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1. Canadian ICT Sector Overview

Canadian ICT Sector
• Overview
• Ecosystem
• Recent Investments
• Impact of Covid-19

June 2021
The ICT Sector is currently transformed by the pandemic and an increased number of cyber threats.

The Canadian ICT Sector represents 15% of Canadian services exports.

55% of Canadian ICT workers have a University Degree.

666,540 workers

43,200 Companies

USD $75B in GDP

USD $9B in Good Exports

USD $9B in Services Exports

USD $170B in Revenue

99% of ICT products manufactured in Canada are exported.

The Canadian ICT centres are Toronto, Montreal, and Vancouver.

Canadian ICT R&D spending represents 41.2% of all business R&D.

Source: Canadian ICT Sector Profile 2019 – Innovation, Science and Economic Development Canada
Canadian ICT Sector Overview

- The ICT market is led by Software & Computer Services
- Small startups form over 80% of the Industry.
- Toronto has the 2nd highest startup density in the world after Silicon Valley.

Source: Canadian ICT Sector Profile 2019 – Innovation, Science and Economic Development Canada
An Ideal Ecosystem for Innovation

Superclusters
In 2018, the Canadian Government announced an initiative to create and invest in five Innovation Superclusters, including 3 in the ICT sector.

• The SCALE.AI Supercluster is based in Montreal.
• The Advanced Manufacturing Supercluster is in the Greater Toronto Area and is the connection between Canada’s Technology and Manufacturing sectors.
• The Digital Technology Supercluster is based in Vancouver.

More than USD $1.5 billion invested by the Canadian Government and the industry.

Sources: Invest in Canada (https://www.investcanada.ca/industries/technology)
An Ideal Ecosystem for Innovation

**Job creation** - More than 50,000 jobs expected to be created in tech Superclusters in the next decade.

**Qualified workers** - The most educated workforce in the world (OECD).

**Foreign talent** - Global Skills Strategy & Federal programs facilitating the immigration of skilled workers.

**Federal Incentives** - A multi-billion dollar strategy over the next decade to develop innovation Superclusters.

**Gateway to the world** - Canada has free-trade agreements with all other G7 countries and has preferential access to two-thirds of the world economy.

The Superclusters unite more than 6,000 actors across Canada.

Sources: Invest in Canada (https://www.investcanada.ca/industries/technology)
https://www.ic.gc.ca/eic/site/093.nsf/eng/home
Foreign Investments Dedicated to ICTs

Global Intelligence and Cyber Centre in Vancouver

Google
Tripling its Canadian workforce & a USD $700 million Data Centre in Quebec

HSBC
Global Data & Innovation Lab in Toronto

Mastercard

Amazon
Building a new 113,000 sq. ft. office space in Toronto

OVH
Has built a 360,000 servers Data Centre in Quebec

Oracle
Building a new Cloud Data Centre in Toronto

Salesforce
USD $2 billion investment in Canadian companies to fuel innovation

Source: Invest in Canada (https://www.investcanada.ca/industries/technology)
Foreign Investments Dedicated to ICTs

Source: Invest in Canada (https://www.investcanada.ca/industries/technology)
The Impact of the Covid-19 Pandemic

Accelerating Digitalization
The Covid-19 pandemic has accelerated ICT transitions and has exposed significant digitalization gaps in most Canadian Sectors. In 2018, it was assessed that the manufacturing and natural resources sectors had a low digitalization degree and that the Canadian government wasn’t far ahead. Three years ago, even the ICT sector didn’t fully qualify as a highly digitalized sector in Canada. Here are some of the most important consequences of the pandemic.

The Big Five - The Covid-19 pandemic has also accelerated the dominance of the Big Five tech giants (the FAAMG), especially due to their cloud service capacities. When countries and companies faced unprecedented challenges during the pandemic, companies like Google or Microsoft where often the only ones with capacities to help, especially in areas as overarching as learning and health. Those large tech companies were especially involved in the rapid and unprecedented transition to work from home.

Source: https://www.investcanada.ca/blog/global-fintech-companies-find-talent-innovation-and-partnership-canada
The Impact of the Covid-19 Pandemic

**E-Learning** - The rapid switch to e-learning platforms is increasing dependence on large companies and cloud computing. It is affecting learning like no other event in recent history and is necessitating the rethinking of every aspect of the school environment. Apart from demanding a complete shift towards home schooling, the pandemic has also accelerated the development of tech tools to improve learning and its impact will show for years to come.

**Cyber Security** - In many ways, Cyber Security is the overarching ICT sub-sector, and as such has been overwhelmingly affected by the pandemic. As changes take place at an unprecedented pace, security is often neglected and it is safe to say that cyber threats are more present than ever.

**Fintech** - As Canadians find themselves alone at home, Fintech is revolutionizing investing. It is estimated that “the adoption of financial technology advanced by 3 to 5 years due to the pandemic, surpassing the U.S. adoption rate.” The pandemic has also accelerated the shift to digital payments and has obliged companies of all size to rely more and more on online purchases.

Source: https://www.investcanada.ca/blog/global-fintech-companies-find-talent-innovation-and-partnership-canada
2. Sub-Sector Analysis

Cyber Security

- Overview
- National Cyber Security Action Plan
- Cyber Security in the Federal Government
- Cyber Security in the Private Sector
- Upcoming opportunities
Overview - The Canadian Government defines Cyber Security as “the protection of digital information stored within your cyber threat environment against cyber threats and cyber threat actors. [...] It is the protection of data, information, computers, devices and networks.”

