

CHAPTER

New media in the new millennium: The Toronto Cluster in Transition

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INTRODUCTION

From Kuala Lumpur to Tokyo to Toronto, governments, regional development associations, and trade organizations have sought to promote the development of multimedia clusters. These initiatives can be partly attributed to a global interest in the potential for multimedia to drive economic growth in urban centres. According to Fuchs and Wolf, multimedia is "a paradigmatic example of industries of increasing importance to regional economic prosperity" (1999: 301). This is not only because multimedia is a high-technology industry, but because it is simultaneously a form of cultural production which is increasingly critical to strategies of economic growth (Scott 1997: 323). The multimedia sector is therefore an excellent example of the paradoxical consequence of globalization: as inputs such as capital and codified knowledge become more readily available around the globe, immobile factors become more significant (see Wolfe, this volume). The paradox is perhaps particularly acute since the Internet, one of the media employed by the sector, has been an agent of globalization.

Recent academic literature and industry surveys have identified the emergence of a multimedia, or “new media” cluster in Toronto. Multimedia here is defined as “the merging of traditional audio, visual and print media through digitization in an interactive format” (Brail and Gertler 1999:100). Since its emergence as a cluster in the mid-1990s, Toronto's new media industry has changed dramatically. These changes have been brought about by the rise of the broader Internet industry, and the related globalization of new media on a worldwide scale. In the mid-1990s, the multimedia cluster was composed primarily of small companies, which provided services to large, local (or locally headquartered) corporations who were experimenting with the introduction of new media tools. Although the cluster is still largely composed of small firms, the industry is becoming increasingly differentiated, as a select number of local firms have rapidly increased in size, and as foreign firms establish branches in Toronto. The establishment of foreign new media companies will increase the competition for customers and skilled labour.

The Toronto multimedia cluster has responded to these challenges by increasing its level of associative activity and developing new forms of association which are gaining support from the provincial and federal governments. The initial development of the cluster has been attributed not only to the presence of a corporate sector which was the primary customer for multimedia services, but to the existence of technological infrastructure, educational institutions, and support for cultural industries, which have largely been supplied by governments. More recently, governments at both the federal and provincial level have recognized the importance of supporting innovation and cluster development in a global, knowledge-based economy. Their attention has been drawn to new media in particular by the actions of a number of multimedia

trade associations which have commissioned reports to analyze the cluster and recommend strategies for action.

CLUSTERS AND MULTIMEDIA

Clusters have been defined by Michael Porter as:

geographical concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies, trade associations) in a particular field that compete but also co-operate (2000: 15).

In contemporary economies, Porter argues, the growth and prosperity of particular geographic areas is not attributable to their natural advantages, but to their capacity to increase productivity through continuous learning (see Porter 2000: 21; and Wolfe, this volume). The concentration of firms and supporting institutions is beneficial because the transfer of resources, knowledge, and information among them enable firms readily to adopt techniques and procedures for increasing productivity - the key to competitiveness in the global market. The productivity of a cluster's firms is enhanced by their access to: specialized suppliers and a pool of skilled labour; information about market conditions and technological developments; and complementary products and services. The proximity of skilled labour reduces the transaction costs of hiring, and nearby suppliers can more easily perform services such as equipment installation and maintenance. Proximity thereby provides some of the advantages of vertical

integration without the loss of flexibility and efficiency. Knowledge is enhanced within a cluster as it accumulates over time with spillover effects for local firms. The existence of organizations with complementary skills also reduces transaction costs for both buyers and vendors - in Toronto, for example, a multimedia firm may contract work out to nearby animation and post-production specialists, which is advantageous both to firms within the cluster and to customers outside it.

A number of characteristics have been cited as common to clusters in various locations. Studies by Porter (1998, 2000) and consultants such as the former Nordicity Group for the National Research Council (1996), the Boston Consulting Group for the Canadian E-Business Opportunities Roundtable (2000), and Information Design Associates and ICF Kaiser, a San Francisco-based consulting firm (1997) have identified several common factors. Joint Venture: Silicon Valley, has identified six cluster characteristics: a technologically-skilled labour force; "anchor" firms that support and propagate entrepreneurial activity; the availability of venture capital or other funding sources; universities and educational institutions which train the labour force, transfer knowledge, and provide technical support and consultancy to local firms; specialized support services such as legal, financial, and human resource services; and government programs to foster economic growth, develop the local workforce, and address quality of life and economic issues (Joint Venture: Silicon Valley Network 2000: 5).

Nearly all of these factors can be identified as a source of competitive advantage for the Toronto multimedia cluster. The lack of availability of venture capital, however, has been frequently cited as inhibiting cluster development.

