CONCERT

CONVERGING CONTENT SERVICES AND PLATFORMS

Appendix 1

Regional Innovation Profile

Prepared by:

Nordicity

for:

CONCERT

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1 Executive Summary

CONCERT's Vision and Goals call for the Toronto Region to become a global leader in research, development and commercialization in the entertainment and creative industries. It focuses on the R&D and innovation that drives what goes onto the screen and on how it gets there.

This report assesses R&D and innovation and commercialization in the Greater Toronto Region's screen-based industries (film, TV, games, mobile content, and other interactive media content). It also assess innovation within these industries that contributes to – or enables – what goes on the screen (design and the arts) and how the content gets to the screen (ICT – primarily software and hardware).

In following the format for a Regional Innovation Profile, this report sets to situate the GTA in the present context – who we are – and evaluates the sector via appropriate regional innovation indicators (e.g. quality of labour, access to R&D, critical mass, etc.). The report examines the strengths and weaknesses of the region and its four main sectors – film/TV/broadcasting, ICT, design, and media arts. To the extent that there is comparable data or insight, the GTA is benchmarked against other regions in Canada and abroad to provide a competitive assessment of the GTA in this sector.

Based on the innovation analysis, we derive conclusions as to what opportunities appear to exist in the region (i.e. what can we become as a region). Our next step is to explore these opportunities further, to understand how the GTA stacks up against other jurisdictions and whether it can compete to pursue these opportunities. Following a further exploration of opportunities, we will seek to identify gaps which exist in the GTA and which may prevent the region from fully taking advantage of the opportunities identified. Identifying these gaps will then enable us to develop initiatives and a long-term strategy which can improve the capacity of industry and research institutions to innovate and contribute to high economic growth in the region.

This report begins with a discussion about the scope of the sector, commencing with a geographic question about the interaction of the GTA and other geographic areas – most notably those in Ontario. This is followed by a discussion of the scope of the sector and the definition of "screen-based" as the key identifier of this sector. Since the innovation profile touches on the sector's full value chain, we make a key distinction between the "adopter" segments (i.e. the markets), and the "enablers" (i.e. the tools and products) that provide the basis through which the creative sector develops unique products for exhibition on one or more of the screen-based channels.

In section 4 we discuss the concepts of innovation, commercialization, and R&D. Since screen-based industries do not engage in classic R&D activities, we feel it is useful to define innovative activities and determine what parts of the screen-based value chain harbour R&D-intensive activities.

Section 5 evaluates the four sectors identified above according to innovation indicators, position the GTA in terms of the Film, TV and Broadcasting, ICT, design and arts sectors. These evaluations will provide the groundwork for the examination of specific areas of opportunity. Such areas will be addressed in a later report. We then conclude the current study by expanding on the conclusions outlined immediately below.

1.1 Conclusions

The Regional Innovation Profile covers a wide path in the screen-based sector, and across the full value chain including component/products/systems R&D that leads to products being developed for applications for the screen-based sector; the creation of intellectual property through creative producer functions across multiple platforms in traditional and new media; and their distribution and exhibition for consumer or industrial consumption.

The GTA demonstrates broad strengths in the creative industries in both traditional and emerging areas. It is Canada's leader in English film and television production. New media firms are developing a significant presence. A vibrant arts community and leading academic institutions in art and design provide a rich climate in which creative industries should flourish. However, while the GTA is rich in resources across the screen-based industries and their enabler industries, this breadth does not appear to be matched by internationally recognized depth in any particular area. There are areas for which R&D, institutional and industry support are very thin, but most of these areas contain some elements upon which one could build. There is evidence that the GTA may have slipped a bit compared to past performance in some areas, but it has recently experience a renewal in the form of the birth of new firms and pockets of expertise. In this vein, we have categorized industries and areas of activity based on key findings from the Regional Innovation Profile:

- Thin support, but growing importance: Design and the arts;
- Former glory, but threatened by competition: Animation and digital visual effects;
- **Buzz-generating and reputation building:** RIM, Toronto International Film Festival, Emmy award-winning cross-,media providers (Xenophile, Marblemedia); IMAX;

- **Strong and unique research capacity:** Vision research, digital cinema lab, among other areas;
- **Early inklings of potential success:** Mobile content and applications, some forms of games, including serious;
- **Areas of solid standing:** Visualization (industry and academic);
- Bedrock of current and future R&D and innovation: Software.

As we move forward with strategy development, these categorizations should be front-of-mind in determining the best approaches to build on existing strengths, seize opportunities, and fill gaps hindering the region.

Also, it should be noted that a great strength of the GTA is its proximity to and links with other Ontario jurisdictions, such as the Kitchener-Waterloo region in Southern Ontario. The leadership exhibited in the screen-based and enabling sectors outside of the GTA can also serve to enhance the GTA's existing strengths, if appropriate inter-linkages are pursued within CONCERT's strategic development.

As befitting a RIP, this report looks forward by suggesting several areas for further exploration. The fact that there are a number of them is a demonstration of the broad potential for the region. The fact that there is no obvious very short list is also indicative of the general strengths of the GTA in this sector. The growing convergence of the screen-based sector makes it an opportune time to initiate discussions to position the region around a few of these potential areas, and grow them through appropriate investment and collaboration.

2 Introduction

2.1 CONCERT

CONCERT's Vision and Goals call for the Greater Toronto Area to become a global leader in research, development and commercialization in the entertainment and creative industries. It focuses on R&D and innovation that drives what goes onto the screen and how it gets there.

This Regional Innovation Profile report is intended to provide an assessment of the region and the relevant industries to which CONCERT assesses R&D, innovation and commercialization in the Greater Toronto Area's screen-based industries (film, TV, games, mobile content, and other interactive media content), as well as in the industries that contribute to – or enable – what goes on the screen (design, and the arts), and how this content gets there (ICT – primarily software and hardware). It examines:

- the ability of several key industries to drive R&D as well as conduct R&D;
- the areas of strength within these industries in the region;
- the areas of research and estimated areas of strength found within CONCERT partner academic institutions in the GTA.

This report is not a definitive recommendation for areas of specialization. It is a step toward defining the areas of specialization CONCERT might explore within its strategy, as well as some of the surrounding factors that may hinder or encourage these areas of specialization to thrive within the GTA.

2.2 The Analytical Framework

The analytical framework for the CONCERT project is as follows. Note that this report addresses points 1 – 7.

Who are we? -- Regional Innovation Indicator Assessment

1. What are the areas of industry strength in creative and culture sectors that make up CONCERT?
    a. Criteria for evaluation.

2. What are the areas of academic strength in the cultural and creative industries?
    a. Criteria for evaluation.

3. What areas fall into the nexus between technology and the creative industries?

4. What are the factors affecting development in these sectors?

a. Market forces
b. Government policy and regulation
c. Availability of Financing

5. How does Greater Toronto stack up against international competitors?

6. What is the scope of CONCERT? What is the linking factor(s)?

What can we become?

7. What opportunities exist?
    a. What criteria were used to identify opportunities?

What do we need to do to get there?

8. What steps are necessary to become a recognized Centre of Excellence?
    a. Do we have or can we create the capacity to exploit opportunities?
    b. Does the government and policy environment facilitate realization of the CONCERT vision?
    c. Are we making the right investments in research and development?
    d. How do we promote collaboration and networks in the creative and cultural industries?

What will be the impacts of success?

9. Expansion and retention of existing businesses.
10. New business formation.
11. Employment
12. Increased commercialization of knowledge generated in the region within the region.

3 The Scope of CONCERT

In this section we address the scope issue for CONCERT, beginning with the geographical context. We identify the screen-based sector as the industry focus for CONCERT, and further categorize related industries and academic disciplines into market segments and enablers for achieving innovation.

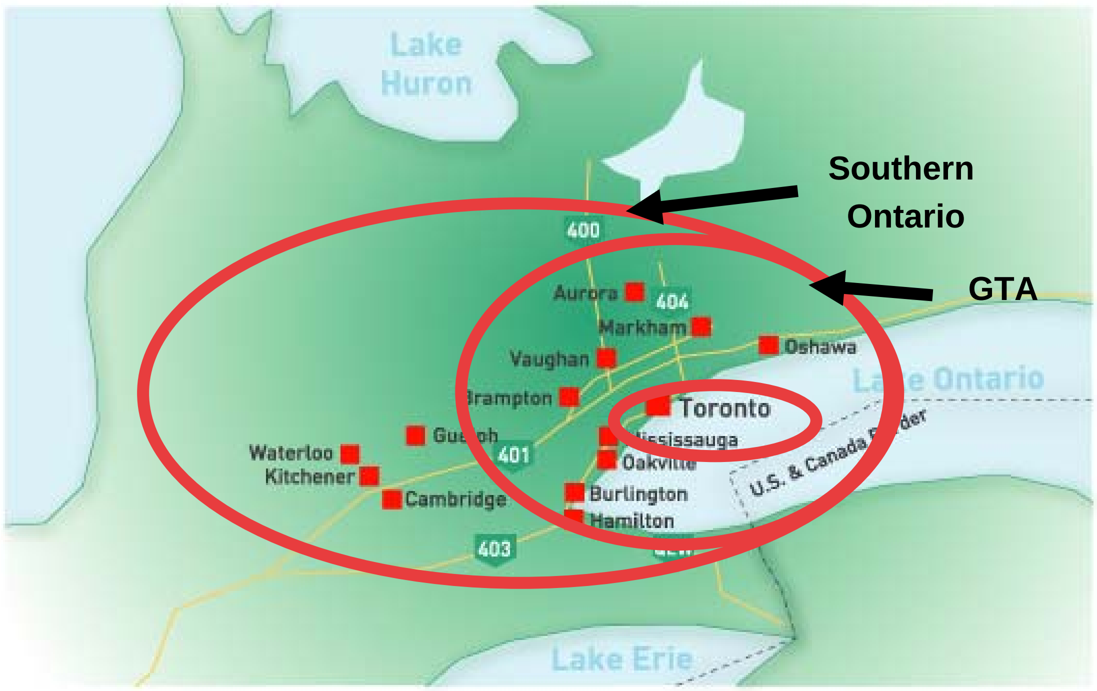
3.1 The Region

The GTA, consisting of Halton, Peel, York, Durham and the City of Toronto, has the third-largest ICT cluster in North America, the largest level of film and television activity in Canada, and the third-highest number of design professionals in North America.

The GTA is home to 19 academic institutions, seven of which are CONCERT partners that demonstrate great strengths in the creative industries.

Linkages to resources in other regions (e.g. Kitchener-Waterloo, the Niagara region, and Ottawa) may develop. In fact, collaboration with other parts of Canada and foreign institutions would also be explored and leveraged as the GTA's screen-based industries build their capacity and expertise.

Figure 1 – Map of the GTA



3.2 The Screen-based Industries Focus

CONCERT focuses on the screen-based and enabling industries, which are sectors within the overall creative industries (see Figure 2, page 12). These sectors include:

- Film, television and broadcasting – including production, distribution, and exhibition;
- Interactive media – including games, mobile content and applications, and other interactive content, including e-learning, and Web 3.0.

The screen-based industries represent a critical focus for the Greater Toronto Area for a number of reasons:

- Screen-based industries are, in Canada, among the largest media industries (television, film, games, and the emerging mobile content services). They represent a significant market opportunity and a source of anticipated economic impact for the GTA;
- They are industries driven by technological advances and innovation, and thus represent a significant opportunity for innovation and R&D activities;

- There is a high level of convergence in the screen-based sector, and innovation and R&D can feed into these industries. Thus, R&D and innovation can be exploited across all these sectors, which would be a better investment for the Toronto Region than a focus on R&D in one sub-sector only. (For example, animation developed for TV productions now finds its way into the games sector.)

The screen-based industries provide the industry-led focus for CONCERT activities. Screen-based producers can be R&D performers (for example, interactive media companies undertake R&D activities for which they receive R&D tax credits). Screen-based industries can also innovate through the use of existing technologies. Primarily, however, screen-based industries are *adopters* of new innovations. From this assessment, we developed an understanding that the real R&D was undertaken by industries or disciplines related to the screen-based industries.

ICT, design, and other industries create new products, processes, and systems which are used by the screen-based industries. They are *enablers*; they undertake R&D and innovate, generating products that can be used by screen-based industries to enable them to, for example, engage in new modes of content delivery. The key enablers we have identified are:

- Drivers of the user-experience on and off the screen:
    - Design: primarily industrial design (focusing on consumer electronics for example), graphic design, and interactive media design;
    - Arts: primarily visual arts and new media arts.
- Drivers of how the content gets on the screen:
    - ICT: software and software

3.2.1 Focus vs. Scope

According to a definition of the creative industries recently undertaken on behalf of the Department for Media, Culture and Sport in the UK[1][2], the screen-based industries are sub-sectors of the creative industries overall. Figure 2 demonstrates in bold the creative industries included as the focus of CONCERT – that is, the industries which represent

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[1] Work Foundation (2007) *Staying Ahead: The Economic Performance of the UK's Creative Industries*

[2] The UK has recently embarked on a large study of the creative industries, and spent significant time defining these industries – therefore, we believe this is a good categorization to explain CONCERT. Note that as the UK paper began to define software as a creative industry while in Canada software is typically identified as a part of the ICT sector, we separated ICT within these industries. An explanation of how ICT is categorized and relevant to CONCERT follows in the next section.

CONCERT's primary concern. In non-bold, the figure demonstrates the rest of the creative industries which are within the scope of CONCERT, but are not its focus. Within scope are the industries that CONCERT could consider over time as relevant or of potential future focus should there emerge evidence that these industries fit within the rationale cited in Section 3.2 – that is, they are high-R&D and offer significant market opportunity and a high level of convergence.

In order to clarify why some creative industries are not in scope, and hence not covered in the RIP, the following chart outlines what sub-sectors in the creative industries are in focus (red-circled) and which are only in scope (plain text).

- **Figure 2 – Identification of Scope vs. Focus CONCERT Industries**

CONCERT industries: **Arts**, **Design**, **Film and tv**, **Interactive media**

Creative Industries Taxonomy	Industries in Scope, Not in Focus
Advertising	**Advertising** encompasses areas of R&D already covered within industries of focus – e.g, the R&D found in tv advertising production is included in film and tv production; online advertising within 'interactive media'
Architecture	**Architecture**: Architecture, landscape architecture and interior design – possibly through interactive design tools, such as Computer Aided Design;
Arts	
Antiques and crafts	**Antiques and crafts**: there is no R&D relevant to the screen-based industries. Some crafts, such as jewellery in wearable computing, may over time be areas of focus
Design	
Designer fashion	**Designer fashion**: Currently there is little convergence and market opportunity to share with the screen-based industries. Over time, areas such as new garment technologies could emerge as R&D enablers in new ways.
Film and tv	
Interactive media	
Music and Radio	**Music and Radio** : R&D will be captured within the industries of market opportunity, such as film, video, broadcasting and/or interactive media (e.g. games) Initial environmental scans did not return any evidence of significant R&D in the GTA.
Performing arts	**Performing arts**: There may be pockets of R&D relevant, such as stage technologies adapted to a film set, but the level of R&D is low, and convergence level is low.
Publishing	**Publishing:** low R&D, and where there is R&D, it is in line with R&D in interactive media (e.g., web publishing)

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3.2.2 Categorization of the CONCERT Industries

Note that throughout the document we progress our categorization of industry segments (i.e. the adopters of new products, processes, and systems, and enabler industries which create the tools and practices used by the screen-based sector). We also recognize that many academic disciplines can be relevant to the screen-based industry, and that many disciplines can be mapped based on the following categorizations.

In sections 4 and 5 we examine both the industry and the academic institutions and their strengths and weaknesses in line with four key industries:

- Film and television production and broadcasting
- ICT (including digital media)
- Design
- Arts

We have used this categorization because it is aligned with available economic data sets. However, when we outline potential opportunities, we move more toward the converged world of screen-based industries. We are trying to move away from 'industry silos' and to work towards converged areas of opportunity for the region. Thus, in section 6 we examine the industries of opportunity (e.g., mobile wireless content, games) and some of the key enabler areas that draw from the sectors identified above, in particular ITC and design.

