

New Brunswick Information Technology Workforce Growth Plan 2021-2026

SUMMARY

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TECH **IMPACT**



New Brunswick is at an Inflection Point

New Brunswick is at an inflection point.

Global digitization trends are creating new opportunities for our business community, driving increases in productivity and profitability and opening up new markets. To take advantage of these opportunities, we must embrace technology. That digital economy requires highly trained, highly skilled Information Technology (IT) workers. These workers are in demand around the world, and New Brunswick, like other jurisdictions, faces a highly competitive market to secure this talent. Yet if we are focused in our efforts and attract these highly skilled professionals to our province it will create an unprecedented opportunity to grow our economy and lead to new jobs and tax revenues.

Artificial Intelligence, automation, robotization and soaring levels of eCommerce and remote work are changing the world. In the face of this relentless pace of change, we need a new strategy to arm our people with the skills needed for IT careers and to attract other skilled workers from around the world.

TechImpact and Jupia Consulting were commissioned to develop a new IT workforce growth strategy for New Brunswick. This strategy builds on the work of the Labour Force Adjustment Committee struck by the Government of New Brunswick and led by TechImpact in the early stages of the COVID-19 pandemic. This Committee was directed to review the IT industry and the skills it needs to grow, assess the impacts of COVID-19 on the sector, develop a tech sector industry plan, review the challenges faced when seeking New Brunswick IT services, and define the IT sector's value proposition in the province.

One clear theme emerged from this work - a skilled digital workforce is fundamental to economic prosperity. It was equally clear that establishing a well-researched, well-thought-out IT workforce strategy was essential to supporting the sector's growth in New Brunswick, and indeed, supporting growth in the entire economy. That strategy was completed by TechImpact and Jupia Consulting in October 2021. This document highlights the key findings of that report and provides the key strategies that need to be implemented over the next five years so New Brunswick's IT sector and the overall economy can achieve its true potential.

About TechImpact



TechImpact is an Atlantic Canada IT industry group promoting growth in the digital economy. Our mission is to help the four Atlantic provinces embrace and accelerate Information Technology adoption and innovation as the cornerstone of our economic future. TechImpact is focused on three major priorities:

1. Workforce Development - expanding the quality, size, strength and diversity of our talent pipeline, from our post-secondary institutions and our ability to attract new professionals from outside the region. This includes nurturing awareness in young Atlantic Canadians about the outstanding IT career opportunities that exist here.
2. Fostering Innovation - encourage and bridge our established private and public sectors' real-life challenges with our innovative tech community's creativity, nimbleness, and inherent ability to solve these challenges. Increased private and public-sector collaboration with post-secondary researchers, start-ups, and technology companies will lead to new products, services and companies being created. Economies that embrace innovation lead to increased GDP, increased exports, increased employment and population growth.

3. Building Business - the IT sector has tremendous potential for growth and we focus on building a supportive environment for growth, from start-ups to larger businesses to international firms with a strong Atlantic Canadian presence.

You can find out more at TechImpact.it. If you would like to learn more about the findings contained in the full New Brunswick Information Technology Workforce Growth Plan, please contact Cathy Simpson, CEO of TechImpact, at cathy.simpson@techimpact.it.

About Jupia Consultants



Jupia Consultants is a full-service economic development planning and consulting firm based in Moncton, New Brunswick. Jupia works with governments, communities, not-for-profit organizations, and industries across Canada. The firm has particular strengths in economic impact analysis, return on taxpayer investment (ROTI), sector development and investment attraction.

You can find out more at jupia.ca.

To develop the IT workforce strategy, TechImpact and Jupia Consulting conducted digital surveys of 80 companies that either were IT professional services, software, product firms or businesses who used considerable IT resources in the operation of their business. These companies represented every corner of New Brunswick. As part of the research and strategy development process, a wide range of stakeholders in business, post-secondary education, economic development and labour development were interviewed. In addition, a host of datasets were examined to better understand the national and global context that New Brunswick operates within.

The results put the need for rapid action in sharp focus. It all comes down to talent – nurturing, attracting and retaining the IT professionals who form the lifeblood of a modern digital economy.

We can move swiftly and with common purpose to take advantage of the opportunities presented to us by expanding our IT workforce, or we can dither and let opportunity pass us by.

The choice is ours.