Another factor which was important for the cluster's conception and its continued growth is the strong presence of the cultural industries in Toronto. As Scott has argued, "local cultures help to shape the nature of intra-urban economic activity; concomitantly, economic activity becomes a dynamic element of the culture-generating and innovative capacities of given places" (1997: 325). The cultural industries have a dynamic impact on cities because spillover effects link different sectors, creating a community that develops a specific sense of style over time. Scott comments that:

The latter synergistic relation is due not only to the circumstance that these sectors typically transact intensively with one another and participate in shared labor markets, but also from their exploitation of design cultures and images drawn from the local urban context, representing a generalized externality or competitive advantage for all (Scott 1997: 329).

He acknowledges that there is a tension between local culture and global, mass-market culture. However, although the production of cultural goods is aimed at a global mass market, production itself occurs predominantly in localized clusters.

1995-2000: THE TORONTO NEW MEDIA CLUSTER

The Internet economy

Given that the Internet has the potential to reduce or eliminate the need for proximity, it is a curious feature of the Internet economy that location still matters. The Internet makes geography and location both hyper-relevant and irrelevant at the same time. Geography is hyper-relevant in the Internet economy because of the need for face to face communication and interaction in order to produce the products of the Internet economy. Geography is irrelevant in the Internet economy in the sense that, at least theoretically, consumers and suppliers can be located anywhere, and still be able to communicate with one another, purchase and receive goods and services, and complete other business transactions without leaving one's computer. However, because personal relationships and interpersonal networking are such key features of the Internet economy, localized clusters of production activity persist.

No communications medium in history has spread to commercial and consumer use as quickly as the Internet. **Figure 1** shows the time it has taken for major communications media to be adopted for use by mass audiences, including radio, television and the Internet. The stunning speed at which the Internet has been adopted for use is a reflection of the speed at which the Internet industry has developed in general.

FIGURE 1 HERE

The Internet has not only transformed the ways in which people and businesses communicate, it has profoundly altered the entire environment through which informational interaction and monetary transactions occur. The opportunities opened up by the diffusion of the Internet have led to the rise of new firms, of new layers or intermediaries in the supply chain, and new business models. Furthermore, the Internet has also led to the destruction of traditional supply chains, the demise of firms who did not embrace the Internet when others in their industry have, and the massive reorganization of many firms in industries being rebuilt through the Internet. In short, the Internet has created a new set of conditions by which firms must now compete, and this has spawned an entirely new industry sector, comprised of both old and new firms alike, referred to as the Internet Industry.

Figure 2 represents a model by which to view the components of the Internet industry. Each component is linked to the other and there are firms which overlap amongst the connected circles. This diagram, though not perfect as there are some firms which fall into more than two or three of these categories, is nevertheless a good representation of the industry today. Traditional corporations are companies such as the Wall Street Journal or The Gap, both of whom have developed strong online offerings and can be placed on the diagram in the spaces linking traditional corporations and content services or traditional corporations and e-tailers. Amazon.com is probably the best known example of an e-tailer or online retailer without a bricks and mortar presence and Yahoo.com is its counterpart in content services. Access providers are firms that include America Online or AT&T; examples of software solutions firms are Netscape and Microsoft and enabling technologies are developed by firms such as Nortel and Cisco. Firms

such as Hewlett Packard bridge the gap between software solutions and enabling technologies. This leaves the category of service providers, and it is in here that the new media firms which design and develop new media and web content for other firms on a fee-for-service basis are found. In comparison to all other categories, this circle is inhabited by companies whose names are relatively unknown. It is populated by U.S.-based companies such as Razorfish and Organic, and Toronto firms such as Cyberplex. While new media, or the combination of text, video and sound in interactive formats, is clearly developed and utilized in a number of these circles, we will focus our attention on the development of new media as a business unto itself (i.e. as a service rather than a product) as it has been recognized by earlier studies that it is this area in which most of the sector's work is done.

FIGURE 2 HERE

Globalization of New Media

Most, if not all, of the fee-for-service firms which comprised the bulk of activity in the new media industry in Toronto and elsewhere initially began as small, local firms in response to local demand for services. The industry is still relatively young, and dominated by small companies which are primarily responsible for the industry's growth (MMSG 1999: 4). In a 1995 study conducted for the Interactive Multimedia Arts and Technologies Association (IMAT), 46% of the multimedia companies employed less than 10 people; by 1999 this had increased to 51%

of firms (AC Nielsen – DJC Research 1999: xii). There is virtually no difference in the average number of employees in companies solely engaged in multimedia businesses; 21 in 1995 compared with 22 in 1999 (xiv). At the dawn of the Internet's launch for the mass market in the mid-1990s, hundreds of small new media firms were established in major cities around the world. The new media industry was characterized by low barriers to entry; it appeared that a few computers and some technically savvy people were sufficient to build a new media firm. Furthermore, small upstart firms were often the supplier of choice for large corporations experimenting with interactive media for the first time and lacking knowledge, experience and understanding about new media and the burgeoning Internet.