Beginning with the Regional Innovation Indicators assessment - and also with the academic research institution assessment - we utilize the following categorization:

(i) Film and Television – Innovation/R&D Adopter

The key sub-sectors of the film and TV industries are production and production services; broadcasting; and distribution/exhibition. Note that production services include animation and visual effects services – using these tools and applying them to TV and film production. The software and hardware tools themselves would fall under the broad ICT classification. Depending on the nature of the production, such services can comprise a large portion of the production budget of an individual production. Science fiction television series like the Vancouver-shot Battlestar Gallactica, for example, will tend to have larger animation and visual effects budgets. For lifestyle, documentary, and reality genres, on the other hand, such expenditures tend to be minimal.

(ii) ICT – Innovation/R&D Adopter and Enabler

The other screen-based entertainment industries fall within the ICT sector. The ICT sector has been categorized in any number of ways (see Appendix B). For the purposes of the Regional Innovation Profile we put forward the following categorization:[3]

- **Interactive digital media – screen-based industry and CONCERT: adopter**: Interactive digital media is a key screen-based industry which drives and adopts R&D and innovation from a number of different sectors, including software, hardware, and design. The key areas of interactive digital media within this profile are:
    - Mobile and wireless content and applications;
    - Games (which can be played on consoles, mobile devices, or PCs);
    - Other online interactive content (e.g. social networking, Web 3.0 e-learning, etc).
- **Electronics hardware: enabler**: including nanotechnologies, audio and video equipment, semi-conductors and components, consumer ICT electronics such as mobile phones;
- **Software: enabler**: software developed for applications (e.g. mobile wireless applications) or content (e.g. animation or visualization software), or systems such as content management systems and communication networks.

(iii) Design - Enabler

Certain sub-sectors of the design industry are within the focus of CONCERT as they are key enablers and drivers of R&D within the screen-based entertainment industries. These include:

- Graphic design (e.g. web publishing);
- Interactive media design (including graphic design, but also user-experience design, including for content, games, animation, etc.);
- Industrial design, primarily device and systems manufacturing for screen-based industries (e.g. navigational tools).

[3] Note that this categorization is imperfect, as there is significant overlap in the value chains, e.g., a certain amount of software development goes into manufacturing chips, which are included under electronics. Software also feeds into the development of interactive content. Interactive content is mobile content. However, according to the ICT sector analysts we consulted (e.g. the TRRA), we understand most ICT categorizations to be imperfect for the purposes of analysis and accuracy.

Further to our discussion of R&D vs. innovation in Section 3, these areas are not always seen as 'true R&D' in the SR&ED sense of the term. However, innovation and research within the design sector fuels much of the innovation in the development of techniques used in and imagery found in the screen-based industries. For example, user-interface design contributes aesthetically to the development of online interactive content, and user-experience design is increasingly a critical component of how a web tool or application is developed to ensure the user's experience is optimal.

(iv) The Arts - Enabler

The arts, as an industry, are critical to the development of a creative class on which the screen-based industries depend. 'Arts for arts' sake' can lead to innovations that are later adopted by industry - arts for revenue's sake - such as design (e.g. a new visual technique created by an artist can be adopted into a website) or the wireless sector (e.g., a new wireless application). While the visual arts will logically be the most critical to the screen-based sectors, the intersection of art and technology can feed into R&D in the screen-based sectors in a number of different ways. These arts are typically termed 'new media arts'.
Therefore in focus for CONCERT are:

- Visual arts;
- New media arts (art + technology).

Academic Disciplines

Note that the academic disciplines that the Regional Innovation Profile addresses are in essence mapped to the categorization we have demonstrated above (e.g., film and TV, ICT (computer and electrical engineering, interactive media, etc.), design and the arts).

Over time, as we work toward identifying the converged areas of opportunity, we may seek to re-categorize the academic areas of interest.

Figure 3: The CONCERT Ecology

ADOPTERS	ENABLERS	ACADEMIC DISCIPLINES
ICT – Interactive Media Games Mobile Content Online Interactive Content	**ICT – Software** Animation Software Visual Effects Software Visualization Software Middleware	**Science (Applied)** Computer Science Mathematics Physics Electrical Engineering Perception
Film and Television Animation Production Digital Cinema and TV	**ICT – Interactive Media** Games Mobile Content Online Interactive Content	**Arts and Culture** Performing Arts Visual Arts Critical Theory
	Arts and Design Graphic Design Interactive media design User Experience Design Industrial Design Visual techniques	**Practice** Advertising and Comm's Business and Finance Design Film and TV Production

4 Defining Innovation and R&D

In this section we discuss the concept of innovation in terms of the screen-based industries, including the limitations of "R&D" as an indicator of activity leading to economic development. We first describe how innovation, commercialization, and R&D are defined in the literature. We then proceed to discuss how these terms can be applied to the creative industries.

4.1 Innovation and Commercialization

Innovation

Innovation is a broader concept than R&D. It is a process through which economic or social value is extracted from knowledge – through the creation, diffusion and transformation of ideas – to produce new or significantly improved products and processes. Innovation can rely on new technology or on existing technology - the knowledge used does not necessarily need to be new.

At one level, "innovation" has been closely associated with science and technology activities. As per the OECD's Frascati Manual definition, "technological innovation may be considered as the transformation of an idea into a new or improved product introduced on the market, into a new or improved operational process used in industry and commerce, or into a new approach to a social service." [4]

Innovation can be product or process, and "therefore involve a series of scientific, technological, organizational, financial and commercial activities." The Manual goes on to observe that "R&D is only one of these activities and may be carried out at different phases of the innovation process."

Commercialization

Commercialization typically refers to the end of the innovation cycle, where an idea (although not necessarily a new technology) is translated into commercial success. While there are many variations, the process can be described as four steps in the innovation cycle (i.e. building a business around an innovative idea[5]):

- Idea generation
- Technical proof of concept

[4] Frascati Manual, OECD

[5] Frascati Manual, OECD

- Develop pre-commercialization prototype
- Commercialization (implementation of commercialization and marketing plan)

The Ontario Ministry of Research and Innovation succinctly encapsulates the concept of commercialization as “the process of moving innovative ideas and technologies from idea to sale as a product or service.” The key point is that commercialization can result from innovative ideas, but is not necessarily related to or dependent on technology.

4.2 Definition of R&D

The Frascati Manual helps us here by breaking down R&D to cover three main activities:

- Basic research - experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view;
- Applied research - also original investigation undertaken in order to acquire new knowledge, but primarily directed toward a specific practical aim or objective;
- Experimental development - systematic work, drawing on existing knowledge gained from research and practical experience, that is directed to producing new materials, products and devices, and to installing new processes, systems and services;

Some of the key aspects of the R&D definition and its challenges according to the Frascati Manual are as follows:

- Social sciences are considered R&D when they involve the concept of novelty as an underlying criterion, since R&D is broadly defined as "knowledge of man, culture and society”;
- For software development projects to be considered R&D, their “completion must be dependent on the development of a scientific and/or technological advance, and the aim of the project must be resolution of a scientific and/or technological uncertainty on a systematic basis”;
- In systems software, individual projects may not be considered as R&D but their aggregation into a larger project may qualify as R&D;
- The boundaries between R&D and training are difficult to define if the research feeds into teaching; however, research for teaching purposes can qualify as R&D.

These issues are relevant to the later discussion of R&D in the creative industries with respect to activities that can be construed as being classified as R&D.

4.3 Relevance of the Definitions to the Creative Industries

Over the decades of fine-tuning the definition and measurement of R&D activities, the emphasis has been on scientific and technology activities. The original focus was on industry and its products, and therefore existing measurement approaches present major challenges to newer sectors like ICT.

The rationale for public support for R&D is that companies are focused on short-term gains and would not otherwise spend resources on R&D. There is also a view that the benefits of R&D to the public are valuable beyond the success of individual companies. However, the link to economic performance is still a matter of debate and research continues.

With respect to the creative industries, a number of countries are keen on designing the right policies for stimulating economic activity in this sector. A recent comprehensive study conducted by the Work Foundation[6] explored national policies across several countries that are aiming to stimulate the economic development of their creative industries. It found that:

- Most of the selected countries and regions have developed special policies promoting innovation in creative industries;
- Several different and interactive trends have emerged within innovation policy;
- Many national governments are developing policies and schemes to create and foster networking, creative partnerships, and collaborative strategies among different sectors and actors, and among different disciplines, as a way of stimulating innovation.

R&D, both technological and non-technological, has emerged as a key strategy in developing a strong creative sector and stimulating innovative projects. R&D schemes and funds are being set up to foster projects at the intersection between the cultural and business sectors to encourage growth in specific creative disciplines that have been deemed critical to national cultural development, or to make better use of promising technology. The majority of the initiatives in this area are directed at the creation/production phase. While specific policies for sub-sectors are present, the majority affect design, film, and gaming.

Much of what producers (TV, film, interactive/games) consider ‘R&D’ are actually innovative activities. For example:

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[6] Work Foundation, *The Knowledge Economy: How Knowledge is Reshaping the Economic Life of Nations*

- Application of new tools in new ways to create new content, applications, or services – typically with IP value, and sometimes with new software development that fits the traditional definition of R&D (e.g. new visualization techniques in game content);
- Application of concepts, tools, or technologies in an interdisciplinary or convergent way to create content/applications with IP value (e.g. new forms of narrative across interactive and linear content for content properties).

In fact, the definition of R&D is quite restrictive with respect to its application to the creative industries. A significant component of software development in digital media, I particular, the software development of enablers or the translation of games design into software programs can qualify as R&D. For the most part, however, not much of the creative activity in developing IP in the creative industries can qualify as R&D. For example, if a games firm innovates in new forms of content or new application of techniques and tools for online content, but does not create a new algorithm for a software application, the SR&ED tax credit is not applicable. The result is lack of access to publicly supported funding activities for innovative activities.

4.4 The Case of Design

This "gap" in coverage for the creative industries is most acutely felt in design research, which historically has not been able to qualify for various R&D support measures (tax credits, NSERC grants, etc.). While the Frascati Manual considers design as an essential part of the innovation process the "design" it refers to has a more traditional bent related to the innovation cycle for a typical manufactured product.

In the UK in late 2005, a commission made recommendations to improve the competitiveness of UK-based SMEs through leveraging the country's design expertise.[7] While aimed at the broader economy, it recognized that creative industries – product design, architecture, fashion, media, games, entertainment, and advertising - need good design to translate creative capabilities into world leading products and services.

The commission's recommendations included the creation of design showcases and centres to develop awareness among SMEs and the general public. It also discussed how to improve the effectiveness of government support and incentive schemes – in particular R&D tax credits. However, it limited its R&D tax credit recommendation to the

[7] The Cox Review, of Creativity in Business, December 2005, UK HM Treasury , http://www.hm-treasury.gov.uk/independent_reviews/cox_review/coxreview_index.cfm

OECD definition[8] and only advocated including product design as part of the eligible expenditures (it was deemed too impractical to identify further expenditures).

Thus, design and much of the innovative activity in the creative industries in Canada remain largely outside the R&D sphere of support programs. Slowly, the world is recognizing the value of the creative sector to the economy, and drawing linkages to economic development. However, it is early in the process, and efforts in the GTA and Ontario will require development over the next several years to bring some maturity to the acceptance of the economic development relationship. A more sophisticated understanding of the economic impact of innovation in the creative industries needs to be promoted so that it can be qualified and quantified as much as the economic impact of other industries, such as the manufacturing industry.

[8] To the OECD, R&D is "a term covering three activities: basic research, applied research, and experimental development.", http://stats.oecd.org/glossary/detail.asp?ID=3111

5 Regional Innovation Profile

This section examines the ability of the various CONCERT industries to innovate, and also seeks to document the kind of innovation that is emerging. We begin with a discussion of the methodology used in this assessment. Then, we provide an overview analysis of some key elements of a RIP, including broad socio-economic indicators, the existence of highly regarded academic and other research resources, support from the three levels of government for R&D helping the screen-based sector, and the existence of early- and medium-stage investment financing. Where possible, we have sought to identify strengths and weaknesses relative to other jurisdictions based on the limited comparative evidence available.

5.1 Research Methodology

A Regional Innovation Profile (RIP) indicates the level of innovation within particular industries in a given region. It gives a snapshot of the regional innovation system which includes primarily:

- Government and policy support structures and strategies;
- Access to financing and capital;
- Research organizations and infrastructure, primarily educational institutions;
- Innovation within business, including adoption of technologies and R&D efforts.

A Regional Innovation Profile is typically developed using a series of innovation indicators to demonstrate the level of innovation within firms and institutions.[9] For the CONCERT Regional Innovation Profile, a range of indicators was developed to ensure that levels of innovation could be evaluated. Note that as there are significant data constraints for information on innovation and R&D within the creative industries, we were unable to develop more sophisticated metrics which might more accurate measure R&D and innovation.

5.1.1 Research Undertaken and its Limitations

The Regional Innovation Profile is based on the following research:

- More than 40 interviews, with approximately 4-5 per key sector of CONCERT, and a number of policy makers and other support mechanisms, venture capital associations, trade associations, etc.;

[9] STRINNOP, Regional Innovation Profiles, 2006

- Academic scans of available funding per university and college, areas of research focus, and facilities within each institution;
- Academic consultations with CONCERT working groups;
- Extensive secondary research.
- It should be noted that there are substantial limitations in this research. First, the number of interviews is very thin in terms of covering the full range of sectors and each component of the value chain, as well as government and other supporting services. Second, the academic scans were based on the preliminary results provided by CONCERT member universities and colleges only. Third, while extensive secondary research was conducted, there are substantial data gaps in the isolation of GTA economic data, and indeed in defining the sectors very precisely. These data gaps are a universal problem and we found when researching other countries.

5.1.2 Analytical Approach

This CONCERT Regional Innovation Profile for each CONCERT sub-sector contains analysis presented through five key sections:

- **Classification of the sector:** How the sector is categorized;
- **Characteristics of the sector:** Types of companies, composition of types of companies, size of companies, etc. These characteristics are not judgements as to strengths or weaknesses, or opportunities or threats – but just the characteristics of the industry itself;
- Regional Innovation Indicators: Classified into two groupings:
    - **Inputs – or Factors affecting industry's ability to innovate**: Using a range of indicators (Regional Innovation Indicators), the Regional Innovation Profile input element examines the ability of the key industries of interest to CONCERT to innovate. The input assessment does not examine the *types* of innovation and R&D being pursued, but focuses on the ability of firms to pursue successful R&D based on a range of factors. The Regional Innovation Indicators are used to assess the inputs of the sector.
    - **Types of Outputs – Evidence of R&D and Innovation**: The Regional Innovation Profile also examines the types of R&D and innovation currently being conducted by both firms and academic institutions within the GTA. Key gaps in data exist regarding R&D being conducted in specific sectors of industry within the GTA. While we have some firm R&D data for the visual media sector overall, for example, we have little information for film, TV, design and visual arts.

- **Summary of strengths/weaknesses**: A summary of both academic and industry strengths and weaknesses in each sector in terms of R&D and innovation is captured, focussing on R&D outputs in an attempt to move us closer to the areas of specialization opportunities. However, the major caveat is that a measure of 'strong' or 'weak' by irrefutable, objective measures for industry outputs is extremely challenging in this area for a number of key reasons, including:
    - There is a lack of data in Canada regarding R&D outputs, particularly in the creative industries and at a municipal level - currently StatsCan is innovating with its measures of R&D inputs and outputs as it has not yet perfected measures, even for ICT or Biotech[10];
    - There is a lack of data at an international level – even if we had better data within Canada, or within the GTA more specifically, it would be difficult to make international comparisons.
- For these reasons, we are using a best estimate approach, based on information we can glean from data, information collection from secondary sources, and the academic scans provided to us by the institutions, including:
    - Recognition based on interviews with key industry players about what they believe Toronto is recognized for, particularly from an international perspective (from those who operate internationally);
    - Companies which have won awards or have been identified by reputable rankings, such as Deloitte's Top 50;
    - Any other evidence which recognizes firms for innovation in a certain area.
- In academic institutions we used the following evidence:
    - A higher presence of researchers and research funding in a certain research area compared to other research areas[11].

