ALGOMA ICT AND TECHNOLOGY WORKFORCE SURVEY

Spring 2021

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About the Survey

Survey Participants

The survey was conducted over 3 weeks between April and May 2021.

15 ICT employers provided feedback on a range of workforce issues including projected vacancies, hiring, recruitment strategies, and challenges, as well as perspectives on candidate skills, education, and training.

This is a follow-up survey that was previously conducted in 2017.

- 80% of employers' head offices are located in Algoma/Sault Ste. Marie.
- 53% indicated they are categorized under Information & Communication Technologies sector. (20% Education, 7% in Manufacturing, 7% Government, 13% other sectors)
- The participating employers employ approximately 518 people in ICT and Technology roles (3,330 people in total)
- 54% Employed 50 or fewer people
- 15% Employed between 50 and 150 people
- 31% Employed over 150 people

Limitations

- Not all employers answered all of the questions. Some of the questions were not required.
- Not all ICT and Technology employers in the region participated in the survey.
- Results, as reported, should be seen as a sampling of employer views rather than comprehensive.
- Tech-sector job titles and terminology, as expressed by employers, are not necessarily consistent with the National Occupational Classification (NOC) codes used by the government, creating additional challenges when gathering and analyzing the data.

Existing Workforce

The employers who participated in the survey employ approximately 3,330 individuals in the sector. Of those individuals employed, approximately 518 specifically work in ICT and Technology roles in Algoma and are employed full-time.

As you may expect the age of the ICT workforce tends to be younger than the overall workforce. 2/3's of the workforce is under the age of 44.

Age

Stats Canada Data
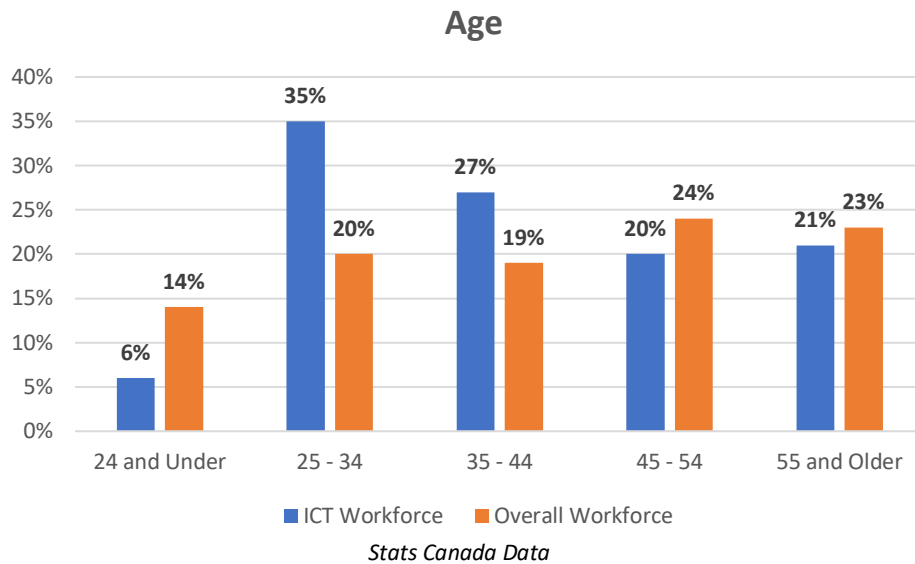
Overall, females make up 49% of the workforce in Sault Ste. Marie. As for gender distribution of ICT & Technology employees, the sector is 83% Male and 17% Female. As a comparator, the 2017 *Women in Communications and Technology (WCT)* report stated that 26% of the ICT workforce in Ontario and 21% of the ICT workforce in Canada was female. The Construction and Healthcare sectors in Sault Ste. Marie is shown to highlight both ends of the spectrum of gender distribution.

