

CONTRASTS IN CLUSTERING: THE EXAMPLE OF CANADIAN NEW MEDIA

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1 INTRODUCTION

New media, interactive digital media, multimedia are all terms used to identify an interrelated set of economic activities that produce digital, text, audio and computer graphic material which may be accessed through the Internet, films, kiosks and related communication channels¹. The new media industry began in the mid-1980s but its period of most rapid growth was during the mid- to late-1990s. This was true internationally. After 2000, its structure was affected negatively by the collapse of the bubble economy of IT. Nevertheless, it has proved to be resilient and continues to be an exciting source of innovation.

Despite its short history of development there has been a rapid transition in new media products. Two broad streams of innovation can be observed:

- In entertainment related markets, digital techniques in animation, post-production and visual special-effects were adopted by firms and by workers formerly using a traditional set of skills and techniques; the development of digital 3D computer graphics software and hardware platforms has made a major impact in animated movies, cartoons and similar products and new media applications on the Internet now routinely contain animated components. The development of video, computer, and Internet games has emerged as a vital, new economic activity.
- Business services have been developed to enable information distribution via Intranets (within organizations), Extranets and information retrieval and business transactions via the Internet. Interactive digital websites have generated completely new services and augmented or replaced print and some telephone services. Interactive e-learning has been developed as have other web-based services incorporating elements of animation and in this respect some firms are “crossover” businesses.

Canadian new media firms are geographically concentrated in three metropolitan centres, Vancouver, Toronto and Montreal and each has between 400 and 600 new media businesses (estimated numbers: Toronto 594, Vancouver 470, and Montreal 450). No single public agency has assessed the differences in the distribution of the new media industry with any accuracy. Perhaps the exact numbers of firms is not of great significance because each metropolitan centre has many ultra-small firms that enter these counts. In each centre, firms are found in games development, e-learning, and website design, animation, production and post-production and visual special effects. Within this general pattern, however, each centre has developed different strengths.

To explain the differences in the mixes of new media activity in the three concentrations we have examined their roots in the Canadian urban economic context. At the beginning of our separate inquiries, we met to explore definitional issues and since then we have reported our

research in largely independent fashion knowing that, at this time, we would begin the process of integration with some results to hand. We have not attempted to prepare standardized data files for this paper mainly because in each location we have undertaken intensive programmes of interviewing selected firms and that is about to end only now . We do rely, however, on our previous papers, in which we have sought to identify the kinds of relationships that exist between firms (Britton and Legare 2004; Britton and Legare 2005; Smith, McCarthy and Petrusевич 2004; Tremblay, Chevrier and Rousseau 2004; Tremblay and Rosseau 2005). We have used also recent survey data from other projects where that has been available in Montreal and Vancouver. Since we are still working with our data and waiting for files from public sources, this paper is in no sense is our final word but we have examined our work to date for common results and contrasts in the patterns of development. As explained in our previous papers, our three inquiries have been designed using cluster theory as a theoretical template, and discussion of this literature is not repeated here in any detail.

2. THEORETICAL BACKGROUND

In this integrated paper we are concerned particularly with similar beginnings in different regions are now associated with distinctive patterns of development. In many ways contemporary economic activities can only be understood in terms of their connections with opportunities made available by antecedent patterns of development. The principle of path dependence has proved especially helpful in allowing us to perceive these relationships. Models have been developed in the literature of path dependence indicating that the process of accumulation in particular places can be augmented or abridged by seemingly random or unexpected events, and sometimes by events that at the outset would not be predicted as particularly influential (Arthur 1990; 1994; David 1985). We have in this connection been alert to the importance of distinctive entrepreneurs, civic developers and institutional choices all of which can have far reaching but unpredicted consequences.

The antecedent factors relevant to understanding the origin of the three new media concentrations include the following:

- Each centre has a history of **film production** and this had its local start as an outcome of the local arts community. It evolved from on-location filming and includes productions for large screens, television programming and advertising. Subsequently, film production led to the establishment of a range of related services including animation, post-production and special effects that relied on a set of creative skills. Thus film production is a fundamental antecedent of contemporary new media. Institutionally, the Canadian film industry was assisted by policies of the Provinces but especially by the National Film Board (since 1939), which supported both French and English language productions and assisted in the development of particular skills.

From the 1950s onward, the location of the headquarters, especially the programming offices, of several **television networks**, including the CBC, gave Toronto and Montreal particular advantages for the local supply of programme content and advertising. Thus the location of network hubs went far to ensure the localizations of skills and firms with relevant connections.

- Toronto has generated a distinctive mix of new media activities because it has the strongest **corporate functions** among the three cities. These activities reflect the headquarters of Canadian banks and other financial corporations, and leading firms in all other sectors including resources, manufacturing, and entertainment. Public administrative functions are also significant. The lead role of Toronto within the Canadian urban system has been most apparent over the last 25 years and one of its agglomeration advantages is its propensity to be a source of significant new demands that recognise the benefits of new divisions of labour and specialization among firms. This has led to concentrations of producer service firms providing new outputs as part of Toronto's arsenal of economic advantages. Of particular importance are new media firms that use the Internet as their channel of delivery for a wide variety of new interactive services.
- **Demanding clients** in all fields have been a stimulus to innovative new media firms. In Montreal, for example, locally based French language TV broadcasting networks have been an important market for new content produced using the latest digital techniques. Parallel relationships established by producers with the English-language networks have been important in Toronto. Nevertheless, the influence of demanding clients is not necessarily an exclusively **local** relationship or even mainly so. Film production companies in Hollywood, for example, emerged in our interviews as an important source of impetus and technological challenge for Toronto post-production firms and this is a relationship that has its roots firmly embedded in the reputation of Toronto's firms formed in pre-digital years.
- **Talent pool:** If the film, animation, and advertising activities of each centre have localized skill and talent in the labour force, so these pools of skills have evolved using digital systems, and it is possible to link the greater strength of contemporary new media industries in Montreal, Toronto and Vancouver to their traditional film (and television) industry roots. Some firms originally established to provide film-related services now also supply the Internet market and can do so because their processes and technology platforms are very similar. In this sense new media firms can draw from a varied labour pool of creative local talent in which there has been on-the-job experience in addition to college/university educational and training programs.
- The local expression of successful **entrepreneurship** has been quite different in the three urban regions. All have generated large numbers of small and ultra-small new media firms, most of which grew in the 1990s, then contracted and stabilized. Others maintained their modest scale attained before digital animation arrived in force and these tend to be located in Toronto and Montreal. In games, however, where economies of scale are possible, international developers/publishers have invested in large studios in Montreal and Vancouver. Behind apparently similar investments, however, lie quite different entrepreneurial processes.