Cyber Security encompasses and supersedes every other technological sector because the quick proliferation of ICTs increases vulnerability to cyber attacks.

Economic Impact - Every year, it is estimated that cybercrime bring about economic losses amounting to more than USD $2.5 billion.

https://www.ic.gc.ca/eic/site/137.nsf/eng/h_00009.html

This plan results from a comprehensive Cyber Review begun in 2016. It includes investments of more than USD $1 billion a year and aims at enforcing the government’s defenses as well as private security.

3 Goals
1. Secure and Resilient Canadian Systems
2. An Innovative and Adaptive Cyber Ecosystem
3. Effective Leadership, Governance and Collaboration

Key Takeaways
- Massive investment in R&D and partnership with the private sector in order to profit from its capacities. Private companies working in cyber security are eligible for significant government help.
- Adjustment of the legislation to international standards.
- Small Canadian businesses represent 71% of Cyber Security breaches and the Plan provides pathways to close the skills and knowledge gap.

The Canadian Centre for Cyber Security is the chief agency in charge of threat assessment and informing citizens.

Cyber Security
Cyber Security in the Private Sector

Increasing Consumer Confidence
The growing complexity of cyber threats, especially in the financial sector, is damping consumer confidence. As an obstacle to trust, cyber security is becoming a significant threat to growth and is addressed correspondingly.

Developing a cyber risk management program
Businesses are increasingly working with governments to harmonize cyber strategies and implement nationwide plans to block cyber threats. CEOs are relying more than ever on outside expertise to assess the needs of digital transformation and to understand how new technologies represent new threats.

Small Businesses are particularly vulnerable
Even if most companies don’t have unbreachable systems, it is safe to affirm that small to medium sized businesses are far more vulnerable. The Federal Government is working to close that gap, but most companies don’t have the energy, nor the resources to fight cyber crime on their own. They at least have to rely on outside expertise.

Cyber Security
Rip & Replace: Huawei and potential forthcoming opportunities

Huawei’s unique position
Since 2009, Huawei has imposed itself as one of the largest telecommunication players in Canada. It now boasts more than 24,000 cell phone towers all over the country and is closely linked to major universities. The company now tries to win contracts to build the Canadian 5G network.

Cyber Security and Telecommunications
Over the last few years, concern has arisen concerning the close links between the Chinese government and Huawei and the UK, the US, Australia and Sweden have proceeded to ban Huawei from acquiring new contracts. In the US, concerns for national security have lead to a Rip & Replace policy. In Canada, the government has yet to take an official position, but more and more key players are speaking against Huawei. The ex-director of Canada’s secret services has recently said that all Huawei’s infrastructures should be taken down and reporters are revealing more troubling news about the Chinese giant every day. If a general Rip & Replace policy were to take place in Canada, significant opportunities would arise for foreign investment and it’s a matter worth following closely.

Source: https://www.journaldemontreal.com/2021/05/15/faut-il-arracher-les-antennes-huawei
https://www.bnnbloomberg.ca/bt-s-700-million-job-to-rip-and-replace-huawei-5g-begins-here-1.1603635
2. Sub-Sector Analysis

Internet of Things

- Overview
- Industry 4.0
- Key Trends

June 2021
Internet of Things

Overview
–The Canadian Government defines the Internet of Things (IoT) as “the network of everyday web-enabled objects that can connect and exchange information. These “smart objects” include [...] personal fitness trackers, TVs, thermostats, or cars.”
–The Canadian Centre for Cyber Security estimates that there will be a 39% increase in the IoT market by 2025.

Uses and Relationship with other ICTs
The IoT is closely linked with cyber security and the more it becomes widespread, the more it is subject to cyber attacks and necessitates new innovation to keep the new technology safe. IoT is also intertwined with PropTech, and data management, both of which will be explored in detail below. Internet of Things devices are also helping to enhance security, and widespread tech like smart boards or smart meters for electricity and water are already transforming the way we live.

Internet of Things
Industry 4.0

The Fourth Industrial Revolution
At the core of IoT resides the notion that we are living the fourth industrial revolution (and maybe the fifth). This revolution is taking place relatively rapidly in Canada with over half of all manufacturing businesses having begun to integrate IoT in their activities.

Opportunities & Work to be Done
While Canada has been one of the leading countries in the 4.0 transition, it is still adopting new technologies at a lower pace than other industrial powers. In any given year, more than 75% of manufactured industrial robots go to either Japan, South Korea, the US and Germany, while Canada buys only about 1%. Nevertheless, most Canadian governmental agencies, Chambers of Commerce and private actors are now uniting to make a significant push towards 4.0 and major steps are bound to take place in the foreseeable future. The next couple of years promise to present many opportunities in this area.

Source:
https://www2.gouv.qc.ca/portail/quebec/infosite?lang=fr&x=3408021445&sm=3408021445&m=dossiers
Home Automation – In Canada, it is estimated that 2021 will see revenues in the Smart Home market reach USD $2.2 billion, and that number is expected to grow to USD $3.4 billion by 2025. The number of households using some kind of automation is expected to be around 7.8 million in 2025. Like most IoT technologies, home automation is mostly popular among young and high income people. Smart Home tech is now an integral part of PropTech and large real estate owners are counting on them to manage their properties more efficiently.

Data – As the IoT takes more place, it is always generating more data and is henceforth closely linked with big data management and processing. IoT is the most important drive for the development of cloud and edge computing. The creation of massive data infrastructure is a direct consequence of the emergence of the IoT.

