

## **CDO in Vancouver**

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### **Background**

This study, lasting almost five years, has presented many challenges. The main challenge has been, that while we have endeavoured to carry out a scholarly analysis of digital industries (DI), the industries themselves have evolved faster than we can study them. Not only have the industries themselves evolved, but the overall global competitive environment has shifted radically, so that, for example, our trade relationships with China and the US, are now completely different than they were five years ago.

A second challenge has been our understanding of the concept of the environment in which DI operate. What is a DI? Virtually every industrial sector, or cluster, operates with a heavy digital component, whether resource-based, manufacturing or services. In Vancouver the visual effects/animation/games cluster (VFX) has been seen as the focus of DI, but as we have learned, this is not true. DI include resource-based industries (both renewable and non-renewable), manufacturing, and in Vancouver (particularly) service industries which include financial, support services for tourism and transportation, personal services and real estate. For the most part these activities are not captured as statistically separate activities, with their own NAICS categories, but are usually hidden in the data from their parent industries.

On the basis of 75 face-to-face interviews and approximately 150 on-line responses to a standard questionnaire on entrepreneurship, our findings are summarized below.

### **The research question: What is the ecology of the digital industry in Vancouver?**

What exactly is (was) the digital cluster in Vancouver? It is not just the games/VFX/animation cluster, (which was been studied in the previous ISRN project) but other digital industries. Many digital industries do not show up in statistics – are they hidden (e.g: in mining, transportation, tourism, and fintech etc.). These industries are not just producers of digital material, but also users of digital material - for example Amazon and Uber. How big is the hidden part of the cluster(s)?

As a corollary, what are the global competitive advantages for the digital industry cluster(s) in Vancouver and what are the linkages between the digital cluster in Vancouver and the rest of the global economy?

### **The key findings**

Vancouver is (almost) entirely a software cluster. This cluster is all about human capital. We have found that in Vancouver the main DI activity is software, in support of some larger sector

of the economy. This is a human resource intensive activity, and Vancouver's success or failure in DI rests on its ability to generate and retain an adequate supply of human capital to feed the demand of the various DI. Cohendet's pyramid of DI firms is a good representation of the situation.

The "gig economy" is another problem. While young talent is willing to work on short-term contracts, there are few incentives to keep middle level talent and managers; many enterprises do not offer long-term employment arrangements to most of their employees.

Given that the cluster is about human capital, Vancouver, and perhaps Canada in general, is pricing itself out of the global market. While Vancouver salaries are competitive, the cost of living is not. Human capital is leaving Vancouver and is only being replaced at the top of the pyramid in Canada because of US immigration constraints.

Knowledge transfer (the transfer of IP from universities to the business world) was not seen as being good. However interviewees reported that the quality of talent coming from the post-secondary system is good. It provides the raw material input for the human capital needs of the cluster. The finance community is impressed with the quality of the educational system output.

Financial capital needs are not great – software-based companies do not require major investments in fixed capital. But the conventional financial system (banks, etc.) are not perceived as being helpful, at least in Vancouver: banks are reluctant to risk lending to firms that have little in the way of fixed assets. IP is not usually seen as a fungible asset. Financing is often raised through less traditional means.

### ***The role of talent***

There is general agreement that there is a good supply of human capital coming from the post-secondary system and from younger DI workers who seek to move to Vancouver because of its perceived cultural, environment and social conditions. Increasingly they work in the "gig economy", where they are hired for short periods to work, almost on a piece-work basis, and then let go at the end of the project. For new entrants into the labour force, this is (usually) not a problem, in that they are exploring the cluster and its opportunities.

But the reverse is true as soon as these individuals wish to set up households and have families. Vancouver is simply too expensive with both housing and other living costs driven up by real estate speculation and its location on the Pacific Rim. At the top end, it is not as much a problem, simply because regressive US immigration policies are leading MNEs to establish branch offices in Vancouver where they can attract global talent, and retain them until they can move them to their US head offices.

Vancouver risks losing its competitive edge simply because the city, province and federal government have never worked in harmony to create an environment where human capital is not only welcomed and nurtured but maintained.

### ***The importance of customers and markets***

Many of the DI firms are either subsidiaries of or suppliers to larger firms in Vancouver that are not usually thought of as being DI themselves. Those that operate independently are often seeking to create a product, specifically, IP, that can be sold on to a user. Such links as do exist are north-south (up and down the Pacific coast of North America) with a few links to China. But the lack of IP protection is a major issue, and until better IP protection is in place, export of IP will continue to be a major problem. The cost of enforcing IP protection in the US is prohibitive, and, of course, there are issues with IP protection in China.

