

The Narwhal List 2018

A successful year for Canada's tech community



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The Narwhal List

“The Impact Centre’s Narwhal List identifies a set of young Canadian companies that have the potential to become successful on the world stage.”

2017 was a remarkable year for Canadian Narwhals. We are continuing to build on our success at creating businesses and now are beginning to show results at scaling our startups to world class.

- Three of the companies from last year’s list (Real Matters, Clementia Pharmaceuticals, and Zymeworks) went public.
- VarageSale was sold, but the good news is that we did not lose it to a foreign buyer. VarageSale was sold instead to a firm based in Canada.
- Compared to last year, we have almost doubled the number of firms that are on track to become Unicorns in the near future.

In terms of fundraising, 29 of 50 firms on the list raised a total of \$1.2 billion for an average round of \$41 million per company, with 20 of these firms newly added to the list. This group raised enough funds to replace a large swath of incumbent Narwhals from last year.

The Impact Centre’s Narwhal List identifies a set of young Canadian companies that have the potential to become successful on the world stage. It also points to possible financial pathways to turn these companies into Unicorns, which are closer to reaching public financial markets. The transition to the Unicorn scale and possibly public listings may give our firms the ability to compete on their own merits and have the currency necessary in public stock to fund acquisitions throughout the world that will lead to greater scale and world-class status.

There are a number of reputable lists in Canada that rank technology firms. The oldest is the Branham300. Generated by the Branham Group Inc., this listing is useful to gain a perspective on the comparative revenues of Canadian firms. Another well-known list is Deloitte’s Technology Fast 50™, which ranks Canadian technology firms according to their percentage revenue growth rates. The Technology Fast 50™ program rewards firms in their earliest years, when extraordinary growth rates are possible from a revenue base of C\$50,000 (the minimum revenue to qualify as an applicant).

The intention of the Narwhal list is to focus on the ability of firms to scale up and reach world-class status. The ranking system is derived from publicly available information and is capable of tracking all firms in the country—not just those that elect to participate by revealing private revenue data. It also enables any business to benchmark itself against other Canadian firms, Unicorns and the competition. Since the Narwhal List includes all firms, it is also a useful indicator for how Canada as a whole is faring in business incubation and growth.

Table 1 features the ten leading Canadian Narwhals. The full list is published at www.impactcentre.ca/narwhal.

The Narwhal List Top 10

Table 1

Rank	Company	Founded	Total Funding (\$US Millions)	Financial Velocity	Employees	Employee Velocity	Sector	City
1	BlueRock Therapeutics	2016	225	112.5	21	11	Healthcare	Toronto
2	DalCor Pharmaceuticals	2015	150	50.0	2	1	Healthcare	Montreal
3	Repare Therapeutics	2016	68	34.0	22	11	Healthcare	Saint-Laurent
4	Hootsuite	2008	230	23.0	1219	122	Internet	Vancouver
5	Lightspeed POS	2005	292	22.5	504	39	Mobile & Tel	Montreal
6	Thalmic Labs	2012	135	22.4	229	38	Consumer	Kitchener
7	Turnstone Biologics	2015	50	16.7	22	7	Healthcare	Ottawa
8	Wealthsimple	2014	62	15.5	130	33	Internet	Toronto
9	PreciThera	2016	29	14.5	3	2	Healthcare	Montreal
10	Kik Interactive	2009	116	12.9	187	21	Mobile & Tel	Waterloo

Measuring Growth

The purpose of the current report is to build on our last year's effort by updating our Narwhal List and by further identifying those private companies that have the potential to scale to world-class status. Shifts and movements on the list can also tell us whether Canada is making progress at creating a cohort of high-potential companies.

In our first Impact Brief of 2017 (*The Narwhal List*, released March 2017), we identified an approach to measuring growth of technology companies through the use of "Financial Velocity". We defined Financial Velocity as the total amount of funding a firm has raised divided by the number of years it has been in existence. This metric is expressed in millions of dollars per year and measures the rate at which companies raise and consume capital. It provides a tool to enable entrepreneurs and investors to gauge the financial attractiveness of young and capital-intensive firms.

With some exceptions, there are two ingredients to growing the revenue of young technology companies. The first ingredient is capital. A firm wishing to grow extremely quickly must acquire vast amounts of capital to fund losses and provide working capital. The second is employment. The firm must also hire increasing numbers of employees to generate revenue, to develop products and to fulfill other critical functions as it grows. This report builds on the concept of Financial Velocity and adds employment as another proxy measure for growth.