Sources: https://www.statista.com/outlook/dmo/smart-home/canada
**Internet of Things**

**Key Trends**

**Blockchain** – The emergence and widespread of the IoT is creating massive trust and security problems and Blockchain is now seen as one of the most efficient ways to keep information safe in a decentralized way. As Blockchain is trending, governments are having more and more difficulty to legislate and to ensure privacy for individuals. Blockchain is also enabling the widespread of Crypto currencies and NFTs, creating further legislation problems for authorities. This aspect of both IoT and Fintech, is generating major environmental concerns because of energy consumption and this is a fact to take into account when trying to assess the future of big data and Blockchain.

**Contradictions** – The IoT is home to many core contradictions. It at once enhances security and endangers it; it aims at helping the environment but by producing such amounts of data as to be an environmental hazard. Surmounting those contradictions is one of the many opportunities presented by the IoT.

2. Sub-Sector Analysis

Fintech
- Overview
- Key Trends
- Digital Payments
- Proptech and the Toronto Region
- Overview of the Ecosystem and Recent Investments

June 2021
Overview

- The Canadian Government defines Fintech as “technology-led innovation in the financial services sector”.
- “In Canada, the adoption of financial technology advanced by 3 to 5 years due to the pandemic, surpassing the U.S. adoption rate.”
- Many Canadian cities rank amongst the world’s most important Fintech hubs: Toronto (12th), Vancouver (36th), Montreal (48th), Calgary (84th), and Ottawa (90th).

In Canada, the big banks enjoy a high level of customer trust when compared to similar countries. Accordingly, fintech companies are trying to collaborate with traditional institutions instead of competing with them.

The Canadian banking system is highly concentrated and, according to the World Economic Forum, it is the soundest financial system in the world. It’s dominated by the Big Five Banks, which combine assets of USD 3,000 billion and serve more than two-thirds of Canadians.

Fintech
Key Trends

**RegTech**
Management of Risk, whether it be insurance or financial security. RegTech represents more than 10% of new Fintech Companies in Canada.

**PropTech**
Collaboration between the real estate industry and new financial technologies. PropTech (Lending & Mortgages) represents about 13% of new Canadian Fintech companies.

**WealthTech**
WealthTech is the combination of all personal finance related technologies. It can be used to encompass such innovations as Crypto and Blockchain. Taken together, those areas comprise about 30% of new Canadian Fintech companies.

**Venture Capital**
2020 saw Canada gain its first private venture Fintech fund of more than USD $1 Billion (OMERS Ventures). More and more, traditional institutions are backing Fintech startups, and despite a decrease in Venture Capital investments during the Pandemic, the future looks bright.

**Brain Gain**
Toronto & Vancouver dominate the North American scene in terms of Fintech brain gain (2nd and 3rd after Silicon Valley).

**A Very Recent Trend**
While a 2016 report by Payments Canada could still boast that “Cash is king”, it is certainly not the case anymore with electronic payments representing 77% of all transactions in 2020. For the first time in 2020, Credit Card transactions surpassed debit and the disappearance of cash was accelerated by the pandemic with cash transactions drowning by 9%. Like most ICTs, digital payments represent a unique challenge for cyber security which can at once produce opportunities and major threats.

**Key Advantages**
Canadians, albeit adopting digital payment slower than many countries, are showing a preference for the rapidity and flexibility procured by the rejection of paper-based payments. Digital payments are permitting a shift to online purchasing with nearly 90% of Canadians shopping online. Digital payments are now a key part of IoT devices and more than 20% of Canadians regularly make in-app purchases.

Source: https://www.payments.ca/industry-info/our-research/canadian-payments-methods-and-trends
Fintech
PropTech and the Toronto Region

**Toronto, Fintech & PropTech**
The city of Toronto has long been a North American Centre of finance, software development, and mining finance. As such, it is understandable that the less flashy PropTech (property technology) has staid under the radar, but this often forgotten sector is booming in the Greater Toronto Area. The fact that the GTA is home to a third of North America’s cranes is a testimony to that state of affair.

**Overview & Trends**
- **297** companies.
- More than USD **$3 billion** raised by the **Canadian PropTech Collective** alone.
- More than 500 investors.
- PropTech is impacting the Canadian scene across **36 industries**, and this number is growing every year.
- Strongly linked to the development of the **Internet of Things**

Source: [https://www.proptechcollective.com/report](https://www.proptechcollective.com/report)
PropTech and the Toronto Region

**Ecosystem**
Canada’s PropTech ecosystem is growing rapidly and recognition by academic institutions as well as governments is stimulating venture capital investments. International companies are now turning to Toronto for leadership and talent in PropTech and the City of Toronto is actively collaborating with PropTech Collective, Alate Partners, and Colliers PropTech Accelerator to attract foreign investments.

**PropTech**
Toronto’s real estate scene is booming in large part due to the growth of PropTech and related software platforms and property management hardware. Now, large real estate owners can monitor the state of infrastructures in order to manage future renovations and maintenance work.

**Numeric Transition and Security**
Whereas most real estate companies have adopted a plan for technological transitions, most of them acknowledge a lack of security in their new systems and complain about a low level of system integration. Hence, most opportunities in PropTech will lie in those areas.

Source: https://www.proptechcollective.com/report

Fintech
BMO has recently partnered with Google Pay to be one of eight launch partners for Google Plex.

Power Corporation is investing massively in fintech startups like Wealthsimple, Koho & Personnal Capital.

