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DIGITAL MEDIA

May 2011

A Human Resource Situational Analysis for Digital Media in Canada

Canada

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Executive Summary

Digital media in Canada is a vibrant, diverse, and creative industry. In Canada we have from approximately 2,300 (Industry Canada, 2010) to 3,200 (CHRC, 2009) Digital Media (DM) companies of which 85% of the companies are 100% Canadian owned (CIAIC, 2009). These companies are reported to employ more than 52,000 people (CHRC, 2009). Combined the Digital Media industry represents between $3.5 billion in business (Industry Canada, 2010) and annual revenues of more than $5.1 billion dollars (CHRC, 2009). This is a "young" industry with firms averaging nine years of operations and nearly 15% of firms being established between 2006 and 2008 (CIAIC, 2009). Digital Media companies are established across Canada with significant clusters of companies in Vancouver, Toronto, Montreal, and Halifax.

At present there is great competition amongst countries as they compete in the rapidly growing and lucrative digital media industry. Communitech's news release (Communitech, 2009) cites PriceWaterhouseCoopers' Global Entertainment and Media Outlook: 2008-2012 stating that the worldwide digital media industry is one of the fastest-growing segments of the knowledge economy (double-digit growth rate) and that it will help drive the global media market up to US $2.2 trillion within the next five years. According to the Canadian Interactive Industry Profile (CIIP) (CIAIC, 2009), which is the *only national study of Canada's interactive media* industry at the time of this publication, the industry as a whole experienced a 50.9 per cent growth rate in revenue from interactive digital media work between 2006 and 2008, and a 17.4 per cent rate of growth in revenue from all sources over the same period.

Although digital media is best known for its contribution to entertainment (gaming, video/television, internet) it is clear that its impact on sectors such as education, health, and communities of people in general through social media, have been and will be increasingly profound. The gaming industry has the largest share of global digital revenue at 35%[1] and Canada is well positioned to capitalize on this global market as demonstrated through our proven track record.

In 2008 it was identified that a barrier to success for Canada was a lack of investment in digital media, which at the time was only receiving about $14 million, as compared to traditional media that saw investments of nearly $3 billion (itBusiness.ca, 2008). This issue was answered, at least in part, by the Ontario government's investment of $26 million in The Communitech Hub: Digital Media & Mobile Accelerator in Waterloo. This was a priority put on digital media as part of Ontario's Next Generation of Jobs Fund.

Despite the importance of Digital Media to the Canadian economy there has been little investigation into the human resource needs of this dynamic industry. The large questions of labour and skill requirements for the current and future state of this critical industry study have gone unanswered. Questions such as: Who works in the industry and what work are they doing? Are there labour shortages or surpluses? Are there skills shortages? Where are the current skills shortages by region or cluster? What and where is the demand for skilled labour? Is the education system producing graduates that meet the skill needs of industry? These questions and many other must be answered in order to coordinate efforts that support the Digital Media industry with the properly skilled talent that industry requires.

This situational analysis is intended to shed light on the human resource related issues that ICTC observed about the Digital Media industry and provide recommendations for addressing those issues.

> "It's a multimedia world in the 21st century — and Canada offers tremendous expertise across the entire multimedia spectrum: animation and special effects, visual effects and post-production, web marketing and business applications, education and training, video and computer games, tools and platforms, hardware."
>
> (Industry Canada, 2010)

> "Following the recent final results of a national survey of the interactive media industry, Canada looks poised to be a strong contender in the growth of the global market."
>
> (INFOPORT.ca, 2010)

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[1]   Presented at "Canada 3.0 Conference – Defining Canada's digital future" (2010).

Summary of the Key Findings

Overall Findings:

- There is a lack of comprehensive and categorized information on the current realities of the Canadian Digital Media workforce.

- There are no formal data collection means embedded in Canada's critical labour market tools to gather industry and occupational information over time – including North American Industry Classification System (NAICS) codes that properly reflect and capture the Digital Media industry, and National Occupation Classification (NOC) codes that effectively count and describe critical characteristics of Digital Media occupations.

- There are no widely accepted competency profiles (job descriptions that provide competency based detail) that are used by industry for human resource management purposes, or by education for the development of learning outcomes for digital media program offerings.

- There is very little information regarding human resource issues facing the industry and there is little to no evidence-based research available.

- Anecdotally there appears to be a need for highly experienced staff in both the high-end technical (enabler) and creative (content) positions. (see Table 1 for definitions)

- The Government of Canada's Digital Economy Strategy (DES) consultation received many submissions from organizations and they all state that talent is a critical component to the success of the Digital Media industry in Canada.

- The DES submissions will likely comprise the Building Digital Skills for Tomorrow component of the DES that is currently in development. It will be important to assess the issues and recommendations identified in this situational analysis against the DES to revise, align, and leverage the final DES to further the development of human resources for the Digital Media industry wherever possible.

Key Finding #1 – Lack of Definition is a Barrier for Change

- There is no widely accepted definition of Digital Media. This in itself is not a problem, but what it does mean is that there is a lack of cohesion in terms of prioritizing the needs of industry – a common voice or a call-to-action on human resource issues.

- Cultural Human Resources Council's (CHRC) compendium of hubs (CHRC, 2010) lays out a very complex and fragmented "system" of the various players involved in fostering and developing Canadian Digital Media companies.

- A comprehensive analysis of the existing NAICS codes needs to be undertaken with a sampling from Statistics Canada's business register to validate the classifications, applying an agreed upon definition of Digital Media, and testing with actual Digital Media companies to ensure validity and to identify the gaps.

- The ability for the industry to collectively prioritize the specific human resources issues and backup their requests for assistance in terms of technological investments or human resource development issues will be strengthened with evidence-based support.

- The lack of data becomes a barrier for business cases that are built for governments (federally and provincially) to provide structural support for the industry, particularly on the technology investment side where the number of high quality jobs created by the proposed investment is a critical component of the equation and decision making.

- A more "institutionalized" approach to survey development is required otherwise the data that is used to describe the labour market for digital media will be based on ad hoc surveys that will vary in scope, methodology, and ultimately quality.

- Many of the remaining key findings in this report would be addressed, supported, or be more "addressable" if this key finding was addressed.

Key Finding #2 – A Cumbersome Labour Market

- The lack of standardized job descriptions for the Digital Media industry leads to inefficient transactions in the labour market.

- The lack of standardized job descriptions also impacts the ability for industry and education to communicate their needs effectively, as they do not have that common "language" upon which competencies and learning outcomes are built.

- This finding affects very-small and small companies the most – as they are least likely to have dedicated human resources personnel within their companies.

- For very-small and small companies this issue directly affects human resource functions such job description writing, recruitment, applicant screening, market assessments of salaries, as well team/skill resourcing for projects or proposals.

- Without standardized job descriptions and benchmarks the cost of hiring staff is potentially much higher than is necessary as employers must rely heavily on recruiters, and the risk or cost of a "bad" hire is potentially increased.

- The lack of well understood and articulated job requirements leads to job seeker frustration and ultimately an inability for first time entrants (new graduates and internationally educated professionals) to gain access to the labour market.

- Without well articulated occupation profiles, often at the National Occupation Classification (NOC) level, Canadian immigration processes can be cumbersome and frustrating for employers and facilitators to navigate.

Key Finding #3 – Supply and Demand Challenges

- Based on the research carried out for this project it is very hard, if not impossible, to assess the current or near-future labour or skill needs of Canada's Digital Media industry.

- Very-small, small, and medium size companies appear to be looking for staff and the large and very-large Digital Media companies seem to be going through cycles of downsizing and hiring.

- Anecdotally, medium to very-large size Digital Media companies have a constant need to find very experienced senior staff (10+ years) for their high level technical (enabler) and creative (content) roles.

- The issue of worker mobility from one region of Canada to another for employment in Digital Media is not well understood.

- Without an analytical framework that is based on a widely accepted definition of the industry, and standardized occupations, forecasting supply and demand for the Digital Media industry accurately will be an on-going challenge. This will constrain the Canadian Digital Media industry from reaching its future potential as this is an industry that is heavily reliant on a highly skilled workforce.

- The variety and inconsistency of Digital Media programs that are offered through the post-secondary system in Canada makes it very difficult to measure the potential supply of labour for the industry.

Key Finding #4 – Industry and Post-Secondary Relationships

- There appears to be a critical disconnect between post-secondary Digital Media programs and the needs of industry. This finding is amplified for Digital Media due to the rapid pace of change for the technologies that are used.

- Industry across the country expressed concern about the ability of post-secondary schools (Universities and Colleges) to rapidly adapt to their changing needs.

- The needs of very-small and small industry (where the majority of hiring occurs) are least likely to be reflected in the post-secondary offerings. This is due to the fact that participation in program advisories or the curriculum review process is time consuming and very-small and small industry are the least likely to able to afford the time.