In 1991, Vancouver's Distinctive Software, a game development firm started by Don Matrick in the early 1980s, merged with the industry leader, Electronics Arts (EA).

Though EA's head office is in California, Vancouver is responsible for decisions on product development. At different times, several spin-out companies have been formed (including Radical Entertainment and Relic Entertainment), but in 2002, EA reabsorbed one of these (Black Box games). Another, Barking Dog Studios was acquired by Take-Two Interactive (headquartered in New York) and it is now one of two Canadian Rockstar development studios.

In Montreal, civic entrepreneurship has been a major influence on the development of the games portion of the industry as the efforts of a local businessman and lobbyist, Sylvain Vaugois, were successful in stimulating public policy efforts by the governments of Canada, Quebec, and Montreal. The development of Multimedia City was one initiative and in 1997, a studio of Ubisoft, a major French game development company was attracted to Montreal. There have been subsequent acquisitions among game firms in Montreal by Ubisoft and by other foreign firms but a pay-off for the subsidies to Ubisoft is the expansion of the talent base of Montreal, which has attracted recent investment by EA.

- Most new media firms are **technology users** and undertaking R&D is not a significant activity. Moreover, the financial resources of most firms ensure that R&D is unaffordable and since 2000, day-to-day management tasks dominate the attention of firms. They focus on creative responses to clients' needs – they are producers of new media 'solutions'. Firms and individuals in new media innovate in many ways but much of the creativity in this industry relates to content in the form of advertising and branding, building 'consumer communities', the visual quality of animations, the functionality of websites, and the interactivity of games. These may be novel but few fall within the 'experimental development' definition applied to R&D. Many firms employ permanent or freelance programmers to undertake system development work and to produce modifications to larger software platforms to work around problems encountered in particular applications. These are outside the standard definitions of R&D.

A miniscule number of new technology-based firms have been started to design new digital systems with the plan to enter a subsequent production and income-generating phase. They have benefited from Canadian R&D programmes (such as IRAP). Inquiries in Vancouver, for example, indicate that 15% of respondents receive IRAP funding and 13% SR&ED tax credits. This is higher than found in Toronto or Montreal. One reason may be ignorance about these sources of financial assistance and for that reason it is not always clear whether innovative work that firms have undertaken would have met the criteria for assistance or not.

- The advantage of the **low exchange rate for the Canadian dollar** in recent decades should have meant that all locations could have realised increased revenue from work for US clients. This does not seem true for Montreal. Nevertheless, a variety of new media firms in Toronto acknowledge the production cost advantages of the exchange rate though firms providing post-production and animation inputs to Hollywood claim that they compete on product innovation. On-location firm work in Vancouver has

gained from the exchange rate and from being in the same time zone as the US west coast entertainment industry. Vancouver is favoured with an attractive physical setting, a prime advantage since it allows superior outdoor **lifestyle**² possibilities and firms indicate that the talent pool, now an important regional attribute, has been influenced by this.

3. SPATIAL COMPARISONS IN LOCAL CLUSTERING

In Montreal, Vancouver and Toronto, new media achieves spatial distinction as it is strongly clustered within the downtown areas of these cities and echoes a pattern recognized in other new media centres including London, New York, and San Francisco, among others (Cooke 2002; Lash and Wittel 2002; Pratt 2000; Scott 2000) . A substantial portion of the industry, mainly small new media firms, relies on employing young technical and creative workers who need effective transit connections and seek the entertainment/lifestyle attributes of these locations. There are exceptions, of course, but the majority of firms have recognized their collective visibility when located in these central precincts where close but flexible association has developed with advertising, communications, television programmers and other clients. Toronto's new media firms are highly concentrated into former industrial/warehouse commercial districts on the fringe of the CBD (see Figures 1 and 2³). In entertainment terms, too, the Central Area of Toronto has provided a good fit to the interests of young workers and an increased proportion of a larger population of firms. More firms than previously (43 per cent in 2004 vs. 33 per cent in 1997) and 58 per cent of employment now are concentrated in this area, implying that business advantages are obtained from locational clustering.

New media firms are concentrated also in central Montreal though it is bifurcated into two areas, one along St-Laurent Boulevard and another in Old Montreal. The latter is the site of Multimedia City, a major renovation project that initially attracted small firms because of the inexpensive rents and a diverse community of artists. The entry of 3D software firm Discreet, however, ushered in a major change. This stimulated the pace of redevelopment and higher rents. In 1999, Montreal had about 400 new media firms, a population stimulated by provincial policy initiatives, but the IT contraction took its toll and there was substantial shrinkage in the number of firms before a subsequent resurgence.

In the three metropolitan centres, many new media firms are in dispersed locations because of their interest in accessing business markets outside the core areas. This is more evident in Vancouver though three trendy central area precincts - Gastown (70 firms), Yaletown (80) and False Creek (70) - contribute 47 percent of Vancouver's 470 new media firms. Another small concentration (9 per cent) in suburban Burnaby, however, is notable because it includes a number of Vancouver's largest firms, Electronic Arts (1350 employees), Mainframe Entertainment (240) and Canadian headquarters of Chancery Software (160).

4. CONTRASTS IN SCALE

The new media industry is usually portrayed as spawning clusters of small, highly creative firms in many metropolitan locations around the world. Superficially, the three major

Canadian concentrations have similar size distributions of firms with 73 per cent of firms in Toronto having 10 or fewer workers (Table 1) and the corresponding group being 66 per cent in Vancouver (Table 2) and 56 per cent in Montreal (1999). There is a stronger incidence of larger and mid-sized firms in the central area of Toronto than the suburbs but this pattern does not seem to be true for Vancouver.