Traditional Institutions are playing a major role in Fintech

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### Fintech

Overview of the Ecosystem and Recent Investments

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### Top 10 FinTech Deals in Canada, 2017 - Q1 2021

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>LOCATION</th>
<th>SECTOR</th>
<th>FUNDING TYPE</th>
<th>QUARTER</th>
<th>AMOUNT RAISED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verafin</td>
<td>St. John’s, NF</td>
<td>RegTech</td>
<td>Private Equity</td>
<td>Q3 2019</td>
<td>$388m</td>
</tr>
<tr>
<td>Nuvei</td>
<td>Montreal, QC</td>
<td>P2P Payments</td>
<td>Private Equity</td>
<td>Q4 2019</td>
<td>$270m</td>
</tr>
<tr>
<td>Fraction</td>
<td>Vancouver, BC</td>
<td>PropTech</td>
<td>Venture round</td>
<td>Q1 2021</td>
<td>$228m</td>
</tr>
<tr>
<td>1Password</td>
<td>Toronto, ON</td>
<td>RegTech</td>
<td>Series A</td>
<td>Q4 2019</td>
<td>$200m</td>
</tr>
<tr>
<td>Lightspeed</td>
<td>Montreal, QC</td>
<td>Point of sale</td>
<td>Series D</td>
<td>Q4 2017</td>
<td>$166m</td>
</tr>
<tr>
<td>Hive</td>
<td>Vancouver, BC</td>
<td>Blockchain</td>
<td>Post-IPO Equity</td>
<td>Q4 2017</td>
<td>$161m</td>
</tr>
<tr>
<td>Wealthsimple</td>
<td>Toronto, ON</td>
<td>Robo Advisor</td>
<td>Private Equity</td>
<td>Q4 2020</td>
<td>$87m</td>
</tr>
<tr>
<td>Flexiti</td>
<td>Toronto, ON</td>
<td>Personal Finance</td>
<td>Debt Financing</td>
<td>Q3 2018</td>
<td>$80m</td>
</tr>
<tr>
<td>Properly</td>
<td>Toronto, ON</td>
<td>Real Estate</td>
<td>Debt Financing</td>
<td>Q3 2020</td>
<td>$75m</td>
</tr>
<tr>
<td>Wealthsimple</td>
<td>Toronto, ON</td>
<td>Robo Advisor</td>
<td>Venture round</td>
<td>Q2 2019</td>
<td>$74m</td>
</tr>
</tbody>
</table>

Source: FinTech Global
Fintech Overview of the Ecosystem and Recent Investments

Traditional Institutions are joining forces with large ICT companies to incorporate Fintech.

CIBC is launching a business platform with Xero.

TD is partnering with Ficinity to develop PFM tools.

RBC is collaborating with NVIDIA and Red Hat to develop Fintech AI.

Canadian Accelerator and Incubator Program (CAIP)

The CAIP “is an initiative of the Government of Canada’s Venture Capital Action Plan and was conceptualized and designed by Finance Canada”. The CAIP distributes up to USD $100 million a year for the development of 16 accelerators and incubators which creates an ideal ecosystem for the flourishing of small fintech companies. Toronto, like in other ICT sectors, is recognized all over the world as a leading tech hub and continues to attract talents in fintech due to programs like the CAIP.

2. Sub-Sector Analysis

E-Health
- Overview
- Important Players
- Telemedicine
- Opportunities

June 2021
E-Health

Overview
The Canadian Government defines e-health as: “an overarching term used today to describe the application of information and communications technologies in the health sector. It encompasses a whole range of purposes from purely administrative through to health care delivery”.

Canadian Health System
- In Canada, health is a provincial competence. As such, e-health developments and initiatives vary significantly from one province to the other.
- Still, the Canadian Government has invested in e-health initiatives since the 1997 Federal Budget and supports provincial initiatives to implement electronic health records.
- The bulk of Canada’s health system is in southern cities, making it particularly difficult for northern regions and Indigenous communities to receive adequate health care.

Source: https://www.canada.ca/en/health-canada/services/health-care-system/ehealth.html
E-Health

Important Players

**General Remarks**
Although many companies are actively working towards the digitalization of health records and e-health, governments are slow to act on such matters and much is still to be done. Opportunities on the next page will show that the playground is still wide-open.

**Digital Health Canada (DHC)**
Although TELUS dominates the scene, there is plenty of space for other players and health digitalization is far from reality for most people. DHC is the largest non-profit organization trying to make the transition happen. Members include public organizations and tens of private companies such as Accenture, Amazon Web Services, CGI, KPMG, Microsoft, and Google. Those companies, through DHC, work closely with Universities and Governments alike to create the future of Canadian e-health.

**TELUS Health**
The telecommunication company TELUS is now the number one provider or virtual care solutions in Canada. Its Akira platform, EQ care, and Babylon smartphone application are used by more than 10 million Canadians. In 2021, TELUS announced that its corporate health platforms would integrate electronic medical records (EMR) to provincial online records.

General Remarks
Although the Covid-19 pandemic has accelerated the development and necessity of telemedicine, its advancement is poised to help some isolated communities and is seen as one of the main ways to close the healthcare gap between Indigenous communities and the rest of Canada.

E-Health at the Service of Indigenous People
The Toronto-based telehealth leader Maple has recently partnered with Indigenous organizations to create Maple Maskawâhtik, centred around the goal to provide equal service to isolated communities. Maple is partnering with Shoppers Drug Mart in order to insure that Indigenous people have access to the drugs they need, however far their community is located. All those players are working together with the support of Health Canada to insure that technology is helping to provide the care of the future and to close existing gaps.

https://www.getmaple.ca/
E-Health Opportunities

**Quebec** - After many unsuccessful attempts to digitalize Quebec medical records in an integrated way, the Government announced in February 2021, a USD $3 billion investment in the *Dossier de Santé Numérique*.