5.1.3 Regional Innovation Indicators

Nordicity developed a series of indicators which assess the level of innovation within the key industries. These indicators include (i) economic, market, and other factors that impact on the ability of firms in that sector to innovate, and (ii) indicators of R&D quality:

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[10] Note that the TRRA is tackling this question with respect to ICT and digital media, and the potential exists to collaborate with their efforts to ensure that the creative industries are captured alongside ICT.

[11] Note: Further analysis is needed to examine funding compared to other jurisdictions in Canada,. This analysis could present a more accurate view of the GTA's academic capacity and its strengths and weaknesses.

Figure 4 – Regional Innovation Indicators

Indicator	Importance
Factors Impacting Industry's Ability to Innovate	
Critical mass	A sufficient size of an industry, indicating a significant market
Sustained and growing level of business	Whether companies are profitable enough to attract investment and invest in R&D
Level of exports & foreign investment	Whether companies are internationally competitive
Existence of demanding adopters in the market	Whether the local market encourages innovation among its suppliers
Costs	If costs are low enough to compete internationally in cost of R&D
Existence of and access to highly qualified labour pool	Whether institutions are developing high-quality, appropriate, and specialized skills
Access to corporate financing	Whether firms can attract new investment for development and retain IP
Evidence of collaboration	Intra-sector, intra-institutional, cross-sector, cross-institutional
Existence of government support	Through regulation or in financially assisting firms and/or their projects
Buzz	Hype of a sector or line of products through leaders, companies/products
Evidence of R&D Quality	
Sophistication of product lines and companies	Whether companies offer the highest end products in their market
Access to high quality research*	High quality research in academic institutions

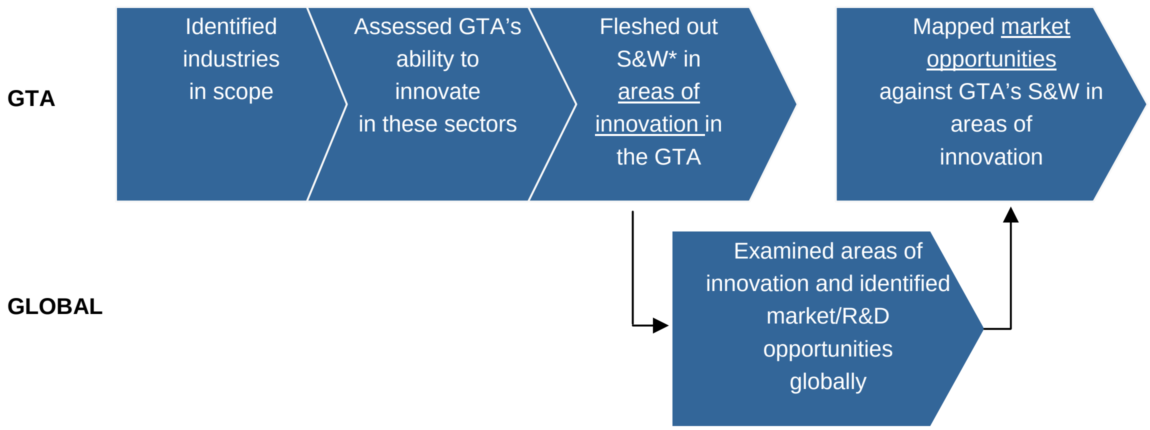
As previously noted, some indicators are more obtainable than others, and we have indicated where evidence is or is not available. For example:

- Critical mass determines whether there are sufficient firms in enough parts of the value chain to sustain a quality labour pool and sector growth. While data is available, it is not an easy process to assess whether critical mass is "sufficient".
- Buzz, on the other hand, is driven by a combination of reputation, momentum, and brand in certain industries among key opinion former circles, and among the general population. Interviewees indicate that this is an important indicator, and we have included it despite the fact that there is no established, robust, data-based methodology for measuring buzz.

Nordicity then applied these indicators to the four CONCERT sectors identified in section 2. As previously indicated, the data that does exist tends to gravitate to these "traditional silos."

In section 6, we begin to move into the convergent areas of opportunity, and more appropriately break out of these traditional breakdowns or 'silos'. Figure 5 below demonstrates the analytical process undertaken to move us from the assessment of the traditional industries using the Regional Innovation Indicators towards identifying the convergent areas of opportunity we examine in Section 6.

Figure 5: Analytical Process of the Regional Innovation Profile



5.2 Overview of the GTA

We reviewed the GTA in terms of key characteristics like workforce, business and finance, and other unique ratings like the Bohemian and multicultural indices[12].

5.2.1 GTA Ranking According to Key Characteristics

<u>Workforce</u>

Toronto has Canada's largest critical mass of a creative and ICT industry workforce, particularly in broadcasting and telecommunications[13], and electronic manufacturing. The composition of Toronto is not that different, however, from Vancouver and Montreal. This means that the GTA does not appear to have a significant advantage over its Canadian competitors in terms of workforce.

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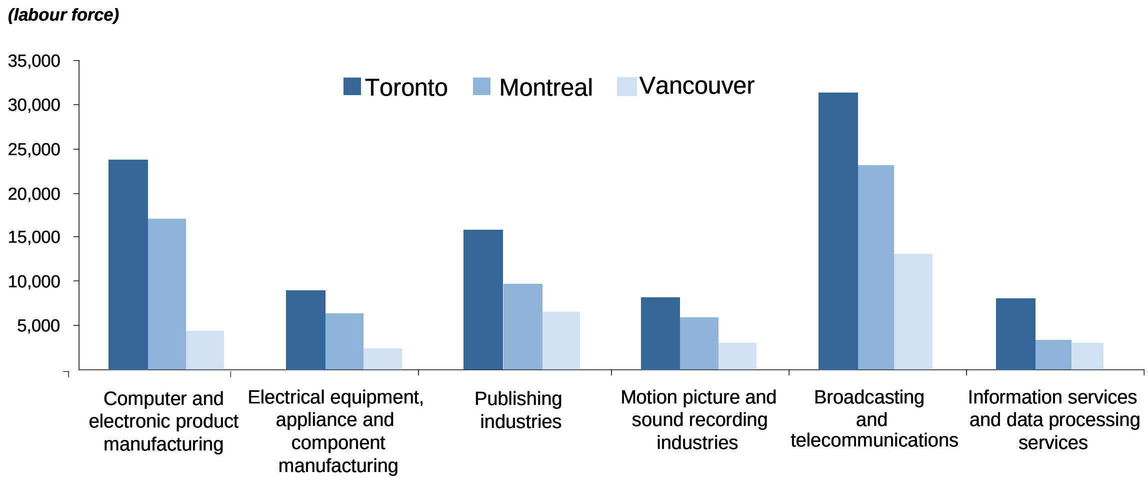
[12] Among other industries of potential interest include the concentration of architects in the GTA – see Appendix G.

[13] Note that Statistics Canada lumps broadcasting together with telecommunications.

Figure 6: - Creative and ICT Industry Employment in the GTA



Source: Statscan data, TRRA (2006)

- 4% of Toronto's (CMA) workforce is made up of employees in art, culture, recreation and sport and 8% in Natural and Applied Sciences, which includes ICT;
- It has the largest number of employees in the ICT sector in Canada, as well as the highest absolute number of employees in art, culture, recreation and sport;
- While not captured in workforce data, the GTA also has the largest advertising sector in Canada – it comprises 4,610 business establishments, approximately 1.2% of all business establishments. Montreal's advertising sector has the same proportion as the GTA of all business establishments, but the total number is lower than in the GTA. Vancouver's advertising sector is half the proportion – it only makes up 0.6% of all business establishments[14].

<u>Business and Finance</u>

- Toronto is the business and financial centre of Canada:
  - It has a higher number of Management and Financial services occupations and establishments;
  - Ontario receives the greatest share of venture capital funding within Canada (and from quarterly evidence available, Toronto receives the largest share within Ontario).

[14] Statscan Business Establishments, 2006

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Bohemian and Multicultural Indices

- In a 2002 study, Toronto ranked high in the bohemian index[15] – a key measure for creativity. According to Richard Florida, "cities [that] rank high on diversity (or multiculturalism) and tolerance tend to attract more creative people." [16]
- Toronto also ranked high on the mosaic index.

5.2.2 Academic and Research Institutions in the GTA

Key Academic Institutions

Academic institutions within the CONCERT partnership display the following strengths. This list is not comprehensive, but illustrates the types of .assets the GTA's academic institutions possess.

Figure 7 – Key Academic Institutions

Institution	Strengths and Unique Attributes
George Brown College	Strong design, including automobile Interdisciplinary *Institute without Boundaries* Game design lab
Ontario College of Art and Design	Design and the arts Increasingly active in the mobile space Good relationships with industry
Ryerson University	Film and TV – creative production talent, across platforms Rogers chairs Media accessibility technology Digital cinema lab
Seneca College of Applied Arts and Technology	Animation Open Source 3d Motion capture Strong industry collaboration
Sheridan College	Computer Animation Digital Media 3d Strong industry collaboration
University of Toronto	Breadth and depth of research Software, engineering, bio-medical including speciality in biomedical communication KMDI – forging linkages across all disciplines Richard Florida, known internationally for his take on the creative industries
York University	Visual and performing arts Media and communication critical studies Biomedical – particularly vision research

It is fully recognized that there are other academic institutions in the GTA which are not within the CONCERT partnership. While not canvassed, it is assumed that they also

15 This is a measure developed by Richard Florida to assess the number of artists, writers, and performers in a given area. His argument is that a high bohemian index will lead to increased innovation and higher value production.

16 Florida, Richard. 2002. *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*. New York: Basic Books.

have programs, research, and resources in areas supporting the screen-based industries. Private institutions range from the International Academy of Design and Technology, Canadian Film Centre, and Max the Mutt Animation School. Other Colleges include: Centennial, Humber College Institute of Technology and Advanced Learning, and Durham College.

- There are some indicators outside the academic scan that question the amount of research that is geared to the screen-based industry sector. According to the TRRA, private sector contracts for research are lower in social sciences and arts than engineering and life sciences.[17] How much of that engineering is related to the creative industries is unknown. In fact, in general little information on commercialization within the creative industries sector is available.

Other Relevant Research Establishments

There are a few key non-academic research institutions of relevance to the screen-based industries including the **Defence Research and Development Canada (DRDC)** with a facility in Toronto. DRDC Toronto is Canada's centre of excellence for human effectiveness science and technology in the defence and national security environment. It covers human-machine interaction and the influence of culture on operational effectiveness, and its activities include 3d human and computer interaction, sound and noise reduction.

There is also the **Communications Research Centre,** an agency of Industry Canada. The CRC is the primary federal research and development (R&D) facility in advanced telecommunications, including wireless and broadcasting technologies. While headquartered in Ottawa, much of the R&D in broadcasting is centred in Toronto.

Commercialization and Collaboration Issues in the Academic Institutions

Notwithstanding the range of relevant resources and research in GTA academic institutions, some issues emerged in the research that indicate potential barriers to collaboration with industry and within the academic community.

Commercialization and IP Policy and Management

- Challenges with commercialization tend to focus on IP policy and management, including:
- Academics in the CONCERT consultations did indicate that the lack of well-staffed Tech Transfer offices deterred commercialization.

[17] TRRA, Contract Research in the Toronto Region, 2006

- A TRRA survey found that 56% of Toronto Region academic institutions felt that private sector companies were worried about IP in working with the universities.

Collaboration

- The degree of collaboration between industry and academic institutions tends to be good. (e.g. the colleges in the GTA have a high level of teaching-oriented collaboration with industry through their industry Advisory Boards);
- In some industries, such as computer science and engineering, there appears to be a high level of collaboration and knowledge transfer between universities and colleges and industry; in other industries – such as film and television, and wireless – there appears to be less collaboration in research;
- The degree of collaboration between institutions, primarily between colleges and universities, remains a challenge for a number of reasons, including:
- The manner in which government funding is measured and divided per student differs from college to university;
- Colleges can implement changes and new initiatives much faster than universities. This may due to their relatively small institutional size, and can facilitate adaptation to the changing needs of industry.
- The coordination of labour force availability to industry needs, as it relates to the training and educational priorities of academic institutions is important to ensure a stable labour pool

5.2.3 Government Support – Regulation, Funding and Financing

- The mandates of the screen-based industry support are mainly project focused, with little direct support for R&D and innovative activities. As noted earlier, support for new media, games, and the operations of CBC/NFB can facilitate new innovation. Some “regulatory pull” decisions support innovation (e.g. the Bell Fund was established as part of the original acquisition of CTV by BCE).

Federal and Provincial Government Support

Based on interviews and preliminary data analysis, much of the R&D-specific support (such as NSERC, IRAP, CFI, and OCE) is mainly applicable to ICT; some of those projects enable innovation in the creative industries. Programs aimed at specific markets do exist, but not necessarily the cultural industries:

- The profile of provincial support largely mirrors this dual thrust toward cultural activity (not R&D/innovation) and more technical science and engineering research (some cultural focus). There are few tools or funding sources that emphasize particularly driving R&D within the creative and screen-based sectors.
- The key funding mechanisms relevant to CONCERT are outlined below – note that there are particularly few sources of funding for design. In each individual sector analysis, we outline the state of government funding.

Figure 8: Sources of Federal and Provincial Government Support for CONCERT Industries

	Federal	Provincial
Support for cultural industries	**Heritage Canada** **Telefilm:** Film fund, CDN New Media Fund, and Music Equity Program **Canadian Television Fund, FACTOR** **CBC, NFB** **Labour-based Tax Credits for production** **Industry Canada:** industry support & regulation of wireless telecom **CRTC:** broadcasting and telecom regs. **Canada Council for the Arts** **Museum Assistance Program (MAP)** **Movable Cultural Property Program**	**OMDC funds:** export, interactive media, film and tv production funds, and games prototyping **Labour-based Tax Credit:** cultural industries, animation/special effects **Ontario Arts Council**
Research and R&D Specific	**NSERC:** science and engineering research grants **SSHRC:** social science research grants **CFI:** research infrastructure grants **Canada Research Chairs funding** **IRAP:** Industrial Research assistance Program **SR&ED tax credits** **NCE – Networks of Centres of Excellence**	**Ontario Centres of Excellence** **Ontario Research Fund** **Regional Innovation Networks** **ORCP** (Ont Research and Commercialization Program)

Municipal support

Government support at a municipal level is critical for the CONCERT industries as well. Municipal support comes in the form of economic development and marketing support, for example from the following: Toronto Film Commission, Toronto Economic Development, Markham Economic Development, Mississauga Film Office and Economic Development.

Based in Toronto, two key government-funded initiatives are driving R&D activity in ICT as well as the biotech industry – MaRs and TRRA. A number of interviewees mentioned how MaRs was driving buzz, collaboration and communication, particularly within the ICT sector. The implication was that CONCERT should explore a continued close relationship with both MaRS and TRRA:

- TRRA: The Toronto Regional Research Alliance - based in MaRs, links with all the major universities in Southern Ontario, industry, and is Vice-Chaired by Chairman of Toronto City Summit Alliance and Luminato creator David Pecault.

- MaRs: Commercialization and Convergence Centre, ICT and Biotech: Rumoured to be the future home of creative industries academic Richard Florida.

5.2.4 Access to Venture Capital

Critical to the growth of R&D, and particularly commercialization, is the availability of financing and venture capital. The following section outlines the status of accessing financing for firms in the GTA and wider Canada.

The evidence demonstrates that access to financing for screen-based industries, and enabling industries, is as critical an issue as it is with other industries. While ICT enjoys the highest amount of venture capital in Canada relative to other industries, many interviewees in the industry still bemoaned the lack of financing available. Film, TV, and interactive media producers appear to be even more challenged in finding access to financing. CONCERT and its industries should be present at the government table along with other key industries in Canada to discuss the challenges in accessing corporate financing for Small-to-Medium Enterprises.