Gender

Women in Communications and Technology (WCT) and Stats Canada Data
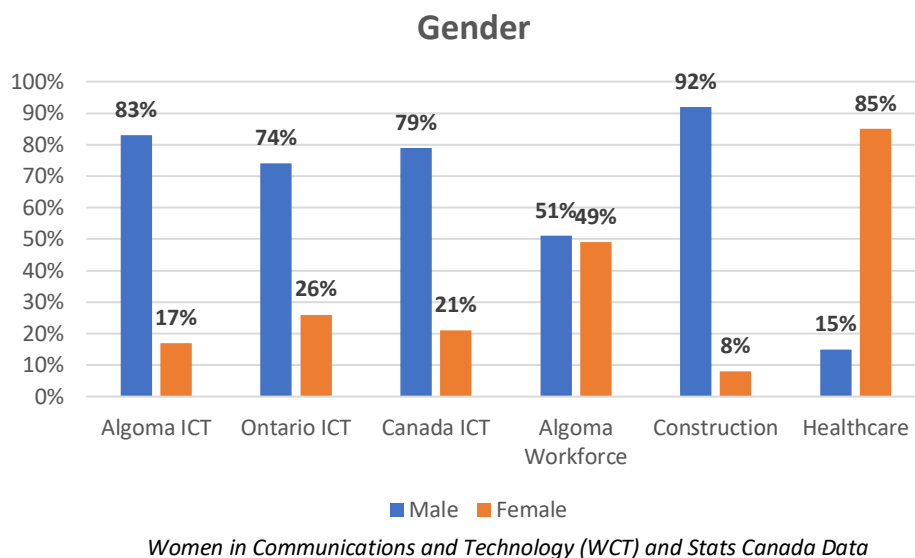
When employers were asked to please list the number of people whose primary function aligns with the following roles. 278 employees were categorized under these primary roles:

Primary Role
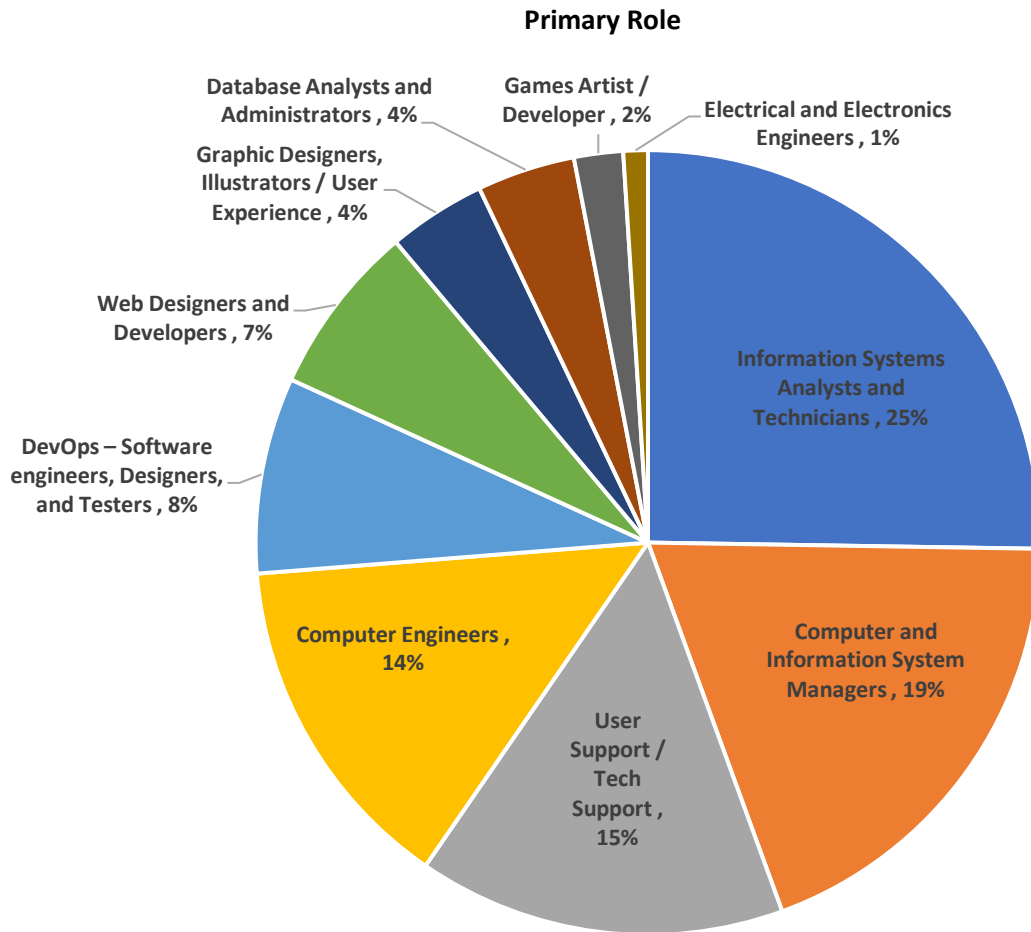
Forecasting Hiring Needs and Skills in Demand

When employers were asked if they plan to hire in the next 12-24 months the majority of positions were classified as full-time. Of the employers provided details on their future hiring plans:

- • 51 Full-time positions
- • 2 Part-time positions
- • 3 Contract positions

The main reasons for new hires reported by participating employers were 73% due to Expansion and Growth. 10% due to Retirements/Succession.