**Ontario** – Like Quebec, Ontario has digitalized partly over time, but now integration is the key problem. A significant number of partners are involved in Ontario’s e-health initiatives and focus is on linking their efforts together. The last official assessment of HER connectivity in Ontario dates from 2015.

**General Opportunities** - While governments are trying to digitalize, lack of organization and leadership has opened a large space for private companies to fill. Many are developing software to manage every aspect of e-health from managing line-ups to online medical records. Although provinces are trying to fill the gap they opened, opportunities in this area can be expected to exist in the foreseeable future.
2. Sub-Sector Analysis

EdTech

- Overview
- Important Players
- Online Classes
- Challenges
- Opportunities
EdTech

Overview
- Until recently, online learning was seldom found in Canada where education usually can be found at relatively low cost and students didn’t see the necessity to enrol in less expensive online classes. Still some noteworthy initiatives have been made to create free online courses available to all and Massive Open Online Courses (MOOC) are frequent in Canada.
- Before 2020, most investments in online learning were made to create online platforms for students. However, the pandemic has changed the scene and is bound to create opportunities for years to come.

Impact of the Covid-19 Pandemic
- As is the case for most ICT sectors, the pandemic has accelerated the transition to new technologies while institutions rely more and more on large tech companies (Google, Microsoft, Skype, Zoom).
- The pandemic has also put forth the importance of cybersecurity in education and the need for institutions to have strong infrastructures.
EdTech
Important players in the past & present

Online Platforms
- Post secondary schools have made large investments in the past to create online platforms where students can access their grades, pay their fees and see documents posted by teachers.
- In the absence of platforms like those Universities have had for a decade or so, primary schools have quickly transitioned to Google Classroom, Meet, and Microsoft Teams.

Skytech is a Canadian leader when it comes to online platforms (Omnivox, Léa, Mia)

Oracle’s Peoplesoft has had large contracts in the past like the University of Montreal’s platform Synchro.

Google
Microsoft
**New but Old**
While the pandemic has accustomed us to a new style of learning, distance education wasn’t born in 2020 and *Massive Open Online Courses* (MOOC) have been around for over a decade. In Canada, somewhat of a parallel education system has developed, stewarded by the private companies as well as Universities themselves.

**A Slow Adoption**
This major trend in education is not uniquely Canadian and it could even be said that its less Canadian than American or European. Observers agree that MOOCs are slow to be adopted by Canadians who have a marked preference for live classes, in part due to low educations costs. This unpopularity is shown by the fact that most platforms used by Canadian Universities to propose MOOCs are either European or American. The Covid-19 pandemic, even if it has accustomed Canadians to online education, is poised to the progress of MOOCs, because studies show that Canadians are tired of isolation and are eager to come back to the school benches.
EdTech Challenges

Quality of Learning
In Canada, the wide spread of e-learning has been decried has a significant lowering of the quality of education. Students and teachers alike have complained that online learning does not offer the necessary support nor the quality of a classroom as a place of learning.

Mental Health
-The pandemic, along with the toll of online learning, has exercised an unprecedented strain on Canada’s students and teachers.

-The isolation and poor quality of e-learning is affecting the mental health of more than 70% of students and it is affecting disproportionately poor persons who don’t have access to a room of their own.

-More educators than ever are quitting the profession, most of them feeling that online learning has doubled their work load.

EdTech
Opportunities

Using Tech to Learn
While the quality of education has been notoriously poor during the pandemic, efforts have been made for over a decade to introduce technology in the classroom and those efforts are bound to continue. In this area, many schools are adopting Microsoft and Apple products for their students, but software opens more opportunities. Indeed, more institutions are looking to use new apps to help students assimilate information or to practice some complicated notion.

Mental Health
Even if the challenges posed by the pandemic have created a profound antipathy towards e-learning among Canadians, they also put some opportunities to the fore. Foreign companies looking to invest the online learning sector in Canada should be aware that the demand is for more quality and less strain on user’s mental health. Those two areas, while representing important challenges, are the most significant opportunities in the foreseeable future.
2. Sub-Sector Analysis

AI & Big Data

- Overview
- Canada’s AI Ecosystem
- Mila & the Montreal AI Supercluster
- Machine Learning
- The Cloud
- Data Management
AI Overview – The Government of Canada has invested for many years to make the country a world leader in artificial intelligence and to “balance innovation with the ethical and responsible use of emerging technologies”. Besides major investments in the Montreal Supercluster, the federal government has funded a CAD $125 million Pan-Canadian AI Strategy aiming at fostering cutting-edge innovation in AI.

Data Overview – As more and more large tech companies invest in Canadian data centres, businesses and governments alike turn to cloud computing and to the management of data as a priority. Accordingly, and with the help of the pandemic, institutions are showing a growing concern for security and the protection of data.

The World Economic Forum estimates that in 2020, there was 44 zettabytes ($1,000^7$) of data in the digital universe and that number is expected to increase by 463 exabytes ($1,000^6$) a day in 2025.

**Ecosystem Overview**
In 2019, Canadian AI companies received 57 venture capital deals and 658 million USD in venture capital. This represented an increase of almost 50% from 2018.

Canada’s AI ecosystem consists of approximately 800 AI companies and 670 AI start-ups.