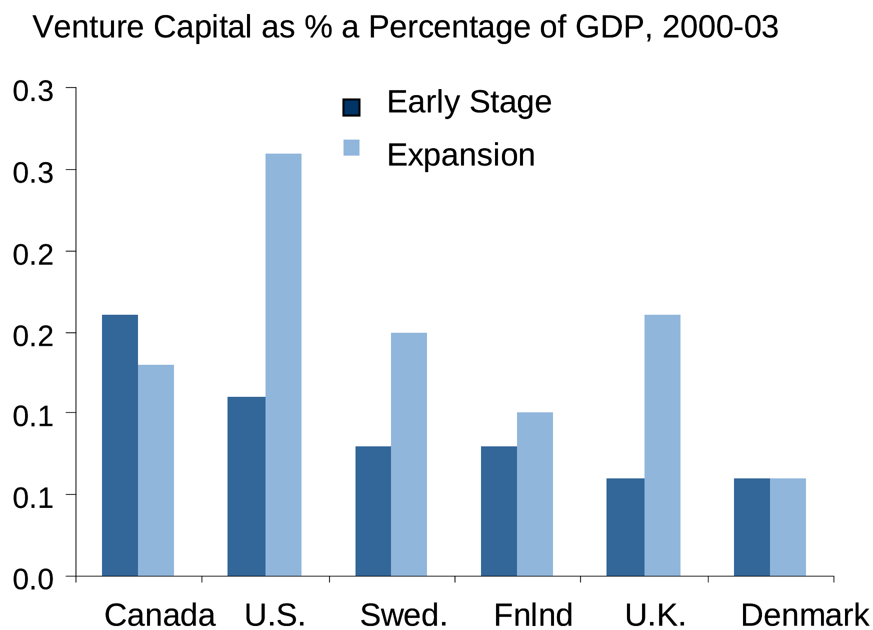
Early Stage vs. Expansion Financing

A common complaint amongst interviewees in all sectors is the lack of investment capital available for financing, particularly for expansion. Some also note that there are issues securing financing at an early stage.

The data demonstrates that expansion is in fact more difficult to finance than early financing, but only marginally (see Figure 3). However, interviewees indicated that Canadians have a harder time securing expansion funding than Americans. Apparently, a number of other countries – such as Sweden, Finland and the UK – have more evolved financial support. But it appears that there is a marginally greater availability of early-stage financing in the GTA compared to the U.S. as well as other countries.

While we do not necessarily have the evidence to demonstrate this, the impact of more financial support on the start-ups could be significant. Based on the availability of financing as a percentage of GDP, a start-up can secure early-stage – that is, the means to start up - but struggle to expand. The inability to expand may in fact hinder the companies' ability to pursue R&D initiatives. Some small companies we interviewed indicated they pursued little R&D because their cash-flow was limited; they could only afford to invest in R&D if it was specifically commissioned by an end-buyer as otherwise, they felt the risk would be too great.

Figure 8: Access to Venture Capital by Country



Source: Conference Board of Canada (2007), How Canada Performs

Toronto vs. Rest of Canada in Venture Capital

Within Canada, Toronto fares reasonably well in attracting venture capital financing. Provincial figures for VC are aggregated, and demonstrate that Ontario leads the way with Quebec following close behind. Venture Capital Association figures are not tabulated at the city level, and are only available on a quarterly basis for the fourth quarter of every year. However, Toronto seems, in recent quarters, to be close to the lead, although it has been surpassed by Ottawa and Montreal for an occasional quarter.

As discussed further in the ICT section, the majority of venture capital funding is directed towards ICT companies – with communications and networking leading the way, followed by life sciences. The breakdown by sector by city is not available.[18]

5.3 Film, Television and Broadcasting Innovation Profile

The film and television and broadcasting sector in the GTA is the largest in Canada. The GTA hosts the headquarters of all the major English language broadcasting groups (with the exception of Canwest Global, whose executive offices are in Winnipeg), and is the

[18] Thomson Financial prepares this data for the Venture Capital Association,.

dominant TV market in the country. The GTA is also home to the largest film and TV production sector in Canada and most of the English language commercial production. Over the years, the GTA has also been the best balanced among the major production centres (Montreal and Vancouver are the other two large centres) in terms of foreign location and domestic production.

5.3.1 Main Sector Components

The conventional sub-sectors of the film and television sector (also in line with StatsCan and CRTC data) consist of the following:

- **Production:** Production of the film and television programs, including development and pre-production, live action shooting and/or animation, and post-production and editing;
- **Production services:** Includes equipment rental (e.g. cameras and lighting), other location services (e.g. catering), financial and other professional (e.g. bonding and insurance), and physical space (e.g. studios);
- **Post-production:** Includes editing and the addition of digital visual effects, although the latter are increasingly being integrated into the production stage;
- **Broadcasting:** Broadcasters do in-house production as well as license programming from independent producers and foreign programming suppliers. Broadcasters package and schedule programming, insert commercials that they have sold, and transmit the broadcast signal over-the-air or as a feed to broadcast distribution undertakings (e.g. cable and satellite);
- **Distribution and exhibition:** For broadcasters, this category comprises of broadcast distribution undertakings (BDUs), such as cable operators and direct-to-home (DTH) satellite operators that transmit the signals to subscribers for a monthly fee; for feature films this category comprises theatrical exhibition as well as home video via retail stores. An emerging distribution channel for video, TV programming, and feature films is broadband Internet – for the most part via fixed high-speed Internet, but it is also beginning to penetrate into broadband mobile wireless.

5.3.2 Key Characteristics of the Industry in the GTA

<u>**Number of Companies**</u>

The production industry comprises many small companies, although a few broadcasters and cable/satellite companies have employment in the hundreds and even thousands.

- The GTA has 4,612 production companies, most of them small with few employees, although the larger ones can manage in excess of $100 million of production annually.
- There are 596 companies in post-production and other related industries, which include production services.[19] Again, most of these companies are small in terms of permanent employment.
- There are 125 broadcasters; two of the private broadcasting groups (CTV and Canwest Global) employ over 500 people, and the CBC's GTA employment is in the thousands.
- The GTA has 224 companies in distribution and exhibition, again the largest in Canada; the largest cable operators in the GTA, namely Rogers and Cogeco, are substantial employers.

Post-Production, Animation, and Digital Visual Effects

Ontario leads in total volume in animation production and overall post-production services,[20] with the majority of firms based in the GTA. As figure 10 below illustrates, this category has substantially greater revenues than animation and digital visual effects.

However, both Quebec and BC are ahead of Ontario in terms of digital visual effects and animation services.[21] The location of these industries is important as they are software-intensive and tend to drive innovation.

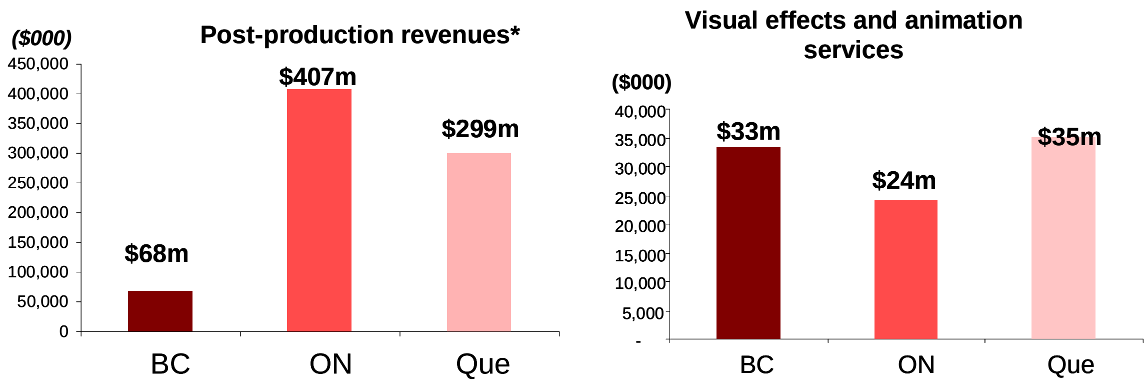
Based on interviews, it appears that BC's lead in animation services and visual effects is likely due to the imperatives of high-end foreign Service production. In Quebec, interviewees indicate that they perceive animation and visual effects services to be less expensive – possibly because of lower wages and higher government incentives.

[19] Statscan Data, 2006

[20] Profile 2007; Statscan Data 2006

[21] Statscan Data, 2006: Profile 2007

FIGURE 10 – Ontario leads in Post-Production, but Lags in Visual Effects and Animation Services



Source: Statistics Canada, 2006

5.3.3 Regional Innovation Indicators: Ability to Innovate

Using the Regional Innovation Indicators identified in the methodology in section 2, we evaluate the inputs of firms in the film and television sector in the GTA – that is, the factors which contribute to their ability to drive innovation and R&D.

Critical Mass

As outlined in the characteristics of the sector, the GTA has critical mass in every element along the value chain in film and TV production.

Highly qualified and specialized labour pool

The GTA has a very highly qualified and specialized labour pool, particularly in production and production services:

- Because of the industry's size in the GTA and its high volume of service production which depends on highly skilled labour, there is a ready pool of qualified labour, a factor essential to attracting foreign service production (although the primary decision point tends to be a lower effective cost structure);
- The need for producers of domestic programming to attract foreign investment and pre-sale commitments is pressuring them to be more cost effective and drives demand for creative and skilled labour;
- However, the lack of business skills of producers coming out of institutions and within the industry was mentioned as a concern by interviewees and by a 2004 WIFT study on employment in the industry.[22]

[22] Framework, WIFT Study, 2004

Buzz

There is a significant level of buzz in the GTA in the film and television sector:

- Buzz is largely driven by key events such as the Toronto International Film Festival (TIFF) and the HotDocs documentary festival. TIFF is specifically credited for putting Toronto on the map – it received 25% of all Toronto mentions in international media, far ahead of any other news category[23];
- Toronto is winning awards in film and TV content driven by the film, TV, and interactive industries (e.g. 2 Emmys for Xenophile for its cross-platform work[24], one for Marblemedia for its cross-platform work); animation (an Oscar for Seneca for the computer-animated film *Ryan*).

Collaboration

There is reasonably good collaboration within the industry, but more is needed between academia and industry, such as with broadcasters and producers:

- Financing mechanisms like CTF and Telefilm force intra-industry collaboration – the CTF encourages broadcasters to work with independent producers while Telefilm encourages and facilitates co-production with foreign jurisdictions;
- Increasingly, there is good collaboration between TV producers and interactive producers, thanks in part to the Bell New Media Fund, which can be applied for solely by interactive projects which involve a TV program production;
- However, apart from what is driven by the Bell Fund, there is limited collaboration with broadcasters and film and TV producers and the interactive design sector (except for graphic design services);
- Interviews indicate there is low R&D and innovation collaboration between industry and academic institutions in film and TV, as relationships appear to be restricted to education and training.

Government support

Production:

Data shows the sector has one of the highest and most comprehensive government support structures in terms of financial assistance for projects; however, there are some challenges faced in terms of government support:

[23] Kopun, Francine "Toronto's Surprise Claim to Fame" Toronto Star, Sept 08, 2007

[24] Note that while Xenophile is an interactive company, one Emmy was won for its involvement in a television related initiatives, driven by the Bell Fund.

- Other Canadian provinces can offer better production and services tax credit incentives, and Ontario's additional tax credit favouring regions outside the GTA acts to divert production outside the GTA (see Figure 11).

Figure 11: Level of Tax Credits for Certain Provinces

Level of tax credits, per province	Service Production	Production	Animation/Special Effects
BC	18%	30%	15%
Ontario	18%	30%*	20%
Quebec	20%	29% or 39% (latter for French language)	10% or 20% (latter for service production)
New Brunswick	40%	–	–

*Note: An extra 5% goes to out-of-Toronto, or regional production

Source: PwC Big Book of Tax Credits, 2006

- US states are becoming ever more competitive in various financial inducements, adding to the woes of a strong Canadian dollar;
- There is little government support for strengthening the corporate side of production, which can in turn drive investment in cross-platform production and innovation. Small production firms have little extra financing to drive innovation and R&D unrelated to particular projects;
- There is little cohesion between the classic support for R&D and support of innovation in the production sector.

Production Services:

- Animation and digital visual effects have access to the OCASE tax credit in Ontario, which is at a similar level to other jurisdictions and even slightly higher than BC (who regardless is still leading in this area). However, the animation and digital visual effects industry has concerns that the OCASE tax credit is not as applicable to the changing needs of their business as it used to be, and has suggested an update of the tax credit to better suit their needs.

Broadcasting:

- The federal government makes an annual grant to the CBC for all its radio and television operations across the country in excess of $1 billion. Nevertheless, this amount is a substantial reduction from a decade ago, and Canada ranks near the bottom (globally) of per capita funding for public broadcasting.

- Private broadcasters are mandated to meet Canadian content commitments. As well, substantial incentives have been provided through regulation (e.g. simultaneous substitution regulations) and tax policy (e.g. section 19.1 of the Income Tax Act) to put more money into the hands of private broadcasters to do this.
- Broadcasters spend minimally on R&D and innovation, and such spending has never been a consideration for the CRTC. In the 1980s and into the 1990s the CBC would actively support Canadian software and hardware equipment supplier firms by procuring the latest technology, but the CBC can no longer do so for financial and procurement policy reasons.

Distribution and Exhibition:

- Government support for the distribution of Canadian television services is primarily in the form of BDU regulations, which are currently under review. Through federal government policies, Canadian BDUs contribute more than half of the budget for the Canadian Television Fund. However, there is no equivalent regulatory stimulus for R&D as there is for spectrum regulation in telecommunications.
- A lack of government support for digital cinema in theatres has hindered significant innovation in this area[25]. For example, in the UK the UK Film Council has funded the conversion of numerous small cinemas to digital screens, which they believed could improve the ability of these cinemas to introduce independent films at a lower cost. While there has been some exploration of such initiatives in Canada, nothing tangible has materialized. This may be due to the significant costs associated with digital cinema initiatives coupled with the relatively small size of the Canadian marketplace.

Corporate Financing

The availability of corporate financing varies significantly between producers and broadcasters:

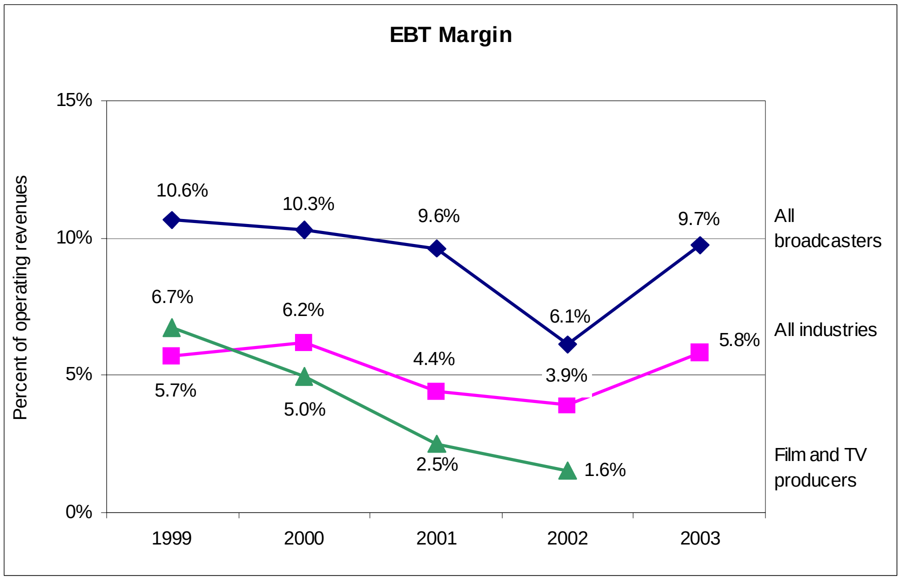
Production companies:

- Production companies are not well financed, nor are they suitably structured for R&D initiatives – Figure 12 demonstrates their earnings before taxes (EBT) are significantly lower than broadcasters. Low margins leave little excess revenues which can be driven back into innovation. R&D is only performed when it is actually financed by a broadcaster's program acquisition licence fee (e.g. developing a media player for a broadcaster).
- Unlike in other countries like the U.K[26]., producer margins are too low to attract private equity, although there are some recent exceptions (e.g. the DCH group has been floated on the AIM exchange in London).

[25] See 2004 Nordicity report on a digital cinema business plan for the NFB and Telefilm. The NFB in particular was interested in stimulating the distribution of Canadian documentary and fiction feature films through digital cinema.