In fact, one can look at statistics for the software industry to see how that works. Table 2 shows the data for 237 public US software companies with revenue above \$100 million. The data demonstrate the relationship between size and the amount of capital required and revenue per employee calculated based on publicly available information. The companies were divided by quartile based on total revenue. There is an almost linear relationship over the long-term between growth in revenue, growth in capital and growth in personnel.

US Public Software Companies (All amounts in \$US Millions)

Table 2

	Revenue Per Employee	Invested Capital Per Employee	Revenue Growth
Top Quartile	318,989	513,233	6.9%
2nd Quartile	160,948	352,519	13.4%
3rd Quartile	191,854	305,270	14.3%
4th Quartile	217,237	496,656	15.3%
Average	288,987	480,782	7.7%

Source: Google Finance June 2017

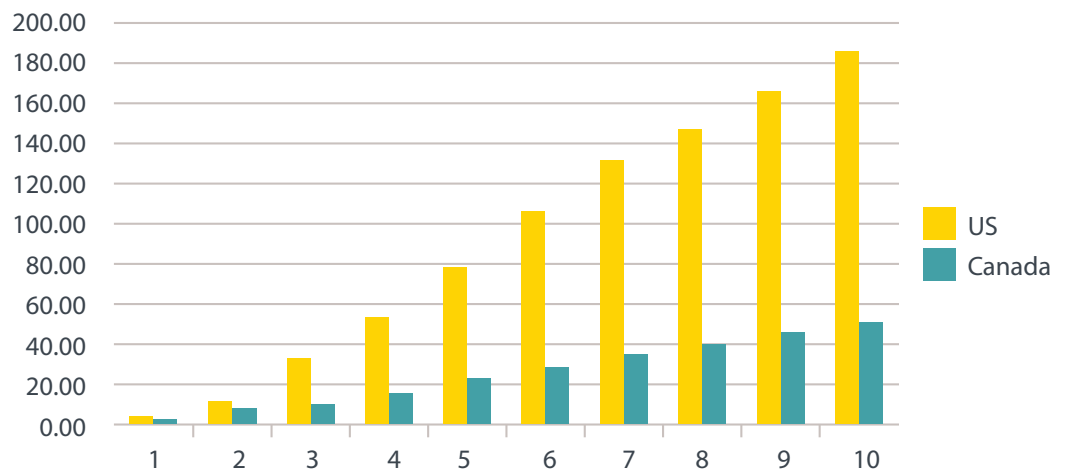
Unfortunately, we could not obtain revenue numbers for the private Canadian companies we wanted to study. However, as a result of the relationships between capital and revenue and employees and revenue, we can use two proxy metrics to measure the growth in revenue, which will be discussed in the following sections.

Financial Velocity

Our first proxy for growth is Financial Velocity, defined as the amount of funding a firm has raised divided by the number of years it has been in existence. This metric is expressed in millions of dollars. The concept of Financial Velocity is a particularly important metric because it speaks directly to a firm's acquisition and consumption of capital as it grows. Figure 1 (reproduced from *A Failure to Scale*, February 2017) shows the Financial Velocity of selected Canadian and US companies over a span of 10 years, demonstrating a remarkable difference between the two countries in terms of capital raised.

An analysis of the amounts in \$US Millions raised by year since inception for selected Canadian and US private companies

Figure 1



As firms grow, they acquire capital to fuel that growth. The faster they acquire capital, the faster they will be able to grow. Thus, Financial Velocity is a proxy for the rate of revenue growth of a private company.

Employment Velocity

The second proxy measure is employment growth. As firms grow, they hire employees to develop or sell products, to create a customer base, and to fulfill a myriad of other critical functions. The faster a firm hires employees, the faster it can grow. This close connection between revenue and employment makes the rate of growth in employment another potential proxy for revenue growth. Instead of measuring a percentage growth in employment, we have decided to use the concept of Employment Velocity. This metric measures the number of employees a company hires per year since its inception. It thus rewards long-term growth in employment and not momentary surges that accompany financing events.