- Digital Media Industry (primarily small and medium size) needs employees with a diverse set of skills including the requisite technical and creative skills, business, entrepreneurial, and communication skills. These complex sets of competencies are often not taught to students within a single post-secondary program. Hybrid programs that cross traditional disciplines such as technology and business are starting to emerge but are not the norm for Canadian post-secondary offerings.

- Post-secondary institutions expressed a challenge in finding qualified Digital Media teachers with up-to-date skills that were willing and able to instruct.

Key Finding #5 – Co-op and Internship Frustration

- Across all regions there was an expressed frustration with post-secondary co-op and internship programs.
- Industry supports the concept and sees the need and value of co-ops and internships, but expressed a strong dissatisfaction with the restrictions around the duration of these activities.
- Industry stressed that co-ops and internship are too short for both industry to receive any benefit from the work done by a student, or for the student as the length of time does not allow them to gain enough experience to be truly meaningful.
- This is a critical issue for the industry as there is a serious risk of disenfranchising recent graduates who will struggle for employment as a result of not having relevant experience.
- A disenfranchised labour market that can't gain access to entry level positions in industry will affect enrollment levels and create cyclical supply and demand problems where the domestic supply of workers can't meet the needs of industry and increases the reliance on foreign trained professionals.

Key Finding #6 – Company Size Matters for Skill Requirements

- At a macro level large and very-large digital media companies tend to hire specialists that have skill depth in either the technical, creative, product/project management, or integration aspects of the work.
- The very-small to medium size companies need to hire staff that are multi-disciplinary, or have skill breadth as employees.
- The availability of talent with the appropriate skill mix appears to have a direct impact on the growth opportunities for very small to medium size companies.
- The Digital Media industry has a significant reliance on immigration to staff for their highly qualified positions and medium to very-large size companies appear to be able to manage this given that they are more likely to have the resources and are less risk averse to tapping into the global labour market.

Key Finding #7 – Awareness of Opportunities in Digital Media for Youth

- Career "Pathing" and career promotion to youth about the vast array of opportunities in Digital Media are not being done in an effective manner.
- The need to encourage math and science and digital media related courses (arts, interactive media, etc.) at the high school level was a need expressed by the majority of industry involved in this situational analysis.
- Awareness of the industry, beyond the image of gaming, must be undertaken to effectively appeal to the future workforce.
- Canadian demographics dictate that the fight to retain or increase the share of students going into Digital Media programs will intensify in the near future as fewer students will be available for an increasingly competitive labour market.

Key Finding #8 – Competition and Prioritized Investment

- There is a clear sense of competitiveness among the clusters in Canada to attract high level talent and private and public investment dollars.
- It is necessary for Canada to develop priorities that strengthen the labour force, foster research and development of intellectual property, encourage and support unique content development, and improve our capacity for product to market strategies.
- These activities could be supported through the strengthening of the existing clusters and centers of excellence and likely through consolidation or improved cooperation of the "hubs" identified by CHRC (CHRC, 2010). This finding would be supported and guided through the development of evidence based research as outlined in the Key Finding #1.
- It is anticipated that some of the issues outlined in this key finding will be addressed in the Digital Economy Strategy by the government of Canada.

Key Finding #9 – Digital Media's Reliance on Internationally Educated Professionals (IEP's)

- Digital Media companies rely heavily on Internationally Educated Professionals (IEP) for the highly qualified talent they require.

- Small to medium size companies are less likely to hire a recent graduate without industry experience.

- The labour pool for talent is restricted by these two factors and requires that both immigration works effectively, and that recent graduates acquire experience with larger companies and then become "available" in the qualified labour pool.

- This finding indicates that small and medium size digital media companies must be aware of immigration processes and procedures to effectively utilize the various streams within the system to meet their human resource needs.

- Many companies that participated in the situational analysis project indicated a need for assistance with, and awareness of, the current immigration process and programs.

Key Finding #10 – Need for Human Resource Management Support for Small to Medium Size Companies

- Agility appears to be a key characteristic of successful small and medium size Digital Media companies.

- This definition of success is highly dependent on good staffing, recruiting, networking, effective skills upgrading, and innovative human resources planning and management.

- It appears that the tipping point for Digital Media companies to have dedicated human resources personnel is about 100 staff.

- Given that the majority of Digital Media companies in Canada are much smaller than 100 staff it is unclear how very small and small companies can effectively manage these creative human resource processes for success.

Summary of the Recommended Actions

Based on the findings outlined in this report ICTC recommends that the following six (6) activities be undertaken to address the human resource needs of the Digital Media industry in Canada.

Recommendation #1 – Development of an Analytical Framework and Labour Market Snapshot for the Digital Media Industry

- The development of an Analytical Framework for the Digital Media industry is necessary to identify the research requirements for a Supply and Demand Analysis of the industry, and to develop a Labour Market Snapshot that provides national and regional (cluster) detail.

- A framework is required for analyzing the human resource issues, capturing the current state of the supply and demand issues facing the industry, and mobilizing the critical players in the Digital Media industry around a strategic agenda to address the issues identified.

- ICTC has developed a model for forecasting the supply and demand needs of Canada's ICT sector and this model could serve as the foundation of a model for Digital Media. ICTC's Outlook is based on the development of an analytical framework, a labour market snapshot, and ultimately an econometric model that has been used repeatedly to develop the forecast.

- Industry-developed mechanisms to guide post secondary education in their program development including standard competency based profiles that capture, at a number of working levels, the critical competencies required of employees to carry out their work.

- This work would need to be informed by an evaluation of similar international work from countries such as Germany, New Zealand, France and Australia that have undertaken work on policies pertaining to national digital strategies (Nordicity, 2009). These countries may have defined and captured statistical coding which could help in defining in the classification of Canada's interactive digital media industry.

- The analytical framework and the supply and demand snapshot will provide the evidence-based background necessary to construct and propose changes to the NAICS system.

- Building upon and working with the Canadian interactive alliance / alliance interactive canadienne (CIAIC) to develop classification codes will lead to a better understanding of the national tracking system needs for the Digital Media industry.

Recommendation #2 – Development of Competency Based Profiles for the Critical Occupations for Digital Media

- ICTC recommends the development of Competency Profiles (industry validated occupation profiles), using ICTC's Competency Profile Model.

- These competency profiles will provide a nationally recognized set of competencies for the five key occupations in Digital Media, that are necessary for industry and education to effectively collaborate on to ensure that industries skill requirements are being met.

- ICTC recommends the development of a Domain Knowledge Area (DKA) for Digital Media that utilizes the framework and process developed for eHealth competency profiles. The DKA will capture the critical competencies that are required for employees to work in the field (domain) of Digital Media that are above and beyond their technological competencies. In other words, what competencies allow ICT workers to apply technology in the content-rich field of digital media?

- The development of these standard profiles also provides the foundation from which the National Occupation Classification (NOC) system can be modified or added to as required. This work will enable the digital media industry to rely on competencies that may be considered as talent-based interpretations of business needs and add value by communicating what people must know to help the business succeed.

- The future data created by a national classification system will support policy change, enable better understanding of skill shortages and /or labour shortages and enable targeted efforts at addressing them through immigration efforts, training and educational institutions as well as for stakeholders in companies planning and addressing their human resources challenges.

Recommendation #3 – Strengthen Post-Secondary and Industry Relationships

- Industry, including small and medium size companies, at the local level must become active in the development and revisions to post-secondary digital media program offerings.

- Opportunities for more creative approaches to industry-education collaborations need to be taken to benefit both small to medium size companies and the students.

- Creative solutions that could be undertaken that benefit everyone rather than focus on the traditional co-op or internship model because it is "comfortable" are needed.

- There is a need for post-secondary institutions to evaluate their offerings and undertake a process to engage industry and integrate multiple disciplines to address the skill needs of industry.

- Industry has the responsibility to participate in program advisories and curriculum reviews to ensure that their current and near-future skill needs are addressed.

- An excellent example of an intentionally designed program offering that captures the needs of industry, and offers a flexible approach for students to customize their learning based on their interests is Northern Alberta Institute of Technology's (NAIT) **Digital Media and IT program** (NAIT, 2009). NAIT's Digital Media and IT program (NAIT, 2009) was designed as an integrated, multidisciplinary approach to offering both IT and Digital Media programs. Students of the program must all take a set of core courses, and then are able to select, across the nine streams, the course offerings they want. Under each of the nine streams NAIT has identified the courses that are; suggested, strongly recommended, those that are required for designation, and a couple of other required courses.

- Another innovative approach to post-secondary education program development for Digital Media is the partnership that formed the **Great Northern Way Campus** (Great Northern Way Campus, 2009). The University of British Columbia, Simon Fraser University, British Columbia Institute of Technology, and the Emily Carr University of Art + Design have come together to offer a graduate degree program called the Masters of Digital Media (MDM).

- Overall the focus of industry and post-secondary education needs to be on creative and innovative ways to provide an experience bridge for graduates, as it is clear that most employers are reluctant to hire a recent digital Media graduate with little to no relevant experience.