Although it is still the case that most multimedia firms are small, there is increasing differentiation in the industry as some established firms grow and increase their reach in the global market. We can now look back on some examples of new media success stories from across North America to gain perspective on how the fledgling new media industry began its maturation process. Razorfish was started by two New Yorkers who attended nursery school together in Minnesota and entered the new media wave in 1994 with the launch of their two-man web design shop. Organic, a San Francisco new media firm, was launched in 1993 by four partners and \$5,000 in a home office. Cyberplex was started in 1994 by two former management consultants who each invested \$15,000 and was headquartered in the solarium of the CEOs Toronto apartment.

What do each of these firms have in common? Seven years ago, each was a very small, new firm testing the uncharted waters of a new industry. They faced hurdles that included having

to educate clients about the value of new media and the inability to raise funds to capitalize their businesses.

Today, each is a leader as a new media fee-for-service agency, all three have multiple global locations – in one case spanning four continents - and all three are publicly traded. Growth at new media firms has generally occurred in one of two ways - either organically, or through acquisition. By growing through acquisition, firms are able to quickly expand their reach either to new geographic markets, or to specialized niche areas. For instance, MarchFirst (formerly USWeb/CKS) acquired more than 40 firms in a two-year period expanding their ranks from hundreds to thousands of employees in a short period.

In 1997, the concept of a full service new media firm meant that the firm was in the 50-150 person range and would be able to develop a full new media product such as a web site from concept to execution without the need to subcontract any part of the work. Today, the concept of a full service new media firm is much broader. It includes a firm that is adept at consulting to determine the most appropriate new media strategy for clients, developing new media from concept to execution, and configuring the back and front end e-commerce enabled system.

Figure 3 provides a more detailed list of the competencies that new media firms attempt to excel in today.

FIGURE 3 HERE

We have seen several recent examples of firms merging and collaborating in an effort to provide more of these services to clients under one roof. In December 2000, itemus, a Toronto-

based Internet operating company, announced that it was purchasing Internet consulting firm Digital 4Sight (formerly the Alliance for Converging Technologies) for \$22 million (U.S.). The deal addresses these firms' method of contending with the overall downturn in the Internet economy, and also enables it to bill itself as an 'end to end provider of Internet and e-commerce services for companies' (Dixon 2000).

Not only are there a greater number of mergers between Canadian companies and those in other locations, but Canadian firms are increasing their exports. Over three-quarters of multimedia firms are exporting, with the bulk of exports directed to the U.S. (MMSG 1999: 4). It is the dedicated multimedia companies¹ that are more likely to be serving international markets outside of the United States, and these companies have achieved greater penetration of the US market than those businesses in which multimedia is but one component. By 1999, 64% were exporting with the bulk of exports going to the United States (ACNielsen-DJC 1999: 8).

Although the Internet enables long-distance communication between multimedia companies and their clients in foreign markets, proximity remains important. In order to satisfy this requirement, Toronto firms have also opened offices in New York, Ottawa, San Francisco, and Boston (Brail 1998: 95). Proximity was important for the initial growth of the cluster in Toronto. In 1997, firms located in Toronto were clustered in the old industrial areas of the city, predominantly in an area known as the "King Street Corridor" in buildings that were formerly used as factories or warehouses. Proximity has been important to the development of the multimedia industry for access to related and supplier industries, freelancers, potential employees, amenities, educational and training facilities, and networking with clients (Brail 1998: 199). Three-quarters of the firms' suppliers by dollar volume of sales are located in the

Toronto area, and one-fifth of supply purchasing takes place in the same neighbourhood as the purchasing firm (Brail and Gertler 1999: 110). The suppliers' location is also significant because 24% of firms' work is contracted out to suppliers. One firm manager reported that he never turns down a contract, but subcontracts as much of the work as is necessary if he is too busy or doesn't have the appropriate skills (Brail and Gertler 1999: 118).

Just as Canadian companies are making inroads into the US market, American companies are also establishing a presence in Toronto. The arrival of US competitors represents a challenge to local firms, who will have to increase their efforts to attract and retain staff and clients. The President of ICE, Doug Keeley, has commented that the firms are moving into a market "that already has a limited talent pool." The presence of global firms has also raised the question of the comparative importance of local versus global knowledge. A Vice-President and managing director of Organic Canada, Troy Young, has claimed that global companies have an advantage over local firms because they can share knowledge from across different regions in which they operate. Since they can also learn from a market which may be 12 to 18 months ahead of Canada's, they have an advantage over local firms which are dependent on local knowledge. However, firms with an understanding of local needs and requirements may well be better placed to maintain their client base. Doug Keeley has noted that having intimate knowledge of Canadian culture and expectations of new media is a key asset in attracting and retaining clients (Mitsopoulos 2000).