A Caveat

We must note that firms can acquire capital and hire employees while not managing to grow their revenue. Although a firm may show strong growth using our proxy metrics, if it does not manage to successfully add revenue, the business will eventually have to lay off employees. If a firm truly fails, it will be unable to acquire further capital. Thus in the long run, any issues with using these two metrics in cases where firms are unable to secure revenue will resolve themselves naturally as such businesses drop in ranking or disappear entirely from the Narwhal List. In fact, the List shows two chief metrics for growth. They are leading measures as increases in capital and personnel usually come before increases in revenue. They are the result of actions a company takes in anticipation of revenue, not as a result of revenue.

Updates to the Narwhal List

In our first publication of the Narwhal List last year, we combined life sciences companies with other firms. This year we decided to make two important updates on how rankings are determined and how companies are presented. First, we have added Employment Velocity to the development of the Narwhal List. Second, in closely examining the growth of these companies, we also teased out a different growth pattern amongst life sciences companies relative to other types of technology companies.

Life sciences companies, particularly in sub-sectors that require massive funding for regulatory approvals, typically raise substantially larger first rounds of capital than other types of firms. They also show low levels of employment growth initially as funds are not used for personnel who may be involved in product and market development. Instead, funds are frequently used for clinical trials and expenses related to regulatory approvals. Thus, we have split the Narwhal List into technology companies (excluding healthcare and life sciences firms) and healthcare/life sciences companies.

Please note that we have not included firms in FinTech that have acquired capital used for the provision of debt as part of their product offering as this application of funding does not make them comparable with other technology firms.

The Narwhal List 2018 – Healthcare Narwhals

Table 3

Rank	Company	Founded	Total Funding (\$US Millions)	Financial Velocity	Employees	Employee Velocity	Sector	City
1	BlueRock Therapeutics	2016	225	112.5	21	11	Healthcare	Toronto
2	DalCor Pharmaceuticals	2015	150	50.0	2	1	Healthcare	Montreal
3	Repare Therapeutics	2016	68	34.0	22	11	Healthcare	Saint-Laurent
4	Turnstone Biologics	2015	50	16.7	22	7	Healthcare	Ottawa
5	PreciThera	2016	29	14.5	3	2	Healthcare	Montreal
6	Fusion Pharmaceuticals	2014	46	11.5	13	3	Healthcare	Hamilton
7	Northern Biologics	2014	40	10.0	33	8	Healthcare	Toronto
8	Highland Therapeutics	2008	82	8.2	7	1	Healthcare	Toronto
9	Ilkos Therapeutics	2016	16	7.9	3	2	Healthcare	Montreal
10	EndoCeutics	2006	85	7.1	52	4	Healthcare	Quebec

The Narwhal List 2018 – Technology Narwhals

Table 4

Rank	Company	Founded	Total Funding (\$US Millions)	Financial Velocity	Employees	Employee Velocity	Sector	City
1	Hootsuite	2008	230	23.0	1219	122	Internet	Vancouver
2	Lightspeed POS	2005	292	22.5	504	39	Mobile & Tel	Montreal
3	Thalmic Labs	2012	135	22.4	229	38	Consumer	Kitchener
4	Wealthsimple	2014	62	15.5	130	33	Internet	Toronto
5	Kik Interactive	2009	116	12.9	187	21	Mobile & Tel	Waterloo
6	Visier	2010	92	11.4	270	34	Internet	Vancouver
7	Breather	2012	68	11.3	178	30	Mobile & Tel	Montreal
8	Ritual Technologies	2014	44	10.9	8	2	Mobile & Tel	Toronto
9	Kindred Systems	2014	43	10.8	52	13	Industrial	Vancouver
10	LeddarTech	2007	117	10.6	77	7	Electronics	Quebec City
11	Wave Financial	2010	84	10.5	148	19	Internet	Toronto
12	D-Wave Systems	1999	182	9.6	158	8	Comp Hardware	Burnaby
13	Hopper	2007	99	9.0	101	9	Mobile & Tel	Montreal
14	Wattpad	2006	107	8.9	2057	171	Internet	Toronto
15	D2L	1999	165	8.7	713	38	Internet	Kitchener
16	Tulip Retail	2013	42	8.5	107	21	Mobile & Tel	Toronto
17	Hubba	2011	59	8.4	76	11	Internet	Toronto
18	Nekso	2015	25	8.3	59	20	Mobile & Tel	Toronto
19	eSentire	2001	141	8.3	286	17	Comp Hardware	Cambridge
20	Integrate.ai	2017	8	8.2	23	23	Internet	Toronto
21	Vidyard	2010	61	7.6	214	27	Internet	Kitchener
22	Manifold	2016	15	7.5	23	12	Internet	Halifax
23	SecureKey Technologies	2008	73	7.3	84	8	Internet	Toronto
24	LEAGUE	2014	29	7.3	129	32	Internet	Toronto
25	Ranovus	2012	43	7.2	37	6	Comp Hardware	Ottawa
26	Flipp	2007	76	6.9	411	37	Internet	Toronto
27	Scribble Technologies	2009	61	6.8	134	15	Internet	Toronto
28	Mojio	2012	41	6.8	64	11	Mobile & Tel	Vancouver
29	Influitive	2010	50	6.2	136	17	Internet	Toronto
30	1QBit Information Technologies	2012	35	5.9	46	8	Software	Vancouver
31	Peraso Technologies	2008	58	5.8	81	8	Electronics	Toronto
32	Deep Genomics	2015	17	5.6	23	8	Software	Toronto
33	Top Hat	2009	50	5.6	350	39	Internet	Toronto
34	Coveo	2005	70	5.4	281	22	Internet	Quebec City
35	Analytics 4 Life	2012	32	5.4	22	4	Software	Kingston
36	FundThrough	2014	21	5.2	26	7	Internet	Toronto
37	Vena Solutions	2011	36	5.1	205	29	Internet	Toronto
38	Freshbooks	2003	73	4.9	269	18	Internet	Toronto
39	Intelex Technologies	1992	122	4.7	454	17	Internet	Toronto
40	TouchBistro	2010	37	4.6	191	24	Mobile & Tel	Toronto

