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The Role of Intellectual Property in the Formation of ICT Ventures



The ITAC White Paper

November 2008

The Information Technology Association of Canada (ITAC) is the voice of the Canadian information and communications technologies (ICT) industry. ITAC represents a diverse ICT community spanning telecommunications and internet services, ICT consulting services, hardware, microelectronics, software and electronic content. ITAC's community of companies accounts for more than 70 per cent of the 572,000 jobs, \$140.5 billion in revenue, \$6.0 billion in R&D investment, \$31.4 billion in exports and \$11.4 billion in capital expenditures that the ICT industry contributes annually to the Canadian economy. ITAC is a prominent advocate for the expansion of Canada's innovative capacity and for stronger productivity across all sectors through the strategic use of technology.

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Introduction

Intellectual property, classically the designs used in commerce, protected by patent or copyright, plays a role in the formation of innovation-driven information and communications technology ventures. But many misconceptions about the nature and importance of that role exist.

It does occasionally happen that an idea, developed by a researcher in a university or publicly-funded lab, gets patented and that patent is licensed to an entrepreneur who develops the technology and successfully brings it to market. But far more often entrepreneurs are interested as much or more in the talent behind the technology. The value of licenses is frequently viewed as of less significance than the value of talent recruited into the enterprise for ongoing research and product development.

ITAC recently interviewed several members of our community who have built technology-based ventures. We asked them to reflect on their experience building their business (or in some cases several businesses) in view of the Ontario Government's proposal for a tax holiday for companies commercializing Canadian IP. Their views are offered here as a measure to better illustrate the role IP plays information of ICT businesses.

Bernard Courtois
President and CEO, ITAC

Lance Greggain

President and CEO, Fresco Microchip Inc.

“The know-how that resides in your people is often more valuable than the intellectual property that resides in your patents.”

The Company: Founded in 2004, Fresco Microchip is a fabless semiconductor company focused on the consumer electronics market.

Ownership: Privately held, with investment from Celtic House and Ventures West

Headquarters: Toronto

Core Mission: Development of leading-edge RF, mixed-signal and digital signal processing architectures for television broadcasting.

An industry veteran whose previous companies include Genesis Microchip, Jaldi Semiconductor and Pixelworks, Lance Greggain has strong views on what constitutes intellectual property, and how companies use it to their advantage.

“Any real VC-financeable startup needs a hook. You need to have a competitive advantage, and if you’re financing a technology company there needs to be some kind of intellectual property that gives you that advantage over the competition. IP is that thing that gives you an advantage in the marketplace, but the patents themselves are rarely useful without the know-how that leverages them. Over 30 years I have seen some really elegant patents that didn’t result in good product because there wasn’t the know-how to leverage that fundamental invention and create something that worked well in the market and added value to the customer. Either that or it was implemented in a way that was too hard to use or didn’t provide the customer enough tools to take advantage of the product. The know-how that resides in your people is often more valuable than the intellectual property that resides in your patents.”

Three decades have brought significant change to the way information and communications technology companies develop their core IP. “Back in the day, if you wanted a circuit you designed every part of it because you had to. There was enough value in being able to do it, and there were no other sources. Today, for logical functions that are basically digital in nature there’s an industry that’s been created to build those functions. As long as the class of what you need is available in the market it really doesn’t pay you to develop it.

“At Fresco, we do many of those functions ourselves because many of the functions, and the performance we want, are not available. If it were available we’d buy it because it’s very expensive to build. We license micro-processors and standard de-modulation blocks.... For most applications, if it’s commercially available you should buy it. It’s how you assemble that adds value to the chip itself. What we do is add circuitry that does things that cannot be done by a third party. The fundamental way in which we do it directs the kind of custom circuitry that we build, and our ability to build that – and to find the people to enable us to build it – those things are tightly coupled. So, there’s IP in the

way that the system hangs together, in the way the things work and in the specific circuitry that is built.”

During his career, Greggain’s relationship with the academic community has been quite circumscribed. He says that, in the six semiconductor startups in which he’s had involvement, none of the fundamental IP has had its source in university labs.

“The biggest thing universities provide Fresco with is talent. That’s not to say that we couldn’t find (a research team or university department) to develop technology with us, but where we are in the market it’s just not something we do. If you can’t generate IP flow you’re going to have a rough time sustaining yourself.”