Recommendation #4 – Awareness of Opportunities in Digital Media for Youth

- The Canadian Digital Media industry must collaborate to create awareness of the diversity and career opportunities the industry can provide to students.

- A national body or a number of Digital Media hubs could lead this initiative by creating tools and resources to promote the industry to students. Tapping into the creative nature of the industry to develop these promotional strategies is an opportunity.

- Canada's Digital Media industry should explore similar internationally executed campaigns to leverage best practices.

- ICTC is engaged in promoting Digital Media through its Focus on Information Technology (FIT) secondary school program (ICTC, 2006).

Recommendation #5 – Development of Human Resource Tools and Products that Support Very-small to Medium Size Digital Media Companies

- Many of the issues outlined in this situational analysis point to a need for the development of capacity within very-small, small, and medium size Digital Media companies to manage their human resources.

- ICTC recommends the development of a Human Resource Guide for Digital Media companies that provides tools and resources that address the critical Human Resource that include topics such as international recruitment, best practices for short term staffing, skills upgrading strategies etc.

- An environmental scan of existing tools and resources and an assessment of the applicability these tools to established use cases would need to be done to develop a list of the final tools to be modified or developed.

- The tools would be released and promoted through the various Digital Media hubs to their member companies if applicable.

- ICTC and **TECHNO***Compétences* have partnered to develop a Human Resource Guide (ICTC, **TECHNO***Compétences*, 2008), for ICT companies that is comprehensive and highly utilized by stakeholders.

Recommendation #6 – Improve Communication about Immigration Processes and Procedures

- As identified in Key Finding #9 there is a critical need for awareness of the requirements, processes, and options regarding the immigration of internationally educated professionals (IEPs) to Canada.

- It is the responsibility of the provincial and federal government agencies to provide clear and comprehensive information regarding all of the various immigration processes and requirements.

- Industry hubs need to proactively provide resources that inform small and medium size companies in their communities about the options and services regarding the immigration processes.

BACKGROUND

Introduction

ICTC's mission is to build a more competent, motivated, and agile Information and Communications Technology (ICT) workforce for all sectors of the Canadian economy. ICTC accomplishes this mission by undertaking programs, projects, and initiatives in five key areas: Labour Market Intelligence, Workforce Competency and Skills Development, Securing the Future Workforce, International ICT Worker Integration, and Diversity and Inclusion.

ICTC believes that the engine that drives the Canadian economy is technology. Therefore ICT workers are a critical component to the country's success. A healthy and vibrant ICT workforce is crucial for Canada's productivity and to our social, cultural, and economic prosperity.

The evolution of ICTC

ICTC is the evolution of the Software Human Resource Council (SHRC). In 2006 SHRC officially expanded its mandate to include the Information and Communication Technology (ICT) industry and its related occupations to its software-industry-based foundation. The new organization was branded as the Information and Communications Technology Council (ICTC).

ICTC, through its Labour Market Information (LMI) program, then undertook research to develop Canada's first Technology Roadmap (TRM) for the Canadian Wireless industry. At the same time ICTC expanded its Occupational Skills Profile Model (OSPM) to include hardware occupations, providing ICT employers and educators with national standard definitions, skills, and accountabilities for 37 ICT occupations. The OSPM has since been transformed into a competency based system that is now called the Competency Profile Framework. ICTC included 3 hardware occupations in its 2008 landmark forecast of ICT Occupations, the Outlook for Human Resources in the Information and Communications Technology Labour Market 2008-2015.

In 2008 ICTC, in partnership with COACH, Canadian Health Information Management Association (CHIMA), ITAC Health, Canadian Institute for Health Information (CIHI), and Canada Health Infoway completed a situational analysis of eHealth in Canada. The consortium of organizations then developed the first Canadian study of Health Information (HI) and Health Information Management (HIM) human resources and released a report in 2009 that provided a snapshot of Canada's eHealth labour force and projected demand for the HI and HIM occupations over a 5 year period. ICTC is currently developing four (4) eHealth competency profiles for the Competency Profile Framework that capture the critical occupations identified by the HI and HIM study. As well, ICTC is adding a new feature to the Competency Profile Framework called a Domain Knowledge Area (DKA). The DKA will capture the critical competencies that are required for employees to work in the field (domain) of eHealth that are above and beyond their technological competencies; in other words, what competencies allow ICT workers to apply technology in the field of health that push innovation and productivity. ICTC is continuing to work with the eHealth partners to strategically address the human resource issues identified in the 2009 report.

Future sub-sector studies to ensure that ICTC is covering the evolving make up of the ICT industry in Canada, as well as ICT workers in whatever industry they may be employed in, will be undertaken. The next sub-sector study is Nanotechnology.

Labour Market Intelligence at ICTC

The Labour Market Intelligence (LMI) program at ICTC researches and reports on labour market issues facing the ICT industry to build a deeper understanding of Canada's ICT sector, which will help develop future human resource strategies and Canadian careers in ICT occupations.

ICTC uses this research to shape projects and programs aimed at enhancing Canada's competitiveness in the global ICT labour market. As well, this research enables industry, government and the education sector to develop the strategies needed to handle future human resource challenges by providing a clear, accurate view of current national labour market issues.

ICTC (SHRC) set out a strategy in 2002 to establish the organization as the source for ICT LMI in Canada. The strategy had 3 stages:

Stage 1: Provide **Data** to all stakeholders,

Stage 2: Use data and develop **Trend** information to gauge the changes in the ICT labour market,

Stage 3: Provide **Analysis** of LMI that establishes ICTC as the thought leader in LMI in Canada.

ICTC has carried out this strategy over the last nine years and has provided the council's various stakeholders with over 45 LMI reports and a multitude of opportunities to participate in discussions around ICT human resource issues across Canada. ICTC has had active participation by industry including an expert panel, industry advisory committees, and various project focus groups. ICTC has used LMI to

establish or rationalize continued support for projects, programs, or initiatives that the organization's board of directors determine are key to addressing Canada's ICT human resource needs.

In September 2009 ICTC received funding from the government of Canada's sector council program for a three project to develop labour market intelligence (LMI) for the ICT labour force. This project entitled Expanding the Awareness is designed to provide ICTC stakeholders with the most accurate, relevant and timely ICT labour market information in Canada. This information is driven by the needs of the industry and delivers intelligent analysis and insight that will empower stakeholders to make the most effective decisions on ICT human resource issues.

The intelligence developed under the LMI project will provide information for three time horizons:

Past – tracking changes to the ICT labour market from 2001 to 2006 through an analysis of the Census,

Current – gauging the changes to the labour market and the labour market characteristics through the monthly Labour Force Survey, and

Future – through research on new and emerging sub-sectors of ICT, and a revision of ICTC's supply and demand forecast, the Outlook 2011-2016.

Sub-Sector Studies at ICTC

ICTC, guided by an Industry Advisory Committee (IAC), will examine three (3) sub-sectors of Canada's ICT industry between 2010 and 2012. The objective of ICTC's sub-sector studies is to identify the human resource issues facing the sub-sector and identify the critical occupations. With this information ICTC and its stakeholders can make effective decisions on what work needs to be undertaken to ensure that Canada has a competent, motivated, and agile workforce. As ICT workers work in sectors across the Canadian economy ICTC needs to be as inclusive as possible to ensure that we are examining issues such as sub-sector competition for talent, evolving skill requirements and acquisition, and overall supply and demand issues at the occupational level.

ICTC has developed sub-Sector studies for Wireless Technology and eHealth.

ICTC's Sub-Sector Development Strategy

ICTC has a four (4) stage strategy for developing the sub-sector studies:

Stage 1 – Identify and Prioritize: The first objective in ICTC's strategy is to identify and prioritize the human resource needs. This stage includes the following activities:

1. A Literature Review that identifies the key players for the sub-sector, sets the context of the work and scans what, if any, human resource strategies have been developed to date,

2. The establishment of Working Groups (industry and education representatives) in three regions across the country to meet, explore, and identify the critical Human Resource issues facing the sector,

3. Gathering of input from the working groups, interviews, and additional research, and the drafting of a Situational Analysis that is Canadian in scope and with regional differences highlighted where possible, and

4. Validation of the draft Situational Analysis with the working group members and project partners.

The Literature Review and Situational Analysis will be used as input for all future activities.

Stage 2 – Partner: Concurrently with Stage 1, ICTC is developing partnerships with governments, industry, and education that will use the Situational Analysis to develop a strategic human resource plan and prioritize the key activities.

Stage 3 – Engage: ICTC will take the strategic human resource plan and develop programs, projects, and initiatives that align with the key objectives of the organization across ICTC's five (5) pillars of activities, which currently include:

a) Labour Market Intelligence,

b) Workforce Competency and Skills Development,

c) Securing the Future Workforce,

d) International ICT Worker Integration

e) Diversity and Inclusion.

