THE IMPORTANCE OF BASIC RESEARCH

By Mike Lazaridis

Founder, President and Co-CEO of Research In Motion Ltd.

and Chancellor of the University of Waterloo

Keynote Address at the

Fourth Annual RE$EARCH MONEY Conference

November 9, 2004

What is the purpose of a university? Most people believe that a university exists to educate and to perform research. But it has a higher role, a sacred trust, to pass down all the knowledge that we've accumulated to the next generation, while developing new knowledge in the process. What would happen if we turned off the whole university system in Canada? I mean literally locking the doors and scattering the people?

In the first year, we would hear nothing much beyond the complaints of displaced professors and students. In the second year, the rumblings would start. In the third and fourth years, companies would begin to feel the pinch of a high quality, skilled labour shortage. They would start to fall behind in international competitiveness. Except for immigrants—now highly sought after—companies would have no new engineers, scientists, accountants or writers. All of a sudden, there would be an outcry: "We must protect our citizens because they can't get jobs anymore!" The borders would be closed. Taxes would be raised. Then we would wake up and say, "Oh my, universities really are important!" So we would open the doors, pour money back in, and hire back the professors—if we could find them. Many years would go by before anything resulted. In fact, it would take years just to get back to the starting point.

(continued)

In Canada, we've just been through an enlightened decade of government support for research in the university environment. We've had Canada Foundation for Innovation, Millennium Scholarships, Canada Research Chairs, and support of indirect costs. What was the outcome? An $8 billion federal surplus, one of the strongest economies in the world, a strong dollar and very high hopes for the future.

However, I keep hearing that there is something fundamentally wrong with the university research system in Canada. Some very influential people believe that we are not getting the proper "bang for the buck" from our investment in university R&D. In fact, having done some R&D, some say we should take upwards of $100 million from the annual budgets of the granting councils and focus instead on commercializing the knowledge we already have. What a dreadful mistake this would be.

A particularly dangerous version of this thinking holds that professors should patent more and, at least by implication, spend less time teaching undergraduates, training graduate students, interacting with their international colleagues, and conceiving novel theories to test in their labs. I have some experience with patenting, and I believe that this is wrong-headed on at least three counts.

THE PATENT TRAP

First, a valuable patent needs to be properly filed in multiple countries and tested in the courts. Universities have no defensive use for patents and certainly do not have the resources necessary to see through the long and protracted legal battles to prove their veracity. Requiring professors to participate in this activity would also be a significant obstacle to attracting and retaining those who want to teach and do research and who, in fact, had accepted their positions with teaching and research as career objectives.

Second, patenting is an inherently secretive process requiring its proponents to withdraw from the very processes that expand and transfer knowledge in a research university—open disclosure, peer review, and publication in scientific journals. When patents are involved, these become replaced by non-disclosure agreements and lawyer-led bureaucratic processes that often lead to adversarial proceedings in the courts. Ironically, a patent holder's worst nightmare is the discovery in court of "prior art" in the form of a paper in a referenced scientific journal!

(continued)

Third, and most importantly, Canada produces less than 5% of the world's knowledge. Science today is a global enterprise. Only a small fraction of the knowledge that Canada needs to commercialize to be successful actually originates here. Focusing our attention on commercializing "made in Canada" intellectual property isolates us from the great discoveries being made elsewhere.

Why must we step up our investment in basic research? Why is it absolutely crucial that we have the best-funded research institutions right here in Canada? Most people think that it's because we will get helpful discoveries 10, 20, or 30 years out. That's true, but it is not the most important reason.

The number one reason to fund basic research well and with vision is to attract the very best researchers from around the world. Once here, they can prepare Canada's next generations of graduates, masters, PhDs and postdoctorates, including the finest foreign students. All else flows from this.

The researchers will bring to Canada both their research prowess and their standing and contacts in the international scientific community. And the students as graduates will commercialize everything they learn—whether discovered in Canada or discovered somewhere else. They will form the society of our future based on the education they've experienced. And, thankfully, some will stay at the university, become great researchers themselves and perpetuate the virtuous cycle—ensuring that the sacred trust of knowledge transfer continues.

PEOPLE MATTER

In the 20-year history of Research In Motion, I have licensed exactly two technologies from university research teams. Over that same period I have hired more than 5,000 students as co-ops, interns and full time employees. I've even hired some of their professors. When I decided to build radios and introduce CAD into our engineering processes, I didn't go looking for patents. I went looking for great people and found them in our universities. Together we have built a successful global company with an enviable intellectual property portfolio.

(continued)

If you really want to understand commercialization, all you have to do is attend convocation at your local university. At mine, the University of Waterloo, we celebrate—yes celebrate—the passage of the next generation of students into the economy and society twice each year. Armed with cutting edge technology from around the world, the latest tools, the latest techniques and processes learned from their work under the very best researchers, they graduate with much fanfare and go on to build the industry, institutions and society of our country. Now that is real commercialization.

I believe so much in this model that I've picked an area of research I believe is fertile for Canada—quantum information theory and quantum computing—and have invested heavily in it. It's a fresh, green valley just waiting for us to claim. I have put $133 million so far into the Perimeter Institute for Theoretical Physics and the Institute for Quantum Computing at the University of Waterloo. We can and will dominate this field if we continue to invest and concentrate that investment in Waterloo.

There are other scientific areas and geographic clusters across Canada where similar injections of funds could pay off. My list includes genomics and biotechnology, nanotechnology, advanced nuclear power and superconductivity. In these areas, exceptional and geographically focused basic research environments will energize our scientific community and create a strong future commercial position for Canada.

As Canadians we enjoy a strong economy and dollar, shrinking debt, and a multicultural and tolerant society with open borders. We're attracting the best and brightest to our universities as students and scholars. As long as we invest in research and focused clusters across Canada, and keep investing in our universities in general, our students will do the rest of the work.

What worries me is that if we misunderstand the virtuous cycle and kick it askew even a little bit, we could make a costly mistake. If we tell our researchers that we're going to reward their efforts by counting the number of patents they register, we will create a nightmare of secrecy and closed-mindedness. If we cut back on our funding of the granting councils—as some would suggest—we might not even notice until it is too late to recover.

(continued)

Let's think twice before we change the way that we account for our tax dollars being spent at universities. Let's go back and think about university education and the virtuous cycle of basic research led by top researchers.

What would it be like if we shut it down? Unthinkable.

What could Canada be with a thoughtful plan to invest in basic science? Simply the finest and most prosperous society on earth.

Please join me in conveying this vision to our leaders and our fellow citizens.

For more information, visit www.researchmoneyinc.com