Table 1: Employment size distribution of Toronto Multimedia Firms, 2004
[% all Toronto firms]

Employment	Central Area	Suburbs	Toronto Region
1	7.1	20.0	27.1
2-5	12.0	17.3	29.3
6-10	8.2	8.6	16.8
11-20	6.1	5.2	11.3
21- 40	5.7	3.5	9.2
41-100	1.9	2.0	3.9
101- 400	1.7	0.6	2.3
Total (n=594)	42.6	57.4	100

Table 2: New Media in BC Employment 2003

Employment	Percentage of Lower Mainland* Firms
5 or less	50
6-10	16
11-25	16
26-50	5
51-100	5
101+	8

Source - 2003 New Media BC Study

*Note: The Lower Mainland is a much larger region than Metropolitan Vancouver

The image of new media as a prevalingly small-scale industry is a partial one. Three processes contribute to the modification of that picture through the emergence of large, multi-locational, sometimes global players. First, well-established firms in animation, post-production and visual special effects have grown larger with the Internet and have diversified into new realms of production (crossovers). Second, large games developers and publishers have emerged to take advantage of talent in the emergent clusters. New studios have been built in some cases and in others firms have grown in scale through the acquisition of going concerns. Third, large firms from related fields of economic activity have entered new media services, for example, IBM and interactive divisions of advertising agencies. The current result is that new media clusters are an interesting mix of large companies, small firms and ultra-small businesses.

Games firms

A small number of very large corporate employers exist in games development supplying video, computer, and Internet games. Large firms and large studios in those companies have emerged. Large size applies to Ubisoft Canada (970 employees in Montreal) and Electronic Arts (in Vancouver (1350 full time employees in suburban Burnaby; 200 Downtown Vancouver). Though international capital is present also in Toronto (for example Rockstar) no company has the scale of Ubisoft or Electronic Arts⁴. Domestically owned firms in all three centres are small in international terms and these usually rely on publishers who acquire their ideas (games) and IP. Small games development firms are mainly private companies and they maintain a high level of secrecy. Games publishers, however, acquire the intellectual rights of individual creators and do so when substantial information is available about a new product.

The explanation for large-scale studios of firms in games development is a combination of the need for intellectual security, very short product cycles, and a boom market. The primary distinguishing characteristic of large firms in games development is their reliance on IP as a competitive advantage and this is associated with a premium on in-house development teams. Probably because of the IP issue, game firms have developed only modest value chain connections in any of the clusters. A minimum of input ties means limiting the exposure of firms to the risk of competitors possibly gaining access to new ideas. The competitive nature of the games market is an additional reason that large scale firms have emerged since large teams are a means whereby new products can be brought to market quickly and they are larger because as games become more technologically complex, they require larger teams to build them. Unlike other parts of new media, IP is an important element in the design of new games and for the first time non-compete clauses in labour contracts are now being invoked (by Ubisoft). The boom market for games and the technological edge that is important for them has had effects among software firms and has led to a pattern of acquisitions⁵.

The obvious question to ask is whether it is reasonable to think of Electronic Arts and Ubisoft in the midst of many small firms as having an anchoring⁶ effect on labour markets? Our conclusion is that large firms in games development inevitably exert some of these influences on the clusters in Montreal and Vancouver. They act as stabilizing influences on the pool of local talent as international gaming firms as large as Electronic Arts (Vancouver) and Ubisoft (Montreal) individually have large impacts on the scale of each regional labour force, its work experience and the recognition and development of talent. The scale of Ubisoft (970 employees), for example, dominates games development in Montreal, which has about 40 game development companies with about 2000 employees in total. These large firms have also been involved in local spin-off and acquisition processes. While spin-offs tend to amplify the scale of clusters, there is also an acquisition process at work providing different opportunities for creativity and business development and a general atmosphere of entrepreneurial vibrancy in each cluster. In Montreal, for example, Hexacto, a mobile games producer was acquired by Jamdat (US), and a local firm Microïds though absorbed into by a French firm MC2 was subsequently acquired by Ubisoft. Events in Vancouver illustrate this

as indicated above and in this case about 120 firms employ about 2,400 but Electronic Arts accounts for 1,550 of this total.

Other large firms

Large new media consulting companies burst onto the production scene in the late 1990s, largely through internal growth, sometimes financed through IPOs, and growth was based on an expected continuation of an expanding market. Some of these (like MarchFirst) had operations in Canada (Toronto) but for a variety of reasons, these very large multi-locational firms have shrunk in scale or disappeared though smaller versions exist currently. In addition to its own start-ups, Toronto has attracted investment from firms that began in other Canadian cities and elsewhere. Some are branches of national and international firms whose corporate scale is derived from other lines of business – for example, advertising firms that have established interactive divisions, and software/hardware/digital service companies - and they gain market spill-over effects from name recognition and the reputation of their parent firms. Toronto also has branches of new media consultancy companies whose nominal headquarters are elsewhere but which have sizeable operations in Toronto. Nurun (owned by Québecor a Quebec-based publishing and printing company) is one example, Blast Radius, which was started in Vancouver another, which moved into the business market in Toronto. In other cases businesses founded in Toronto have been acquired from outside. Thus, Infinet (Internet solutions in the healthcare field) has been swept into the new media portfolio of the Transcontinental Group. Organic though part of a US firm was established as a subsidiary office.

While these examples demonstrate that the Toronto market and labour force attracts inward investment, in the entertainment segment of new media some Toronto companies operate satellite offices in Vancouver because of film work there and because they can often accommodate over flow of work from Toronto. In contrast with Vancouver and Montreal, where gaming development firms are the largest, Toronto's largest employers, also its oldest, specialize in 3D animation, post-production and visual special effects animation and related aspects of digital content (for example Command Post, Corus/ Nelvana). These have gained from their longevity and reputation for content innovation and they are distinctive in the mix of firms in Toronto. Their importance is attributable to the longevity of animation work and this itself represents a path dependent link with the history of film and cartoon production, and other outlets for animation work.