Even with what Greggain calls IP flow, commercialization takes time. From his experience, he says that moving from chip design start to final product routinely takes 18 months – and more than two years if the product is complex. “Then you need a characterization period, a promotion period, and then your customer needs to put it into an application. So, in general, from a clean sheet of paper to commercialization you’re looking at three years at least to the first tiny trickles of revenue. I wish I could say that any of my experiences were faster, but not one has been.”

Looking back to his experience with Genesis Microchip, he says the process can be complicated and extended if you have a product that serves a market that is still developing.

When it comes to the issue of a tax holiday on commercialization of IP, Greggain points to Ireland as a model of how things could work. “The real economic miracle of our day is not China – which really has the same model as Japan – it’s Ireland, which centres around a tax holiday for new enterprise. In my mind, a well thought-out tax holiday for new enterprise is a good model, but it’s not a simple thing; you need more than just free money.... It depends on how long it takes you to get a market for your product, so you have something to pay tax on.... If a tax holiday can be made to work it’s a great thing. But it may be better at attracting the expansion of a profitable operating business than anything else. These are businesses that want to save taxes. They need the whole package to bring them in. In the case of semiconductor fab, electricity rates, water, government funding and other considerations are calculated. The tax holiday might only be part of the package but it is a very important part.”

Frédéric Boulanger

President, Macadamian Technologies Inc.

“There’s no venture capital now, no access to money. We’re back to the days when companies are growing very organically.”

The Company: Founded in 1997, Macadamian Technologies is a software product development-outsourcing partner for North American companies that are developing new products and improving existing products.

Ownership: Privately held

Headquarters: Ottawa

Core Mission: Helping software development managers attain the mix of skill, speed, quality and cost needed to successfully deliver on their commitments.

A co-founder of the Ottawa Software Executive Forum, Frédéric Boulanger takes a holistic approach to a definition of IP. “It’s the outcome of internal activities toward the creation of a product. For example, when you create software the IP is the source code of that software, but also the intellectual output of the programmers, designers and R&D group who work at creating that source code. It’s a whole organization working together, or even the output of more than one organization.

“IP is your know-how, your understanding of the market, your understanding of the technologies, the team working together with the customer to figure out what they need. Everything needs to work hand-in-hand in order to get to market successfully. You can compare the acquisition of IP to buying a business; whatever goes into making that acquisition successful after the deal is completed is what really matters. This is the bulk of the work and it’s the same with IP – what you see is an end-result, but what matters is what has gone into it before that.”

As the head of a product development outsourcing company Boulanger has the advantage of having a window into a number of organizations. He says that 90 percent of the companies he sees create their own IP, reuse existing technology or build on top of something that already exists. “The exception – the 10 percent – license it from another party, and those cases it likely involves collaboration with a university. But that’s very rare in the people I deal with. In my experience, the companies that have links to universities are the larger ones.”

He also has a pragmatic view of how smaller companies must function in the current economy. “People have no money because there’s no venture capital market in Canada. So, startups don’t purchase anything now; they take open source technology and build on it. Companies won’t spend money they don’t have, so very rarely will they go and buy their own stuff. It’s a grassroots movement now; it’s people working in their garage. Maybe they can actually start to pay their own salary when they’re in startup mode. We’re seeing companies bootstrapping on a shoestring. We’re back to the days when companies are growing very organically.”

In this market, Boulanger says that recruiting and developing talent is more important than purchasing existing IP. “In my reality, small firms can’t afford to buy IP; they build and create.”

As a result, he views the path to profit as long and challenging. “To make a successful product you’ll struggle for five years, maybe break even for another five, and then you may be running a company that’s actually making some money. So it’s 10 years to get to the point where you’re just starting to be successful, and it’s even longer if you’re in an emerging marketspace.”

Not surprisingly, he sees few benefits for nascent businesses under a 10-year tax holiday. “You’re only going to be making money after eight years. Before then a tax holiday might help establish businesses, but if you’re looking at kick-starting innovation in Canada, those companies won’t see a benefit for a long time – if they even get there. The bigger companies would see the real benefits.”

Adam Chowaniec

Chairman, Tundra Semiconductor

“We worry about R&D tax credits and proposed tax holidays, but 70 percent of your expenses go toward sales, marketing, human resources and finance.”