Stage 4 – Support: ICTC will provide support to our partners for the strategic plan activities that other organizations take on which contribute to the overarching goal of ensuring that the sub -sector in Canada has the right people, with the right skills, at the right time to compete and lead in this sector.

Digital Media Research Methodology

Literature Review
The literature review involved a broad internet search to locate, evaluate and review key sources of information which would provide insight into the current situation in digital media within Canada. The review was conducted between early December 2009 and mid-January 2010.

Focus Groups
Three focus groups were conducted with 28 industry and post-secondary education representatives in Vancouver, Kitchener-Waterloo, and Toronto.

Validation
Validation for the key findings of the research was conducted through facilitated conference calls with participants of the focus groups. Validation of this final report has been conducted through a collection of comments, suggestions, and revisions by a diverse set of digital media stakeholders.

Situational Analysis
The situational analysis was developed using information collected during the literature review, the focus group sessions, additional interviews with digital media industry representatives, and additional research including the review of approximately fifteen (15) Digital Economy Strategy submissions.

A Human Resource Situational Analysis for Digital Media in Canada

ICTC selected digital media as the first sub-sector to be examined based on a number of factors including the magnitude of revenue by the industry, the reported level of current investment, the perceived economic value of the jobs created by this industry, and the lack of available detailed labour market information for the industry. Another determining factor for selecting digital media is its appeal to youth, as all of ICTC's stakeholders are interested in attracting youth to the ICT industry.

ICTC has identified that the Canadian digital media industry has the following characteristics:

- It is an extremely diverse industry that changes very rapidly to adapt to technological and consumer demands.

- It is best known for entertainment (ex. Gaming and special effects) but it has, and will continue, to increase its influence on many other sectors including, but not limited to, Education, Health, Financial and insurance services.

- There are estimated to be 2,300 – 3,200 digital media companies with about 52,000 employees.

- Annual revenues for Canadian digital media companies exceed $5.1 billion.

- It is a very young industry that is established across Canada with strong clusters of companies in Vancouver, Toronto, Kitchener-Waterloo, and Montreal.

- There is no broadly excepted definition of digital media and the lines between technology companies and digital media companies blurs as a result.

- It is a very competitive international market that is growing at a very rapid pace.

- Canada is a world leader in digital media verticals, including gaming.

Definition of Digital Media

ICTC uses Digital Media to include terms such as New Media, Interactive Media, and Interactive Digital Media. There are several definitions used for digital media in Canada. ICTC selected the Canadian Interactive Alliance / L'alliance interactive canadienne (CIAIC) definition of the industry provided in the 2008 Canadian Interactive Industry Profile (CIIP) report. The CIAIC definition of Interactive Digital Media is as follows:

Digital content and environments with which users can actively participate or which facilitates collaborative participation among multiple users for the purposes of entertainment, information or education, and is commonly delivered via the Internet, mobile networks, gaming consoles or media storage devices. The two essential sub-sectors of the interactive digital media industry include the entities creating the end-user experience (creators) and those designing the applications allowing for the creation or distribution of the content and environments to the user (enablers). (CIAIC, 2009)

This definition was selected based on the fact that it captures a broad spectrum of what is understood to be digital media; as well it delineates the distinction between "creators" and "enablers" in as clear a fashion as possible.

It is acknowledged that the scope of this project was not to define digital media or identify the occupations which are digital media occupations. The goal was to observe what exists in the labour market, describe the human resource challenges, and provide recommendations to address the issues identified.

Digital Media Verticals

For the purposes of this analysis ICTC selected the following six (6) categories to define the scope for digital media companies in Canada.

1. Game Design & Development
2. Simulations and Interactive Training
3. Advertising & Promotional Content
4. Software Design & Development
5. Content Management Systems
6. Web Design & Development

The rationale for selecting the six categories is based on the fact that the 2008 CIAIC CIIP report identified that these business activities (work) accounted for 75% of the revenue for Canadian digital media companies (CIAIC, 2009). ICTC's categories are a simplification of CIAIC's taxonomy that was used to ensure that participants that were engaged in the focus groups and interviews could easily identify themselves as digital media companies.

The following table provides a summary of CIAIC's 2008 Taxonomy (CIAIC, 2009) for defining the sector. Under the groupings of Creators and Enablers there are seven (7) Task Categories (Entertainment/Arts, Education/Training, etc.) and 24 Task-Sub Categories (Game Design and Development, Interactive Narrative, etc.). This taxonomy has evolved from a 2006 version and provides a framework from which a line of business (work), or multiple lines of business (work), can be used to define a company as an interactive digital media company, using CIAIC's definition.

2008 Canadian Interactive Industry Profile (CIIP)
Creators

Entertainment/Arts
Game Design and Development*
Interactive Narrative
Original Art-based Interactive
Cross-Platform Entertainment
Education/Training
Simulations and Interactive Training*
Curriculum-based Interactive Education
Marketing
Advertising and Promotional Content*
Branded Entertainment
Product Extensions
Information/Social
Social Networking
Mash-Up Engines
Interactive Social Services
Interactive Information Services

Enablers

Software Developers
Software Design and Development*
Digital Compression Software (Audio & Video)
Java-Type or 'Write Once, Run Anywhere' Applications
Distributors
Software Publishers
Game Publishers
Portals/Aggregators
Service Providers
Animation Graphics
Rendering Motion
Capture & Scanning
Content Management Systems*
Web Design and Development*

* denotes Task Sub-Categories used by ICTC to define digital media for this situational analysis.

SOURCE: CIAIC Canadian Interactive Industry Profile 2008 P. 23

The following definitions (CIAIC, 2009), also provided in the 2008 CIAIC CIIP report, provide clarity on the Task-Sub-Categories that ICTC selected for this situational analysis.

1. *Game Design and Development:* Video game content creation and production

2. *Simulations and Interactive Training:* Digital interactive content used for workplace training, other professional accreditation purposes, or other product use training

3. *Advertising and Promotional Content:* Digital interactive content used specifically to create awareness of a product, service or event

4. *Software Design & Development:* Producing computer software to be used for the distribution or production of interactive content and services

5. *Content Management Systems: Hosting or storing digital interactive content and managing its dissemination*

6. *Web Design & Development: Producing websites for the purpose of hosting interactive content or environments*

SOURCE: CIAIC Canadian Interactive Industry Profile 2008, P. 139-141

Key Findings

General Observations

Overall, there is a lack of comprehensive and categorized information on the current realities of the Canadian digital media workforce. While the 2008 CIAIC profile provides an excellent framework and a Canada-wide snapshot-in-time of the industry, the report provides little detail with regards to the human resources of this industry. It is clear that there are no formal data collection means embedded in Canada's critical labour market tools to gather industry and occupational information over time. This includes a lack of North American Industry Classification System (NAICS) codes that properly reflect and capture the digital media industry, and National Occupation Classification (NOC) codes that effectively count and describe critical characteristics of labour, working in digital media occupations. As well, it is clear that there are no widely accepted competency profiles (job descriptions that provide competency based detail) that are used by industry for human resource management purposes, or by education for the development of learning outcomes for digital media program offerings.

The literature review for this project identified very little information regarding human resource issues facing the industry. Anecdotally many individuals that were engaged through ICTC's research indicated that there was a need for highly experienced staff in both the content and enabler positions. Typically, when probed, the participants indicated that 10 years of relevant experience was required and not readily available in the labour market. Important questions such as; who works in the industry and what work are they doing? Are there labour shortages or surpluses? Are there skills shortages? Where are the current skills shortages by region or cluster? What is the demand for skilled labour? Is the education system producing graduates that meet the skill needs of industry? All of these questions and many others remain unanswered due to a lack of evidence-based research.

Existing Human Resource Strategies for DM

In terms of identifying any existing human resource planning activities that are directed at the digital media industry in Canada, there are few documented activities planned.

In 2009 the Cultural Human Resource Council (CHRC) released a Technology Roadmap for Digital Media Content Creation (CHRC, 2009). The report identified recommendations for training and skill upgrading that will be required as a number of specific technology projects are brought on stream for the digital media industry to meet market demand. The CHRC Technology Roadmap identified the need for the following Human Resource initiatives to fully realize the vision:

- Incentives for hiring newly graduated post-secondary students from digital media related courses of study, to offset some of the costs involved in training and mentoring new graduates who lack job-experience.

- Support for internships to provide on-the-job training for emerging digital media content creators from education to the workplace.

- Funding to encourage enrollment in retraining programs to help transition individuals from previous work to a career in digital media content creation.

- Programming to attract internationally renowned researchers and academics in digital media to conduct their research in Canada.

- Strategies for retaining Canadian-trained digital media workers, that are not now included under the North American Free Trade Agreement (NAFTA) Professionals Category system of labour mobility. This category grants qualified applicants a one-year work term in NAFTA nations.

- Facilitating access to foreign workers in digital media content creation, and easing the mechanisms for hiring them.

- Matchmaking-mentoring programs to support collaboration between companies of different scales with varied capacities to enable intensified collaboration as well as mentoring.