Small firms

We have described multimedia as relying primarily on very small enterprises. Firms can be small and can build reputations locally and be profitable. Technology allows them to be small as platforms are available to suit them. There are good reasons to believe that there are limited economies of scale in production though wider reputations for creativity/innovation may lead to the growth of firms as seen in animation and visual special effects. If economies of scope lead to multiple in-house sets of skills larger scale may follow but under constrained market conditions firms tend to reflect core competencies and remain small and specialized. Cluster learning, however, may occur through the mobility of acclaimed freelancers (see next

section) without any scale effects of economies of scope being apparent among individual firms. It was not always so, as noted above, and many firms have shrunk from their 1999 - 2000 levels of employment: for example, some media consultancies shrank from 200 to 25 employees and they became more like the smaller more conservatively managed firms that had avoided bubble economy clients.

The project-based production system

The general absence of scale economies in new media can be attributed to the project-based nature of new media business, combined with the mobility of workers, which together mean uncertainty of financing (Christopherson 2002; Grabher 2002). Many multimedia firms are really service businesses dependent on projects whose delivery times are negotiated. Since all projects are different, there are limited opportunities for firms to earn internal returns to scale though they are of necessity highly reliant on their abilities to demonstrate project-to-project variety in solutions (Elkinsmyth 2002). Design and functional creativity is essential. The principal outcomes of the project focus of the production system for most firms are the unpredictability of their revenue stream, the need for a contingent labour supply and there are significant financial implications (see below).

The business model for most firms is a fee-for-service arrangement and as there is irregularity in the size and timing of projects. Firms, therefore, need a highly flexible labour system. Established firms attempt to smooth the work-flow for their core labour force in terms of the scale and completion times of overlapping projects. This also minimizes fluctuations in the demands of firms for additional production workers. Firms also pay attention to the range of their in-house skills (specializations) that are required for them to bid on projects. The existence of a cadre of highly skilled freelance workers known to firms in terms of reputation and proven abilities is a major asset of each cluster, though the firms we interviewed in Toronto were more explicit about the way they augmented their core competencies in this way from project to project. We encountered also virtual firms, which operate as network structures with a known set of consultants available as principals to bid on jobs but no permanent workforce. These entities present the availability of their services on the Internet in the same way as bricks-and-mortar businesses.

As a revenue smoothing strategy, new media firms have succeeded in expanding the portion of their business that requires 'maintenance' services, that is the updating of the content and functions of websites. In similar fashion, some firms imitate the 'agency-of-record' model of the advertising industry in their relationships with clients. In these instances, the contribution of the new media firm is primarily branding, 'building communities' and marketing. There is in these cases, too, an element of continuity in the relationship.

Labour and learning

After the frenetic pace of labour churning in the late 1990s as wage rates climbed, the years since 2000 have seen wages fall and a lower rate of job mobility be the norm. But to get to this state, as noted above, many former members of the new media labour force were thrown out of employment. Even the very highly skilled suffered the collapse or shrinkage of firms.

Some now have jobs in former client firms and total placements in this type of work probably have increased. Some left the industry. Less experienced workers have attempted to upgrade their capabilities and accumulate experience through temporary or part-time work. They like recent college graduates are vulnerable workers, as not all firms exhibit enlightened labour practices and some firms, by reputation, seem willing to hire and release workers from regular jobs according to the expediency of project requirements.

Many of the most skilled workers have always described themselves as consultants /specialized freelancers, and this group of workers is now a significant source of talent, experience and skills, which are under continual improvement as they take on new jobs (working from home as short-term employees). Most work locally and are 'nomadic' in the sense of job variety and their strength is their known expertise. From project to project, firms use them to augment the skills among in-house workers. Some rely on social networks and contacts as a means for learning about projects and acquiring contracts and do not even present themselves on the Internet as consultant 'firms'. They are, however, key names in the rolodexes of account managers. Freelancers accumulate 'career capital' based on enhanced competency obtained by learning through experience and their contribution to the industry is through informal communities of practice that develop in each location (Tremblay 2004). Our interviews in Montreal indicate that there is little evidence of very formalized or structured human resources management strategies and more informal relationships prevail; this does not inhibit the development of semi-autonomous teamwork, but workers can be moved from one project to another, still without structured strategies in most small firms (Tremblay 2004). In contrast, there is evidence in Toronto that teams of workers are reconstituted for large projects and members may be drawn in part from other companies. These cases demonstrate the compatibility of the two goals of stabilizing the core in-house workforce and acquiring temporary human resources to complete projects.

From the standpoint of the hiring firm a premium is placed on experience compared with unproven talent emerging from college programmes. This is probably an inevitable distinction, especially as total employment opportunities have shrunk while training programmes in Montreal, Toronto and Vancouver have proliferated. There is also variability in the quality of training, according to interviews. The scale of education in this field may have outstripped the market and there is a sense that educational programmes are not as current in terms of the latest technology as they could be. The combination of this and the limited experience of graduates may be the source of some additional dissatisfaction among firms interviewed in Toronto and Montreal. Nevertheless, for every interviewee who voiced an interest in hiring only experienced workers and disappointment with recent graduates there was someone else who pointed out the great value of the programmes in providing basic, public education directed to the needs of firms in new media production. The lack of platform flexibility among recent graduates may be related to the limited opportunities for internships and co-op placements, a direct consequence of the limited recovery of markets since 2001. Nevertheless, some firms and experienced individuals support college programmes by participating in curriculum committees and teaching on an occasional basis and some programmes rely heavily on a part-time teaching staff as professionals from multimedia practice are regularly in the classrooms.

Finance for new media

Services constitute the bulk of new media work. The primary contribution of firms is to gather talented, creative and skilled individuals who can use software and devise new uses of existing platforms and meet the goals of clients with solutions. In this context the assets of firms primarily take the form of human capital (Hitters and Richards 2002). Firms are exposed, therefore, to the risks that critical intellectual and production resources are capable of leaving quite suddenly. This is possible even for key personnel with 'permanent' positions with firms.

In these circumstances venture capitalists have limited understanding or interest in multimedia firms. Venture capitalists flirted with new media in the late 1990s but that experience, and the retelling of it, has led to a much more reserved stance since then. This is verified by interviews in the venture capital sector in Toronto, Vancouver and Montreal. For good reason, these sources of capital are unfamiliar with new media products (especially content), new media product cycles (time frames), and the relatively small scale of investments and associated potential market gains. For these sources of capital 'content' is a risky investment though it has been an active interest of investors with expertise with Federal and Provincial film production incentives.