New Brunswick's IT Sector Today

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Our study showed that nearly 10,000 people work in IT or IT-related jobs in New Brunswick. It is important to understand that the IT sector goes well beyond the professional services, product firms and start-ups that have operations in the province. It is better to think of IT as a workforce, employed in IT firms as well as a core function at

major New Brunswick employers like McCain Foods, Ganong, J.D. Irving, Atlantic Lottery, Medavie, UNI, and many more. Between 2014 and 2019, total IT employment was up 28 percent.

This workforce is essential to ensure New Brunswick's economy survives and thrives in the coming years, particularly as we emerge from the COVID-19 pandemic's shadow. The IT sector is, in its own right, a major economic force in the province. IT jobs pay much more than the average New Brunswick wage. Salaries from IT careers in New Brunswick are estimated at \$700 million per year.

Within the broader IT sector, over 4,000 people work directly in the IT professional services industry, IT product companies or start-ups in nearly 300 companies. This is a rapidly growing sector, with revenues soaring by 49 percent from 2015-2019 to nearly \$600 million. That resulted in an increase of 29 percent to the sector's direct GDP contribution to the province. These companies now represent \$400 million in export revenue annually.

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We are seeing New Brunswick-based firms scale up. According to Statistics Canada, there are now 13 firms with more than 100 employees and there has been a 53 percent increase in the number with at least 50 employees between 2015 and 2020.

Yet despite the strong growth across the IT sector in recent years, New Brunswick still lags behind the key national averages. We saw an IT trade deficit of \$316 million in 2017, the most recent year figures available. That means New Brunswick imports \$316 million more in IT products and services than it exports to the rest of the world. New Brunswick also has fewer IT professionals in most sectors of the economy (like transportation and manufacturing) than the national average. This is particularly troubling as digitization is essential to developing new processes that result in significant new levels of productivity and profitability across all industry sectors.

By embracing technological innovation, we will address the economic gaps that are emerging in our economy compared to regions that are already investing heavily in IT related services.

IT Jobs Are Soaring

Here in New Brunswick, our survey identified the expected number of IT jobs open in the province and the number of openings anticipated over the next five years. This data is striking.

Among the 52 companies who completed these detailed questions, there are 2,675 current IT-specific jobs in New Brunswick today for roles like software developers, cybersecurity professionals, and cloud computing experts, with a further 1,983 positions to be filled in the next 12 months, 1,939 in the next two to three years, and 2,036 openings in the next three to five years.

There are 1,983 IT positions that will need to be filled in New Brunswick over the next year. We do not have enough skilled workers to fill them.

That totals nearly 6,000 IT positions that will need to be filled to keep our economy moving forward based on those that participated in this data collection. While on the surface this is great news - these highly paid jobs are welcomed - the reality is that New Brunswick does not have enough skilled workers to fill these positions. Employers will not be able to wait for the supply of local talent to catch up to their demand and they will need to recruit from other parts of Canada or the world.

In fact, it's not even close. Our analysis shows thousands of IT jobs will need to be filled in New Brunswick in the coming years.

	Currently Employed	Open Positions Next 12 Months	Open Positions Next 2-3 Years	Open Positions Next 3-5 Years	TOTALS
Developer	899	656	662	718	2,935
Analyst	551	374	346	310	1,581
Software Architect	282	241	220	213	956
Cloud Related roles	134	123	101	96	454
Data	181	155	141	129	606
Cybersecurity	164	125	131	83	503
Infrastructure	146	63	84	122	415
IT	147	103	94	124	468
Other	171	143	160	241	715
TOTAL	2,675	1,983	1,939	2,036	8,633

While some of these looming jobs can be filled by local university and college graduates, that will not be enough to meet demand. The needs of New Brunswick's IT workforce are varied, meaning we require junior, intermediate and senior talent. That will only be achieved by an influx of skilled workers to complement our local supply.

In addition, these are not the only jobs that will be created. These types of roles lead to new hiring for sales, business development, product management, project management, human resources and so forth. The digital economy is an engine for job creation.



A Global Trend

New Brunswick is hardly the only combatant in this new war for IT talent.

Nationally, the Information and Communications Technology Council concluded that 250,000 digital jobs will be created by 2025. New Brunswick is competing for talent with every other province, and, beyond that, every other country in the world.