To further address the labour shortages and skill shortages related to the new technologies that the CHRC technology roadmap recommends, a Phase 2 project was planned and it "will help to ensure that Canada's digital media employers and content creators are well-prepared and properly resourced to stay ahead in this rapidly changing industry" (CHRC, 2009). One of the Phase 2 projects is currently underway to assess the impact of digital technology on the cultural sector (including digital media) and the results of that work are expected in early summer 2011.

After the completion of the literature review for this project the Digital Economy Strategy (DES) consultation was launched by the federal government of Canada. In reviewing numerous DES consultation submissions it is clear that organizations including, but not limited to, CHRC, CIAIC, DigiBC, Entertainment Software Association of Canada (ESA), Information and Communication Technologies Association of Manitoba (ICTAM), Microsoft Canada, New Media Manitoba, Nordicity, Ottawa Centre for Research and Innovation (OCRI), and the Ontario Media Development Corporation (OMDC) all state that talent is a critical component to the success of the digital media industry in Canada. The acknowledgement that talent is a critical issue for the industry is extremely important. However, the recommendations that are provided around building Canada's human resource capacity in digital media are limited to very generic statements about the need, and the recommendations lack direction and detail as to the "what" and "how" and "who". Nordicity, a respected research firm with extensive experience in the Canadian digital media space, offers the following statement "We would need to address fundamental issues of human capital (talent, training gaps), new skills development and upgrading of skills, and the training of new workforce entrants."(Nordicity, 2009). This is an excellent articulation of what is needed, but the details of what competencies are required, what partnerships are required for success, and to how the required skill upgrading should occur remain unanswered.

There are many elements from the DES submissions that will likely comprise the Building Digital Skills for Tomorrow component of the DES that is currently in development by government of Canada. It will be important to assess the issues and recommendations identified in this situational analysis, against the final DES in order to revise, align, and leverage the DES to further the development of human resources for the digital media industry wherever possible.

ICTC has determined, through our sub-sector study that the following human resource related issues currently exist for Canada's digital media industry. It should be acknowledged that there are many interrelated elements between the following key findings and duplication has been reduced as much as possible.

Key Finding #1 – Lack of Definition is a Barrier for Change

There is no widely accepted definition of digital media. This in itself is not a problem, but what it does mean is that there is a lack of cohesion in terms of prioritizing the needs of industry – a common voice or a call-to-action on human resource issues.

An excellent project, carried out by CHRC maps out more than 300 "hubs" (CHRC, 2010) that have some involvement in the digital media space in Canada. CHRC defined a hub as "a significant and observable cluster of activity…(with) a stated mandate or "focus of activity" that include supporting the digital media industry." (CHRC, 2010). CHRC's compendium of hubs highlights the diversity of organizations in Canada's digital media space by province, and lays out a very complex and fragmented "system" of the various players involved in fostering and developing Canadian digital media companies.

A solid attempt to develop a framework for the sub-sector and capture data in a consistent fashion has been led by the CIAIC. The 2008 CIIP report provides an economic and business activity profile of the industry, with some basic staffing information. CIAIC updated their 2006 taxonomy in 2008 to ensure a step-down approach that links seven (7) Task categories (the work they do) to 24 Task Sub-Categories (more detail of the work within that Task). The two main Task categories of "Creators" and "Enablers" were retained from the 2006 profile report (CIAIC, 2009). An important acknowledgement in the 2008 report is that an ever increasing number of companies are reporting that the primary work they do is in more than one Task Sub-Category (companies could select up to a maximum of five) and a statistically significant number of companies selected Sub-Tasks that crossed both the Creator and Enabler groupings. This finding captures the diversity and convergence of companies working within this sub-sector; as well it underlines the challenge of defining the sector as

is required by the institutional mechanisms of the NAICS and NOC to collect data. Canada, like many other countries (ATSF, 2002), has not yet developed widely adopted systems to track the interactive digital media industry in terms of employment, financial and operational situations in terms of the North American industry classifications and codes (CIAIC, 2009) even though interactive digital media is of great economic importance and is projected to grow at double digit rates for the near future (Entertainment Software Association of Canada, 2010). For methodological reasons, inclusion in the NAICS is limited to industry category classes that are "consistent with classification principles of mutual exclusivity, exhaustiveness, and homogeneity of units within classes" (CIAIC, 2009) so companies tracked can only be in a single (one) industry category. CIAIC accounted for this constraint when they created the 2008 National Profile, and as a result, only companies that do the majority of their work in the area of interactive digital media were included in that study (ex. *"broadcasters, which generate hundreds of millions of dollars in overall revenue with a small percentage coming from in-house interactive digital media activities, were excluded" (CIAIC, 2009)*).

The NAICS system is made up of 20 2-digit industry codes that are then broken down into 3, 4, 5, and 6 digit codes to describe, in increasing detail, the specific industry. Currently, because all Canadian businesses are "fit" into the existing NAICS codes, the digital media industry is captured in existing NAICS codes (CIAIC, 2009), likely in the codes outlined in the following table.

Table 2 – NAICS (2007) Classification Codes for Digital Media Companies

51 – Information & Cultural Industries	54 – Professional, Scientific & Technical Services
511 – Publishing Industries (except Internet)	541 Professional, Scientific & Technical Services
5112 Software Publishers	5414 Specialized Design Services
512 – Motion Picture & Sound Recording Industries	54143 Graphic Design Services
5121 Motion Picture & Video Industries	5415 Computer System Design & Related Services
51211 Motion Picture & Video Production	5418 Advertising & Related Services
51219 Post-Production & Other Motion Picture & Video Industries	
5122 Sound Recording Industries	
516 – Internet Publishing & Broadcasting	
5161 Internet Publishing & Broadcasting	
518 Internet Service Providers, Web Search, & Data Processing Services	
5181 Web Search Portals	

This rough assessment of relevant NAICS for digital media does not allow for an analytical approach that would lead to a reliable statistical description of Digital Media as an industry. The most effective revision to the NAICS for the digital media industry would be the development of 4 digit codes that would accurately reflect the definition of the industry, and would differentiate digital media from other industries, including more traditional industries in similar segments. This would bring a level of specificity to the codes that would allow for detailed analysis. A comprehensive analysis of the existing NAICS codes would need to be undertaken with a sampling from Statistics Canada's business register to validate the classifications, applying an agreed upon definition of digital media, and testing with actual digital media companies to ensure validity and to identify the gaps.

It is apparent that digital media is not a "neat and tidy" sub-sector to describe. The challenge is that, just because it is difficult to do, does not mean that it should not be done. The benefits of firstly developing or adopting a widely accepted definition, and secondly identifying and describing the critical occupations and competencies for the industry that are tracked over time, outweigh the challenges in the long run. The ability for the industry to collectively prioritize the specific human resources issues and backup their requests for assistance in terms of technological investments or human resource development issues will be strengthened with evidence-based support. The lack of data becomes a barrier for business cases that are built for governments (federally and provincially) to provide structural support for the industry, particularly on the technology investment side where the number of high quality jobs created by the proposed investment is a critical component of the equation and decision making.

It is also apparent that the digital media industry itself has demonstrated a need for more detailed information regarding its labour force. Aside from the CIAIC 2008 Industry Profile that has been previously described, another example is a grass roots approach to surveying and presenting information on the labour force is being undertaken by an organization called Pixel to Product. This **open survey** has the goal to:

"…answer the question of "How many people are employed in the digital media industry in Canada?…By collecting this data, we'll have a better understanding of the size and scope of the Canadian digital media labour force. For example, we'll understand the salary ranges as it relates to the job titles found in our industry, which

areas of the country have the highest concentration of visual designers, and the relationship between education levels and job satisfaction." (Techvibes, 2011)

This approach demonstrates a need for basic labour market information for the industry. As well it highlights the fact that without a more "institutionalized" approach to survey development the data that is used to describe the labour market for digital media will be based on ad hoc surveys that will vary in scope, methodology, and ultimately quality. This is not an assessment or criticism of Pixel to Product's survey itself, but more a holistic view for the industry.

Many of the remaining key findings in this report would be addressed, supported, or be more "addressable" if this key finding was addressed.