### ***The availability of capital***

Since virtually all of the Vancouver DI firms are software based, with consequently relatively small needs for capital, many respondents to our interviews did worry too much about finding funding. They did note that major, established, financial institutions (banks), are not helpful. Most startups are self-funded: the consequence is that for many startups, success is measured in terms of being able to sell their IP and cash out. Scaling up is often not an option, and the presence of the large firms at the top of the pyramid, means that there often a ready market for startup IP. This has led to the creation of a group of “*serial entrepreneurs*” in Vancouver, who themselves are often a source of venture capital for startups. At the top of Cohendet’s pyramid, the larger firms usually fund their DI activities from internal resources.

### ***Access to knowledge in terms of research, data sources and intellectual property (IP)***

Given that in Vancouver much of the DI activity is software-related, the conventional model of university and industrial lab research, leading to innovative new products and processes, is not as important as the development of software skills and the marketing of those skills. The Centre for Digital Media is a good example of this, producing digital entrepreneurs rather than new hardware. There is a strong research group in quantum computing at UBC, but their efforts are being overrun by much larger, and better funded groups, elsewhere in the world.

IP is a perennial problem in that it is frequently difficult to patent digital IP, and even when it is patented, or becomes proprietary, it is difficult to enforce those rights, particularly in Asia and in the US (“*patent trolls*”). Essentially it is a free-for-all, where the only defence is to try to stay ahead of the competition with new IP.

The new DI superclusters program offers a potential new program for the development of IP. Essentially the superclusters are reverse National Centres of Excellence, where industry first develops a program (and hires talent), and then get support from the federal government. However, at least in Vancouver, there is yet to be evidence of a wide-scale roll-out of these programs. It should be attractive to large firms, in that it will allow them to try out innovations, with essentially fifty-cent dollars, as well as scout and observe new human capital. It is interesting to note that a few large-scale DI players (e.g. Microsoft) have made substantial funding commitments to the program.

### ***The broader social impact of the digital transformation***

One of the clearer implications of the digital revolution in Vancouver has been the explosion of the “*gig economy*”. VFX industries were (and are) often project-related with the human capital

shifting from one project to the next and one employer to the next. Security of employment in VFX is a luxury reserved for very few in that sector. But the same is generally true in the rest of digital economy. This insecurity and lack of social benefits accruing from permanent paid employment does nothing to improve the climate for innovation in as much as many of the innovators are permanently concerned about where their next gig will come from, and indeed if they will receive due compensation for the IP they are currently working on. The “*precarial*” extends beyond the commercial world. Most academic researchers are in contract, or contract-like, positions; only the relatively few tenured faculty and technical specialists enjoy any kind of security.

The digital transformation has focussed a spotlight on a trend in the free-market economies that is not unique to the DI. The move to contracted labour, owner/operators, and part-time employment is a social phenomenon that has occurred over the past fifty years, reversing a trend that had occurred over the previous century as large manufacturing firms (and governments and universities) sought to establish reliable workforces, albeit with the encouragement of strong labour unions. Now firms are trying to divest themselves of long-term obligations such as secure employment and pensions.

### ***The role of big data***

But this is not the only social aspect of DI. The rise of the large social media and their data acquisition capabilities takes society into a world where we have not been before, except perhaps in a few police-states. The Internet of Things, spaces where my fridge instantly knows whether or not I have had a midnight snack or my car knows if I have been speeding, leads to a suppression of individual choice.

We have, in Canada, a “*perfect storm*” in digital policies, or more precisely, the lack of them. Nor do we have a national vision or a national flagship project such we had with the Canadarm for our space industries. We have no consistent policies on:

- Data security and ownership of data by the individual
- The content of digital media and the acceptable norms for that content
- Broadcasting and entertainment outside those media controlled by the CRTC
- The ownership and protection of digital IP
- The encouragement and training of human capital to work in the DI
- The provision of suitable economic and social environments for the development and retention of human capital in Canada

It has been argued that social media are leading to a fall in collective human activity and a rise in compartmentalization of the individual, where the individual no longer interacts in a shared physical space with other individuals but in small compartments connected only by electronic means (as first described in “*Bowling Alone*”). We, in Canada, with our socially liberal outlook on life need to redefine what it is we want from the DI and what it brings that we have to guard against. This is not a new concept: the European Union is much further down this path than Canada (or the US or China).