**An Ideal Ecosystem for Foreign Investments**
The province of Ontario has the largest number of pure-play AI firms with 361 companies, compared with 131 in Quebec, 103 in British Columbia, and 49 in Alberta.

Many international firms and tech giants have chosen Canada to establish new AI research labs. These include, but are not limited to, Erricson, Facebook, Google DeepMind, Microsoft Research, Uber and Zesty.ai

The Montreal Scale AI Supercluster

Scale AI is Canada’s AI Supercluster. Its mission is to accelerate the growth of AI startups and enrich Canada’s AI ecosystem. To date, Scale AI has invested more than CAD $127 million and their budget is scheduled to increase each year. It invests in projects ranging from optimization of transportation assets to intelligent forecasting in the supply chain and cognitive supply chain in aerospace.

Mila (Montreal Institute for Learning Algorithms)

With more than 750 researchers from all over the world, the Mila Institute positions as a worldwide leader in AI. It collaborates with local, national and international organizations as well as more than 70 private partners. It has supported the growth of over 40 AI startups and its international reputation insures Montreal’s place as an AI metropolis.
A World Leader – One of the key components of Canada’s leadership role in AI is its constant innovation in machine learning and its conjunction with the IoT. In terms of spending, Canada comes second only to the United States in machine learning and the Mila institute is a large part of that success.

Impact of the Pandemic – The pandemic has increased spending in machine learning and AI in general as innovations in this area presented real-life advantages for tracking the disease and preventing its spread. It is likely that such uses will become more widespread in the future.

Canada’s Armed Forces – The Canadian Government is working hand in hand with the private sector to enhance efficiency with machine learning. For instance, the armed forces are relying on machine learning and IoT for the maintenance of aircrafts. Lockheed Martin’s C-130 are now equipped with hundreds of censors producing fault codes on failing parts and the system can develop good practices for the maintenance of the aircraft. This is just one example of the Canadian government working with the private sector to develop new and more efficient technologies.

Sources: https://www.idc.com/getdoc.jsp?containerId=prUS46794720
By 2023, it is estimated that public cloud computing spending in Canada will amount to USD $10.3 billion (double from 2019).

In 2019, two-fifths of Canadian companies used cloud computing. The Covid-19 pandemic doubled that figure.

Canada has been a destination of choice to install data and cloud centres due to its geographical location. The colder climate and the rarity of earthquakes present optimal conditions for their installation.

Small to medium-sized Canadian businesses are the slowest to adopt the cloud, but the gap is slowly closing. Opportunities for foreign investment are mostly centred on those companies.

Sources:
https://www.statista.com/
https://www150.statcan.gc.ca/n1/en/daily-quotidien/201123/dq201123a-eng.pdf?st=De57Hy6g
The Data Science Network – The Data Science Network is an initiative of Statistics Canada which stems from the need to form a community of “data science enthusiasts.” This initiative was put forth with the objective of creating a common space where academic, government, and private sector actors can share information about data science. With the Data Science Network, Statistics Canada hopes to better the use of data in Canada in general, with the final objective being to enhance security both at an institutional and individual level.

Key Opportunities - Initiatives like this one aim at directing government policies and enlightening decision making of all sorts. This objective highlights that data management is a key component of public and private administration and reveals that opportunities in this area are bound to emerge in the next years. Once again, concern for Cyber Security will drive innovation and provide openings for investment.

Source: https://www.statcan.gc.ca/eng/data-science/network/about#a5
Opportunities in Data Management - Whereas small companies are slower to adopt data management infrastructures, it may be their best shot at competing with large tech companies. According to the Harvard Business Review, data management and the adoption of data software is giving midsize companies a way to compete with digital giants. By optimizing their activity, those innovations open opportunities for businesses willing to adapt and change in order to survive in a world dominated by large companies. Opportunities for foreign investments are certain to arise in that area for years to come.

Sources: https://hbr.org/2021/02/how-midsize-companies-can-use-data-to-compete-with-digital-giants
https://www.lapresse.ca/affaires/techno/2021-05-10/google-confirme-l-implantation-d-un-centre-de-donnees-a-beauharnois.php
2. Sub-Sector Analysis

Video Games & Digital Media

- Overview
- Historic Overview
- Major Players
- Key Trends
Overview – The Canadian video game industry is the 8th largest in the world and is making some of the biggest games of the planet. With a strong esports scene and a thriving gaming industry, Canada positions as a world leader in the video game market, both in quality and in quantity.

Revenues of USD $3 billion in 2020.

Esports is growing exponentially and promises to become the most important sector in the industry.

More than 50,000 full-time employees.

The number of gamers has increased as the result of physical distancing measures enforced to manage the Covid-19 pandemic.

23 million Canadians are playing video games.

There are more than 700 game development studios in Canada.

https://www.theglobeandmail.com/business/adv/article-canadas-video-game-industry-is-a-major-player-on-the-world-stage/
Provincial Government Incentives
In 1997, leading video game companies such as Ubisoft received incentives from the Quebec government to open in Montreal. Since 1997, Ubisoft Montreal has grown to be one of the largest studios by employee-count and expanded its operations with the opening of a new studio in Quebec city and Saguenay.

A Turn Towards Digital Media
After becoming a major innovation hub for video games, the Greater Montreal Area transformed and became focused more and more on attracting digital media companies and the Montreal scene developed into a major pole for 3D modeling and the film industry. Today, Toronto and Vancouver are also attracting major digital media businesses and are known world-wide for the quality of the ecosystem and governmental incentives. As in other ICT sub-sectors, investors are enticed by a highly qualified and low-cost workforce.

