and the general public.

ACTION PLAN

To grow technology-based business in Canada through technological entrepreneurship will require the concerted efforts of many stakeholders. To harness these efforts, **the Academy proposes that a National Steering Committee on Technological Entrepreneurship (NASCENT)** be formed, initially composed of one representative from each of the principal engineering and business organizations in Canada, with power to add. Thirteen founding members are proposed (ref. 2).

The purpose of the Committee would be to define priorities, policies and programs and to implement activities that strongly enhance technological entrepreneurship formation and success in Canada; it would encourage all sectors of Canadian society to participate in proposing, developing and applying effective programs and work plans.

The Committee would be initially created for three years and cease to exist thereafter, unless strongly supported to continue by the business community based on results achieved. Its direct operating expenses would be funded by a grant from the federal government, based on appropriate budget, reporting and accountability criteria.

The Academy offers to coordinate the work of NASCENT.

References:

1. *Technological Entrepreneurship and Engineering in Canada*—a background report— Canadian Academy of Engineering (Roger A. Blais - Ed.) — September 1997
2. *Wealth Through Technological Entrepreneurship* — Canadian Academy of Engineering, March 1998

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