[26] Nordicity Group (2007), for the CFTPA, "The Creation of Regulated Terms of Trade between Producers and Broadcasters in the U.K., www.nordicity.com/reports

Figure 12 – EBT Margin of All Broadcasters, All Industries and Film & TV Producers



Source: Nordicity Group (2007) Analysis of Canadian Broadcaster Financial Performance and Programming
Expenditures for the CFTPA (www.nordicity.com/reports)

Broadcasters:

- On the other hand, broadcasters have relatively high EBT margins, and have better access to corporate financing, as evidenced by Goldman Sachs' involvement in the recent Alliance Atlantis/CanWest deal.
- However, this does not necessarily lead to greater opportunities for R&D in the GTA. Broadcasters expect that their technical and business software vendors do the R&D, and such R&D is not necessarily outsourced locally, despite the concentration of broadcasters' headquarters in the GTA.
-

Production Services, including Post-Production

- There are some smaller innovative companies who are able to access financing which enables innovation. For example, the Toronto-based InDEF media, which has innovated in new tapeless production workflow solutions, was able to generate funds for start-up for a range of initiatives. However, they are 'innovators' rather than researchers and developers, and their story might be the exception rather than the rule.

- Otherwise, we know little about the access to financing of production services firms, including those working in animation and digital visual effects.

Exports and foreign investment

Export revenues for producers and broadcasters are fairly low; however, foreign service production for producers is important and the recent role of Goldman in the CanWest deal demonstrates potential for Foreign Direct Investment in broadcasting:

- Foreign location production (an export service) experiences cycles are driven by a number of factors (e.g. the value of the dollar, relative tax credit levels, and competition from foreign jurisdictions, and health epidemics like SARS). Studio facilities, crews, and services are particularly sensitive to the level of foreign location production in Ontario;
- In terms of domestic production earning foreign revenues or attracting foreign investment, recent trends are negative. Treaty co–productions[27] and foreign sales and presales are down significantly from 5 years ago, reflecting in part a lowering of the international demand for mid-range TV programming and the tightening of foreign incentives (in particular the UK);[28]
- Some Canadian broadcasters have invested abroad (e.g. Canwest Global in Australia), and some are participating in the launch of new digital channels to expand their market for product (e.g. Corus). However, the Canwest Global acquisition of Alliance Atlantis with extensive financing from Goldman Sachs, if approved by the CRTC, could bring a new dimension to financing within the Canadian broadcasting system.

Demanding Buyers

Producers do not have the budgets to be demanding, and broadcasters are demanding in some regards – but work with off-shore vendors:

- Production quality is world class (docs, kids, some TV drama sold globally), but budgets of programs for both film and television are generally lower than in other jurisdictions (particularly the U.S.). This lower- to mid-range production hinders the ability of producers to innovate in new technologies such as CGI (computer generated imagery, or digital visual effects), which are R&D intensive areas;

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[27] Productions carried out jointly by firms which are in different countries that have signed a ‘treaty’ offering conditions to producers which encourage co-productions.

[28] Profile 2006

- Canadian broadcasters are among the early adopters of some major systems, such as traffic management and digital asset management systems. However, the key vendors in these deals (for CTV, CBC, and CanWest Global) are all off-shore[29];
- Also, unlike other countries where the public broadcaster is tasked with driving innovation in the sector, the CBC has little incentive and few resources to drive R&D and innovation[30] – it is costly, and there would be little market advantage gained as its competitors are not pursuing R&D in any significant manner.
-

5.3.4 Regional Innovation Indicators: Evidence of High Quality Innovation and Research

The following section examines the types and level of innovation witnessed within the film and television industry, as well as the research found within academic institutions in the GTA. Note that evidence is limited, and information is primarily based on secondary research (industry) and information submitted by the academic institutions.

Sophistication of product lines and companies

This indicator demonstrates the level of innovation and R&D occurring within the film and TV sector. Overall, as identified earlier, producers and broadcaster tend to be adopters of R&D and innovation from other sectors. For example, digital cinema and broadcast equipment technologies such as HD and 4k, which are primarily driven within the ICT sector (e.g., in broadcast equipment, digital compression). However, the sophistication of product lines and companies in production and broadcasting in the GTA then has a significant impact on those enablers and on demand for their products. In terms of adoption, broadcasters and producers in the GTA are fairly advanced. For example, because of competitive pressure from the US, Canada is ahead of European countries (but remains behind the U.S.) in terms of both broadcasting and producing in HD.

- The one key area where broadcasters and producers innovate significantly within their organizations - and work with enablers and other companies - is in cross-platform initiatives. Some examples include:

[29] Based on an interview with CBC

[30] In the U.K., the BBC has R&D within its mandate, and spends significant resources on R&D, primarily through an in-house capacity, collaborations with universities, and primarily UK-based vendors.

- Marblemedia, a GTA-based cross-platform production company has won an Interactive Emmy for its *Art of Seduction* mobile TV shorts, commissioned by broadcaster Bravo!FACT as well as the public institution National Film Board[31] [32];
- Xenophile Media, an interactive media company, has won 2 Interactive Emmy's - one for its interactive work on *Regenesis* jointly with Shaftesbury Media, a Bell Fund project, and the other related to a TV program commissioned by Disney;
- The GTA was the first to launch an interactive film, *Late Fragment, etc.* which was a co-production between the private Canadian Film Centre and the publicly funded National Film Board.

It is worth noting most of the innovation identified here is driven by publicly funded or mandated institutions or funds. While broadcasters' innovation activity is mainly focused on interactive media (as compared to other R&D, such as broadcast engineering), they have not been as aggressive as their counterparts in the US. This may partly be due to the fact that they typically cannot as yet acquire the new media rights for the high-appeal US entertainment properties, and thus have little ability to drive traffic to their sites as US counterparts do. Also, it is clear that broadcasters in Canada are more risk averse than their US counterparts – for example, we see little evidence of acquisitions of innovative companies in the interactive media space like the ones we have seen in the US (for example, with Disney's acquisition of Club Penguin). With the merger of CanWest/Alliance Atlantis we have seen similar new media initiatives killed (e.g. blogTV), demonstrating a continued risk aversion in the new media space.

Access to High Quality Research in Institutions

There are a number of high quality research institutions in the GTA. Animation is a particular strength, evidenced by the Academy Award Seneca College received for *Ryan*. However, the Communications Research Centre in Ottawa very much drives high-end R&D in the broadcasting sector (e.g., signal processing, new mobile broadcasting standards[33]). There appears to be little other research in the film and TV departments of institutions which may have high research capacity but do not undertake projects of

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[31] Marblemedia website, "The Art of Seduction"

[32] The short crosses the boundary between TV and interactive media – it is a video production, but distributed via an interactive platform

[33] Note that signal processing capacity is assessed within the ICT sector, as it is typically found within the electrical engineering departments.

relevance to film and TV producers broadcasters. Note that we have captured here only research in institutions which are *directly related* to the film and television sectors.[34]

NB: High Research capacity is based on data available pertaining to grants – a high is attributed if a major grant of over $1m has been attributed to a specific university/college, or if there have been a number of small grants totaling over $1m. Note that as the grant funding is not yet complete, this qualification is an early estimate.

Figure 13 – Research in CONCERT Member Academic Institutions

Film and TV	Institutions	Research capacity?*	Type of Research	Facilities
Production (radio/film arts)	Ryerson, Seneca	Medium	Production skills; narrative across platforms	
Management	Ryerson, Schulich (York)	Medium	Shape of production sector, management skills, entrepreneurship	n/a
Digital cinema	Ryerson, Seneca	High*	From capture (camera) through to post-production	Digital cinema laboratory (under construction)
Animation and digital visual effects	Seneca, George Brown, U of T (software, see ICT)	Medium**	Software development (see ICT), and application of techniques to film and TV	
Film and TV critical theory	York, Ryerson, U of T, OCAD	Medium - High	Semiotics, political/social theory related to media/communications	Media labs
Signal processing	See ICT			

**Note that this funding relates only to the CFI grant recently awarded, which pertains to infrastructure only and not research staff. There may be other grants relevant in other disciplines such as signal processing (electrical engineering) which can contribute to this project.*
***The presence of animation and digital visual effects teaching is high, the amount devoted to research is unknown as no funding data available.*

[34] Note also that our qualifier 'high capacity' is not in comparison to other jurisdictions within Canada.

5.3.5 Strengths and Weakness – Indicator Conclusions

Based on an evaluation against the indicators, we conclude the following strengths and weaknesses:

- **Strength:** The GTA has critical mass in all elements of the value chain in the film, TV and broadcasting sector - this could be an opportunity for it to be a 'test-bed' for new innovations to be adopted within this sector;
- **Weakness:** Budgets for domestic film and TV programs are low, and producers have low margins; therefore, the film and TV industry has little ability to spend on R&D and innovation. Broadcasters are fairly risk averse, and have little incentive to innovate. This is evidenced, for example, by the short-lived and under-funded Alliance-Atlantis BlogTv.ca experiment, which shut down after just six months of operation.

Figure 14 – Evidence of Strengths and Weaknesses in R&D and Innovation

•	• Industry	• Academia
Strength	There is evidence of high innovation in cross-platform content, partly driven by the availability of public institutions and private funds.	Ryerson's digital cinema lab increases research capacity. Critical theory Production skills, including narrative across platforms; Animation and digital visual effects
Weakness	The GTA appears to be losing its edge in key areas such as animation and visual effects services, which are relatively high R&D areas.	

5.4 Information and Computer Technology (ICT)

5.4.1 Main Sector Components

For the purposes of CONCERT, we have sifted through a range of categorizations (some of which are included in Appendix B). We put forward the following classifications, which map to other categorizations and sources of information, but also provide enough relevance to the aims of CONCERT. Note that the biggest challenge with the categorization of ICT is that interactive digital media, while dependent upon and sometimes synonymous with ICT, is a screen-based industry and thus is also 'an adopter' or market for ICT. Others segments (like software and hardware) are 'enablers' supplying the screen-based market. As such, because of the way the industry is classified, the indicators are best applied according to these categorizations.

- **Interactive digital media**: Interactive digital media is a category of enablers that includes all elements of the value chain in interactive digital media, including software development, graphic designers, multimedia artists, animators and providers of digital visual effects. Note that interactive digital media is often comprised of a number of the other categories of ICT (e.g. software and systems). The key subsectors of interactive digital media, which may experience some overlap, include:
  - Mobile and wireless content;
  - Games content (which can be delivered via console, mobile, or online) including games for e-learning;
  - Broadband online interactive content (e.g. social networking, e-learning, etc).
- **Electronic hardware:** Including nanotechnologies, audio and video equipment, semi-conductors and components, and consumer ICT electronics such as mobile phones.
- **Software:** Software developed for applications (e.g. mobile wireless applications) or content (e.g. animation or visualization software), or systems such as content management systems and communication networks.
- Systems and networks development: Including wireless[35].
- **ICT services:** e.g. data processing.[36]

The following section on the ICT sector focuses on the innovation ability of the ICT sector in general, drawing from a range of sources. The overall ability of the ICT sector to innovate is critical to understand in order to ascertain how well – or ill - equipped the sector is to enable R&D in the screen-based industries overall.

[35] Note that we do not address this sector in future sections, as it is not as relevant to CONCERT as the others

[36] Note that we do not address this sector in future sections, as it is not as relevant to CONCERT as the others

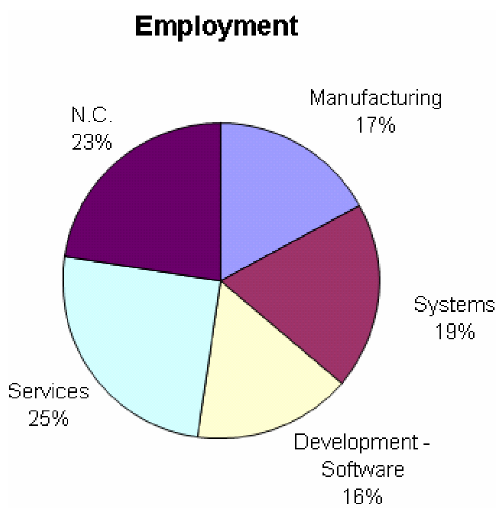
5.4.2 Key characteristics of ICT in the GTA

- The ICT sector, as suggested by the IBM benchmarking study conducted for the TRRA, is a recognized cluster in the GTA and has the lowest operating costs compared to top US Metro Areas.[37]

Labour Force

- According to City of Toronto Statistics Canada data within the ICT sector, the GTA employs the highest number of people in services, followed by systems development. Software development is lower than both of these, but still significant.

Figure 15: Employment in ICT



Source: City of Toronto Economic Development; ICT Report 2006; Statscan data, 2006

- 'Interactive media' is not a category for Statscan research, and the Canadian Interactive Industry Profile (CIIP) does not identify city-level information. Therefore, it is unknown how many companies are in interactive media compared to other jurisdictions. A comprehensive survey of the region's interactive media companies would be required to attain such data, but as of yet no such study has been undertaken.

37 IBM Benchmarking Study, for TRRA, (2006)

Companies

- The GTA has the following breakdown of business establishments in the ICT sector. It is dominated by the number of computer systems designed and related services. Note that we are not confident of the Interactive Media categorization, as the number appears quite small – there may be firms captured in other categories, such as software publishers and/or systems that may constitute interactive digital media.

Figure 16 – ICT Number of Business Establishments

HARDWARE	616
Computer and Peripheral Equipment Manufacturing	178
Telephone Apparatus Manufacturing	30
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	57
Other Communications Equipment Manufacturing	44
Audio and Video Equipment Manufacturing	63
Semiconductor and Other Electronic Component Manufacturing	244
INTERACTIVE MEDIA	**179**
Internet Publishing and Broadcasting	112
Web Search Portals	67
ICT SERVICES, NETWORKS, AND SYSTEMS	**24,626**
Internet Service Providers	222
Data Processing, Hosting and Related Services	400
Computer Systems Design and Related Services	23,703
Wired Telecommunications Carriers	156
Wireless Telecommunications Carriers (except Satellite)	130
Other Telecommunications	15
Software	295
Software publishers	295

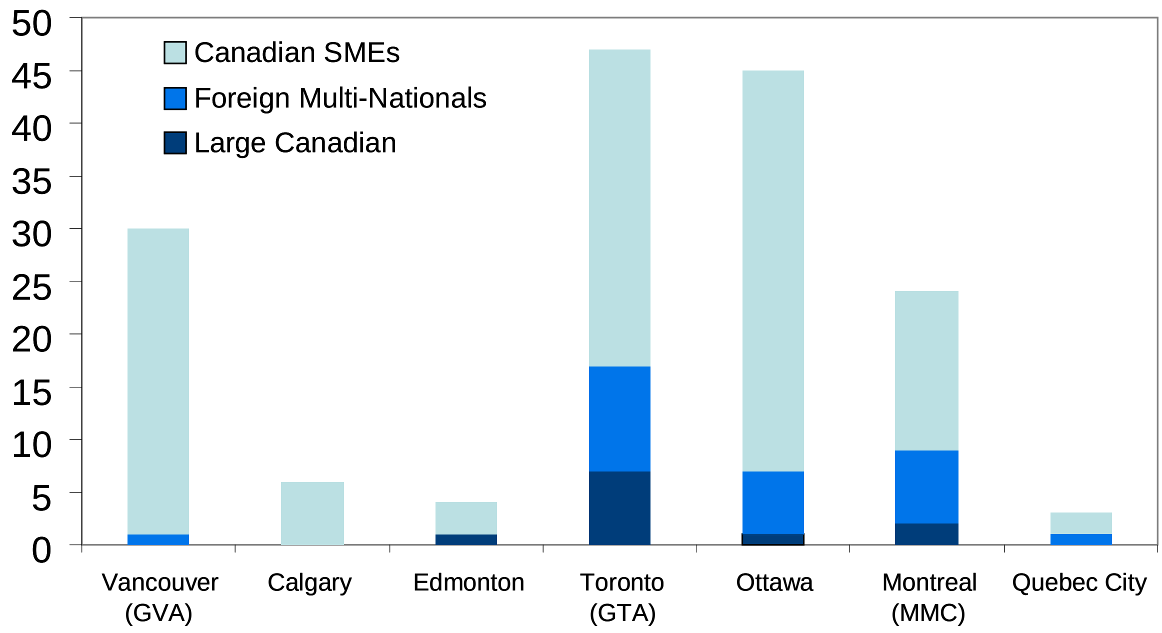
Source: Statistics Canada, Business Establishments (2007))

- **Hardware:** While there are quite a few hardware firms, the most relevant to CONCERT being those that manufacture audio and video equipment **(**e.g., 4k cameras and projectors) and broadcasting and communications equipment manufacturing; and those that manufacture semi-conductors and other components (e.g. graphics chips). Figure 23 on page 60 outlines some of these companies, in relation to their contribution to R&D in the region. These firms tend to be large in size.