Venture Capital

The development of a globally recognized new media sector, and its association with the Internet industry as a whole, has had another important impact on the industry - the venture capital (VC) industry has opened up to new media. In the third quarter of 2000, venture capital investments in new media accounted for over one billion dollars of a total of 17.6 billion dollars in venture capital financing throughout the United States (PWC Moneytree 2000), making this the fifth most popular industry to receive VC funds in the US behind software, telecommunications, networking & equipment and business services. In addition, more than \$10 billion was invested in Internet related firms cutting across all industry sectors over the same time period, with Internet services firms receiving \$2.23 billion in VC funding in Q3 or 22% of VC funds invested in Internet related activities during that quarter. It should also be noted though that investments in Internet firms declined from Q2 to Q3 by nearly \$2 billion, reflecting the overall downward shift of funding available to Internet firms (PWC Moneytree, 2000).

The importance of available, regionally-based VC funding is highlighted through some recent work by Zook (5, 2000) which finds that “it is common for many VCs to limit their investments to a geographical area which they can easily access.” Furthermore, more than one third of all new media venture capital invested in Q3 2000 was invested in Silicon Valley. Not only do VCs tend to invest in firms located in the same regions as themselves, but the US experience also shows that VC investments overall are largely focused on a small number of large urban areas in the US. The top 25 MSAs and CMSAs in the US received close to 90

percent of all US-based venture capital between 1995 and 1999. This evidence makes two things clear for the Toronto new media industry. First, if Toronto new media firms seek funding from US investors, there is a good chance that they will also be asked to relocate as a condition of funding, and there are in fact several anecdotal examples of this.² Second, if the Canadian VC system follows closely along the organizational lines of the US system, this bodes well for Toronto in terms of its leadership role in the VC community in Canada. A similar geographic analysis of the Canadian VC industry is unavailable, and while the availability of VC is not nearly as abundant in Toronto as it is in the US, the Canadian VC community has matured in the past five years and Toronto-based firms have a number of options in terms of raising funds, aside from looking to US firms for VC.

Brightspark is a Toronto-based Internet incubator and venture capital firm which both develops and invests in Internet and software companies. Brightspark has raised in excess of \$80 million in its venture capital arm, with a mandate to invest in graduates of its own incubator program, as well as other leading technology and Internet companies. To date, Brightspark has ‘graduated’ one firm from its incubator called borderfree (www.borderfree.com) and is currently incubating four other firms in its lab. Brightspark is an example of a privately held firm that invests in other Canadian (and largely Toronto-based) new economy firms, thereby expanding the scale and scope of the Toronto new media industry through targeted investments.

There are also examples of new media firms and e-businesses that have sought financing through public markets, and have used the cash raised to invest in other new media companies. A prominent Toronto example of this is a company called NAME (formerly EcomPark). EcomPark was established as an Internet services firm that invested in early stage Internet startups and

provided web services including web design to businesses. EcomPark raised funds publicly through the Canadian Venture Exchange and proceeded to purchase a series of web development firms, including the Toronto-headquartered NAME for \$16 million, to develop its internal web services capabilities. EcomPark is presently listed on the TSE, though it is currently trading at less than \$1.00/share and has been an significant player in both consolidating and investing in the development of Toronto as a new media centre.

There have therefore been some dramatic changes in the venture capital industry and the nature of capital availability for multimedia in Toronto. The establishment of Toronto-based venture capital firms, and the increased willingness of investors to support the multimedia industry has led to a far greater availability of capital. However, the downturn in the high-technology market since April 2000, discussed further below, has decreased availability.

Lack of capital was a problem emphasized in all of the reports on Toronto new media. AC Nielsen noted that large companies and web site developers are more likely to seek financing from banks; new companies, and those with revenue under \$250,000 per year, were more likely to seek funding from government sources (2000: 58). The lack of venture capital was also identified as a problem in the TNMW report, particularly for content developers. It has also been noted that most money for content production is directed toward supporting the creation of proprietary products, even though Canadian companies tend not to own the intellectual property they produce (MMSG 1999: 26). The smallness of Toronto firms also inhibits their access to financing and their growth potential (PriceWaterhouseCoopers 2000: 41).

Will the downturn in the high-technology market mean that lack of capital will continue to inhibit the growth of the cluster? It is difficult to determine what impact this will have on the

cluster in the long term, however it should be noted that firms such as itemus have continued to raise funds, with Compaq Canada investing US \$10 million in the company out of its US\$1 billion New Economy Fund (itemus 2000).