Source: https://www.international.gc.ca/investors-investisseurs/assets/pdfs/download/vp-digital_media.pdf
**Made in Canada** – There is a strong video game culture in Canada which is reinforced by the fact that more than 80% of the country’s gaming companies are controlled and owned by Canadians. It is a sector relying like no other on national expertise and is makes it particularly hard for foreign companies to make their mark.

**Esports**

– Esports is a relatively recent but major trend in the video game industry. Worldwide, there are more than 300 million persons watching or playing esports. During the pre-Covid year, the Entertainment Software Association of Canada (ESAC) estimates that over 30% of Canadians were engaged in esports in one way or another. In its study, the ESAC found that 15% of Canadian adults play esports and more than 20% of kids and teens have watched esports tournaments online.

- The fact that Toronto headquartered company GameSquare Esports has reported a 97% year-over-year revenue growth for Q1 2021 is testimony to the importance of this trend.

### Video Games & Digital Media

#### Key Trends

**Entertainment and Media:**
- Third most filmed country in the world
- In 2018, film and television contributed $12.8 billion and supported 181 thousand jobs in the industry
- Canada’s digital media studios provide visual effects and animation for Hollywood blockbusters and Academy award-nominated films. Multimedia technologies that major studios rely on for films like Maya, Houdini and Harmony were developed here.

**Key Institutions:**
- Vancouver Film School
- Sheridan College (Toronto)
- School of Arts Animation and Design (NAD) (Montreal)
- Nova Scotia College of Art and Design University (Halifax)

Source: https://www.investcanada.ca/industries/entertainment-and-media
Besides Canadian companies, international players like Microsoft, Blizzard, Electronic Arts (EA), Square Enix and WB Games are also active in Canada.
2. Sub-Sector Analysis

Hardware

- Overview
- Leading Players
- Supply Chain
- Regulations
Overview:
This subsector comprises establishments primarily engaged in: manufacturing computers, computer peripheral equipment, communications equipment, and similar electronic products, as well as components for such products.

Key Stats
- There are 2860 establishments in Canada involved in the manufacturing of electronic hardware.
- In 2019, the top two provinces for manufacturing are Ontario (CAD $3621 million) and Quebec (CAD $1544 million).
- According to 2019 trade data, Canada exported USD $14.9 billion and imported USD $51 billion in hardware.

Source: https://www.ic.gc.ca/app/scr/app/cis/summary-sommaire/334
Hardware
Leading Hardware and Infrastructure Companies

3 Leaders
Celestica, CAE and Sierra Wireless are the top 3 Hardware companies in Canada. Celestica is the Canadian leader in Fintech and Medtech, while Sierra Wireless is also a leader in medtech.

Hardware and Edtech
Smart technologies is lower in the list of Canada’s top hardware companies, but remains a leader in hardware for Edtech. The company is currently owned by Foxconn but is headquartered in Alberta.

Exports
- The Canadian ICT manufacturing sub-sector relies heavily on the export market. About 99% of ICT products manufactured in Canada were exported in 2019.
- Canadian exports of ICT goods increased by 1.6% in 2018 to $11.9 billion. Exports of electronic components and computer equipment increased the most (+$676 million and +$138 million, respectively), while communications equipment had the steepest decline (-$171 million).

Export Trends
- Exports of ICT goods to the United States increased (+6.5%) to about $8.5 billion in 2019 accounting for 71.4% of all ICT goods exported from Canada.
- Overall, Canadian exports of ICT hardware and services grew by 3.4% annually from 2013 to 2018 to reach $22.9 billion.

Source: https://www.ic.gc.ca/eic/site/ict-tic.nsf/eng/h_it07229.html
Hardware Regulations

**Canada’s Energy Efficiency Regulations**
These apply to imported electronic products such as TVs, audio and video equipment and other electronic devices. The regulations outline the energy performance standard in terms of the maximum number of watts used while the device is powered off and powered on.

**Energy Efficiency Verification Mark & Report**
These are required to confirm that the energy performance of the electronic device has been verified. The mark must be granted by a certification body that is accredited by the Standards Council of Canada. A prominent certification body for electronic devices in Canada would be CSA, founded in Ontario in 1919.

**Provincial Regulations**
The provinces of Quebec, Ontario and British Columbia have their own energy efficiency regulations for electronic devices. Likewise, import taxes are different depending on the province of entry. All provinces have a unique tax rate and it can affect costs significantly.

Source: https://www.nrcan.gc.ca/energy/regulations-codes-standards/6859#verification
3. Concluding Remarks

Concluding Remarks

• Key Takeaways
• Trade Shows and Major Events
Concluding Remarks

The Canadian ICT Sector

After a slower 2020, the Canadian ICT Sector is set to bounce back and grow from the 2019 figures. In fact, Canadian ICT spending is forecasted to reach more than USD 100 billion a year by 2024 and foreign investment will contribute significantly to this trend.

Every single ICT sub-sector was affected in one way or another by the Covid-19 pandemic and its long-term effects are still to be assessed. Still, we have been able to provide an overview of the ways in which the pandemic has modified the ICT landscape. For most sub-sectors, transitions have accelerated and the adoption of new technologies was forced by necessity. This has presented new challenges and opportunities. Here are the most important takeaways from our findings.