The Company: Founded in 1995, Tundra Semiconductor delivers high-performance products and design services to many of the world’s leading communications, computing and storage companies.

Ownership: Publicly held, listed on the Toronto Stock Exchange

Headquarters: Ottawa

Core Mission: To deliver technology that connects critical components in embedded systems.

To some, Adam Chowaniec will always be best known for his seminal role in the development of the iconic Commodore Amiga personal computer, but in his 33-year technology career he has fulfilled a number of roles with companies large and small. That experience has taught him that successful organizations are defined by their employees.

“In the broadest sense, IP is what people have in their heads. When you hire people what you’re hiring is some of their knowledge and experience, and that is the most valuable IP. If you go to any venture capitalist and ask them what they look at when they’re considering an investment in a company they’ll tell you the number one thing they look at is the team of people. It’s the team of people – and the knowledge that resides in that team – that is the most valuable.”

At both Tundra and previous endeavours, Chowaniec says IP has been acquired largely through internal efforts. “What generally happens is that you identify a market, and a product you think is going to sell into that market, and then you begin to develop that product. During that process, occasionally you might find some IP externally, but I’ve found it rare – outside of the life sciences – to start a business with IP from outside. It’s generally stuff that’s developed by people who have information in their heads rather than picking up pieces of IP from outside.”

In the case of Tundra, he says: “We’ve occasionally bought product lines or IP because it fits into our business model, but I don’t think we’ve ever licensed IP from academic institutions. There’s a back-and-forth dialogue with academic researchers, and occasionally we’ve let contracts for specific pieces of work, but to survive in business these days you need to be focused on a very narrow niche in which you excel, and that’s what’s going to give you your competitive advantage. So the likelihood that there is someone sitting in a Canadian university who’s looking at exactly the same area is pretty small.”

But universities do play a major role in Tundra's ability to develop the IP it needs to compete, through its recruitment efforts.

"Bringing talent into the company is absolutely crucial. Finding that talent – whether it comes from other companies or from academia – is the lifeblood of knowledge-based companies. In many ways, the training and education that people get is far more valuable than any IP they may have been working on previously. Finding a fit for that might be very difficult, but bringing in their skill set and having them work on projects within your company is very effective."

He feels strongly that government support for technology companies has been misplaced. "One of the things we focus on too much is R&D. If you take a snapshot of a company that's doing \$50 million in sales and is profitable... 70 percent of their revenue probably goes toward sales, marketing, human resources and finance, and yet we do nothing to support that end of companies. We worry about R&D tax credits and tax holidays, but really 70 percent of your expenses are somewhere else. For every dollar we invest in R&D we should be finding ways to invest two or three dollars in marketing programs or better training for business students. That's where you'd get the biggest return as opposed to the R&D or tax side."

Specifically on the topic of a tax holiday, Chowaniec believes a 10-year window is too limited. "It takes five years to get a company to the earliest point where it might be cash flow break even. It could take another five years before you're really profitable and paying taxes. For me, 10 years is almost a starting point. Some of the slowest-growing companies are those that start with IP as opposed to starting with a market idea or a product, so the likelihood of this having an impact is relatively small.

"The other thing I would argue is, if you're profitable, paying taxes is a fact of life but not paying taxes is not going to change your business model significantly. You're not going to build a company a different way just because there's a tax holiday."

Brian Doody

Chief Executive Officer, DALSA Corporation

“Information isn’t really worth anything unless you can do something with it.”

The Company: An industry leader in digital imaging and semiconductor technology, DALSA was founded in 1980 by Dr. Savvas Chamberlain to develop charge coupled device image sensors.

Ownership: Publicly held, listed on the Toronto Stock Exchange

Headquarters: Waterloo

Core Mission: The design, development and manufacture of integrated circuit and electronics technology, image processing hardware and software, and high-performance semiconductors.

Brian Doody stands apart from many of his technology peers as someone who has been at the same company – one that has its roots in academia – for more than 23 years. He has watched DALSA evolve from a handful of employees to more than 1,000 people around the world with annual sales revenue of close to \$170 million.

As the company has grown, it has acquired intellectual property in three ways.

“The company was founded on IP that Dr. Savvas Chamberlain developed when he was at the University of Waterloo, and that core IP was used to develop a line of products and services that we used to self-fund the growth of the company.