Challenges to Toronto New Media

New media - along with the entire Internet economy - has undergone a massive shift in fortunes between March and December 2000. The market capitalization of firms has declined sharply during this time period, and this has been followed by office closures and layoffs.

Since the April 14, 2000 plunge in the Nasdaq index, the fortunes of new media companies in the United States, which had been bolstered by expanding e-business opportunities and a rising stock market, have changed dramatically. There is evidence that capital is becoming more difficult to obtain for new media firms in New York; a recent article in the *New York Times* noted that:

Several high-profile Internet companies in New York, like Brandwise.com, have gone under, or, like APBNews.com, are barely hanging on, and more are expected to succumb in the coming months. This spring, several dozen companies cancelled plans to go public. Venture capital companies are becoming more selective and keeping a closer eye on their investments. And landlords are increasingly reluctant to rent to risky Internet companies, with some demanding huge security payments. (Pristin 2000: A14).

Small Internet firms have become a casualty of the Nasdaq crash, which hit larger firms and prevented them from investing in startups.

Prominent US new media firms, including those which have recently established bases in Toronto, have been experiencing financing difficulties. MarchFirst, a Chicago-based Internet professional services company whose branch is the largest foreign firm in Toronto, recently filed a quarterly report with the US Securities and Exchange Commission showing that it had only \$45 million in left in free cash, barely enough to meet its estimated biweekly \$30 million payroll. In November, the company announced layoffs of 1,000 people. The firm has since secured \$150 million in financing from private equity fund Francisco Partners in return for 32% of the company's common shares (Hammer, December 2000). While it is clear that the company will certainly stay afloat until the new year, they desperately need to develop a profitable strategy in order to remain a competitive player over the long term.

Toronto area firms have not been immune to this decline, with one prominent firm, ExtendMedia reducing its staff by fifty percent in a five week period (Hamilton 2000b). ExtendMedia announced two consecutive rounds of staff cuts in November and December 2000 in a reorganization that reflects lagging growth in the emerging, interactive TV market (Hamilton 2000a and b). In January, Cyberplex laid off 80 of its employees and will take a fourth-quarter charge of up to \$10 million (Tuck et al 2001: B1).

However, the Toronto new media industry as a whole may be slightly protected from this global retreat in market capitalization and staffing as it has fewer firms playing on the global stage and in the public markets. At the same time, it should be noted that even of the US firms that are experiencing cutbacks, none has announced that it will be closing offices in Toronto - while there are instances of office closures in Silicon Valley and in Texas (Hammer, December 2000). It remains to be seen whether this period of cutbacks and declining valuations is a short or

long-term phenomena, or whether it is simply part of a maturation process being experienced by the Internet economy as a whole.

A report commissioned by the Toronto New Media Works group and released in 2000 highlighted the vulnerabilities of the Toronto cluster. By comparing the Toronto cluster to other multimedia centres in San Francisco and New York, the report claimed that a “digital content gap” is emerging in the GTA. San Francisco, with total area population of 3 million has approximately \$10 billion of revenue in multimedia; New York, with 15 million, has \$8 billion in revenue, whereas Toronto with 4.5 million has \$1 billion in revenue. The report states that:

Toronto is conceivably losing between \$2 and \$3 billion in lost direct, indirect, and induced economic output from this digital gap. This equates to a minimum of 10,000 jobs directly and another 20,000 jobs indirectly for a total of 30,000 potential jobs lost....If the Toronto New Media cluster cannot grow in a sustainable manner, it is unlikely that Canada can participate fully in e-business and other digital activity, to its own advantage (PriceWaterhouseCoopers 2000:1).

However, the authors of the report underestimated the population sizes of all the other comparison regions they used in the analysis (presumably because they used figures for the central portion of these regions, not the entire region). New York City's regional population is more than 19 million according to the latest Census data (not 15 million as used in the report). San Francisco and Vancouver regional populations are also much larger than the numbers used, but for Toronto the report quotes the full GTA figure of 4.5 million.

Strengths and weaknesses of the industry in Toronto

It is difficult to predict the impact of the market downturn on the Toronto cluster. However, it has a number of strengths that have encouraged its growth and expansion.

Productivity

The cluster is characterized by high productivity: the Toronto *New Media Works* report notes that new media falls within the productivity benchmark range for high-tech industries of \$100,000 to \$150,000 in revenue per employee (at \$110,000 per employee) (PriceWaterhouseCoopers 2000: 13). The multimedia industry in Toronto has rates of growth approximating global rates for the industry, which are running at 20-25% and has an estimated total output of \$1 billion (14). The two consultants' reports released in 2000 note that the development of e-commerce presents a growth opportunity for the industry and expect that higher rates can be achieved in the next few years (PriceWaterhouseCoopers 2000; AC Neilson-DJC Research 2000).

