



Submitted by:

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Matrikon is an Alberta based technology company, with Global operations, that provides consulting and productivity based technologies to the processing and manufacturing industries. The technologies provided are focused on real-time data management for decision support systems. These technologies have been developed in Canada and are considered leading edge and innovative, propelling Matrikon to a well know global leader in their field of plant optimization software. Matrikon's strategy for development relies heavily on innovation and partnership with Universities to find the next generation technologies. I am answering these questions in the capacity of Vice President of Matrikon, having managed the technology development group and our University/Industry consortiums.

1. In addition to the R&D activity defined by the OECD, should government be funding other business activities related to the commercialization of R&D? If so, what and why?

Moving from an idea to a commercial product involves 3 steps.

- 1) Proposing the idea, initial research, developing the idea, verification (lab tests, simulation, case studies), confirming the idea works
- 2) Gapping the details for implementing the idea, solving minor but abundant technical difficulties, putting the idea into perspective with current technology, market research, making sure the idea does whatever it is supposed to do in real world
- 3) Converting the idea into a product/service, business development based on the product/service, marketing, sales

Universities and businesses usually do Step 1 and Step 3 very well, respectively. But in my opinion Step 2 (mainly the D part of R&D) is where most ideas are likely to fail. This is true for both business-university partnerships and for pure business driven R&Ds. If it is the primary challenge, then it needs to have focused funding to address it.

2. Does Figure 2, the model of business innovation presented above, capture the key structural factors and inputs to innovation? If not, what is missing?



As I explained, innovation alone is not enough. After each raw idea, hours of labor are required to develop the idea into a commercial offering (Edison's overused quote come in mind: Genius is 1% inspiration and 99% perspiration).

3. Regarding capital, is there an adequate supply of risk capital for Canadian firms at each stage of their growth (start-up, small, medium, large)? If not, why not? Where returns on investments are low, what are the reasons and potential solutions?

Canada has some tremendous potential for innovation coupled with the entrepreneurial requirements to bring this innovation to commercial products. I believe that we can always use more capital in this area, but the key is to focus the capital in Canada's key areas of growth. Investment must be clearly targeted to Canada's strategic focus areas. We must also reward the companies (start-up, small, medium or large) that clearly demonstrate the ability to drive growth from their innovation.

4. Regarding ideas and knowledge, do you believe it is important for Canadian firms to perform their own R&D and, if so, what do you believe are the key factors that have been limiting business R&D activity in Canada?

R&D is a culture in companies. It can be very costly and also very difficult to demonstrate clear success and an ROI. Companies performing their own R&D see it as a strategic component for their competitiveness and a requirement to remain ahead of their competition. If companies are already able to meet the productivity levels required to be profitable, then R&D often gets neglected. Companies that are simply no longer able to compete, often embark on a R&D program, but it is too late and the investment can be wasted. What also limits the business R&D is the lack of knowledge/resources to cover the D part (Step 2 above). This part cannot be done completely by the universities, due to lack of knowledge related specifically to this step. However with tighter collaborations and proper guidance, university researchers can effectively facilitate this transition.

5. Regarding networks, collaborations and linkages, what are the main impediments to successful business-university or business-college partnerships? Does the postsecondary education system have the right capacity, approaches, and policies for effective partnerships with business?

Universities and businesses have two separate goals. Universities' goal is (in addition to training) increasing general knowledge (measure in the number of publications). Businesses' goal is making money. To have a successful partnership, these two goals should be more or less aligned. This is only possible if the both partners adjust their expectations a little bit to satisfy the other.

If universities understand the amount of work and resources it takes to make an idea into a product/service, they can help bridge some of this gap. This is something that government can enforce



within its funding programs. Businesses also need to realize that with proper guidance to university researchers, they will benefit far more from these collaborations.

6. Regarding the creation of demand for business innovation, what role, if any, do you believe that government should play in being a “first customer” for R&D investments in Canada?

Government can help with funding and structure to help facilitate Step 2 above.