“During the first 20 years of the company’s growth the IP was developed exclusively by the people who worked for DALSA – the engineers and scientists who we hired – both through their work internally and in doing contracts for the third parties. We very clearly set out in contracts that we owned all the IP that was developed in the course of those contracts, and that mode of developing IP continues today.

“The third way that we acquired IP was through acquisition of complementary companies. Our acquisition strategy has been to look for companies that would expand our technology pool. We’ve completed six acquisitions since 2000, and five of them were directed at acquiring IP.

“We have – from time to time – purchased licences, but it’s a pretty small part of the way we’ve acquired IP.”

Not surprisingly, Doody’s definition of IP relates strongly to its value. “To me, IP is something a company or an individual has that creates some type of competitive advantage. I only view it as IP if it has some value. Information isn’t really worth anything unless you can do something with it.”

He estimates that the division is just about equal between IP that has been developed internally and obtained through acquisition. “In every case, acquisitions have allowed us to add people to our development team who had IP in their heads but also meant that we acquired patent portfolios that we could use in our own business and documented know-how that we could apply to our current and future products and use in our development work with third parties.”

Although DALSA’s acquisitions have brought IP onboard, Doody says that talent recruitment and development have been more important overall to the company’s growth. “Once you’ve done an acquisition the only way you can release the IP is to continue to grow the skills of the people on staff. Even when we’ve gained access to IP through acquisitions that IP really resides in the heads of those individuals. Keeping those technology pools strong and adding to them is how we can actually turn that IP into revenue.”

The company’s heritage and location give it a unique relationship with the University of Waterloo. “Our founder remained as a part-time professor for 10 years while he grew DALSA to about 100 employees, and we benefitted from his relationship with the university. I’m a very strong proponent of Waterloo’s policy of allowing researchers to retain ownership of IP and extremely frustrated that it hasn’t been more widely adopted in other institutions in Canada. We can see that if Dr. Chamberlain had been encumbered by having to protect his own IP versus that of the university during the growth years of DALSA the company would not have prospered to this point.”

Today, in addition to supporting research activities through funding NSERC chairs, DALSA continues to look to the University of Waterloo for co-op and graduate students, and counts a number of Waterloo grads among its key employees.

Looking at the development cycle of IP, Doody says: “We don’t start to see any recovery of investment until at least three years, whether it be a development of our own or through an acquisition. We generally look for companies that are viable when we acquire them so they’re kind of self-sustaining. In some cases, it could be five years before we see any recovery of IP investment.”

While he says that a tax holiday on IP commercialization would’ve benefitted DALSA, due to the way it grew from IP developed within an academic setting, he sees a greater potential benefit in getting other universities to adopt the University of Waterloo’s approach to IP ownership.

Brian O'Higgins

Chief Technology Officer, Third Brigade Inc.

"Companies are not making money for 10 years if they are developing technology that's coming out of the university."

The Company: Founded in 2004, Third Brigade delivers enterprise-class security solutions that protect mission-critical business systems.

Ownership: Privately held with investment from Celtic House, Summerhill Venture Partners and the Business Development Bank of Canada

Headquarters: Ottawa

Core Mission: Deliver host intrusion detection and prevention systems that include stateful firewall, application firewall and intrusion detection and prevention to individual networked hosts and virtual machines within virtual environments.

A 20-year veteran of the technology sector whose past experience includes work with Bell-Northern Research, Nortel Networks and Entrust, Brian O'Higgins represents a company that takes a multi-faceted approach to IP development. "We acquire technology in a number of ways. We've licensed a particular technology set for a product, and we recently purchased an open-source product. We have the knowledge internally to build the set of features that our customers want."

He estimates that the cost of acquiring IP may only be about 10 percent of the total cost of taking technology from concept to full commercialization.

Determining the ownership of the IP in their products makes up a significant part of the commercialization process. "You have to understand the heritage of every piece of code. It's quite complicated, because so many libraries are embedded and you don't want to accidentally discover open-source code in a product you're trying to sell. We spend a significant amount of time in this due diligence process – completing almost a line-by-line review of the libraries. Even something fairly small requires several days."

The four-year-old Third Brigade has accumulated staff along with technology. "When we started, we acquired three companies and built from there. As you build your development staff you build more technology yourself. You're more likely to buy when time to market is more critical. If you want a particular set of features you look around to see if there's a quick way to get it... But there's always a point in time when you need to control your own destiny, so your staff becomes a priority – allowing you to build and maintain a product."