Employers were asked to list the top 3 ICT & Technology Jobs currently in demand at their organization:

#1	#2	#3
Cybersecurity Specialist	Network Admin	System Admin
Junior and Intermediate Developers	Data Analysts	GIS Technicians and Analysts
IT Support	Graphics Designer	
System Engineers	LAN Administrators	Software Developers
IT Business Analyst	Automation and Control engineer	Telecommunications Engineer
Systems Administrator	Help Desk	PHP Developer
Network Analysts	Tech Support – Help desk	Software tech – Student Systems
DevOps (all related roles)	Automation (various areas)	Integration
Gaming Programmers	Laser Equipment Setup	Laserists
System Analyst	IT support	Developer
Cloud Computing	Systems Design/Networking	Cybersecurity

Hard Skills in Demand

When employers were asked what technical skills (hard skills) they require and will target during the hiring process the list below are from highest to lowest technical skills:

Current Skills in Demand	% of Responses
Cybersecurity	64%
SQL	55%
Networking	55%
Cloud Technology	55%
NET Framework	36%
HTML	36%
C++ Programming	18%
JavaScript	18%
C#	18%
Python	18%
Java	9%
C	9%
jQuery	9%

We then asked employers to 3-5 years into the future and forecast what technology areas or skill-sets do they foresee as having the most potential growth:

Future Skills in Demand	% of Responses
DevOps (Software Development & IT Operations)	89%
User Interface / User Experience	67%
Machine Learning / Artificial Intelligence	67%
Cybersecurity	67%
Full-stack web development	56%
Back-end web development	44%
Agile Development	44%
Data Science / Big Data	44%
Front-end web development	33%
Programming Languages	33%
Blockchain	22%
Automation*	1%

Automation was not included as a selection in the question, which may account for the low number of responses to an area having high growth potential.

Top 10 Critical Hard Skills for select ICT occupations as Identified by ICTC
Canada's Growth Currency: Digital Talent Outlook 2023. Information and Communications Technology Council (ICTC) – October 2019

Software Developer

- ✓ Proficiency with Java
- ✓ Proficiency with SQL
- ✓ Proficiency with Python
- ✓ Proficiency with CSS
- ✓ Proficiency with JavaScript
- ✓ Ability to work with and create APIs
- ✓ Proficiency with HTML
- ✓ Ability to use cloud platforms like AWS
- ✓ Proficiency with C/C++
- ✓ Proficiency with open-source version control platforms like Git

DevOps Engineer

- ✓ Extensive experience with continuous integration
- ✓ Proficiency with Java
- ✓ Proficiency with SQL
- ✓ Ability to use cloud platforms like AWS
- ✓ Proficiency with container management tools like Docker
- ✓ Proficiency with open-source automation software like Jenkins
- ✓ Ability to work with and create APIs
- ✓ Proficiency with open-source container orchestration systems like Kubernetes
- ✓ Familiarity with open-source deployment tools like Ansible
- ✓ Proficiency with automation products for software infrastructure like Puppet

UX/UI Designer

- ✓ Proficiency with JavaScript
- ✓ Proficiency with HTML
- ✓ Ability to work with and create APIs
- ✓ Expert use of InDesign
- ✓ Ability to work with open-source front-end web frameworks like AngularJS
- ✓ Expert use of design toolkits like Sketch
- ✓ Expert use of Photoshop
- ✓ Proficiency with open-source version control platforms like Git
- ✓ Familiarity with JavaScript libraries like jQuery
- ✓ Familiarity with product design platforms like InVision

Machine Learning Engineer

- ✓ Proficiency with Python
- ✓ Deep knowledge of Machine Learning
- ✓ Proficiency with C/C++
- ✓ Proficiency with SQL
- ✓ Proficiency with Java
- ✓ Familiarity with open-source neural-network libraries like Keras
- ✓ Proficiency with open-source data libraries like TensorFlow
- ✓ Ability to use and manage cloud platforms like AWS
- ✓ Familiarity with open-source software utilities for networks like Hadoop
- ✓ Deep knowledge of natural language processing