Demand conditions

Multimedia firms have agglomerated in Toronto partly because the headquarters of Canada's major national and multinational corporations are located in the city, Canada's largest metropolitan area. The growth of the multimedia industry is largely a function of the demand for new media products from locally headquartered national and international corporations (Brail

1998: 93). The advertising, banking, financial services and corporate management industries are key multimedia clients. Approximately 60% of Toronto firms surveyed gear more than half of their work to the corporate sector (90), a figure which is confirmed by AC Nielsen (2000: xii); and the Multimediator Strategy Group reports that over 90% of firms surveyed indicate that their market is "corporate" and "business-to-business" (MMSG 1999: 16).

Education

Both the academic and consultants' studies praise the quality of Toronto's labour force, which in turn is a consequence of the concentration of universities and colleges in the GTA. There are three major universities in the region: the University of Toronto, Ryerson Polytechnic University, and York University, and seven colleges. There are 19 universities, and 25 colleges, in Ontario. In Ontario, 2.8 million people, or 47% of the workforce, has completed post-secondary education. Graduates have both technical and artistic skills; there were more than 5,000 IT & T graduates in 1999, but also potential employees with creative and general skills which are regarded as particularly important for new media production. In the new media area, the skill levels in animation and graphics can be attributed to Sheridan College's animation program, which began in 1968 and is now the third-largest classical and computer animation school in the world (Deloitte and Touche 1999).

In addition, recent government and private sector initiatives have provided further funding for training programs in computer science and new media. At Centennial College, the provincial government, along with Bell Canada, AliasWavefront, and Sony, have invested \$36 million in the Bell Centre for Creative Communications. In 1997, the province committed \$150

million over three years to increase the number of computer science graduates to 17,000 by the year 2000; Nortel also committed to this fund. In addition, at the initiation of Smart Toronto, a number of colleges involved in new media training, including Centennial, Sheridan, Seneca, and Ryerson Polytechnic University, have formed the Toronto New Media Trainers' Alliance, which was formed to promote the city's new media training institutions and guarantee the quality of the training they provide. Recently, the Knowledge Media Design Institute at the University of Toronto, Ryerson, Sheridan College, and the Canadian Film Centre proposed the creation of a Canadian research institute focusing on digital media, and organized a lecture series to explore and publicize research in the area and foster discussion on the form of the proposed institute. The series was sponsored by the provincial government and private sector. The Digital Media Institute is currently exploring funding and organizational options in the hope of launching a formal Institute in the future.

Although there is a good supply of high-skilled labour, thanks to the presence of higher-education institutions with training programs in multimedia-related fields, there are shortages of senior personnel and highly skilled programmers (Brail 1998: 70). However, respondents to the AC Nielsen survey described finding personnel as "a challenge rather than a crisis" (2000: xii).

Infrastructure

Both Deloitte and Touche (1999) and PriceWaterhouseCoopers (2000) identify the quality of the region's technological infrastructure as a contributing factor in the strength and maintenance of the cluster. The GTA has one of the most fibre-rich environments in the world. It

also has eight major wireline and wireless service providers; low telecommunications costs; and high rates of technology adoption (Deloitte and Touche 1999).

Infrastructure has largely been provided as a result of federal government initiatives. The Canadian government's investment in a "Connected Canada" through Industry Canada has been identified as a source of competitive advantage (Deloitte and Touche 1999). The first Internet backbone in Canada was established in 1990 with the support of the National Research Council, and has been updated several times by the Canadian Network for the Advancement of Research, Industry and Education (CANARIE) which recently launched the world's first national optical internet network, CA*net 3. Industry Canada has provided \$55 million for the network's development, and additional funds have been provided the Bell Canada consortium. CANARIE has also made \$8 million in funding available over the next three years for research on high-speed Internet applications, network and wireless access, network services and technology projects through the Advanced Network Applications, Services and Technologies (ANAST) program (CANARIE 2000).

However, it should be noted that CANARIE is a research network, and that because this level of capacity is not yet available to businesses such as new media firms, it is not having a direct impact on commercial activity. The government's role in connecting Canadians to the Internet has probably had a more significant impact on the fortunes of new media. In 1998, proportionately more Canadians accessed the Internet than Americans (BCG 2000: 15). Canada was the first country to connect its public schools and libraries to the Internet via the SchoolNet and LibraryNet programs. Since 1994 the Community Access Program has established affordable public Internet sites in 4000 rural communities and is expanding to 5000 urban sites

(Latta 2000); The Voluntary Sector Network Support Program (VolNet) will also offer connectivity, equipment, and skills development to 10,000 voluntary organizations by the year 2001 (Distaler 2000).