Key Finding #2 – A Cumbersome Labour Market

The lack of standardized job descriptions for the digital media industry leads to inefficient transactions in the labour market. This finding impacts employers and potential employees alike. Without a common "language" upon which skills required and acquired skills can be matched there is great potential for there to be miscommunication between job seekers and employers. The lack of standardized job descriptions also impacts the ability for industry and education to communicate their needs effectively, as they do not have that common "language" upon which competencies and learning outcomes are built. The rapid pace of change in digital media technology demands that employee skills need to be constantly upgraded. Establishing skill benchmarks and regularly refreshing and updating those benchmarks is a critical element to ensuring that employees have, and maintain, the requisite skills. This appears to affect very-small and small companies the most – as they are least likely to have dedicated human resources within their companies. Large digital media companies have the resources and staff expertise and are more likely to have developed in-house standardized job descriptions to ensure that they are; implementing the appropriate skill upgrading programs, addressing pay equity issues, implementing creative retention strategies, and are able to compete from a compensation perspective with their competition. For very-small and small companies this issue directly affects human resource functions such job description writing, recruitment, applicant screening, market assessments of salaries, as well as team/skill resourcing for projects or proposals. This finding does not mean that these functions are not carried out in these companies; it simply states that it is not done efficiently and therefore valuable time and resources are spent

dealing with a business process that could be improved with standardization. Without standardized job descriptions and benchmarks the cost of hiring staff is potentially much higher than is necessary as employers must rely heavily on recruiters, and the risk or cost of a "bad" hire is potentially increased.

Digital media occupations, like most technology related occupations, require an increasingly complex set of skills. Employers, especially in small to medium size enterprises, require technical, creative, communication, business, and in many cases, entrepreneurial skills. The lack of well understood and articulated job requirements leads to job seeker frustration and ultimately an inability for first time entrants (new graduates and internationally educated professionals) to gain access to the labour market.

With the of the Temporary Foreign Worker Priority ICT Occupations program by the government of Canada, it has become necessary for employers that wish to hire a foreign trained professional to seek a labour market opinion (LMO) to demonstrate that the current Canadian labour market is unable to fill the skill requirement that the employer seeks. This is implemented in different ways across the various provinces and territories but is nonetheless the future requirement for hiring skilled immigrants in Canada. Without well articulated occupation profiles, often at the National Occupation Classification (NOC) level, this process can be cumbersome and frustrating for employers and facilitators to navigate. This process will inherently exclude the very small and small size companies from accessing this labour pool as it will not be feasible for them to apply the necessary resources from other required activities. The development of standardized job descriptions provides the commonality and the basis for future supply and demand analysis that will improve the efficiency of the immigration process.

Key Finding #3 – Supply and Demand Challenges

Based on the research carried out for this project it is very hard, if not impossible, to assess the current or near-future labour or skill needs of Canada's digital media industry. In a very general sense, with a relatively small sample, the very-small, small, and medium size companies appear to be looking for staff, and the large and very-large companies seem to be going through cycles of laying off and hiring. Anecdotally it appears that the medium to very-large size digital media companies have a constant need to find very experienced senior staff (10+ years) for their high level technical and creative roles.

Very-small and small digital media companies appear to be forecasting their labour needs within a very short timeframe – no more than 6 months to 1 year, and are very likely to be planning their resource requirements on a project by project basis. As also demonstrated in the CIAIC 2008 CIIP report (CIAIC, 2009) the large and very-large digital media companies are very closed or quiet about changes to their labour force so it difficult to assess their needs at a macro level.

The issue of worker mobility from one region of Canada to another for employment in digital media is not well understood. Anecdotally it appears that this is dependent on the position that is being staffed. For some high level, highly skilled positions it is clear that it is a global market place for talent and for other positions it appears that the local or provincial labour market provides companies with their required labour. This is not a conclusive finding.

It is clear from the research that without an analytical framework that is based on a widely accepted definition of the industry, and standardized occupations, that forecasting supply and demand for the digital media industry accurately will be an on-going challenge.

Without accurate forecasting of the needs of industry it will be hard to impact the labour issues that constrain the Canadian digital media industry from reaching its future potential as this is an industry that is heavily reliant on a highly skilled workforce that requires skill upgrading on an on-going basis.

The variety and inconsistency of digital media programs that are offered through the post-secondary system in Canada makes it very difficult to measure the potential supply of labour for the industry. This can be done through a process of estimation but it does not appear to have been attempted thus far. The reported statistics for enrolment and graduation rates for Canada's post secondary institutions generalizes the program offerings into a system called the Classification of Instructional Programs (CIP) (Statistics Canada, 2005) which is generic in order to accommodate the sheer variety of program offerings by the institutions. Add to this the fact that digital media crosses the domains of technology and arts and the problem of generic program coding is compounded.

Key Finding #4 – Industry and Post-Secondary Relationships

There appears to be a critical disconnect between post-secondary digital media programs and the needs of industry. This issue is shared with the broader Information and Communications Technology (ICT) industry, but it appears to be amplified in the case of digital media due to the rapid pace of change for the technologies that are used. Industry across the country expressed concern about the ability of post-secondary schools (Universities and Colleges) to rapidly adapt to their changing needs. Although it is unlikely that there could ever be a system where post-secondary and industry are perfectly in sync, it is clear that the relationship between post-secondary schools and industry could be improved. This relationship can be enhanced by the use of standardized job descriptions (detailed competencies and learning outcomes). It is critical to ensure that the curriculum be adapted to the local market in order for the relationship to be effective. What is also clear is that the needs of very-small and small industry are least likely to be reflected in the post-secondary offerings. This is due to the fact that participation in program advisories or the curriculum review process is time consuming and very-small and small industry are the least likely to able to afford the time. It appears that the majority of hiring occurs in the small to medium size companies so it is critical that post-secondary institutions investigate ways to engage this segment of the industry when undertaking their reviews. If medium and large size organizations are the only engaged industry the programs that are developed may be skewed to meet a market demand that does not match the majority of the local hiring's.

What also emerged from our research is that the digital media Industry (primarily small and medium size) demands employees possess a diverse set of skills including the requisite technical and creative skills, business, entrepreneurial, and communication skills. These complex sets of competencies are often not taught to students within a single post-secondary program. The demand for this broad skill requirement by industry is starting to be addressed by the post-secondary institutions in the form of hybrid programs that cross traditional disciplines such as technology and business. These hybrid programs are not the norm for Canadian post-secondary offerings but it appears as though the transition to a more integrated, multidisciplinary approach is accelerating.

A secondary finding related to the post-secondary institutions was that there was an expressed challenge in finding qualified digital media teachers with up-to-date skills that were willing and able to instruct. This finding is in line with the other finding that those employees with a high level of experience in the industry are highly sought after.

Key Finding #5 – Co-op and Internship Frustration

Across all regions there was an expressed frustration with post-secondary co-op and internship programs. Our research indicates that industry, in general, supports the concept and sees the need and value of co-ops and internships, but expressed a strong dissatisfaction with the restrictions around the duration of these activities. Industry stressed that co-ops and internship are too short for both industry to receive any benefit from the work done by a student, or for the student as the length of time does not allow them to gain enough experience to be truly meaningful. This is a critical issue for the industry because without new approaches to providing students with meaningful practical industry experience, prior to landing in the job market, there is a serious risk of disenfranchising recent graduates as they try to get employed. There is a critical time for most graduates where, upon graduation, they need to land employment to use the skills that they have been taught. If the time between graduation and meaningful employment is prolonged there is a risk that the skills they have acquired will become dated or will remain underdeveloped. This issue affects the industry in the long run, as the overall labour market will only grow if individuals believe that there is an opportunity to get a related job after they invest their time and money to take a post-secondary program. A disenfranchised labour market that can't gain access to entry level positions in industry will affect enrollment levels and creates cyclical supply and demand problems where the domestic supply of workers can't meet the needs of industry and the reliance on foreign trained professional increases.

Key Finding #6 – Company Size Matters for Skill Requirements

Given the relatively small scope of this sub-sector project it is hard to definitively explore the comparative aspects of digital media employers by company size. What did emerge from the findings is that at a macro level large and very-large digital media companies tend to hire specialists that have skill depth in either the technical, creative, product/project management, or integration aspects of the work. The very-small to medium size companies need to hire staff that are multi-disciplinary, or have skill breadth as employees.

The availability of talent with the appropriate skill mix appears to have a direct impact on the growth opportunities for small to medium size companies.

The digital media industry appears to have a significant reliance on immigration to staff for their highly qualified positions. Medium to very-large size companies appear to be able to manage this given that they are more likely to have the resources and are less risk averse to tapping into the global labour market.

This subject needs to be explored with more rigor and detail to indentify the specific skill issues that digital media companies experience as it relates to their size.

Key Finding #7 – Awareness of Opportunities in Digital Media for Youth

Career "Pathing" and career promotion to youth about the vast array of opportunities in digital media are not being done in an effective manner. There appears to be a drop in enrolments, which are regionally sensitive, at the post-secondary level. The need to encourage math and science and digital media related courses (arts, interactive media, etc.) at the high school level was a need expressed by the majority of industry involved in this situational analysis. It was clearly expressed that an awareness of the industry, beyond the well known image of gaming, must be undertaken to effectively appeal to the future workforce.

The following quote from 2002 captures the current day challenge when trying to describe digital media.

> "No wonder it is difficult for new entrants to understand. The important concepts to hold on to are 'interactive' and 'media' across a range of 'delivery channels' or 'platforms'….There are many terms used to denote the interactive nature of digital applications—multimedia, new media and interactive design are common examples. Because the interactive sector has quickly evolved through phases, the terms have often been coined to reflect a phase that then gets surpassed. A quick historical overview will give the background that causes confusion for those joining the dynamic sector." (ATSF, 2002).