In each city, founders/ proprietors in new media are the principal source of funding (for example, over 80% in Vancouver) with debt finance (19%) the second most important avenue. One effect is that privately financed firms are not familiar with the investment models used by sources of capital. By way of contrast, firms that focus is on software and systems development face a different financial situation. These businesses can patent their intellectual property and are of interest to venture capitalists but they are at the margin of our research. Very few new media firms produce patentable output.

Some financial institutions are more knowledgeable and/or interested than others – for example, Royal Bank of Canada (RBC) is more interested in the film and new media industries. Nevertheless, interviews indicate that a substantial proportion of small new media firms are unaware of the full range of services available to them from RBC and accounting firms with focused services.

5. LOCAL RELATIONS VS GLOBAL LINKS

Input and circulation of technical knowledge

New media relies on international sources of technical knowledge in the form of software and hardware platforms but firms in both Toronto and Montreal might appear to have advantages because of the success of local animation software producers⁷. Moreover, there is a legacy of computer graphics experimentation (in Toronto), which might have reinforced this type of relationship. Business failures often have the potential to release entrepreneurial, technical and creative talent so that it can function to better advantage in subsequent enterprises. Two decades ago, for example, new software and applications firms (particularly SideEffects

Software and Alias) emerged when Omnibus failed. Subsequently, Maya, the major animation software of Alias, has become a significant international success.

Interviews (in Toronto), however, suggest that there are no perceptible, direct clustering effects from these proximities. In effect, software firms are dependent on established international markets and local users are not in any advantaged position. There may be indirect effects in terms of the associated visibility of new media firms because of the product recognition achieved by software houses and there may be benefits in terms of the circulation of programmers in and out of the software firms. There are agents in each location for all the major international software and hardware systems but as websites become more complex, especially in terms of their e-business capabilities, firms often look outside the region for particular software modules and in this sense new media firms are themselves discriminating clients.

Though few firms do R&D there have been experiments in Montreal and Vancouver to establish research centres. These claim to diffuse information to firms in the industry and they probably achieve some visibility for new media but their failure rate, which is about 50 per cent must be confusing for new media firms and clients. In Montreal, these centres include the Centre for Computer Research, though new media is one of its lesser interests, and the Institute for Research/Creation in Media Arts and Technologies (Hexagram) which coordinates research in UQAM and Concordia University. Société des arts technologiques is also important in terms of digital or new media arts in Montreal and has become known worldwide. This formal and well-organized attempt to make available the outcomes of university research is funded by Quebec's university financing organization (Valorisation-Research Quebec) and Canada Economic Development for Quebec Regions. The impact of this and precursor organizations⁸ is indirect as there is limited connection between small multimedia firms and research in Montreal; older rather than young firms have had contacts but these have been project specific and there has been little continuity.

In Vancouver⁹ since 1990, the Media and Graphics Interdisciplinary Centre (MAGIC) has been connecting researchers from diverse departments at UBC. Its goals are to facilitate the application of research on interactive technology in the private sector and it uses industry sources, government, and not-for-profit organizations to support the creation of new technology-based products and local start up firms. A different tack is taken by Mobile MUSE (Media-rich Urban Shared Experience), which calls itself a collaborative research project to achieve novel, personalized, interactive services using wireless (cell phone and PDA) technology. A wide variety of major corporate, government, and academic institutions have identified with these goals. New media associations are members and they may be conduits for small firms to benefit.

Toronto¹⁰ appears to present a quite different pattern. There are no formal institutions concerned with diffusion to new media firms, and even at the University of Toronto there is no digital reference point with the applied orientation of MAGIC. There are many research programmes/centres/institutes concerned with digital technology partnerships with industry but not in new media. The nearest connection is research in computer graphics whose substantial history dates from the late 1960s with the inception of the Dynamic Graphics

Project. It has provided a point for intellectual exchanges with software firms (especially with Alias) and a university base for projects such as the Ontario Telepresence Project (1992-1995 headed by Bill Buxton). Currently, the ePresence project of the university's Knowledge Media Design Institute conducts experiments with its own interactive media software, a webcasting system that delivers video and presentation media over the Internet and captures and archives content.

While there may be no attempts to develop new media knowledge hubs in Toronto, a variety of interpersonal relationships occur at several levels of business responsibility, especially among the principals of firms but also among project/account managers and these buoy up local networking. Consultants, employees and former employees are also involved in formal information pooling when project teams are formed, and informal transfers occur through gossip and related socially-based interaction. All these relationships assist the circulation of knowledge about new projects, innovations in techniques, and emergent trends. We were surprised to find that in Montreal many of these kinds of connections and exchanges of information are rare, though there is technical knowledge circulation by freelance consultants (see above). The difference may reflect better access of firms in Toronto to larger local business and entertainment markets, better access to national markets, and their ease of direct access to US clients. It is important, however, to note that networking does not occur at the expense of competition and in Montreal and Toronto it is evident that Requests for Proposals from clients are contested opportunities, as the same firms whose principals arrange informal opportunities to share market information are also effective competitors.

Market Relations

Several generalizations apply though there is a mixed pattern of market relations – local vs. Canada vs. US - depending on the cluster and the specialization within it. Generally, the maturity and reputation of firms, initially based on local success tends to lead to external clients. In **entertainment**, the early development of digital animation, post-production and visual special effects studios in Toronto and Montreal illustrates this. There, the relatively large scale of local markets in these primary centres for English and French broadcasting networks and film and television production has been important. Subsequently, success in Canadian markets generated access to Hollywood, particularly in the case of Toronto, while games firms that have become better established in Montreal have market connections in France and US through foreign ownership in Montreal.

The entertainment-focused industry in Vancouver has grown despite the limited local market and the more limited history of the antecedents of new media. Service work for US film companies filming in the region has become a source of work but animation firms have relied more on undertaking service work for Canadian animation firms in Montreal and Toronto. Exports to US come in second place to Canadian markets as income generators despite the time zone advantages in connecting with west coast US clients. Vancouver's game industry has strengthened and the ultimate market is strongly international.