In addition, the company has recruited through its relationships with academic research facilities. "Even if you don't get technology that you can use through those relationships, you find good people. The one consistent winner from these relationships is the student doing the project; they gain experience and they're likely to get hired."

“Relationships with university labs are quite relevant to our field. Academics are always looking for problems to solve, and in business there are always problems that need solving. The ones that seem to work are those where you have a personal relationship with the researcher and they are familiar with your executives. If you can find someone who has a research area that’s related to the future of your product, that’s a really good fit, so we tend to look for those.”

But, while Third Brigade continues to be open to relationships with researchers in the academic community, O’Higgins says that commercializing products with technology that has its roots in university labs is a long-term project. “If you’re acquiring IP that’s in a prototype form already, you might be looking at commercializing it in 18 months – a pretty quick spin. If you’re trying to develop something with its origins in someone’s research you could be looking at 15 years.”

In general, O’Higgins believes the cycle to full commercialization normally exceeds 10 years. “I think a lot of the patents seem to be running out when companies are ready to make money using them, and that’s 17 years. I think the idea of a tax holiday for IP commercialization is a good one, but aligning with the patent period would be more relevant than a 10-year horizon. There may not be much consequence if it’s only 10 years. Companies are not making money for most of those 10 years if they are developing technology that’s coming out of the university.”

John Breakey

President and CEO, Unis Lumin Inc.

“There should be recognition of what goes into marketing as well as the technology component. Without that marketing component, the IP is kind of useless.”

The Company: Established in 1990, Unis Lumin is a technology outsourcing and systems integration company.

Ownership: Privately held

Headquarters: Oakville

Core Mission: To help customers adopt and use communication technology to improve their business.

A veteran entrepreneur, who grew Unis Lumin from a home-based business to a global player, John Breakey is a committed believer in the importance of marketing.

His definition of IP is broad and relates directly to his emphasis on promotional work: “It’s some sort of unique process, formula or technology that does something different than what it’s competitive products do... (but) the irony is that when you focus on IP by itself it really has no value. It’s what you do with it that creates the value.

“Governments have moved from the perspective of looking at R&D to looking at commercialization, but I don’t think the way they look at commercialization has caught up with the way they looked at R&D. If you consider R&D you’d say the product is the outcome, but with commercialization the people are absolutely instrumental to the commercialization of IP.

“We’ve got lots of examples where IP never got to market, or never became anything to speak of, not because it wasn’t a great technology but because it wasn’t sold or executed well. We’ve probably got an inventory of IP on the shelf in Ontario because nobody knew how to sell it. There’s a distinctive skillset difference between developing IP and selling IP, yet the government doesn’t recognize the selling component. They want to tax exempt the effort to develop IP but not the marketing campaign you produce.”

Breakey sees a dichotomy between the value placed on the marketing component in Canada and the United States. “As a general rule, the U.S. recognizes the importance of sales more. In Canada, the sales component has been kind of a dirty word and that’s led to missed opportunities.”

He traces the root of the issue to our education system, saying that while Canadian colleges and universities have placed tremendous emphasis on technological development – and seen some important results – the sales and marketing aspect of commercialization has been neglected. “There’s a need to connect development and sales. If I was creating software I might turn to Sheridan College to leverage their depth

of knowledge, but what if I had a product and needed some marketing or business know-how? There's a lack of connection between the math and engineering faculties and the business schools."

One solution, Breakey says, would be a clearinghouse approach that could coordinate activities at the colleges and universities so that entrepreneurs could tap into both scientific and marketing expertise.

When it comes to how government could assist with the development and commercialization of new technology, he says the approach must recognize the effort and expense that's expended throughout the entire enterprise. "If I bought some IP from a Canadian-controlled company, I think that everything that went into creating it should be recognized.... (A government tax program) should be about generating more value, more taxes. Commercialization will create new jobs and more tax dollars. There should be some recognition that if I buy a piece of technology as an integral part of the product that I'm creating, that should be eligible for a tax break, as well.

"You have to make it and sell it, and there should be some recognition of what goes into the marketing of it as well as the technology component. Without that marketing, the IP is kind of useless."