Canadian demographics dictate that the fight to retain or increase the share of students going into digital media programs will intensify in the near future as fewer students will be available for an increasingly competitive labour market.

Due to the fact that an increase in enrolment in year 1 does not provide appropriately skilled employees until year 3 or 4, it is critical for industry, as a collective, to provide vision and articulation about the future of the industry to effectively

recruit its workforce of tomorrow. This is true for the Information and Communication Technology (ICT) sector as a whole, as well as for digital media specifically.

Key Finding #8 – Competition and Prioritized Investment

Digital media in Canada is perceived to be a lucrative market with huge global selling opportunities. There is a clear sense of competitiveness among the clusters in Canada to attract high level talent and private and public investment dollars. This is a reality and is most likely a key factor that drives innovation in the industry. Canadian norms dictate we are reluctant to essentially "pick winners" in terms of prioritizing where and what investments and resources should be made. Due to the global competiveness of digital media it is likely necessary for Canada to develop priorities that strengthen the labour force, foster the research and development of intellectual property, encourage and support unique content development, and improve our capacity for product to market strategies. These activities could be supported through the strengthening of the existing clusters and centers of excellence and likely through consolidation or improved cooperation of the "hubs" (CHRC, 2010) identified by CHRC. This finding would be supported and guided through the development of evidence based research as outlined in Key Finding 1.

At this point in time it is anticipated that some of the issues outlined in this key finding will be addressed in the Digital Economy Strategy by the government of Canada.

Key Finding #9 – Digital Media's Reliance on Internationally Educated Professionals (IEP's)

All evidence thus far indicates that digital media companies rely heavily on Internationally Educated Professionals (IEP) for the highly qualified talent they require. As well, small and medium size companies are less likely to hire a recent graduate without industry experience. The labour pool for talent is restricted by these two factors and requires that immigration works effectively, and that recent graduates acquire experience with larger companies and then become "available" to the qualified labour pool. It is also likely that many individuals unwillingly enter the labour market as independent contractors and, over a period of time, develop a portfolio of work experience that increases in complexity over time. This finding indicates that small and medium size digital media companies must be aware of immigration processes and procedures to effectively utilize the various streams within the system to meet their human resource needs. As well the effect of delayed integration

which tends to "rust out" the IEP's skills may be exacerbated by the fact that technology shifts occur very rapidly in the digital media space.

As indicated in previous key findings, the immigration process requires institutional structures to function efficiently and currently those structures (NOC, NAICS) are not available or are not reflective of the current needs for the digital media industry. Many companies that participated in this situational analysis indicated a need for assistance with, and awareness of, the current immigration process and programs.

Key Finding #10 – Need for Human Resource Management Support for Small to Medium Size Companies

Across all of the research the term or description of agility was used. Agility appears to be a key characteristic of successful small and medium size digital media companies. The three areas where agility was expressed as a requirement for success are:

1. the agility to respond to changing market demand with innovative, savvy products and services,
2. the agility to up-staff for critical skills as projects get the go-ahead and conversely downsize after the project is complete, and
3. the agility of staff to learn new technologies at a break-neck pace to be able to deliver the innovative product or service.

This definition of success is highly dependent on good staffing, recruiting, networking, effective skills upgrading, and innovative human resources planning and management. This is a comprehensive list of sophisticated human resource management practices. It appears that the tipping point for digital media companies to have dedicated human resources personnel is about 100 staff, and given that the majority of digital media companies in Canada are much smaller than this it is unclear how very small and small companies can effectively manage these processes for success.

Additional Issues Observed

There are number of other human resource related issues that were identified by this research project. These issues required further investigation to be able to draw any conclusions from or provide recommendations to address if required.

- Career Changers from traditional media are a potential labour supply with related skills and experience – skills upgrading is required.
- Commercialization and the skills necessary to be successful in this area were an identified gap for many companies.
- Students in general are too risk averse – need to be taught to take more chances, be more entrepreneurial in general.
- Funding to support Research and Development for Small to Medium size companies was an expressed need.
- It appears the much of the employee skills upgrading is left to the individual to manage and pay for in order to stay relevant in the industry.

"While the opportunity for growth in this sector is immense, Canada's ability to participate as a leader in this industry is rapidly diminishing. As with other emerging industries, government and industry must work together to establish policies and programs that will help position Canada as a leader in this knowledge-based sector. This Technology Roadmap is one tool to help with this process."

(CHRC, 2009)

Recommendations

Based on the findings outlined in this report ICTC recommends that the following six (6) activities be undertaken to address the human resource needs of the digital media industry in Canada. These recommendations are intended to provide substance for the development of projects that align with the mandate of ICTC, and for partnerships with national and regional partners that focus on activities that provide foundational support for the digital media industry and address short term skills needs of the industry.

Recommendation #1 – Development of an Analytical Framework and Labour Market Snapshot for the Digital Media Industry

The development of an Analytical Framework for the digital media industry is necessary to identify the research requirements for a Supply and Demand Analysis for the industry, and to develop a Labour Market Snapshot for digital media in Canada that provides national and regional (cluster) detail. ICTC has developed a model for forecasting the supply and demand needs of Canada's ICT sector and this model could serve as the foundation of a model for digital media. ICTC's forecast model is entitled the Outlook for Human Resources in the Information and Communication Technology Labour Market, or The Outlook (ICTC, 2008). ICTC's Outlook is based on the development of an analytical framework, a labour market snapshot, and ultimately an econometric model that has been used repeatedly to develop the forecast.

ICTC believes that it is time is to move quickly to develop a framework for analyzing the human resource issues, capturing the current state of the supply and demand issues facing the industry, and mobilizing the critical players in the digital media industry around a strategic agenda to address the issues identified. The old adage that you can't change what you can't measure rings true when applied in this case as the plans that are implemented to address the identified issues must be based on evidence to ensure that they align with the current and near-future needs of industry from both a labour and skills perspective. Undoubtedly the most effective way for digital media regions or clusters to effectively address skills and labour issues will be through locally informed initiatives that bring industry, education, and possibly government together. The most effective way for clusters to move forward is that have industry-developed mechanisms to guide their program development. These mechanisms include standard competency based profiles that capture, at a number of working levels, the critical competencies required of employees to carry out their work.

The development of this analytical framework and the supply and demand snapshot will begin to address the need expressed in CHRC's Digital Media technology roadmap as follows:

> … an overarching strategic framework needs to be developed to guide the policies, program development and regulations that affect digital media to ensure that they are coordinated and complementary to enable maximum growth of the industry… A broad and multi-sector group could be founded to steer its creation, incorporating various levels of government, academia, mass media, guilds/unions, and of course digital media developers, producers and creators as well as publishers, distributors and aggregators. With such an approach, the strategy will capture all players in the digital media value chain/path to market…. network of national and international partners from industry, academia, and government. It should specifically include (but not be limited to) addressing foreign market access; digital media research knowledge development and transfer; and public and private venture capital… (CHRC, 2009).

This work would need to be informed by an evaluation of similar international work from countries such as Germany, New Zealand, France and Australia that have undertaken work on policies pertaining to national digital strategies (Nordicity, 2009). These countries may have defined and captured statistical coding which could help in defining in the classification of Canada's interactive digital media industry.

The analytical framework and the supply and demand snapshot will provide the evidence-based background necessary to construct and propose changes to the NAICS system. There is an excellent opportunity to partner with CIAIC on this as it was a stated goal in their 2008 CIIP report. They stated that there was a need to do this work as "a basis for further inclusion and recognition of the interactive digital media industry, or its largest sub-sectors, by national statistical agencies such as Statistics Canada and the NAICS" (CIAIC, 2009). ICTC has extensive experience in working with Statistics Canada and Human Resources and Development Canada on these fundamental tools.

CIAIC also recommended in their Digital Economy Strategy submission, entitled "Canada's Digital Future", that "Understanding workforce convergence – The ICT and cultural skills are inherently related in creation of interactive media content and services, and significant support should go to sector councils to underwrite activities that research, document, and promote these relationships and convergences." (CIAIC, 2010) Building upon and working with CIAIC to develop classification codes will lead to a better understanding of the national tracking system needs for the digital media industry.

Recommendation #2 – Development of Competency Based Profiles for the Critical Occupations for Digital Media

ICTC recommends the development of Competency Profiles (industry validated occupation profiles), using ICTC's Competency Profile Mode. These competency profiles will provide a nationally recognized set of competencies for the five (5) key occupations in digital media, that are necessary for industry and education to effectively collaborate on to ensure that industries skill requirements are being met. Additionally ICTC recommends the development of a Domain Knowledge Area (DKA) for digital media that utilizes the framework and process developed for the eHealth Competency. The DKA will capture the critical competencies that are required for employees to work in the field (domain) of digital media that are above and beyond their technological competencies; in other words, what competencies allow ICT workers to apply technology in the content-rich field of digital media.