The cultural sector and the general policy environment

The multimedia cluster has multiple links to the cultural industries also concentrated in Toronto. Toronto is the third largest film production centre in North America, and the second largest television production centre (Brail 1998: 42). The concentration of cultural industries in Toronto has contributed to multimedia development in three ways: first, it has provided a training-ground for multimedia entrepreneurs and employees, many of whom have previously been employed in the cultural sector; second, this sector provides much of the content for multimedia production; and third, it is a major client for the industry.

The development of the cultural industries has been facilitated in part by federal and provincial government policies which supported the cultural industries, including magazine and book publishing, feature film production, and television. In the 1930s, both the Canadian Broadcasting Commission (CBC) and the National Film Board (NFB) were established. In 1968, the Canadian Radio-Television and Telecommunications Commission was founded to regulate both private and public broadcasting. It developed regulations specifying Canadian content requirements for radio and television broadcasting which have been crucial for the development of Canadian content production (Audley 1983). Thirty-five per cent of the popular music broadcast on Canadian radio stations must be Canadian, and at least 60% of the programming broadcast by private television licensees must also be Canadian (CRTC 1999). In the 1980s, the

CRTC mandated increased Canadian programming in “underrepresented” categories (ACCISS 1994: 69). Film production has been supported by government-sponsored investment programs, and tax rebates on private investment. The book and magazine publishing industry has been supported by: special postage rates for Canadian magazines; Income Tax Act credits for advertising in Canadian publications; and grants from the Ontario Publishing Centre, Ontario Arts Council, and the Canada Council (ACCISS 1994).

However, Canadian cultural industries still face a number of problems which inhibit their capacity to compete globally. The Canadian domestic market is small, and is dominated by US-based conglomerates with integrated production and supply networks (ACCISS 1994: 12). Audley argues that the production industry’s success is limited by the absence of an effective distribution industry (1983: 249). Another problem facing the television production industry is the lack of advertising revenue. Canadian spending on television advertising, in dollars per capita, is much lower than either Australia or the US, because US corporations can advertise their products on US networks broadcasting in Canada. Also, the domestic market is limited, and it is difficult to obtain access to foreign markets. Independent Canadian producers only recoup 30% of their costs in Canada (289).

The importance of the cultural industries, and of public policy in sustaining them, has tended to be overlooked in consultants' analyses.

Responses to globalization - new media and government policy

As governments and trade associations have become more aware of the importance of location in sustaining competitive advantage in a global market, they have begun to implement policies to encourage associative action. The Canadian federal and provincial governments have also employed policies specifically designed to encourage the development of new media.

New media policies

In 1996, Telefilm Canada introduced a pilot program to provide venture capital for multimedia production along with other cultural industries (Brail, 1998: 137). Since 1998, Telefilm Canada has administered a \$30 million fund to support multimedia production, especially by small and medium-sized enterprises (Telefilm Canada 2000). As a condition of the CRTC's decision to permit competition in cable, the CRTC mandated that Canadian telecommunications companies contribute to funds for broadcast and new media production. Since 1996, the Bell Broadcast and New Media Fund has invested \$7 million in 43 projects to promote partnerships between television and new media producers in Ontario and Québec (BBNMF 1999: 1). However, a recent study has noted that "on a per project basis, the sums involved [from the various production funds] appear to be relatively small" (PWC 2000: 40).

At the provincial level, the Ontario government has tried to encourage innovative behaviour through the provision of electronic infrastructure and tax incentives, as well as through the funding of programs specifically intended to foster the multimedia industry. An Ontario government report argued that "[d]igital technology will both drive and enable much of the

innovation that will take place in creating new products, services and processes and new ways of doing business" (OJIB 1999: Section II, 3). Since the release of the report, the Ontario government has implemented several measures intended to foster innovation in the region, including policies specifically targeted at new media. In order to encourage personal incentives for innovation the government introduced a personal tax exemption on the first \$100,000 in benefits that employees earn from stock options and capital gains in the 2000 Budget (Government of Ontario, 2000: 1). This policy complies with recommendations for the introduction of a limited capital gains exemption in order to encourage the development of e-commerce in Canada (BCG 2000: 8). The multimedia industry also benefits from two tax credits: the Ontario Computer Animation and Special Effects (OCASE) and the Interactive Digital Media Tax Credit (OIDMTC) provide credits on labour expenditures in Ontario (OFDC :1).