In providing solutions for **business clients**, as noted earlier, firms cope with an element of market uncertainty and there is still substantial market capacity especially among smaller

clients. Existing clients have tended to demand enhanced performance of their websites as they have achieved greater familiarity with new media solutions. In this respect, new media firms strive to establish on-going relationships with the same clients, undertaking upgrades and maintenance. These relationships (see above) take a form like the Agency of Record type of tie that exists in the advertising industry. Though these relationships reflect a performance-type of trust, it is evident that competition always exists. All the evidence points to larger clients being more advanced in their positions on the learning curve in using new media and this has meant that the larger (corporate and public sector) markets of Toronto and Montreal have been a considerable advantage to local firms.

For most branches of new media including web development, e-learning and marketing/branding on the web, forward linkages are strongly local in all three centres. Our interviews in Montreal indicate that firms across a wide market spectrum have difficulties in marketing their services outside the local area, with the exception of the large gaming firms. One interpretation is that there is a lack of knowledge about the capabilities of Montreal's smaller firms in US and elsewhere. In contrast, a number of Toronto's firms bid directly on projects with US and other Canadian clients and have demonstrated that their teams can function well in the business locations of their clients, whether these are Canadian or US cities. Other Toronto firms have established branch offices in US cities so that they will be able to make a bid from a local office even though most of the work will be done in Toronto; in all cases where firms exported they perceived that they have a cost advantage because of the Canada-US exchange rate.

Production relationships

Collaboration: Interviews in Toronto, establish that there is increasing collaboration among firms with the goal of responding to the needs of particular clients. This development has occurred since the results of a 2000 consultant's survey (PWC 2000), and identifies a shift from the growth regime of the 1990s to the present when firms are much more conscious of goals that involve their stability and survival. Websites for some firms such as that of the GSI Group list the specialized fields of their regular partner firms. In other cases, individual specialist firms have common financial support and bid on projects in an integrated fashion. More generally, interviews have established that firms across a broad frontier are experimenting with co-bidding and these tend to be well-established firms of small scale, with strong reputations among their peers. While we thought there would be similar pattern of adaptation in Vancouver and Montreal this has not proved true. In Vancouver, collaborative relationships occur only among ultra-small firms in e-learning¹¹. Firms producing interactive web designs, electronic games, and animation, however, have only weak relationships with each other as they tend to act as lone wolves. In Montreal, while there have been a few cases of collaboration for specific projects or for marketing in the US, it does not appear to be a strong trend.

Outsourcing/sub-contracting: Firms in each of the three centres use freelancers quite frequently, as noted earlier, and they also have initiated subcontracting relationships with other firms. Large firms are involved in local outsourcing for capacity reasons especially in Toronto, but also in Montreal. The principles used in these cases is avoiding variations in the

scale of their labour force and minimizing production costs by using smaller firms to augment production capacity.

There are many more examples, among small firms in Toronto and Vancouver and this practice occurs in both entertainment-related areas and in business applications. This is a recent pattern related directly to the market contractions that stimulated firms to reduce their scale and to specialize. Now, many small firms outsource excess production work to firms with unused capacity or to those with complementary capabilities whether in terms of tools or expertise. The principle appears to be one of working closely with peer firms that are known to reciprocate in similar fashion and which are reliable and creative partners. Interviews reveal firms striving to establish these kinds of relationships and others already enjoying them as a means of competing with larger, internally more diversified companies. In this context firms may be individualistic and competitive with clients but willing to 'share' work. Thus, animation firms, for example, outsource post-production work, e-learning companies outsource flash animations, advertising agencies hire interactive web design or animation firms for service work and even game companies may outsource their animation or sound-stage work. As noted above, not all production subcontracting is local and there are links between Toronto and Vancouver companies.

6. CONTRASTS IN ASSOCIATIONAL DEVELOPMENT

In each location, new media has tried to generate industry associations to try and meet some of the needs of an industry composed preponderantly of very small firms. Experimentation has involved different types of organizations but attempts at cluster marketing and better information flow, financing, and connection between firms have been foremost goals as has the desire to see these needs recognised by one of the two senior levels of government. There have been very different degrees of success in each location.

Vancouver has several associations and interest groups whose activities include learning sessions, participation in government initiatives and online forums, which provide members with opportunities to meet, build relationships and facilitate knowledge flow. The size of the industry in Vancouver contributes to familiarity between many in new media because of educational, work or volunteer experiences (Petrusevich 2005). A few core associations meet regularly and have significant membership. New Media BC, founded in 1998, is sponsored by Industry Canada, the Western Economic Diversification Fund, NRC (IRAP), BC Film and Telus. Its mandate is to promote BC's digital media companies and to facilitate knowledge transfer between firms, helping them meet potential partners and exchange ideas. It serves as an umbrella organization for the industry though it only has 135 members and provides services to all companies in the form of networking events, peer-to-peer mentoring programs, advocacy work and marketing the new media community locally and abroad. Another class of associations caters to the needs of specific audiences as found in E-Learning BC which helps these predominantly micro-sized firms establish familiarity with each other so that firms expect responsible subcontracting. Resources to support the many specialized associations are scarce and made the more so by the IT crash and many companies have insufficient revenue to pay membership fees or provide staff time (Petrusevich 2005).

In contrast to Vancouver, Toronto has never had an umbrella association quite like New Media BC with its federal, provincial and industrial sponsorship. It has, however, experienced experiments by a variety of specialized industry associations, including private-public relationships to support community foci for new media firms; for example, for a couple of years new media associations from different precincts in the central area of Toronto¹² were active. New Media Business Alliance, formed in 2001, represents the interests of digital media content producers, a subset of the broader new media industry, who create the information, entertainment and education content delivered through various digital platforms (Internet, Web-TV, CD-ROM, etc). It provides a locus of reaction to the comparatively limited public support for the industry in Ontario compared with other provinces (especially Quebec) and other countries (Australia) and potentially could undertake the role of an umbrella organization. An organization successfully catering to specialized interests is the Association of Internet Marketing and Sales (AIMS). It is a co-operative venture that acts as a network building organization as regular meetings are an opportunity for representatives of firms to interact professionally with counterparts and with prospective clients. There is a more limited desire to build networks in the entertainment sphere (animation etc) perhaps reflecting the history of film, TV and other animation-based products, the strength of US market relationships and the importance of the interaction that comes from highly knowledgeable and demanding clients, such as those from Hollywood.