According to the World Economic Forum, these will be the most in-demand jobs globally in 2025:

1. Data analysts and data scientists
2. AI and machine learning specialists
3. Big data specialists
4. Digital marketing and strategy specialists
5. Process automation specialists
6. Business development professionals
7. Digital transformation specialists
8. Information security analysts
9. Software and application developers
10. Internet of things specialists
11. Project managers
12. Business services and administration managers
13. Database and network professionals
14. Robotics engineers
15. Strategic advisors
16. Management and organizational analyst
17. FinTech engineers
18. Mechanics and machinery repairers
19. Organizational development specialists
20. Risk management specialist

Clearly these are highly skilled positions that are essential to economic growth in the coming years and the findings of the World Economic Forum align with our findings here in New Brunswick. Is New Brunswick ready for this massive change in employment? Our study suggests that work must be done to help New Brunswick prepare for this new reality.

Challenges Facing New Brunswick's IT Sector

New Brunswick is not alone in facing challenges to fill in-demand IT roles. This is a common story across North America and around the world. The rapid trend toward digitization has created unprecedented demand for IT professionals.

New Brunswick faces similar challenges to many other jurisdictions in expanding its IT workforce, including:

- The rise and impact of remote work meaning jobs filled outside of the region have a smaller economic impact on the overall New Brunswick economy
- New Brunswick's digital brand awareness as a top destination for a tech career
- Expanding our talent pipeline, including global recruitment and focus on diversity
- Low enrollment in IT-related programs at New Brunswick universities and colleges compared to national averages
- Challenges scaling post-secondary education programs and capacity to match specific labour market needs



The Double-Edged Sword of Remote Work

While people will almost certainly come back to the office, office employment will likely never return to the pre-COVID era. The door has been opened much more widely to remote work.

While much of the discussion about remote work and New Brunswick has been positive – professionals fleeing the enormous housing prices in big cities to work remotely from New Brunswick and enjoy the good life here– there is an emerging issue that has the potential to more than offset this good news.

Major IT employers in New Brunswick are no longer competing only with each other to find skilled IT talent in the province. Instead, they are now competing with Google, Facebook, Amazon and Shopify, amongst hundreds of others, who may offer higher salaries and, in some cases, more global brand experiences to New Brunswick-based IT professionals who can take on these jobs without leaving their house. It creates increased pressure on our provincial labour force at a time when we are already behind.

New Brunswick is now competing with Google, Facebook, Amazon and Shopify to find IT talent.

Build New Brunswick's Digital Brand

In New Brunswick, the pioneering work of NBTel and the historic successes of Radian6 and Q1Labs put the province on the global technology map. Today, companies like Introhive are demonstrating that innovative global companies can be built here. We have the opportunity to enhance our brand and clearly show that New Brunswick is a place where the future is being created. We need to be thoughtful about how we are positioned and proactively tell our story of growth and progress to the world.

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Expand Talent Pipeline, Including Global Recruitment

There is a global war for talent taking place and New Brunswick is working hard to attract and retain the skilled workers that will lead to greater economic prosperity. To optimize our recruitment process, we can become better coordinated across various organizations and jurisdictions and we need to expand to include more diversity and underrepresented groups. This type of enhanced coordination will ensure we succeed in creating, attracting, diversifying and retaining talent.

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Build and Grow Enrollment at Universities and Colleges

New Brunswick has made tremendous strides in educating the next generation of IT professionals, having seen enrollment surge by 25 percent over the last five years. Still, the province still ranks last in the country for the number of post-secondary students enrolled in STEM programs when adjusted for populations size.

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The situation is similar at the college level. In 2018-2019, 582 students were enrolled in IT-related programs, or 1.8 percent of the national total. The number of female students in college IT programs declined by 14 percent from 2014-2019, placing New Brunswick eighth out of ten provinces. New Brunswick is excelling at attracting international students to college IT programs. These international students represented 37 percent of students in college IT programs in 2018-2019.

By building on recent efforts to promote IT careers to students in middle and high schools throughout New Brunswick, we can further close this gap. There is a great story to tell about the IT career opportunities available in New Brunswick and we must continue to focus on telling this story to our students, educators, and their parents.

Align Labour Market Needs With Post-Secondary Education

New Brunswick's universities and colleges would benefit from closer ties to better understand labour market needs and more closely aligning programs with anticipated demand. This is a challenge recognized by universities and colleges who have asked for ongoing curriculum reviews with private sector partners as well as establishing an annual review of industry demand. This more formal approach to increasing industry engagement is welcomed by all.