- **Interactive digital media:** While no definitive data is available on the number of Interactive digital media firms in the GTA, we know there are 115 members of Interactive Ontario, based in Toronto, 66% of which are firms between the size of 1 and 4 employees.
  - The GTA lacks console games companies of significant size in terms of revenues and employees, unlike Vancouver, which has Electronic Arts, and Montreal, which has Ubisoft. However, the GTA does appear to have a number of small firms working in games, and Southern Ontario boasts medium-sized games developers like Silicon Knights in St. Catharines. This is important as large gaming companies have traditionally been key drivers of games-related employment. This may, however, be changing.
  - There is a clustering of e-learning companies, as well as interactive media content companies.
- **Software**: There are 295 software publisher firms, and we know there is a large presence of software development in the city (e.g. IBM's second largest software lab worldwide is located in the GTA).
- **Systems and Networks (including wireless):** All of the large telecom and wireless carriers are available to the GTA's residents, which is unique to many jurisdictions. As shown in the figure below, it has the highest number of foreign multinationals as well as large Canadian firms compared to the rest of Canada. Ottawa has a higher number of SMEs in the wireless space,[38] however, indicating it might be leading in certain areas of communications innovation and development. Vancouver also has a very high number of SMEs.

38 Source: CATA Industry Report, Wireless, 2006

Figure 17 – Number of Wireless Companies by Type, by City, 2005



5.4.3 Regional Innovation Indicators: Ability to Innovate

Critical Mass

- The GTA appears to have critical mass in all sub-sectors, a positive indicator that the various elements of the value chain are all represented in critical mass in the GTA.
- Interviews highlight the importance of some supplier companies developing new products that focus on the production and distribution sector of film/TV production, radio and broadcasting, and mobile content.

Costs

In a study conducted by IBM for the TRRA[39], several key ICT sub-sectors were ranked in terms of costs of conducting R&D relative to other jurisdictions:[40]

- Next Generation Electronics: Toronto ranks third, behind Manchester and Bangalore, but ranks well above its North American counterparts;

[39] Global Investment Trends and Toronto's Competitive Positioning in the ICT sector, March 2007, IBM Corporation

[40] It does not appear that other key Canadian jurisdictions were examined in the study; therefore, it is difficult to ascertain Toronto's relative position comparative to Vancouver, Montreal and Ottawa.

- Specialist software - Wireless: The IBM study focused on software which specializes in applications for telecom related businesses (content for carriers and mobile content providers). Toronto has the second lowest costs, next to Bangalore;

- Digital media (what we have termed interactive digital media): Toronto has the second lowest operating costs, again next to Bangalore.

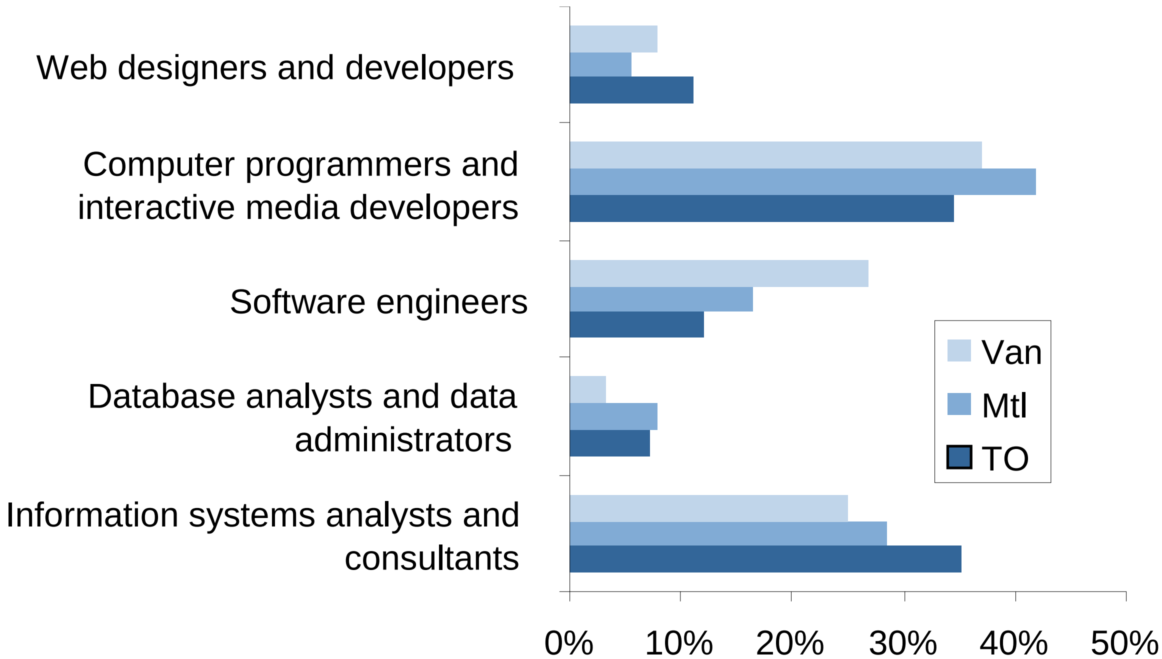
Highly qualified/specialized labour pool

Software:
GTA has top skills in software and computer science. Many interviewees mentioned the proximity of Waterloo as being a key driver of success in the Toronto ICT industry, and U of T was also mentioned as being a critical feeder institution for high quality software engineers.

However, as Figure 18 shows, the GTA does not have as many specialized software engineers within the cultural industries[41] as other jurisdictions, like Vancouver. However, the presence of semi-conductor firms like AMD has established a critical mass of highly specialized software and hardware experts in the region, working on chips, processors, and accelerators for particularly visualization and graphics in the screen-based industries.

[41] Note: this does not necessarily mean that software engineers are not providing products and services to the information and cultural industries, as they could be in a company – such as AMD – which is not classified as an information and cultural industry. The Vancouver data likely does reflect the number of software engineers that are employed directly within the games industry.

Figure 18: Types of ICT related Employment within the Information and Cultural Sectors



Source: Statscan, 2006

Interactive Media:

Interviews indicate digital media is strong in terms of graphic design, animation skills, narrative across platforms. Toronto has a strong mix of creative and software skills. However, some interviewees and secondary research highlighted certain skills gaps in the interactive media sector, including:

- A shortage of interactive media user experience designers in the GTA was identified in a couple of interviews;
- The 2004 WIFT study identified there were skills gaps in Flash and C++ software languages used in interactive media;
- The importance of cross-disciplinary skills in interactive media was highlighted by interviewees as critically important to the success of the sector. The most pertinent were the following:
- Project management, to manage complete projects;
- Technical skills, ability to develop software;
- Art and design skills, ability to use software to design and apply an aesthetic and a strong user experience;

- Business acumen.
- Being able to mesh all these elements together was seen as critical for the successful future of the interactive media industry in the GTA.

Collaboration

- Interviews indicate a growing degree of collaboration in certain sub-sectors. Between industry and academia, collaboration is quite strong, particularly in software. Based on academic consultations, there is evidence of a solid exchange of expertise between professors and industry.
- Among small firms, there appears to be good collaboration and networking – driven by integrating locations like MaRs and events like Torcamp and Basecamp which bring together the industry for development of ideas and skill building.
- While the Bell Fund encourages collaboration between the TV sector and the interactive industry, interviews indicate there could be ever more collaboration encouraged between these two sectors.

Government Support

- ICT has strong support for R&D, primarily in the form of SR&ED tax credit.
- The interactive digital media sector has access to tax credits provincially as well as certain funds emerging from the OMDC – such as the games prototyping initiative. However, from interviews it appears that interactive digital media companies are not accessing the SR&ED tax credits in any significantly way. This may be because they do not qualify (e.g. further to section 3, they are 'innovating' but not conducting true"R&D"); or they do not have adequate knowledge about how to access the credits.
- In the wireless sector, a lack of government support for wireless standards is seen as putting Canada behind other countries (such as those which have adopted DVB-H, etc. for mobile TV).

Buzz

- The MaRs Centre was mentioned as a generator of buzz within the city, along with events like Mesh and Torcamp. However, according to interviews, there appears to be a lack of international recognition that Toronto is a centre for expertise or innovation – particularly in wireless content and games applications. Some interviewees mentioned that we could risk losing high quality software talent to areas with better buzz in high-opportunity market areas employing high-end software engineers, such as games (e.g., Vancouver) and wireless (UK, Asia).[42]

Exports and foreign investment

- The ICT sector has experienced significant foreign investment and takeovers over the years (e.g. Alias, Leitch, and ATI), and foreign financings (e.g. Quick Play). However, these companies appear to remain GTA assets. Other large ICT sector companies, led by giant RIM in Kitchener-Waterloo and historically Nortel, point to a strong export record.
- According to the CIIP survey[43], proportionately, more Canadian firms in interactive entertainment engage in export compared to other sectors,[44] and on average export a higher percentage of their business. This achievement demonstrates that Canadian interactive entertainment firms have to be internationally competitive to earn sufficient returns on their development and marketing investments.

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[42] Quite a few interviewees noted that the primary role an organization like CONCERT could play would be to identify key innovation successes when they happen, and in the words of one interviewee, "promote the hell out of them to put Toronto on the map and retain talent."

[43] Canadian Interactive Industry Profile, PricewaterhouseCoopers, 2007

[44] We do not know how many firms in interactive entertainment which export are based in the GTA compared to other jurisdictions

Figure 19 – Canadian Interactive Firms which Export, 2006

Primary Activity Group	Primary Task Category	Percentage of Firms that Export	Average Percentage of Business for Export
Content Creator	Interactive Entertainment	75.7%	69.4%
	E-learning and Education	46.9%	48.7%
	Information and Reference	52.8%	26.9%
	Social, Culture and Arts	35.7%	40.0%
	Animation	54.6%	47.1%
	Other	58.3%	60.0%
Content Creator Overall		**55.9%**	**48.5%**
Enabler	Software Development	66.7%	43.7%
	Internet Application	63.2%	22.7%
	Other Enablers	80.0%	38.8%
Enabler Overall		**66.7%**	**34.0%**
Overall		**58.0%**	**45.2%**

Demanding Buyers

There are a few critical examples of where the GTA may be falling behind because of a lack of demanding buyers.

- **Carriers:** We know that carriers in Canada spend significantly less on R&D compared to other carriers internationally (see figure 19) and we also know that they invest less in non-voice services, as the percentage of their revenues from data (including content) is significantly lower than other countries.[45] For whatever reason, Canadian consumers are not yet high adopters of data and content wireless services.
- **Wireless Manufacturers:** While RIM is a reasonably high spender on R&D (see figure 19), the RIM product line has not yet emphasized a platform for media and entertainment or content. However, RIM does encourage the development of applications which can work on the Blackberry platform. Since RIM will provide platforms that track the market, it can be assumed that the Blackberry platform will become more multimedia friendly in the future. There are few handset manufacturers remaining in the GTA who source R&D locally, apart from RIM.

[45] CATAAlliance “Mobile Content and Services” 2007

- **Animation and digital visual effects:** In interviews, there was a sense that the GTA is lagging in its former lead position in the animation and digital visual effects software development industries, possibly because the province is lacking in animation and digital visual effects services. However, little research has been conducted into this sector to better understand the GTA's relative competitive position. Nonetheless, the decrease in the barriers to entry in this market, stemming from cheaper computing power and the lower cost of animation software, may have been influential in this trend.

Figure 20: Selected R&D Performers among Large Companies

Manufacturers – R&D Expenditure

	R&D ($ million)	R&D/ Sales
Ericsson	3.956	15.7%
Lucent	1,177	12.5%
Nokia	4,945	11.2%
Motorola	3,700	10.1%
Nortel	1,960	18.6%
RIM	158	7.6%

Carriers – R&D Expenditure

	R&D ($ million)	R&D/ Sales
NTT	1,152	1.3%
France Telecom	949	1.5%
Deutsche Telekom	258	0.9%
Vodafone	404	0.7%
AT&T	*130	0.3%
Telus	$.3	0.5%

Source: CATA Alliance "Mobile Content and Services" 2007

However, despite the lack of demanding buyers in some areas, there are a few positive indicators of potential demanding buyers which could drive innovation. For example, Canadian high speed usage is high, as we are one of the few countries in the world whose internet penetration is higher than mobile penetration.[46] In this regard, consumers themselves could turn out to be demanding consumers of interactive content, which could drive demand in this area.

46 Solutions Research Group, *Fast Forward Trend Analysis* for the CRTC, 2006

Financing

- In Canada, ICT receives the highest amount of venture capital funding relative to other industries. Note that within ICT, communications and networking – which includes wireless and fixed line technologies – receive the highest share of VC financing.

Figure 21 – Venture Capital Investment in Canada by Industry

VC investment– IT and life sciences	$ Amount (mm) in 2006
Communications and Networking	238
Electronics and Computer Hardware	110
Internet Focus	81
Other IT Services	47
Semiconductors	95
Software	311
TOTAL IT	**882**
Total Life Sciences	493

Source: Venture Capital Association, Canada

- The CIIP survey captures the sources of financing for the industry. Figure 21 demonstrates that SR&ED tax credits are used by enablers much more than by creators, but both do use them. Moreover, the NRC's IRAP program features prominently and does as well as angel investment and even bank financing.
- Note that while cash flow should be the most critical source of financing for IP development, it is among the least available sources of funds to date in this sector.

Figure 22 - Most accessed source of funding, by Industry Type (CIIP, 2006)

(Ranking as to the most commonly accessed source of funding)

	Fee for Service Activity		IP Development	
	Creator	Enabler	Creator	Enabler
SR&ED	3	1	8	4
IRAP	6	4	10	6
Tax Credits	2	2	4	6
Angel	–	–	9	4
Bank	1	1	6	2
Cash Flow	–	–	1	1

Source: Canadian Interactive Industry Profile, 2006

5.4.4 Regional Innovation Indicators: Evidence of High Quality Innovation and Research

Sophistication/excellence of product lines and companies

- **Interactive Digital Media[47]:**
  - In an IBM study for the TRRA, Toronto was identified as having the lead in quality in digital media (what we have termed interactive digital media) primarily due to the proximity of both computer programming talent and creative media talent.[48] In Deloitte's 'Fast 50' assessment, 17 companies were from the GTA, and 2 of the top 5 were GTA-based mobile companies (TIRA wireless and MyThum Interactive). These companies built on a few existing successful mobile content or applications companies, including Quickplay.[49]

[47] Interactive Digital Media refers to content which is interactive and digitally distributed, either via broadband internet, consoles, CD-ROMs, DVDs, etc. Interactivity is defined by the user interacting with the content – e.g., controlling a game, surfing the web, etc. A digitally distributed film, for example, is not interactive digital media, although an interactive film is.

[48] IBM for TRRA

[49] Note: Quickplay provides mobile video applications and so straddles the classifications of pureplay software company and an interactive media firm

- While the GTA lacks a large games console firm, there are a number of highly innovative mobile and online games companies, including Capybara and BitCasters. If Southern Ontario is considered, there are also successful console game developers (Silicon Knights).
- Web 2.0 and 3.0 and social networking companies in the GTA, such as Casero, have also achieved success.