Specialized associations like the International Game Developers Association are active in Montreal but more notable is the support for the industry by the provincial and federal governments. They fund, for example, an umbrella organization Alliance numériQC, with 238 members, and it supports the expansion of companies, the development of skills, and facilitates contacts between firms. It represents the voice of the Quebec industry though our interviews reveal only limited participation of firms in organizations¹³. Even more tangible is the dominant role of the Provincial government in the redevelopment of the Multimedia City as a visible concentration of new media firms in Old Montreal.

7. CONTRASTS IN PUBLIC INITIATIVES

A variety of federal government initiatives have supported the development of new media but, as implied above, the strongest flow of funds has been to Quebec primarily to the industry in Montreal through Canada Economic Development for Quebec Regions. Visible effects have been its contribution to the fund to attract Ubisoft (with Quebec subsidies) and contributions to the Multimedia City development and to Alliance numériQC. To a lesser degree, federal funds either through Industry Canada or the Western Diversification Fund have contributed to BC's initiatives to develop an industry association but recently funding has been withdrawn. Canadian Heritage, through Telefilm Canada, supports the development of some Canadian cultural products in new media and firms from all regions may apply.

A policy avenue common to the three provinces has been provincial support for education and training geared to creating a specialized pool of labour skills. In each case the primary locus of training programs is the post-secondary college system. These initiatives have been successful to a point but, as noted earlier, firms need experienced workers and this means

co-op programs and internships need support, especially at a time when firms are significantly stressed.

There are differences between provinces in the way policy action has been initiated. As indicated above, Quebec has made substantial investments in the development of a new media precinct in Montreal. Though the province has been a significant sponsor of the Multimedia City development the principal beneficiaries were large software firms¹⁴ able to take advantage of the subsidies, the refurbished accommodation and the visibility of the relatively central address. Largely, the Quebec government¹⁵ took over a locally inspired initiative led by the Agence du Faubourg des Recollets in order to initiate a cluster building strategy in which a bricks-and-mortar solution was used to attract larger firms.

The lobbying efforts of firms have successfully established the visibility of the industry and the legitimacy of their case that new media is an industry with great potential. Ironically, their lobby efforts were stimulated by the financial assistance given to Ubisoft in 1995 by the Quebec and federal governments and a current expansion of Ubisoft has attracted additional subsidies. The expansion of Ubisoft is expected to produce substantial spin-offs.

From 1997 to 2003, generous Quebec labour tax credits¹⁶ were made available to support new media firms and jobs. E-business was also designated as a target of the same subsidies. The tax credits are part of an implicit cluster development program and Quebec officials are convinced that this form of public support has been significant in building up the scale of the industry (Tremblay 2004). Though a change in government, in 2003, meant a halt to new entrants to the tax credit programme, firms with agreements retain them until 2008. This represents a substantial continuing commitment to the industry and this level of financial advantage in Montreal has been unmatched in Toronto or Vancouver.

Over the years, the limited support for the industry by the provincial government in BC mainly has taken the form of funded of research reports and studies on the industry and some operating subsidies for the office of the New Media Innovation Centre. Though this was a unique collaborative R&D centre for the new media sector, its funds were withdrawn in 2004. The subsequent support of New Media BC by both levels of government has been to generate social capital within the industry. Survey results in Vancouver suggest that one result is a higher level of knowledge by firms about IRAP and the SR&ED program than exists in Ontario, although this is still low compared to firms in other high technology sectors.

In Ontario the principal industrial policy initiative is the Interactive Digital Media Tax Credit¹⁷ of 20% of eligible labour expenses, a much weaker scheme compared with a number of other provinces, especially Quebec, in which a much larger credit applies to both fee for service work and original content creation. Ontario's credits apply only if Canadian **cultural** products are produced, and they require that IP is retained by producing firms, thus excluding small games development firms who rely on publishers. Few new media firms actually are assisted possibly because to benefit firms need internal resources that can be diverted to the application process. It is relevant that from 1995-2002 Ontario was governed according to the neo-liberal rejection of direct industry-building policies. Thus, the government played no useful role during the period when the first growth phase of the industry ended and the

industry's health was challenged by the reduction in market growth. Since then, film industry assistance has been the main focus of related policy interest.

8. LEARNING AT THE FIRM AND CLUSTER LEVEL: SUMMARY

- New media, consisting primarily of small-scale, privately funded, entrepreneurial ventures, experienced an initial growth spurt during the 1990s. In common with other producer service industries, firms respond to a bidding, design and production sequence based on individual projects negotiated with client firms and other organizations. Firms are highly dependent on the availability of talented and creative workers whose supply is an integral component of the scale of Canada's three largest new media clusters. Learning by workers and firms is an outcome of their need to innovate by providing non-replicated solutions for clients. The circulation of labour has been an important mechanism for firms in the three new media concentrations to share the knowledge generated in other local workplaces.
- Growth in company employment-size during the 1990s was predicated on expectations of market expansion and reflected the illusions of a 'bubble economy'. This trajectory of growth was curtailed, however, as a result of a broad market crash, which was initiated by a lack of confidence in IT stock prices beginning in late 2000. The changed market conditions of the last four years have necessitated major adaptations by firms. In particular, the employment scale of new media firms contracted, particularly those with clients in the business market. Advertising budgets were reduced and entertainment-content firms were affected through the weak demand for new media products. Similarly, clients with websites have been inclined to restrict their contracts to renovation and maintenance rather than new designs and technical functions.
- There has been a booming market for Internet and video games and this has positive effects for two concentrations of games developers in Vancouver (Electronic Arts, the international leader) and Montreal (Ubisoft, now 20% owned by EA and a new studio of Electronic Arts). The economics of these firms as developers, especially their scale, responds to large potential profits that may be generated over extremely short product cycles. Small games development firms are very much reliant on the distribution power of publishing firms that succeed through their ability to capture the IP rights of 'independent' innovators.
- Since 2001, new media businesses have accelerated their experimentation with inter-firm relationships as a means of accommodating new market conditions. One aspect of this relies on the many experienced consultants/freelancers who are drawn into the creative and production teams of a broad variety of firms. Many of these are single-worker entities obtaining contracts as a result of their experience, high level of skill and recognized talent and strong reputations. There have been increased attempts by firms to learn how collaboration with other small firms benefits each in an environment in which all have more limited resources than previously. Most businesses in this industry have sought to diversify the range of clients they serve while recognizing that

their survival and growth relies in the first instance on identifying and enhancing their core competencies. Out-sourcing to local firms as well as to freelancers is common in all centres but co-bidding on projects is more clearly a trend in Toronto.