As a part of the \$20 billion SuperBuild Growth Fund infrastructure, the Ontario Ministry of Energy, Science and Technology (MEST) will spend \$82 million over five years to link 50 "connected communities" electronically (MEST 2000). Targetting funding more directly to multimedia, MEST established a \$10 million Interactive Digital Media (IDM) Small Business Growth Fund in 1998; six projects received \$6 million in funding commencing in the year 2000. The Ministry is currently in the process of allocating the remaining funds. Some of these projects received finance jointly with the Telecommunications Access Partnership (TAP) (MEST 2000). MEST is also providing \$2 million over three years for a program encouraging women's participation in the Information Technology sector (2000), and \$1 million to the creation of a digital media centre in downtown Toronto, which will act as a hub for digital media firms and

will provide services such as human resources and training, information sharing, partnership development and access to capital (MEST 2000: 1).

Digital media is a key focus area for Communications and Information Technology Ontario (CITO), a provincial Centre of Excellence. CITO funds the development of multimedia tools including: improved rendering and animation in computer graphics; multimedia interaction and authoring tools, and human/computer interaction (CITO 2001). CITO is currently sponsoring a collaborative project at an Ontario university for the development of animation rendering and video formatting tools. The Ministry of Energy, Science and Technology is sponsoring a related project which will showcase these tools in an international environment under the Ontario/Baden-Württemberg collaborative agreement.

Associative action

Toronto has a number of trade associations and advocacy groups which have had an impact on new media. Action by industry associations has focused policy makers' attention on the multimedia industry; aided in the provision of technological infrastructure; and supported networking among individuals and groups connected with multimedia. Two of the associations which have had an impact on the sector in Toronto are the Interactive Multimedia Arts and Technologies Association (IMAT), a national organization which holds a significant Toronto membership; and SMART Toronto, the city's advocacy group for the high-technology sector. IMAT produces a newsletter and holds regular meetings (Brail 1998; Brail and Gertler 1999). SMART Toronto sponsored both the Deloitte and Touche report on IT & T in Toronto, and led

the *Toronto New Media Works* initiative which co-ordinated the most recent cluster study. It has also acted on the report's recommendations for the creation of an icon to identify Toronto as a new media centre by co-ordinating the Liberty Village Enterprise Centre which will provide low-cost space to organizations and to small firms in order that they may showcase new products. SMART has been particularly active in lobbying for the infrastructure and services necessary for the growth of multimedia in Toronto; the extension of the CANARIE bandwidth to the city occurred as a result of the organization's efforts. Recently, SMART has shifted its emphasis from the provision of physical infrastructure to that of other goods and services, particularly venture capital and more intangible goods such as a sense of community. SMART launched other Toronto associations such as the New Media Trainers' Alliance and offers them a contact point. In order to expand the inclusiveness of the sector, SMART has launched a Women and Technology initiative which co-ordinates the efforts of a number of groups working to encourage women to enter technology-related careers (SMART 2000).

It should be noted that both IMAT and SMART initially received government funding. IMAT and SMART Toronto both received funding from the Cultural Strategic Development Fund. However, this fund was created to compensate partially for the cuts to arts funding (Brail 1998: 139). Given that the multimedia sector depends on the existence of a vibrant arts community, however, targeting funding specifically to multimedia ventures while reducing overall funding to the arts may not result in the desired outcome.

CONCLUSION

The rise of the Internet industry has transformed the conditions under which firms compete. Although the Internet enables transactions to take place over distances, the development of the Internet industry itself has been dependent on networking, local knowledge, and regionally-specific competitive advantages.

The new media industry, as a segment of the Internet industry, has been bolstered by its expansion. New media firms in a number of locations have grown, merged with other firms, and established a global presence. The Toronto new media cluster has been affected by the dramatic changes in the Internet industry and concomitant globalization. Increased market opportunities and capital availability have led both to the development of new start-ups and the development of a select number of firms which have increased in size and expanded into global markets.

It is difficult to determine what effect the recent downturn in the high-tech market will have on new media in Toronto. Although the industry is increasingly exposed to the global marketplace, a dearth of venture and other forms of capital at the industry's inception forced Toronto firms to develop by building their sales base rather than relying on external financing. Toronto may therefore be comparatively sheltered from the vagaries of the market. The cluster also has a number of strengths which facilitated its growth and development: a skilled labour force; a strong customer base; a highly connected population; and the presence of the cultural industries. There are also a number of trade associations in the cluster, which have launched a number of initiatives to foster sectoral growth, are increasingly aware of the need to encourage

collaboration among firms in the sector, and which have drawn policy makers' attention to the importance of the industry.

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¹ Dedicated multimedia companies are those for which revenues are derived solely from multimedia; approximately one third (34%) of companies.

² Softbank funded a Canadian firm that provided online digital photos (find name) and required the firms' relocation as a condition of funding.