The Profile of Narwhal

The average company on the Narwhal List is almost 8 years old and has raised \$66 million of funding since its inception. Most firms operate in the internet software and services industry and are headquartered in Toronto (Tables 5 and 6)

Breakdown by Industry

Table 5

Industry	Number
Internet software and services	21
Healthcare	10
Mobile and telecommunications	9
Electronics and computer hardware	5
Other	5

Headquarters of the Top 50 Narwhals

Table 6

Location	Number
Greater Toronto Area	24
Greater Montréal	7
Metro Vancouver Regional District	6
Kitchener/Waterloo Region	5
Other	8

Unicorn Velocity

As a point of comparison to the Narwhal List, Table 7 shows the ranking of US Unicorns according to their Financial and Employment Velocity. The list includes all US-based Unicorns in the CB Insights database as at December 1, 2017 for which we could determine both Financial and Employment Velocity.

Unicorn Velocity
Table 7

Company	Total Funding (\$US Millions)	Financial Velocity	Employee Velocity	Company	Total Funding (\$US Millions)	Financial Velocity	Employee Velocity
Uber	15,110,000	1,678.9	4063	Tanium	395,290	35.9	56
Lyft	3,962,500	660.4	1718	Appnexus	394,170	35.8	94
WeWork	4,460,000	557.5	383	Robinhood	176,000	35.2	47
Airbnb	4,398,000	439.8	685	Github	350,000	35.0	84
Social Finance	2,194,070	313.4	148	DocuSign	513,430	34.2	161
Avant	1,719,000	286.5	73	Greensky	410,000	34.2	51
Kabbage	2,450,000	272.2	43	Credit Karma	368,500	33.5	66
Magic Leap	1,892,500	236.6	158	Unity Technologies	448,500	32.0	115
Moderna	1,340,000	191.4	76	Mozido	313,710	31.4	8
Indigo Agriculture	366,500	183.3	543	Lookout	281,000	31.2	44
Pinterest	1,465,000	183.1	224	AvidXchange	547,773	30.4	41
STX Entertainment	700,000	175.0	45	Thumbtack	273,850	30.4	123
Infor	2,633,000	164.6	957	Docker	240,670	30.1	59
Dropbox	1,710,000	155.5	215	Cylance	177,000	29.5	134
AppLovin	845,020	140.8	25	AppDirect	249,500	27.7	56
Palantir Technologies	1,940,000	138.6	144	Apttus	329,000	27.4	110
DraftKings	727,600	121.3	70	Warby Parker	216,400	27.1	104
Zenefits	583,620	116.7	140	Nextdoor	210,200	26.3	35
Instacart	675,010	112.5	227	Sprinklr	228,500	25.4	183
ContextLogic (dba. Wish)	718,700	102.7	62	Gusto	176,120	25.2	67
SpaceX	1,635,000	102.2	310	Quora	226,000	25.1	41
Stripe	717,290	89.7	105	Qualtrics	400,000	25.0	98
Slack Technologies	790,200	87.8	104	Anaplan	299,000	24.9	78
Domo Technologies	694,560	86.8	121	Actifio	207,000	23.0	40
Clover Health	425,000	85.0	71	Quanergy Systems	134,500	22.4	19
Peloton Interactive	444,707	74.1	71	JetSmarter	130,200	21.7	41
Fanatics	1,700,000	73.9	98	Zoom Communications	145,500	20.8	81
Rubrik	292,000	73.0	172	Zocdoc	225,520	20.5	55
Zoox	290,000	72.5	51	CloudFlare	182,070	20.2	54
Uptake	287,000	71.8	179	Rubicon Global	196,000	19.6	31
Desktop Metal	211,760	70.6	48	reddit	252,020	19.4	29
Proteus Digital Health	417,200	69.5	51	Insidesales.com	264,300	18.9	31
Katerra	205,573	68.5	166	Eventbrite	224,160	18.7	66
Houzz	613,600	61.4	202	Glassdoor	201,500	18.3	85