▪ **Software:**

- As previously indicated, the GTA is home to IBM's second-largest software lab in the region, and the GTA is strong in visualization software and hardware. However we are not necessarily leading edge in Canada in software entrepreneurship - for example, in IDC's Top 10 small software companies to watch, only 3 were from Toronto while 4 were from Vancouver[50].
- In specialist software development for the wireless sector, Toronto has a similar quality offering to other North American cities. However, Toronto is not top-ranked, as Boston and San Jose have a stronger presence of universities and research institutes in computer programming, as captured in the ranking for the presence of industry / cluster. While Bangalore leads in low costs as mentioned, it is also nearly on par with the GTA in terms of quality[51].

▪ **Hardware – Audio-Visual and Broadcasting Equipment:**

- There is a grouping of digital cinema or 'visual media' manufacturing companies in the greater Toronto region, including Waterloo (see Figure 22). These companies develop and sell technologies used all along the value chain in production – from cameras to post-production technologies. However, note that R&D in Canada in audio and video equipment has declined by 11% since 1996[52].

▪ **Hardware – Components:**

- Toronto had the third-highest quality rating, primarily driven by its proximity to companies using next generation electronics.[53] The percentage of revenues spent on R&D in this industry are high relative to total revenue (e.g. AMD Worldwide at 16.8% of total (worldwide) revenue, and Gennum at 30%). R&D in components and semi-conductors increased by an estimated 135% from 2005 to 2006 according to the Statscan innovation survey (see Figure 24).

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[50] IDC's top 10 small software companies to watch, 2006

[51] IBM Benchmarking, for TRRA

[52] ICT Sector R&D Expenditures, 2006 Intentions, StatsCan 2007

[53] No details were given about these companies .

Figure 23 - Key CONCERT Relevant Hardware Companies in the GTA

	Type Of Product	R&D Based in Greater Toronto Region
Audio and Video Equipment and Broadcasting Equipment		
Harris Corporation (formerly Leitch)	Broadcast infrastructure - post production, content management, storage etc.	Yes
Panavision	Camera systems	–
Dalsa (Waterloo)	Digital imaging products and solutions (electronics + software)	Yes
Deluxe	Digital cinema, post-production	Yes
Christie Digital Systems	Cinema Projectors	Yes*
Semiconductors and Components		
AMD	Semi-conductor/chips	Yes
Gennum (Burlington)	Semiconductor /chips solutions	Yes*
Other Hardware and Software		
Apple	Computer hardware and software	No
Motorola	Wireless handsets	No (R&D relocating to U.S)

Source: Interviews, Company Annual Reports and 0k SEC Filings

Figure 24 - Anticipated Level of R&D Expenditure in the ICT Sector

Industry	2006i	% Change
($'000,000)		2005-2006
Commercial and Service Industry Machinery Manufacturing	48	2.40%
Computer and Peripheral Equipment Manufacturing	170	1.50%
Communications Equipment and Communication Wire and Cable Manufacturing1	1,561	1.70%
Audio and Video Equipment Manufacturing	18	0.00%
Semiconductor and Other Electronic Component Manufacturing	869	3.90%
Navigational, Measuring, Medical and Control Instruments Manufacturing	345	4.40%
Total ICT Manufacturing	3,010	2.60%
Software Publishers	657	9.20%
Communications Services (incl. Telecom and Cable/Other Program Distribution)	809	0.80%
Internet Service Providers (ISPs) and Web Search Portals	8	0.30%
Data Processing, Hosting and Related Services	17	0.30%
Computer Systems Design and Related Services	1,056	-9.20%
Electronic and Precision Equipment Repair and Maintenance	6	4.00%
Total ICT Services	2,555	-1.70%
ICT Wholesaling (NAICS 4173/41791)	165	1.10%
Total ICT Sector	5,730	0.60%
TOTAL CANADIAN PRIVATE SECTOR R&D	14,850	1.30%
ICT R&D as a PERCENTAGE of CANADIAN PRIVATE SECTOR R&D	38.60%	

Source: ICT R&D Planned Investment, Statscan 2006

NB: 2006i is 'intended R&D expenditure for 2006 in millions')

Access to High Quality Research

The CONCERT adopter industries have access to high quality research in the GTA. An early estimate of research capacity in various CONCERT relevant academic sectors is outlined in Figure 25. Note that the total funding analysis from all major sources of research funding will give us a much clearer assessment of the GTA's capacity in relation to other Canadian jurisdictions and disciplines.

Figure 24 - CONCERT Relevant ICT Research Capacity in CONCERT Academic Institutions

ICT	Institutions	High research capacity?*	Facilities
Haptics	Seneca	Low	
New forms of narrative	Ryerson, York	Low	
Robotics	York	Low	
Augmented Reality	York	Low	
Motion Capture	Seneca	Low	
Mobile computing			Mobile computing lab at Ryerson
Open Source	Seneca, U of T	Medium	Centre for Development of Open Technology (CDOT)
E-Learning (incl serious games)	Ryerson, Seneca, York	Low	Centre for Learning Technologies, patent
Human-machine interface	York	Low	
Visualization and 3d	Ryerson, York, OCAD,	High	Ryerson 2 CFI grants for infrastructure;
Signal Processing/Electrical Engineering	Ryerson, U of T,	Medium	Digital cinema lab, Ryerson (under film and TV)
Management	Ryerson, York,	High	
Content Security	Ryerson	Low	
Vision research [54]	York	Medium*	Vision Research Lab
Geo-ICT	York	Medium	

Source: Academic Scans submitted by CONCERT members

5.4.5 ICT Regional Innovation Indicator Conclusions

The following chart summarizes the key strengths and weaknesses in the industry in the three areas of CONCERT focus – interactive media as a screen-based industry, and software and hardware as the enablers.

54 Note: Vision research is jointly conducted in the biomedical field.

Figure 26 - Key Strengths and Weaknesses in CONCERT Relevant ICT in the GTA

Strengths	Industry	Academic
Interactive Media	Toronto has the lead in cost and quality for digital interactive media. High exportability meaning greater opportunities for routes to market. Some games and mobile content and applications present (e.g., MyThum, Transgaming).	Strong particularly in colleges, but more in teaching not research necessarily. No real particular focus in mobile or games research, except mobile design at OCAD. (see design) Vision Research at York; augmented reality in a number of institutions.
Software	Web 2/3.0 and social networking. Visualization software firms (e.g. visible). Animation and digital visual effects software (e.g. side-effects).	Proximity to strong software at U of T and Waterloo. Open source has a presence. 3d and data Visualization also has a presence in a number of institutions. Animation and digital visual effects software.
Hardware	Semi-conductors and components (e.g. AMD). Audio and video and broadcasting equipment.	Electrical engineering, visualization. Electrical engineering. Ryerson digital cinema lab (see film and TV).

5.5 Design

Design is of critical importance to CONCERT as an enabler of innovation in content on the screen (e.g. graphic and interactive media design), and also of the screen itself (e.g. industrial design in handset manufacturing). However, the design sector suffers from several challenges: there is limited data on the types of firms and their contributions to the screen-based sectors in the region; design in industry overall is under-funded from government and from buyers; and design research in academic institutions is under-funded.

5.5.1 Classifications

There are a variety of classifications in the design industry. In the RIP, we draw primarily on the categorization offered in the report *Making the Link: Advancing design as a Vehicle for Innovation and Economic Development (2006)*[55]. These are:

[55] Published by the City of Toronto's Economic Research and Innovation Branch

- Industrial Design
- Graphic Design
- Architecture
- Landscape Architecture
- Interior Design

As discussed in section 2, the first two are primarily of focus for CONCERT. To this classification we would add "interactive media design", even though it wasn't covered in the report. Increasingly, this is an area of importance, particularly for the screen-based industries and should be considered separately from graphic design. Graphic design focuses on the image on-screen, while interactive media design includes the user experience, thus incorporating user experience design. Note that we have little information on capacity or strength in this area, as StatsCan and other sources do not yet capture employment or other firm level data in this area.

5.5.2 Key Characteristics of Design in the GTA

Labour/Workforce

The GTA has the third-largest number of designers in North America. Important to note, however, is the Location Quotient of designers[56] – this indicates design share of total employment. San Francisco leads the way, and Montreal is tied with Toronto. So while Toronto leads in absolute numbers in Canada, this is largely a function of its size – while Montreal has quite a high number of designers relative to its overall workforce.

[56] Location Quotient is a term used by economists to describe the concentration of a particular profession in given location; it is derived by comparing the percentage of people employed in a given profession in a certain location (the GTA) with percentage employed in that profession nationwide.

Figure 27 - Design Employment and Design Concentration in Major North American cities.

Rank	Design Employment	Designers (000)	Design Concentration	Location Quotient (LQ)*
1	New York	35.2	San Francisco CA PMSA	3.3
2	Boston	17.5	Boston MA-NH PMSA	2.6
3	Toronto	17.3	New York NY PMSA	2.5
4	Chicago	17.1	Toronto ON CMA	2.2
5	Los Angeles-Long Beach	15	Montreal QU CMA	2.2
6	Montreal	12.1	Seattle-Bellevue-Everett WA PMSA	2.1
7	San Francisco	11.5	Vancouver BC CMA	1.8

Source: Making the Link, Advancing design as a Vehicle for Innovation and Economic Development 2004

The GTA has nearly 30% of all designers in Canada, and 64% of Ontario's designers. It leads particularly in the area of graphic design – note that nearly 50% of all designers in the GTA are graphic designers (which presumably at the time of the census included interactive media design).

Figure 28 – Composition of the GTA Design Labour Force Relative to the Rest of Canada

	Architects	Landscape Architects	Industrial Designers	Graphic Designers	Interior Designers	Other Designers	All Designers	Total Labour Force
Toronto CMA	3,680	570	2,610	12,680	3,410	2,695	25,645	2,564,590
Ontario	5,135	1095	4,505	20,230	5,515	3,570	40,050	6,086,820
% of Ontario	71.70%	52.10%	57.90%	62.70%	61.80%	75.50%	64.00%	42.10%
Canada	12,800	2,410	9,795	44,615	11,655	9,825	91,100	15,872,070

Source: *Making the Link, Advancing design as a Vehicle for Innovation and Economic Development, 2006*

Note also that most of these graphic designers are self-employed as freelancers or as services providers. Nor are they necessarily employed within the ICT and cultural industries as much as, for example, industrial designers are employed within the manufacturing industries (see Figure 29).

Figure 29 - Employment Breakdown of Industrial Designers vs. Graphic Designers

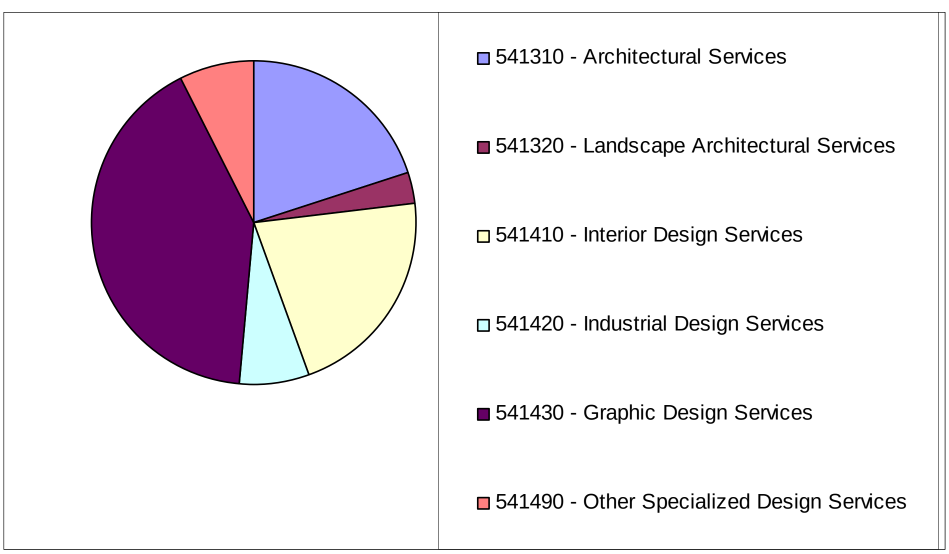
Industry	Professional, Scientific & Technical services	Manufacturing	Info & Cultural Industries
All Designers	**59%**	**15%**	**8%**
Industrial Designers	30%	51%	2%
Graphic Designers	60%	13%	13%

Source: Making the Link, 2006

<u>Companies</u>

In addition, given the high level of graphic designers in the GTA, and the high number of graphic designers who are freelancers, companies in this sector in the GTA are primarily small. In fact, 61% of these graphic design companies (whose information was captured by StatsCan) were identified as having under 4 employees. This means that most GTA design firms will have significant challenges tackling larger projects.

Figure 30 - The Number of Design Establishments in the GTA, by Type



Source: Statistics Canada (2006), through the TRRA.

Revenues

Data about revenues for Toronto-based design firms is not known, as Statscan data is not available at a municipal level.

5.5.3 Regional Innovation Indicators: Ability to Innovate

Critical Mass

Data show that the GTA is the third largest design community in North America. However, Montreal and Vancouver follow closely behind. As demonstrated in the previous section, most design is in graphic design, and of that, it is uncertain how much is in interactive media design, which is most critical to CONCERT.

Costs

We can estimate only that the costs of design in the GTA are relatively low, based on evidence of salaries. As most design is freelance in the GTA, salaries directly correlate with costliness of design. Designers have fairly low salaries relative to the average workforce, and even more so compared to other jurisdictions, such as New York. Average salaries in Montreal are, however, lower than those in Toronto[57].

Highly qualified/specialized labour pool

Secondary research indicates labour is qualified, but not necessarily highly specialized. According to *Designing the Economy,* the design workforce has higher levels of formal education (college or university) than the overall workforce in Ontario: 34% of designers have a university degree compared to only 22% of the overall workforce[58].

In addition, the quality of training in colleges and universities is high. However, it is important to note that design professionals are not paid incrementally for additional education - graphic designers, interior designers, and other designers all have average employment incomes below that of the labour force as a whole[59]. This is of concern for the industry if it wants to grow this discipline, as low salaries can be a deterrent for entry into the industry.

57 Statscan Data, Workforce Data, 2006

58 Designing the Economy, Gertler and Vinodrai, 2004

59 Designing the Economy, Gertler and Vinodrai, 2004

Collaboration

Interviews indicate that collaboration among some institutions and interactive firms is strong (e.g. George Brown, OCAD are cited). However, collaboration between design and the production industry appears to be less so.

Collaboration appears to be quite strong between particularly the advertising industry and the design community, evidenced by collaborations such as the one between OCAD and AstralMedia and Edelman. Collaboration has also been present to a significant extent in the mobile space within OCAD's Mobile Experience Lab. There, projects like Portage, as well as OCAD's work with Telus, have yielded some innovative results.

Buzz

While there is 'buzz' for certain design projects in the GTA, such as International recognition for design projects like *Massive Change,* buzz still does not compare to other jurisdictions, such as Scandinavia, which is known for its design, and London, which hosts events like London Design Week. Buzz in the design sector is critical for not only attracting talent, but also for demonstrating to the industry the importance of integrating design into development.

Exports and foreign investment

It is unknown how many local design firms provide services to clients internationally. Considering the small size of design firms, it is unlikely that there has been significant foreign direct investment into design firms, particularly graphic design firms.

Demanding buyers

Interviews indicate that while Canadian manufacturers are not heavily reliant on designers, the creative sector (which includes the advertising sector), has placed a high value on quality web designers[60]. This value shows up in data on graphic designers in the information and cultural industry.

Some interviews indicate that interactive digital media companies are increasingly seeking design skills, but are having trouble filling roles – for example one interactive media company has been looking for a user experience designer for 9 months to no avail.

[60] Web designers can be both design workers (those who design the site for style and user experience) and ICT workers (those who code the site) or both

Access to financing

It is unlikely that a lack of financing significantly impacts design firms, as they would likely not pursue R&D with access to financing. Demanding buyers encouraging innovation and paying fees for this is likely more important.

Government Support

Compared to other industries, government support is relatively low for the design sector. There are few tax credits or funds accessible for this industry compared to other jurisdictions; for example, Montreal has access to Quebec's provincial tax credits and has a design commissioner. What limited government support there is in the GTA comes in the form of support for organizations such as the Design Exchange, a national body which promotes Canadian design and organizes events[61]. Government support is definitely an area of weakness for the design sector.