Source:
https://www.idc.com/getdoc.jsp?containerId=CA45058320#:~:text=As%20a%20result%2C%20Canadian%20ICT,will%20reach%20C%24122%20billion.
**Concluding Remarks**

**Key Takeways**

**Cyber Security**
- The pandemic and an increasing dependence on ICTs have resulted in more frequent cyber threats and vulnerabilities seem more exposed than ever before.
- Cyber security creates opportunities across ICT sub-sectors.
- Small and medium-sized businesses are particularly vulnerable and need outside expertise to face threats. The Canadian Government is investing massively to close this gap; this creates a friendly ecosystem for foreign investors.
- The perspective of a general Canadian *Rip & Replace* policy could provide multi-billion opportunities and this is a trend worth following closely.

**Internet of Things**
- Opportunities reside mostly in the transformation towards the 4.0 industry and in this area, Canada is well behind many of its counterparts.
- Home automation is also a significant trend to look out to, despite strong competition.
- IoT is finally to be regarded as one of the main sources of new data and is hence opening doors for companies involved in data management.
Concluding Remarks

Key Takeways

**Fintech**
- Canadian finance is extremely concentrated. The strength of the major banks makes collaboration with traditional institutions a necessity for anyone interested in implementing new tech in the financial world.
- While online and digital payments are already well implemented, new sub-sectors like regtech and proptech are booming and presenting ongoing opportunities.
- Wealth management has also boomed with the pandemic, but competition is fierce and companies like WealthSimple and Nesto are rapidly gaining market share.

**E-Health**
- While health is a provincial competence, the federal government is chaperoning initiatives in telemedicine and private companies are taking the lead when it comes to digitalizing health records and assuring high-quality e-health.
- As such, the growing fragmentation of the Canadian health system is opening never seen before opportunities, especially with provinces still looking to implement integrated digitalized health records and to close the care gap between Indigenous communities and the rest of the population.
Concluding Remarks

Key Takeways

**EdTech**
- Until recently, EdTech was about learning hardware and student platforms.
- The pandemic changed everything and put the focus on platforms like Zoom, Microsoft Teams, and Google Classroom as well as on the quality of online learning in general.
- The most important opportunities now lie in rendering online learning more efficient, more healthy and human and in developing better learning hardware.

**AI & Big Data**
- The Montreal Region and Canada are world leaders in AI and provide an ideal ecosystem.
- Canada is more and more seen as a perfect location for building cloud and data centres.
- Most of the world’s major AI and data companies are already present on the Canadian soil, making it a very competitive sector.
- Canada is a must destination for AI and data companies, but one has to keep in mind the competition and challenges awaiting.
**Video Games & Digital Media**

- Clusters like Montreal, Vancouver and Quebec are still home to an important video game industry, but incentives are turning more and more to the digital medias.
- Esports and 3D modeling are not set to go away soon and were even helped by the pandemic. Those sub-sectors should increase activities by double-digit figures every year.
- While it presents interesting opportunities, one has to keep in mind that it’s a market where almost all the large companies are already present.

**Hardware**

- Canada is a major manufacturer of hardware and Ontario is full of small to large companies involved in that sector.
- There is still a significant gap between needs and production as Canada still relies on more than USD $50 billion of hardware imports every year.
- The federal government is working to palliate this gap by investing massively in made in Canada hardware. This could present relatively low-cost opportunities for foreign companies looking to manufacture in Canada.
**Concluding Remarks**

**Trade Shows and Major Events**

**Big Data x AI Toronto Conference:**
Providing a unique platform for IT decision-makers and data innovators to explore and discuss insights, showcase the latest innovative projects, and connect with the best and brightest minds in the industry.
Toronto, Ontario
October 13-14, 2021

**Collision Conference:**
Collision is the meeting place for tech and media leading companies. Collision unites more than 100 partners, 1,260 startups, and 38,000 attendees from more than 140 countries.
Toronto, Ontario
June 20-23, 2022

**World Summit Americas:**
Top AI brains giving their predictions for 2021
Heated discussions on AI and ethics and AI4good, applied solutions for enterprise and hands-on workshops
Montreal, Quebec
October 13-14, 2021
Concluding Remarks
Trade Shows and Major Events

Canada’s Medtech Conference
Attendees will hear from and engage with high-profile health system leaders and network with colleagues in the medtech industry. Previous conferences have hosted Ministers of health, Hospitals CEOs and other influential thought leaders.
October 5-6, 2021
Virtual conference

IoT Health Care Summit
Healthcare professionals and solution providers will be sharing new developments, case studies, and ideas that help the healthcare sector move forward.
May 2022 (Date TBA)
Location TBA

IoT People First Summit
Municipal leaders in human capital and solution providers from across Canada and the world will be discussing the future of work in the public sector.
May 2022 (Date TBA)
Location TBA

IoT Intelligent Cities Summit
- Leading global municipal professionals and tech experts will share ideas and case studies on how to utilize new technology to make cities more intelligent – making them more efficient, offering better city services and improving quality of life.
May 2022 (Date TBA)
Location TBA
Canadian Fintech Summit
Attendees will compete for investment opportunities and partnerships in a pitch battle, listen to powerful founders, CEOs and industry leaders share insights on the currently challenges and opportunities for the Canadian fintech industry. Attendees will also be able to engage in hands-on learning workshops led by industry leaders to deepen their knowledge on fintech and learn how to adapt turn current issues into the solutions of tomorrow.
Toronto Ontario
April 5-7, 2022

Canadian Higher Education Information Technology
It’s the only national conference for higher education IT professionals. Given the changes in learning due to the COVID-19 pandemic, the conference will be discussing the exciting changes in e-learning that should persist and be further developed, as well as ways to improve remote learning.
May 2022 (Date TBA)
Location TBA