Human Longevity	300,000	60.0	48	Age of Learning	181,500	16.5	50
Intarcia Therapeutics	1,288,730	56.0	17	Afiniti	137,200	15.2	62
Illumio	267,150	53.4	43	Duo Security	121,500	15.2	66
Flatiron Health	313,000	52.2	93	Procore Technologies	255,000	15.0	62
Vice Media	1,220,000	50.8	135	Medallia	255,000	15.0	72
Fanduel	417,500	46.4	39	Mu Sigma	208,000	14.9	150
Vox Media	324,650	46.4	94	Zscaler	148,000	14.8	98
Adaptive Biotechnologies	411,350	45.7	25	Automattic	190,600	14.7	42
Outcome Health	500,000	41.7	42	Pluralsight	192,500	13.8	85
Buzzfeed	496,550	41.4	184	C3 IoT	122,609	13.6	19
23andMe	494,000	41.2	35	Ten-X	141,750	12.9	92
CrowdStrike	281,000	40.1	111	SMS Assist	255,000	11.1	24
JustFab	300,000	37.5	10	MarkLogic	172,500	10.1	32
OfferUp	221,980	37.0	38	Rocket Lab	75,000	6.3	5
Coinbase	217,209	36.2	43				

The average Unicorn is one year older than the average Narwhal but has an average Financial Velocity of \$93.7 million per year meaning that, on average, these firms have raised \$93.7 million per year since inception. Taking out Uber as an obvious outlier that has amassed substantially larger funding, the average financial velocity for the Unicorn Club is still \$77.4 million per year compared to the Canadian Narwhal average of \$9.4 million per year in the non-life sciences sector. Employment Velocity for Unicorns (excluding Uber and Lyft due to issues in determining employment size) is 107 employees per year related to an average non-life science Narwhal Employment Velocity of 22 employees per year.

Comparative Velocity

Table 8

	Financial Velocity (\$US Millions/year)	Employment Velocity (Employees/year)
Unicorn	93.7	107
Narwhal	9.4	22

2017: A Great Year for Canada's technology innovation ecosystem

Fundraising

Since we first published our Narwhal List in 2017, 29 firms have raised a total of \$1.2 billion for an average round of \$41 million per company, with 20 of these firms newly added to our list. This group raised enough funding to replace Narwhal incumbents from last year, which we hope are only taking a year off from fundraising and will make a strong showing next year.

Graduations

Four firms left the Narwhal List of private companies as a result of their sale or initial public offering (IPO). What we would like to point out is that no firms left the list as a result of a sale to a foreign buyer. Firms that left the list as a result of IPO or sale include:

1. Real Matters

Real Matters raised \$114 million at a valuation of approximately \$809 million. Their revenues for the year ended September 30, 2017 were \$302 million, up 22% from the prior year.

2. VarageSale

VarageSale, which had raised \$34 million in 2015, was sold to Vertical Scope, a Toronto-based company incorporated in 1999 and sold to Torstar in 2015.

3. Zymeworks

This biotherapeutics company, which had acquired \$143 million since its founding in 2003, raised \$85 million in their TSX and NYSE-listed IPO and became the first Canadian venture-backed life science IPO since 2014.