New Brunswick's universities and colleges would benefit from a better understanding of labour market needs.



Our Vision for the Digital Workforce

To overcome the challenges facing our IT workforce, we need a clear vision and a game plan for growth. This is our starting point for a province-wide vision for our digital workforce:

Vision

To be globally recognized as a leading digital economy with a talented and skilled workforce that supports a diverse and connected ecosystem of stakeholders including talented workers, businesses, investors, students, academic institutions, and supporting organizations. People will come here, they will learn and stay here, build new businesses here, they will invest in this place, enjoy rich diverse careers, and our economy will transform.

To achieve this desired end state, we need talent.

Partnerships

Working collaboratively to GROW the digital talent pool to meet a growing demand for technical skills now and in the future. We do that together as partners with post-secondary institutions, industry and talent stakeholders.

The result is a talented and diverse workforce that is thriving and growing our digital economy.



Four Pillars and 23 Recommendations for IT Workforce Growth

While the need to take proactive steps to boost the number of skilled IT professionals in the province is unquestioned, the reality is there is no silver bullet to solving this labour force challenge. A number of approaches will be required that will demand considerable collaboration over the short and long term.

Our report identifies four pillars for workforce growth:

1. **Workforce supply and demand:** Understanding demand from entry-level to highly specialized senior tech talent. Ensuring all partners are aligned and are using industry data to drive supply strategies and tactics.
2. **Talent acceleration:** Produce and develop more talent with scarce in-demand technical skills. Building the curriculum, programs, and approaches by our post-secondary educational institutions and alternative training partners focused on the skills, experiences and numbers that are required to grow our digital economy.
3. **Talent pipeline development:** Drive awareness of digital careers from early in the educational school mix through to diverse new channels of women, newcomers, and other under-represented groups while also exploring new channels and programming targeted at driving diversity.
4. **Recruitment:** Strategies and approaches for local, national and international recruitment.

Within these four pillars, our report recommends 23 talent initiatives aimed at building significantly increased IT capacity within New Brunswick.

1. Workforce supply and demand:

1. Undertake college IT program curriculum reviews with industry
2. Undertake university curriculum or outcomes review with industry
3. Establish an annual review of industry demand and supply

2. Talent acceleration:

4. Grow post-secondary enrollment in technology programs
5. Develop an approach to upskilling and reskilling of our existing workforce
6. Launch micro credentials and bootcamp programs
7. Add non-IT job ready skills as “must have skills” for all technical graduates to acquire over their post-secondary learning
8. Engage training and skills partners like Microsoft, AWS, Google, Salesforce, and others who have in demand and skills training programs
9. Align workforce development with digital literacy training efforts
10. Ramp up and scale up experiential learning for all technical programs so all students graduate with hands on experience
11. Build digital skills in our educators for teaching excellence and new approaches to learning in demand skills

3. Talent pipeline development:

12. Build a best practice guide to assist in our diversity and inclusion (D&I) agenda. Understand common DE&I barriers for the technology workforce and educate the stakeholders widely. Learn from other jurisdictions and implement a plan of action
13. Partner with the New Brunswick Multicultural Council and other groups to find newcomers with a tech background and assist them to build their career in New Brunswick
14. Build and launch a Digital New Brunswick brand. Establish New Brunswick as a place to learn, start and grow a career and ensure this brand reflects diversity
15. Attract a diverse global student body, engage them in the New Brunswick ecosystem, and build a path for long term employment here
16. Learn from the Indigenous programs (JEDI, PQA) and substantially increase Indigenous participation in the digital workforce
17. Build targeted bootcamps for a selection of this diverse talent pipeline

4. Recruitment:

18. Build and launch ongoing recruitment campaigns
19. Contribute, build and launch an Atlantic Canada digital brand
20. Build recruitment module-based program of best practices, tools and templates and train New Brunswick companies
21. Bring in more newcomers and fast track those with specific IT backgrounds
22. Develop and share best practices in IT recruitment
23. Mentor and encourage international students studying at our academic institutions to stay in New Brunswick

Benefits of a Strong IT Workforce

Making commitments to growing New Brunswick's IT workforce will yield almost immediate ROI. It will lead directly to a more competitive and productive economy, increasing jobs and opportunity and delivering more tax revenue.