This recommendation is also provided in CIAIC's Digital Economy Strategy submission, entitled "Canada's Digital Future" that "The government should support programs that promote common industry standards for training outcomes for specific competencies in close consultation with the industry" (CIAIC, 2011).

These standard profiles form the basis of a common language from which educators and industry can converse as they focus on the learning outcomes required of digital media graduates. The development of these standard profiles also provides the foundation from which the National Occupation Classification (NOC) system can be modified or added to as required. This process is rigorous and is also dependent on the cyclical revision of the NOC system but in terms of collecting detailed and longitudinal information on digital media occupations this work is necessary. The alternative to revising the NOC system is the reliance on the independent surveys to be carried out by associations or special interest groups that fill the current need, but are often snapshots in time of the industry, are not comparable from one region or cluster to another, and are not consistent in reliability or quality. This approach is an alternative to structural changes to the NOC but it is likely not the most efficient approach in the long run for the industry. ICTC has been instrumental in adding and modify the NOC codes for

ICT occupations throughout its history which stems from the development of our Competency Profiles and its predecessor the Occupational Skills Profile Model (OSPM).

This work will enable the digital media industry to rely on competencies that may be considered as talent-based interpretations of business needs and add value by communicating what people must know to help the business succeed. This is imperative during competitive times since digital media is an emerging and yet rapidly evolving industry.

The future data created by a national classification system will support policy change, enable better understanding of skill shortages and /or labour shortages and enable targeted efforts at addressing them through immigration efforts, training and educational institutions as well as for stakeholders in companies planning and addressing their human resources challenges.

Recommendation #3 – Strengthen Post-Secondary and Industry Relationships

Industry at the local level must become active in the development and revisions to post-secondary digital media program offerings. This participation must include the small and medium size digital media companies to ensure that their skill requirements are reflected in the programs that are offered. Opportunities for more creative approaches to industry-education collaborations need to be taken to benefit both small to medium size companies and the students which includes, but is not limited to, creative and innovative ways of partnering between institutions (formally and at the student level) and industry. A participant in the Vancouver working group articulated that project based exercises that reflect a real world challenge for the industry partner could provide a win-win for students as they can learn and apply their skills in a safe environment. Creative solutions that could be undertaken that benefit everyone rather than focus on the traditional co-op or internship model because it is "comfortable" are needed.

To address the key finding that a disconnect between industry and education exists, there is a need for post-secondary institutions to evaluate their offerings and undertake a process to engage industry and integrate multiple disciplines to address the skill needs of industry. Industry has the

responsibility to participate in program advisories and curriculum reviews to ensure that their current and near-future skill needs are addressed.

An excellent example of an intentionally designed program offering that captures the needs of industry, and offers a flexible approach for students to customize their learning based on their interests is Northern Alberta Institute of Technology's (NAIT) Digital Media and IT program (NAIT, 2009). NAIT's Digital Media and IT program was designed as an integrated, multidisciplinary approach to offering both IT and Digital Media programs.

Under Digital Media there are five streams;

1. Game Design,
2. Web and Rich Media,
3. Video Production,
4. Animation, and
5. Visual Communication.

Under IT there are four streams;

6. Systems Administration,
7. Business Analysis,
8. Applications Development, and
9. Game Programming.

All students of the Digital Media and IT program are required take a set of common or "core" courses. The core courses include;

1. Communication in IT and New Media,
2. Digital Graphic Design Tools,
3. Introduction to Flash,
4. Essential Technical Skills,
5. Co-op Work Experience (2 sessions),
6. Capstone Project, and
7. Project Management.

Students are then able to select, across the nine streams, the course offerings they want. Under each of the nine streams NAIT has identified the courses that are; suggested, strongly recommended, those that are required for designation, and a couple of other required courses. This is by far the most

flexible program offering that ICTC identified and also offers NAIT the ability to revise or tweak the program as required to meet industry needs without a massive overhaul.

NAIT's Digital Media and IT program is not the only offering of its kind but it does provide an excellent blueprint for program design that intends to balance the needs of industry and the wants of students.

Another innovative approach to post-secondary education program development for digital media is the partnership that formed the Great Northern Way Campus (Great Northern Way Campus, 2009). The University of British Columbia, Simon Fraser University, British Columbia Institute of Technology, and the Emily Carr University of Art + Design have come together to offer a graduate degree program called the Masters of Digital Media (MDM). This program leverages the collective strengths of its partners and is, by design, highly integrated with industry at all levels. This program is slated to grow both physically, in terms of bricks and mortar facilities, and in enrolment over the next couple of years to meet demand.

Overall the focus of industry and post-secondary education needs to be on creative and innovative ways to provide an experience bridge for graduates, as it is clear that most employers are reluctant to hire a recent Digital Media graduate with little to no relevant experience.

Recommendation #4 – Awareness of Opportunities in Digital Media for Youth

The Canadian digital media industry must collaborate to create awareness of the diversity and opportunities the industry can provide to students. This awareness can take many forms and needs to address the fact that the industry is perceived to encompass only the gaming aspect, or vertical of the industry. A national body or a number of hubs could lead this initiative by creating tools and resources to promote the industry to students. Tapping into the creative nature of the industry to develop these promotional strategies is an opportunity.

There are examples of efforts that are being made to engage youth and increase awareness of the industry and opportunities in digital media. One of these examples is the British Interactive Media Association's – BIMA Schools Digital Challenge. This is an annual industry lead initiative for secondary schools students to develop a concept using

technology that addresses a supplied creative brief. Students need to use digital media to record the process they followed from beginning to end. Industry experts officiate the challenge and prizes are awarded at an industry event for the winning schools, and various individual achievement awards. Industry is an active participant in the process and support of the program.

ICTC is engaged in promoting digital media through its Focus on Information Technology (FIT) secondary school program. This program offers students the opportunity to learn about, and develop skills in digital media with the goal of having the students advancing to post secondary in a related field.

Recommendation #5 – Development of Human Resource Tools and Products that Support Very-small to Medium Size Digital Media Companies

At a macro level many of the issues outlined in this situational analysis point to a need for the development of capacity within digital media companies to manage their human resources, with a clear target on the very-small and small to medium size companies as being in need of the most assistance.

ICTC recommends the development of a Human Resource Guide for Digital Media companies that provides tools and resources that address the critical Human Resource needs as identified in this situational analysis. This would include the topics such as international recruitment, best practices for short term staffing, skills upgrading strategies etc. The tools and resources would be designed for very small to medium size companies, but could also be utilized by large companies, and would be provided exclusively online.

The development of these resources should include a needs assessment to define the exact requirements of the small to medium size companies and build various use cases. As well, a sample of large digital media companies and their human resource needs will also be assessed and identified. An environmental scan of existing tools and resources and

an assessment of the applicability these tools to the uses cases would need to be done to develop a list of the final tools to be modified or developed. These tools would then need to be tested against the use cases and then finally released and promoted through the various digital media hubs to their member companies if applicable.

ICTC and **TECHNO***Compétences* have partnered to develop a **Human Resource Guide** (ICTC and **TECHNO***Compétences*, 2008), for ICT companies, that is comprehensive and highly utilized by stakeholders.

Recommendation #6 – Improve Communication about Immigration Processes and Procedures

As identified in Key Finding #9 there is a critical need for awareness of the requirements, processes, and options regarding the immigration of internationally educated professionals (IEPs). Digital media as an industry appears to depend heavily on IEPs to staff their highly skilled positions. It is the responsibility of the provincial and federal government agencies to provide clear and comprehensive information regarding all of the various immigration processes and requirements. Industry hubs need to provide resources that inform small and medium size companies about the options and services regarding the immigration processes. This is a proactive approach to informing industry about what options they have as opposed to a more passive approach that currently leads to confusion and inefficiency for information seekers.

It is important to acknowledge that there are two initiatives that are currently underway that will inform the findings and recommendations of this report. These two projects are, the Cultural Human Resource Council's (CHRC) Impact of Emerging Digital Technologies on the Cultural Sector research project, and the government of Canada's Digital Economy strategy which is anticipated include recommendations for the digital media industry in Canada.

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Notes

Notes

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**Information and Communications
Technology Council**

A not-for-profit sector council, the Information and Communications Technology Council (ICTC), strives to create a prepared, diverse and highly educated Canadian ICT industry and workforce. ICTC is a catalyst for change, pushing for innovations that will provide standards, labour market intelligence, career pathways and immigration for the Canadian ICT industry, educators and governments. We forge partnerships that will help develop the quantity and quality of ICT professionals needed to maintain and improve Canada's position as a leader in the global marketplace.

To achieve these goals, ICTC focuses on five main areas that are proven building blocks for a healthy, successful and forward-looking sector:

• Standards

• Labour Market Intelligence

• Career Pathways

• Immigration Initiatives

• Partnership

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