5.5.4 Regional Innovation Indicators: Evidence of Quality R&D and Innovation in the Region

Sophistication/excellence of product lines and companies

Interview results indicate broadly that while Canada does have good design firms, it does not have a reputation for top design like, for example, Scandinavia. There are, however, isolated examples of firms gaining international recognition in certain design subsectors. These include:

- Interactive multi-media design: Gorbet Design Inc., Toronto has been recognized in publications such as *I.D. Magazine,* the leading U.S. design publication, for its work in interactive design on kiosks and psychical installations; Aniko Multimedia labs combines architectural techniques with multimedia design. Both have been internationally recognized.
- Interactive–design Advertising: There are numerous advertising firms that have excellent reputations, particularly in interactive design, such as Boxx3g.
- User experience design: there is some evidence of activity in the GTA, such as with the company Digital Cement, but it is limited. For example, Toronto Interacts – the user experience association – is not very active in running events and initiatives.

61 DesignExchange.org

Overall, while it appears that there is an excellent base of graphic design firms in the GTA, we have little evidence of the level of or strengths in other types of design of importance to CONCERT.

High Quality R&D Resources

While a number of interviewees saw the importance of design, particularly in interactive digital media, the availability of R&D resources was not necessarily seen as important. Rather, the availability of highly qualified designers with good training in both design and technology was considered as more critical to success.

In addition, it must be noted that as much design is not eligible for traditional academic funding sources, it is at present difficult to assess 'capacity' as compared to other areas of research.

Figure 31 – Design Research Capacity in CONCERT Academic Institutions

Design	Institutions	Types of Research	Research capacity	Facilities
Mobile	OCAD, U of T	User experience design, handset design, locative technologies.	Medium*;	Mobile lab
User experience design	OCAD, U of T	Applications of Ergonomics (Medical) Personalization; user-centred interface design	Low	Interactive Media Lab at U of T
Wearable technologies	OCAD, U of T	Ubiquitous computing	Low	
Industrial design	OCAD, George Brown	e.g., Mobile handset design	Low	
Advertising	OCAD	Graphic design, interactive media design, branding	Low	
3d visualization	OCAD, U of T, Seneca, Ryerson	3d and virtual worlds, 3d modelling	Medium	3d rapid prototyping lab at OCAD

5.5.5 Design - Regional Innovator Indicator Conclusions

While we have little evidence of firm level activity in the design sector in the areas of interest, we come to the following conclusions about the region's strengths and weaknesses in design:

Strengths

- The GTA has strengths in advertising and graphic design;
- The GTA has a strong presence in companies in the interactive media design industry, evidenced by data shown in the ICT section on the number of web developers;
- Certain institutions – such as OCAD – are increasing capacity in mobile handset and content related design.

Weaknesses

- There is little evidence of significant activity in user experience design, which according to interviews as well as secondary research appears to be of increasing importance in the interactive media sector;
- There is little buzz behind or funding for research and innovation in design.

5.6 Arts

Overall, because of the limited amount of data available in the public domain about the arts in the Greater Toronto Area, as well as a limited ability to conduct extensive intra-secotral research in the arts community, we have conducted little research on the arts.

However, for reasons addressed in Section 2, it is evident that the arts should form a critical component of the CONCERT innovation strategy, and therefore more information should be sought in order to understand this sector further.

5.6.1 Categorization

The Arts can be classified in a number of ways, including:

- Visual arts (including sculpture);
- New media arts (typically combining technology and visual arts in a certain way);
- Performing arts.

As discussed earlier, the first two are the most important for CONCERT's purposes; however, there may be circumstances where the other areas are in scope – such as when research in interactive dance could be applied to R&D in motion capture for the games industry.

The following section looks primarily at visual arts and new media arts, however some data – such as arts funding for the city – includes arts in the round, and does not separate out visual and new media arts.

5.6.2 Regional Innovation Indicators: Ability to Innovate

Critical Mass

According to the Toronto Arts Council, there are approximately 20,000 resident artists in the Greater Toronto Area – however, there may be many more who are not self-identifying or permanent artists[62]. There is no evidence to indicate whether these are visual, new media, performing artists or sculptors.

Costs

There is a relatively low cost of living and studio space for artists - but costs in Montreal are lower.

Highly qualified/specialized labour pool

There is little evidence to demonstrate whether artists are in any way specialized (e.g. in sculpture vs. new media arts, etc.).

Collaboration

Interviews indicate collaboration between arts and other industries is low. However, there appears to be headway in improving the situation. For example, there are certain events and institutions which are driving to facilitate greater collaboration between the arts and other sectors including:

- Interacess Centre which is driving the nexus between art and technology;
- Informal networking places like the Spoke Club driving interaction between film, TV and interactive media.

[62] Toronto Arts Council website, http://www.torontoartscouncil.org/press.htm

Buzz

The GTA was hardly on the map a few years ago in terms of its 'buzz' and reputation in the arts scene. Now it is making headway in generating more excitement and more of a reputation in this industry. However, compared to other jurisdictions, there is still a long way to go.

The growth in the city's 'buzz' is evidenced by high success events like Luminato in 2007, the second Scotiabank-sponsored Nuit Blanche which featured many art-meets-technology installations, as well as exhibitions put on by the popular (bar-cum-art venue) 'The Drake'. However, there are still few artists who are recognized on an international scale, and the GTA – as compared to, for example, New York and London- is by no means yet a world-class centre for Art.

Demanding buyers

According to one interviewee, buyers in the GTA are still very traditional in their taste, and enjoy the 'Group of 7' more than they would up-and-coming modern artists. This preference tends to hinder the growth of an *avant garde* art scene, as opposed to places like New York and London where there is major demand for this kind of art.

Exports and foreign investment

As mentioned, the arts in the GTA are not recognized by international buyers

Access to Financing

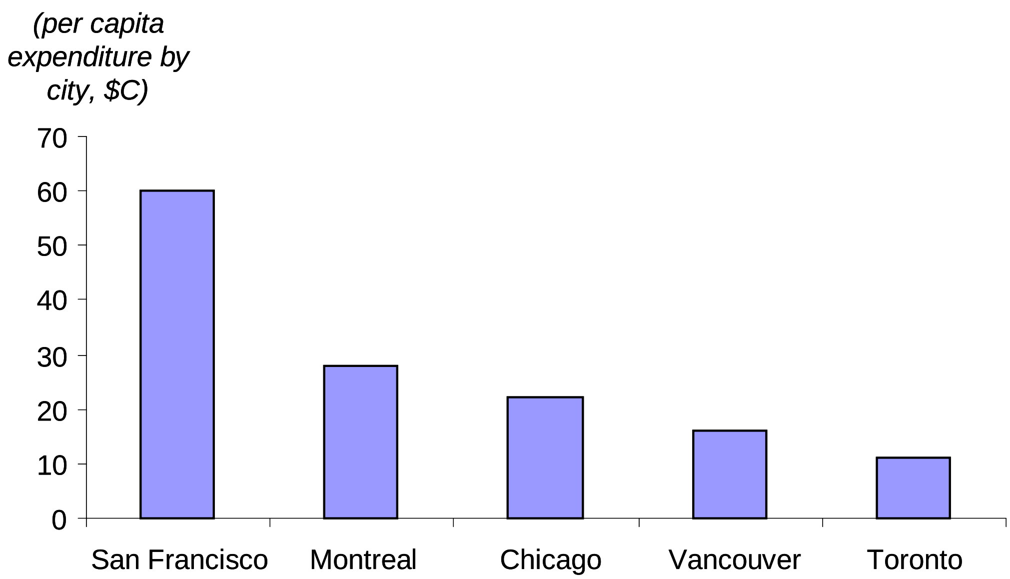
Experimental and multi-media art is funded in part by the Canada Council and the Toronto Arts Council, but artists and galleries have very little access to financing other than public monies, private donations, and limited revenues from art sales. Artists themselves are significantly under-financed – according to the Toronto Arts Council, their average salary in the GTA is $21,000.[63] Note also that 75% of Toronto Arts Council grants are less than $10,000, so even government grants cannot contribute to significant financing for artists.

Government support

Compared to some foreign jurisdictions, support for visual and new media arts is low (see Figure 32).

[63] Toronto Arts Council website, 2007

Figure 32 - City Comparison – Arts & Culture Operations Funding



5.6.3 Regional Innovation Indicators: Evidence of High Quality Innovation and Research

- Sophistication/excellence of product lines and companies

Interviews indicate that although there is innovative art being produced in the GTA,the city is still not leading in *avant garde* art on the international scene. However, we have little information on the types of artists present in the GTA and the type of art and/or innovative nature of the art these artists are pursuing.[64]

[64] We suggest that CONCERT develop relationships with the Toronto Arts Council to gain access to better information in this area, as well as Interacess which combines art + technology (www.interacess.org).

The types of R&D in the academic institutions are identified below.

Figure 33 - Types of R&D

Arts	Institutions	Type of research	High research capacity?	Facilities
Art History and Critical Theory	OCAD, York, U of T		Medium	
Interactive Art	York		Low	
Image Arts	Ryerson	Film, photography , new media	Low*	
Integrated media	OCAD		Low*	
Drawing and painting	OCAD, York			
Digital sculpture	York	Translation of digital code into reality		

5.7 Summary of Regional Innovation Indicators

Outlined below in Figure 34 is a summary of the regional innovation indicators and their scoring across all sectors.

Figure 34 – Scoring of Regional Innovation Indicators, All Sectors – Ability to Innovate

Strong / Moderate / Poor	Film and TV	ICT	Design	Arts
Ability to Innovate				
Critical Mass	Strong	Strong	Strong	Strong
Costs	Strong	Strong	Strong	Strong
Highly qualified/specialized labour pool	Strong	Strong	Strong	Strong
Buzz	Strong	Moderate	Moderate	Moderate
Government support	Moderate	Strong	Poor	Poor
Collaboration	Strong	Strong	Strong	Moderate
Exports and foreign investment	Moderate	Strong	Moderate	Moderate
Demanding buyers	Moderate	Moderate	Moderate	Moderate
Access to corporate financing	Moderate	Moderate	Poor	Poor

Figure 35 — Scoring of Regional Innovation Indicators, All Sectors – Evidence of High Quality Innovation and Research

Strong / Moderate / Poor	Film and TV	ICT	Design	Arts
Evidence of High Quality Innovation and Research				
Sophistication of product lines and companies	Moderate	Strong	Moderate	Moderate
Access to high quality academic research	Moderate	Strong	Moderate	Moderate

6 Conclusions

The Regional Innovation Profile examines the screen-based sector and the breadth of its full value chain, including component/products/systems R&D, the creation of intellectual property across multiple platforms in both traditional and new media, as well as their distribution and exhibition for consumer or industrial consumption.

The GTA is rich in resources throughout this value chain, especially in terms of its technical, creative, and entrepreneurial talent pool. In fact, we found that we could not easily cut out potential areas for growth on a global stage. There are areas in which support, be it institutional, industry, or R&D-focused is very thin, but most of the areas contain some elements upon which to build. We discovered that in some areas the GTA may have slipped compared to its past performance (such as in animation), but there has been of late a resurgence exemplified by the birth of new firms and the development of pockets of expertise.

It should be noted when discussing the GTA as a region that it is so interlinked with other Ontario resources, particularly Southern Ontario, that it would not be prudent to draw too much of a distinction. Leadership is exhibited in the screen-based sector both outside and within the GTA.

That being said, the GTA and its extended region has no globally recognized area of expertise. Even though the ICT sector is very strong, it does not enjoy that recognition. There are exceptions among individual companies, like RIM, or among institutions, like the Toronto International Film Festival. However, aside from being the obvious Canadian centre for screen-based production and distribution, there is no sense of Toronto being a global powerhouse in specific screen-based niches.

The growing convergence of the screen-based sector makes it an opportune time to initiate the discussions to position the region around potential areas of innovation and opportunity, and grow them through appropriate investment and collaboration. The next report will identify these areas and elaborate on their potential for success in the Greater Toronto Area. That analysis will be based upon the foundation presented in this Regional Innovation Profile.

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Primary Interviews - Industry and Government

Company	Size	Sector	CONCERT Member Y/N
AMD	Large	Micro Electronics, Hardware	Y
Apple	Large	Software and Hardware	Y
Bitcasters	Small	Games	N
Breakthrough New Media	Small	Interactive Digital Media	N
C.O.R.E. Digital Pictures	Large	Animation and Digital Visual Effects	N
Canadian Film Centre and Media Lab	Medium	Educational institution, private	
CBC	Large	Broadcaster (government)	N
Cinespace		Production Facilities	Y
City of Missisauga	Large	Municipality	N
Communications Research Centre	Large	Research Lab (government)	N
Comwebmail	Medium	Production Facilities	N
CVCA	Small	Venture Capital	N
Decode Entertainment	Small	Interactive Digital Media	N
Deluxe Laboratories	Large	Post Production Services	N
Design Exchange	Small	Attraction	N
Eccentric Arts	Small	Arts/Design/Interactive Media	N
FilmOntario	Small	Trade Organization	Y
Guru Animation	Medium	Animation	N
Greater Toronto Marketing Alliance	Small	Marketing	N
inDEF, CUTO & Frameblender	Small	Production and Post Production	N
IBM	Large	ICT	
Industry Canada	Large	Government	N
Interaccess	Small	Art Gallery, arts and technology	

Company	Size	Sector	CONCERT Member Y/N
Interactive Ontario	Small	Trade Association	Y
Invivo	Small	Animation	N
MarbleMedia	Small	Interactive Digital Media	N
Ministry of Culture			

Company	Size	Sector	CONCERT Member Y/N
Ministry of Economic Development and Trade	Large	Government	N
Ministry of Research and Innovation			
MIT		Academic	
Motorola	Large	Telecommunications	Y
MRI			
Murmur	Small	Interactive Digital Media	N
MyThum	Small	Advertising and Telecommunications	N
Optix Digital Pictures	Small	Post Production Services	N
ORANO	Small	4th Pillar	N
Panavision			
PriceWaterhouseCoopers	Large	Service Provider	N
Quick Play Media	Medium	Mobile Technology	N
Research in Motion	Large	Wireless	
Rocket Science	Small	Digital Visual Effects	N
Royal Bank	Large	Bank	
Royal Ontario Museum	Large	Museum	N
Shaftsbury Films	Medium	Production Company	
Side Effects Software	Medium	Software Developer	Y
Stitch Media	Small	Interactive Digital Media	N

Company	Size	Sector	CONCERT Member Y/N
Toronto Arts Council	Medium	Government	
Toronto Artscape			
Toronto International Film Festival	Small	Festival and Events	N
Town of Markham		Government	
Transgaming Technologies	Small	Software - Gaming	N
Individuals:			
Olivier Fuller,		Visual and New Media Arts Consultant	
Michael McEwen		HD Expert and Consultant	

APPENDIX A: ICT CATEGORIZATIONS

ICT - Categorization

The ICT sector is typically defined by several sectors. Example categorizations include:

E&B Data, for the TRRA

Manufacturing (Computer, peripheral, major components)
Development (Software, systems, communication networks)
Services (data processing, telecoms and internet, equipment, etc)
Within these areas, digital media falls in between development and digital/interactive media.

While this categorization is useful, it does not include the content creators (e.g. interactive media production) as a separate component. As interactive content media production is a creative industry, and the others are not, this distinction is useful for CONCERT's purposes.

Canadian Interactive Industry Profile

Content creators (interactive entertainment; e-learning and education; information and reference, social, culture and arts)
Enablers (software development, digital compression technologies, internet applications, visual effects, interactive television)

Note that this definition falls short of CONCERT's needs as hardware is not included, which is one of the key components of R&D and innovation intended for the CONCERT industries.

3. IBM Report for TRRA on the ICT sector in Toronto (2006)

- Next Generation Electronics (production of small lots of using nanotechnology, optical, bio, or other non-metallic circuits for application in areas such as the communication sector)
- Professional shared services - the provision of IT support to middle office operations for business.
- Specialist software development - the sectors selected by the TRRA and IBM focussed on software development for telecommunications companies as well as mobile carriers and content providers.

- Digital media – focussed on content creators, including games developers. This includes software providers, graphic designers, multimedia artists, animators and providers of digital visual effects.