4. Clementia Pharmaceuticals

Clementia, a pre-revenue company in phase two and three trials for drugs to treat debilitating bone diseases, raised \$120 million on the Nasdaq Stock Market to become the second life sciences IPO of the year for Canada.

2018 Forecast: On the Path to Unicorn Status

Compared to last year, Canada has nearly doubled the number of firms that are on track to become Unicorns.

The Narwhal List suggests that Canada has the potential to grow several Unicorns in the near future. One Canadian Narwhal, Kik Interactive is already a Unicorn. (Hootsuite, which was previously accorded Unicorn status has been removed from the Unicorn list, not through misadventure but because the original inclusion on the list was found to be premature.) Bluerock Therapeutics and DalCor Pharmaceuticals are the closest contenders for the Unicorn Club, but we estimate that, depending on valuation, they would need to raise another \$50 million each to reach that level.

If you look at the lowest-ranked Unicorns in Table 7, you will note that there are 26 US Unicorns with a Financial Velocity of \$10-25 million per year. There are 18 Narwhals in Canada with a Financial Velocity in that range, and this is up dramatically from the 10 that were at this level last year. This means that we are making progress in our ability to scale companies; if each of these companies can maintain this rate of growth, they all have the potential to become Unicorns in the near future

In terms of Employment Velocity, Hootsuite leads the pack with a velocity of 122 employees per year. There are 17 Narwhals with an employment velocity ranging from 20 to 40 (with 12 Unicorns in the same range) showing that reaching Unicorn status is a reasonable target for a number of Canadian firms that can continue this rate of employment growth.

These results point to a sense of cautious optimism in Canada's technology space. Although we have made dramatic progress and have continued to leverage our investments in startups and incubation, our analysis suggests that we have significant work ahead of us. For example, while the 18 Canadian firms with a Financial Velocity of \$10-25 million per year have raised, on average, \$105 million per company, American Unicorns have accumulated nearly double that amount (\$202 million per firm) in the same timespan. Based on these numbers, one can argue that to turn 18 Narwhals into Unicorns, they must each raise another \$100 million at valuations that would qualify them for entry into the Unicorn Club. The sheer difference in scale between investments available to technology firms here and the US is a stark reminder that we have to be significantly smarter about how we nurture and invest in Canadian technology companies.

Methodology

This study looked at the fundraising patterns of 97 private US companies that had been identified as Unicorns in December of 2017. It also looked at over 1,000 private VC-funded Canadian businesses listed on the CB Insights' database as at December 1, 2017. All amounts are stated in US dollars. Additionally, we examined the results of over 750 public technology companies whose results were obtained from Google Finance. Employment data were obtained from LinkedIn.

The data were only collected from public sources and may therefore be incomplete. Despite our best efforts, we may have omitted a company that belongs on the Narwhal List or may have included one that does not fit. All efforts were made to check the veracity of the data. Please note that all readers are encouraged to report errors or omissions. If we have made a mistake in reporting your company statistics or have inadvertently left out your company, please contact us and we will be pleased to update the list in a subsequent release. For further details on methodology, please revisit our original report at <http://www.impactcentre.ca/research/the-narwhal-report/>

This study was not intended to be academically rigorous; nor was it intended to be all-encompassing about the topic of Financial and Employment Velocity and business potential. It was designed only to add to the conversation on innovation and highlight areas worthy of future research by looking at data available from publicly available sources. We plan to continue exploring and developing research on the subject in future Impact Briefs.

About the Impact Centre

Science to Society

We generate impact through industry projects and partnerships, entrepreneurial companies, training and research.

We bridge the gap between the university and industry to accelerate the development of new or improved products and services based on physical technologies. We work with graduate students and researchers to help them commercialize their discoveries. We provide undergraduate education and training for students at all levels to ease their transition into future careers.

The Impact Centre conducts research on all aspects of innovation, from ideation and commercialization to government policy and broader themes such as the connection between science and international development. We study how companies of all sizes navigate the complex path between a discovery and its market and how their collective innovations add up to create a larger socioeconomic impact.

Our objective is to understand how we can improve our ability to create world-class technology companies, how governments, companies, and academia can identify and adopt best practices in technology commercialization.

Impact Briefs

Read our collection of Impact Briefs: www.impactcentre.ca/discover/research

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