- Public policy support for new media in each of the three locations has been identical in the support that training programmes have received. In all other respects they have exhibited different profiles.

From the mid-1990s, Montreal and the Quebec government saw an opportunity to encourage the building of a critical mass in an emerging segment of the IT industry and enlisting the support of federal funds for economic development in Quebec, set its sights on game development firms, other new media producers and software producers. It proceeded on three fronts: it attracted a star player in the booming games field; it supported the renovation of industrial buildings in Old Montreal to create Multimedia City to attract (small) firms through the availability of ideal infrastructure; and it introduced very attractive labour tax credits to assist the founding and expansion of new media businesses. It has succeeded and further investment and spin-offs have followed.

New media in Vancouver has received minimal direct financial support. Local successes in animation and games may have encourage a *laissez faire* attitude but only limited and inconsistent support for new media organizations has been forthcoming and this has been a joint provincial-federal response to collective action by new media firms.

In Ontario, support for new media via labour costs has been limited in incidence and applies only to Canadian cultural products. In this respect Vancouver and Toronto have faced similar environments and while most firms are developing their skills they can spend only to a very limited extent on experimental development of products.

- In each location, the multimedia industry has endeavoured to establish its identity by forming various associations to represent the interests of firms in a collective sense. Claims have been made for support from the public sector but, except in Montreal, these public connections have been of limited effect. There has been inexperience in choosing achievable goals and there has been a lack of appreciation within the bureaucracies of the strains encountered by very small businesses in interacting with them, or coping with inconsistency in public sector actions. Most surprising of all is the universal inaction in recognizing the opportunity to assist the many small firms adapt to the market downturn.
- None of the three new media concentrations exemplify fully formed clusters, though labour skills and labour mobility are evident local sources of strength. In the circumstances this is not surprising given the youth of the industry, its fast and continuing evolution in terms of products and market-induced stresses. The spatially concentrated form of development of the industry in each city provides advantageous conditions under which collaborative and cooperative forms of inter-firm relationships

may be explored though even these locations are of interest to a larger market of design and business service firms.

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Endnotes

¹ A variety of definitions of new media have been employed including that of the Canadian Radio-Television and Telecommunications Commission, which frames new media as “encompassing services and products that make use of video, audio, graphics and alphanumeric text, and involving, along with other more traditional means of distribution, digital delivery over networks interconnected on a local or global scale” (CRTC Website 1998). According to New Media BC the use of new and emerging interactive digital media for the purposes of entertaining, educating or informing which is one distinguishing characteristic, the other is that new media bridges culture and technology (New Media BC 2002). It has adopted an 8-category classification for its directory. Independently, we classified firms in our Toronto database according to five of these categories, namely Games development and publishing, E-learning (training, evaluation), Interactive design and Communications (recognising Web design (front end specialists), Communications Consulting (back end specialists), Animation/digital content including Post Production/Visual effects, and Software/systems/ modules/ tools. We treated Connectivity and delivery as infrastructure and

excluded two non-digital categories, School government and associations, and Professional Services.

² In a 2003, a study of 260 companies found 152 ranked lifestyle as extremely important compared with 107 that ranked the large talent pool as extremely important. This ranking was consistent across company age or size (New Media BC 2003).

³ See Britton and Legare 2005.

⁴ The games industry in Toronto has several domestic companies of only modest size – Pseudo Interactive, Digital Extremes, and Brainbox – and units in foreign companies such as Rockstar. The Toronto chapter of the IGDA is active in supporting small firms and individuals through the flow of information and regular contact with publishers and larger game developers.

⁵ Discreet in Montreal is now owned by Autodesk [USA], SoftImage is owned by Avid [USA] and in 2004 Alias (from Toronto) acquired Kaydara another 3D computer graphics firm in Montreal after its own status as a division of SGI was replaced by its acquisition by Accel-KKR, a private equity firm [USA].

⁶ See Ecotec Research & Consulting 2003.

⁷ These include Alias, SideEffects and MGI Software (Roxio Photo Suite etc) in Toronto and Discreet (formerly Discreet Logic), SoftImage and Kaydara in Montreal.

⁸ CESAM, which specialized in multimedia technology and applications closed.

⁹ Until late 2003, the New Media Innovation Centre (NewMIC), was a major hub of R&D activity in Vancouver. It was a unique collaborative R&D centre that connected industry, academia and government with the goal of growth in Western Canada's new media sector. It focused on NewMIC's focus was on applied research in multimedia content creation, web-based solutions, e-tainment, explorations in virtual reality, and communication networks. It lost its funding and was dismantled.

¹⁰ Some research activity is undertaken at Sheridan College as a response to provincial incentives for colleges to generate knowledge. There is only very slight evidence that firms have useful, direct relationships with educational institutions other than through the participation of personnel from firms in teaching.

¹¹ Two or three companies commonly work together on a project; one company may build the backend of an online course another may focus on design while a third may develop and deliver content.

¹² Liberty Village New Media Centre LVNMC and Spadina Bus had access to provincial fund for their start-up period.

¹³ Some firms are active in Montréal International, which has interest in the whole IT sector.

¹⁴ These include Discreet, Cognicase, and Tecsys.

¹⁵ The Centre d'entreprises et d'innovation de Montreal, an incubator for the broadly defined IT sector in the Island of Montreal, supplies technical support to firms.

¹⁶ These were typically 60% of wages in year 1 (to \$25,000 per employee) and 40% per year per employee up to 2008 (\$15,000 max per job).

¹⁷ There is also an Interactive Digital Media Small Business Growth Fund but despite its name this does not fund individual business ventures.