Full-Stack Developer

- ✓ Proficiency with CSS
- ✓ Proficiency with HTML
- ✓ Proficiency with JavaScript
- ✓ Ability to use cloud platforms like AWS
- ✓ Proficiency with SQL
- ✓ Proficiency with Python
- ✓ Proficiency with Java
- ✓ Ability to work with and create APIs
- ✓ Proficiency with PHP
- ✓ Ability to work with open-source platforms like Node.js

Data Scientist

- ✓ Proficiency with Python
- ✓ Proficiency with JavaScript
- ✓ Proficiency with SQL
- ✓ Expert use of Excel
- ✓ Strong understanding of Machine Learning
- ✓ Familiarity with open-source data libraries like TensorFlow
- ✓ Familiarity with data visualization programs like Tableau
- ✓ Familiarity with SAS
- ✓ Ability to use and manage cloud platforms like AWS
- ✓ Strong knowledge of AI for data science

IT Support Specialist

- ✓ Expert use of Excel
- ✓ Proficiency with SQL
- ✓ Proficiency with ITIL practices
- ✓ Deep knowledge of local area networks (LAN)
- ✓ Familiarity with cloud computing and virtualization software like VMWare
- ✓ Deep knowledge of virtual private networks (VPN)
- ✓ Familiarity with DNS
- ✓ Familiarity with programming languages like Java
- ✓ Familiarity with protocols used on IP networks like DHCP
- ✓ Proficiency with SharePoint

Soft Skills in Demand

Employers identified the following soft skills that are most important for their ICT and Technology employees to have:

Soft Skills in Demand
Oral/written communication
Teamwork/interpersonal skills
Problem solving/reasoning/creativity
Work ethic, dedication & dependability
Time management and/or organizational skills
Self-motivation/independence
Professionalism
Willingness to learn
Analytical/research skills
Ability to follow instructions

Supply of Talent/Qualified Workers

Supply of local talent

	Strongly disagree	Disagree	Agree	Strongly agree	Uncertain
The supply of qualified workers is adequate	**9%**	**64%**	27%	0%	0%
Applicants have the required education and credentials	0%	36%	**55%**	**9%**	0%
Applicants have the work experience	0%	**64%**	27%	0%	9%
Applicants have the technical skills	0%	18%	**82%**	0%	0%
Our wage and benefit packages are competitive with similar employers	0%	27%	**36%**	**36%**	0%
Difficulty competing with other employers	**9%**	**36%**	**36%**	**9%**	9%
Retaining talent is a problem	**27%**	**18%**	45%	0%	9%
"Poaching" of talent by another employer is an issue	18%	27%	**55%**	0%	0%
We have limited opportunities for advancement	**18%**	**55%**	27%	0%	0%
Applicants meet language requirements	0%	18%	**27%**	**45%**	9%

Hiring Graduates

Of those employers who have hired local graduates:

- 90% have hired Sault College graduates
- 80% have hired Algoma University graduates
- 10 % have hired Lake Superior State University, graduates

When employers we asked to rate the recent graduates:

- 50% rated them as Good
- 30% rated them as Excellent
- 20% rated them as Fair

Hiring local

Most employers indicated they are "Often" recruiting within the community/Algoma. "Sometimes" within all of Canada, and "Sometimes" or "Never" recruiting Internationally.

	Often	Sometimes	Never
Within the community/region	100%	-	-
Within the Province of Ontario	64%	36%	-
All of Canada	11%	78%	11%
Internationally	-	63%	37%

When we asked employers if they recruit ICT & Technology employees and allow for full-time remote working:
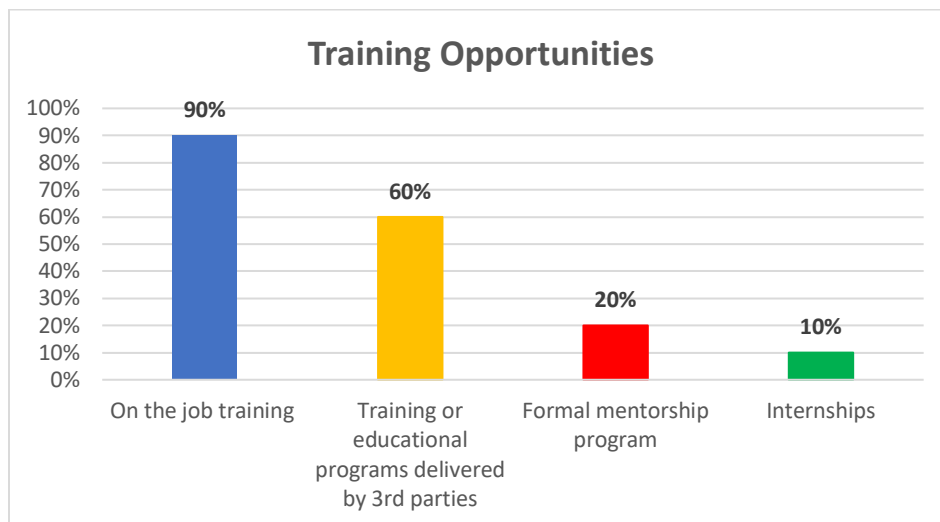
- 55% reported "No"
- 45% reported "Yes"