7. Regarding talent, is Canada producing sufficient numbers of graduates with the right skills to drive business innovation and productivity growth? If not, what changes are needed? Where demand for advanced skills is low, what are the reasons and what changes, if any, are needed?

Yes and no. The number of university graduates is probably more than enough. But the problem is with the skills. There are two sets of skills that are generally expected from university graduates:

- Technical skills related to their field of study (an electrical engineer should be able to do electrical engineering). Universities are more or less successful here, and with little effort graduates can fit well in their related businesses.
- General skills required for successful business: problem solving, systematic view to problems and logical approach to their solutions, productive planning, understanding the difference between an idea and a result and knowing how to get from one to another, etc. These are the skills missing from most of university graduates, specifically in postgraduate levels.

The key is to create programs at the graduate level and drive funding to help technical people develop the industry and business acumen to allow them to fully leverage their technical talent to drive business innovation and productivity growth. This is where the biggest GAP sits.

8. Can you describe whether and how your firm employs students currently enrolled in community colleges, polytechnics and universities, and what government measures could make it easier to work with students during their academic programs and to recruit them after their graduation?

We currently collaborate with some universities as part of Industrial Research Chair and NSERC Strategic Project Grant programs. We find the NSERC Industrial Funding Programs are key to building the next generation innovation leaders in industry.

9. With which federal programs supporting business or commercially oriented R&D in Canada do you have direct experience and knowledge?

NSERC Industrial Research Chair and NSERC Strategic Project Grant programs.

In your view:



a. Which of these programs are working, and why?

Programs that fund targeted areas and that focus on bringing universities and business together to jointly ally their skills within a common program. NSERC programs force a strict approval process where the business value of the R&D, the value to Canada and the impact on students are all evaluated before funding is granted.

b. Which programs are not working, and why not?

The ones that do not have a clear expectation of the value the R&D is to deliver.

10. If you have direct experience and knowledge of the SR&ED tax credit, what are your views in relation to the following:

a. Does the current structure of the SR&ED tax credit encourage incremental investment in R&D? Does it free up capital to invest in other aspects of innovation activities in the firm? Does this vary by size, ownership, sector or nationality of firm?

b. What are the strengths and weaknesses of the refundable portion of the SR&ED tax credit for Canadian-controlled private corporations and to what extent does it encourage the growth and commercial success of SMEs?

c. Bearing in mind the improvements being made by the Canada Revenue Agency, are there additional opportunities for change to simplify the administration of the SR&ED tax credit and facilitate the applications process?

11. How could the Government of Canada lighten the administration requirements of its programs on recipients and improve outreach to business?

I do not find the administrative requirements to be an issue. Key is to identify the key areas where we want to drive innovation for growth and then fund the programs best designed to bring universities/researchers together with industry. We need to facilitate this union, and encourage the investment from industry by showing clear business value.

12. How could the Government of Canada be more innovative and responsive to meet new needs or opportunities, and try alternative service delivery-approaches in its programs?

Reward and overfund programs that demonstrate success and growth.

13. Are there any gaps in the Government of Canada's support to business and commercially-oriented R&D? Do firms performing R&D in other countries have an advantage over Canadian firms because of



access to programs that are not available in Canada? What would be the principal features of new programming to fill these gaps?

14. What lessons and best practices can be taken from provincial business and commercially oriented R&D programs, and how should the two orders of government align their programming?

In Alberta provincial programs are better adjusted to the needs of businesses. One particular feature that I think is really important is that in some provincial program the industrial partner is allowed to use up to 25% of the researcher's time (usually a graduate student) for business, marketing, management and other similar tasks. This both advances the researcher's skills and helps the business with some of the load related to Step 2.

15. Is there a difference between R&D and innovation? If yes, how are they different? Should government focus on R&D or Innovation? What should the balance be?

In my opinion, R&D is more general than Innovation. In R&D, one is responsible for making sure the idea is making positive difference in the real world, which is not the case with Innovation.