For example, our analysis demonstrates that each IT worker earning \$80,000 per year will contribute approximately \$13,000 in taxes to the Government of New Brunswick and municipal governments each year. The public cost of providing an IT education to a New Brunswick student will be repaid in less than two years through taxes and personal spending.

Beyond those direct economic impacts, expanding our IT workforce means that New Brunswick industries, particularly export industries, will be able to effectively deploy digital technologies to ensure they survive and prosper. It also allows the province's IT professional services sector to grow which is key to reducing the major IT trade deficit that exists today.

Investing in New Brunswick's IT workforce will lead directly to a more competitive and productive economy, increasing jobs and opportunity and delivering more tax revenue.



What New Brunswick Must Do

Based on the surging demand for IT professionals and the increasingly global competition for talent, New Brunswick is taking decisive steps. We will act immediately to both protect and enhance our economy by addressing our digital workforce. That means we must:

- Grow the number of highly skilled, in-demand, highly paid jobs with citizens that can contribute more to the economy through taxes and discretionary spending
- Build the brand and value proposition of New Brunswick as a digital workplace and a great place for growth.
- Commit and build our innovation and digital economy
- Ensure existing businesses transform digitally to be globally competitive
- Build digital skills, methods and capacity of our educators at all levels
- Work collaboratively to establish a talent pipeline (from within and abroad)
- Build more employment options for rural New Brunswickers through remote working
- Draw from untapped markets to create a more diverse workforce (women, Indigenous peoples, new Canadians, rural, LGBTQ, and more) creating more employment opportunities
- Fund initiatives and organizations that will make this happen
- Get the job done. Quickly.

Making It Happen

No single organization is responsible for IT workforce growth in New Brunswick. There are a wide range of stakeholders involved from government, private sector business, business associations and citizen groups. Still, despite this focus, no single group or leader is accountable for New Brunswick's performance.

TechImpact is uniquely positioned to support this strategy's implementation.

Our report recommends the creation of a New Brunswick Digital Workforce Growth Committee to implement this strategy. TechImpact is uniquely positioned to support the workforce strategy's implementation and play the role of convener within this Committee, working collaboratively with other key stakeholders in the provincial and federal governments, academia, business and not-for-profit organizations. Already, the Atlantic Canada Opportunities Agency and the Government of New Brunswick have provided critical funding to support the growth of our digital workforce, particularly the announcements of support for the University of New Brunswick, the McKenna Institute at UNB, and the Université de Moncton, to name a few.

The New Brunswick Digital Workforce Growth Committee will be responsible for implementing the four pillars and 23 recommendations contained in the IT Workforce Growth Strategy report. Metrics and Key Performance Indicators will be established to measure progress, with a regular reporting schedule.

TechImpact will be accountable for the overall performance of the New Brunswick Digital Workforce Growth Committee effort, under the direction of the Committee members.



Immediate Next Steps

Timing is a critical factor. We must continue to act to create, attract and retain the digital talent that will power our economy. The immediate next steps required to do this are:

1. Put the New Brunswick Digital Workforce Committee in place
2. Develop multi year workplan
3. Socialize with all stakeholders and finalize plan
4. Develop Year One budget and secure funding support
5. Put team in place to lead this work
6. Aggressively work on high demand issues and quick wins to have an impact while allowing more time for longer term actions

Conclusion

New Brunswick is a wonderful place to live and work. But that position is not guaranteed. We must work hard to ensure our economy and our workforce keeps up with the relentless pace of change.

One key factor we must address is our IT workforce. These highly skilled professionals are needed to ensure our economy remains productive and competitive. IT-related employment has surged in recent years, and we anticipate thousands of more positions needing to be filled in the coming years. We must take proactive steps to ensure our economy evolves. That means we must attract and build the talent needed to fuel that evolution.

Today, we do not have the talent needed to meet that demand.

But by working together - government, business, academia and not-for-profits - we can develop a digital workforce growth strategy that nurtures talent within New Brunswick and attracts talent from well beyond our borders. Building up this talent pool is mission critical - if we do not take immediate action, New Brunswick faces the prospect of falling farther and farther behind as technology disrupts virtually every industry.

But if we do take the steps outlined in this report and others underway, our entire economy will grow, attracting new residents, new investment and new tax revenues. This is a global war for talent and, working together, New Brunswick can triumph.

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