If the employer answered "Yes", some responses indicated they recruit within Canada, the USA, Mexico, or anywhere. If the employer answer "No", some reasons for preventing full-time remote workers include:

- Hiring locally whenever possible
- The future business model is being assessed
- Employees need to be onsite

Training/Work-Integrated Learning

In the last 12 months, did your business directly provide or financially support any of the following education and/or training opportunities to your ICT & Technology workforce?

Training Opportunities

- On the job training: 90%
- Training or educational programs delivered by 3rd parties: 60%
- Formal mentorship program: 20%
- Internships: 10%

To what degree do the following present a challenge when providing training and/or educational opportunities for your ICT & Technology workforce?

	Uncertain	Very Significant	Somewhat Significant	Not Significant	Does Not Apply
Cost of training	0%	**20%**	**60%**	20%	0%
Lack of awareness of available training programs	0%	20%	20%	**60%**	0%
Lack of awareness of training funds for employers	0%	**20%**	**40%**	40%	0%
Relevant programs not offered in the region	20%	**20%**	**30%**	30%	0%
Distance to travel for education and/or training	20%	**30%**	**30%**	20%	0%
Loss of trained employees to other employers	0%	**30%**	**30%**	40%	0%
Loss of productivity during training periods	0%	**30%**	**20%**	**50%**	0%

How interested would you be in any of the following formats for training and/or skills development?

	Not interested	Somewhat Interested	Very interested
Bootcamps (1+ week)	0%	**89%**	11%
Custom/corporate training	44%	33%	22%
Online modules	11%	**44%**	**44%**
Webinars	11%	33%	**56%**
Workshops	11%	**44%**	**44%**

Thoughts for the Future

Opportunities for the ICT Industry

In the ICT/Tech industry as a whole, what do you see as the top three opportunities for growth over the next 2-5 years?

Opportunities
Cybersecurity
AI/Automation/Machine Learning
Cloud
Remote Working/Learning
Augmented/Virtual Reality
B2B and API integrations
Software integration between applications
eCommerce
Tourism Apps

Threats for the ICT Industry

In the ICT/Tech industry as a whole, what do you see as the top three issues/challenges over the next 2-5 years?

Workforce issues
Sourcing and retaining IT talent
Salaries are becoming harder to remain competitive
Lack of skilled workforce (limited experience)
Finding a skilled workforce in small communities
Remote work (assuming this means local employers competing with employers outside of the region – could be managing remote teams)
Global competition/pay models
Maintaining relevant/engaging post-secondary learning in the face of global/online offerings
Budget reductions
Rate of growth
Travel restrictions

IT issues
Security threats/Data protection/Cyberattacks
Broadband outside of Sault Ste. Marie

Conclusions

Struggle for Talent
- ✓ Extend the reach of the sector by promoting to national and international talent pools
- ✓ Promote opportunities for remote work

Developing Talent Pipeline
- ✓ Increase efforts to promote ICT/Tech careers to secondary and post-secondary students
- ✓ Explore opportunities to attract young women to the ICT/Tech sector
- ✓ Provide more work-integrated learning (WIL) opportunities to connect students to tech-sector employers and increase levels of experience

Skills Development
- ✓ Support training around skills needed for DevOps and Software roles
  - Proficiency with Java
  - Proficiency with SQL
  - Proficiency with Python
  - Proficiency with CSS
  - Proficiency with JavaScript
  - Ability to work with and create APIs
  - Proficiency with HTML
  - Ability to use cloud platforms like AWS

- ✓ Support introductory level training in emerging technology
  - Cybersecurity
  - AI
  - Automation
  - Machine Learning
  - Cloud Computing

Support local ecosystem
- ✓ Raise awareness of employment and training support programs for ICT employers
- ✓ Support development of local training programs by local institutions such as micro-credentials
- ✓ Support providing introductory level training in these emerging technology