

An Innovative and Holistic Approach for Autism Employment and IT labor Shortage

President and CEO at Technology North Corp.



Status is online

Technology North has, through its masBility Inclusion Framework Research and RoboCoach project, developed a novel approach to a current social trend encompassing business, technology, and employment. As businesses advance in this technological age, and with greater access to and deployment of software and web environments, the advent of machine learning, and Big Data, vast oceans of data are produced and need to be housed and transmitted. Data housing occurs at the most basic level on computer servers, the monitoring of which is usually assigned to junior ICT specialists. Server monitoring includes a set of tasks which are unattractive due to their repetitive nature, so there is great fluidity in the employment of junior ICT specialists whose interests quickly transcend their work. Tech companies worldwide are struggling to fill the void left by employees departing from these positions with stable, reliable employees likely to maintain the position for the long-term. In Canada, for instance, there is a reported vacancy of over 216,000 junior ICT specialists. Concurrently, there is a largely untapped workforce desiring employment but largely left out due to their special needs.

People on the autism spectrum whose disability is mild and manageable—those within the top 40% of people with ASD—many of whom are university-educated and are as motivated as neurotypical individuals, find little opportunity to use their unique talents and gifts. Instead, they are frequent subjects for governmental assistance to provide treatment and living costs, a scenario persisting life-long. In Canada, some 50,000 individuals have a mild form of ASD which requires support but which may not, with assistance, bar them from the benefits of employment. Technology North intends to bridge the gap between tech companies and people with ASD with its novel social-technological approach, detailed below. We believe this approach will provide much-needed assistance to tech companies and people with ASD, providing the one with a reliable workforce and the other with the means to a more typical lifestyle unattainable through government support alone.

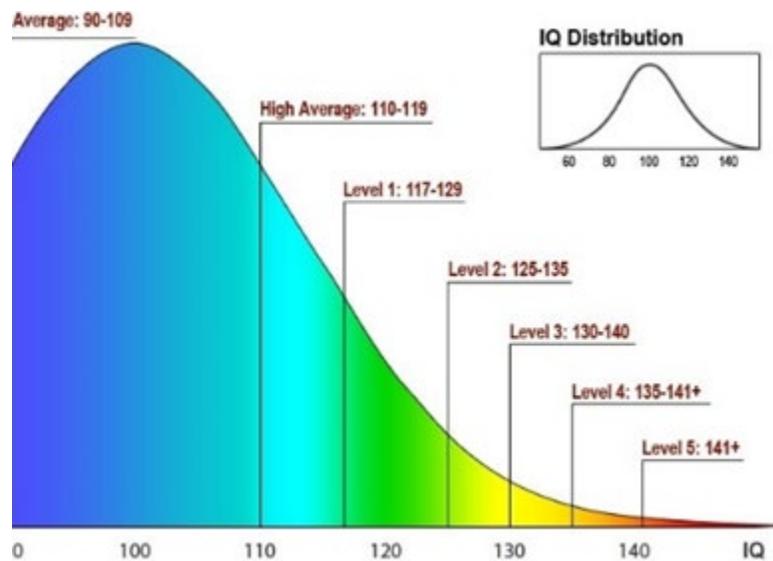
Who is Technology North?

Technology North Corporation (TN) is an Alberta-based IT firm incorporated in 1998. Since 2010, Technology North has been dedicated to developing and commercializing accessible and assistive technology and practical program in partnership with stakeholders in the disabilities sector. TN has over 20 years of experience developing technological solutions, including software development, health IT systems, large-scale infrastructure design and deployment, IT security, and business process automation.

The Need for Better Autism Inclusiveness in Employment Contexts

There is a need defined by the requirement within business jurisdictions to increase the social inclusivity of people with disabilities in employment spaces. Employers face increasing regulations to provide meaningful employment to segments of the disability population. People on the autism spectrum are within this category as at least 85% of people with autism are either unemployed or underemployed despite their skillset or education level. Regardless of their disability, people with autism desire meaningful employment as a means to self-actualization and to live as neurotypical people do. Due to the need for well-defined management strategies which go beyond those found within typical organizations, the costs to manage people with autism are higher than a neurotypical employee. Social workers to support people with ASD are not typically found within an organization's structure and would need to be contracted, incurring a substantial cost. Furthermore, the support capacities of social workers managing employees with autism one-to-one diminish with an increased caseload. This limits the number of people with autism which any single social worker may adequately support. There is a need to provide reasonably-costed support services to people with ASD in employment contexts to reduce the cost of care, increase the management caseload, and ensure the same or better outcomes.

Complexifying the challenges faced by people with autism is the latent belief shared by many neurotypical people that autism and employment are mutually exclusive. People on the autism spectrum are perceived to be unable to attend to and complete work tasks successfully or profitably, requiring significant support, undermining ROI. Figure 1, right, shows the IQ distribution across the autism spectrum.





70% of the autistic population has some form of intellectual and/or language impairment. Despite this statistic, people with autism have been found capable of working within employment contexts profitably with the right mix of support. Current support systems available are prohibitively costly, requiring at minimum a full-time interventionist, and do not typically leverage current technological advances.

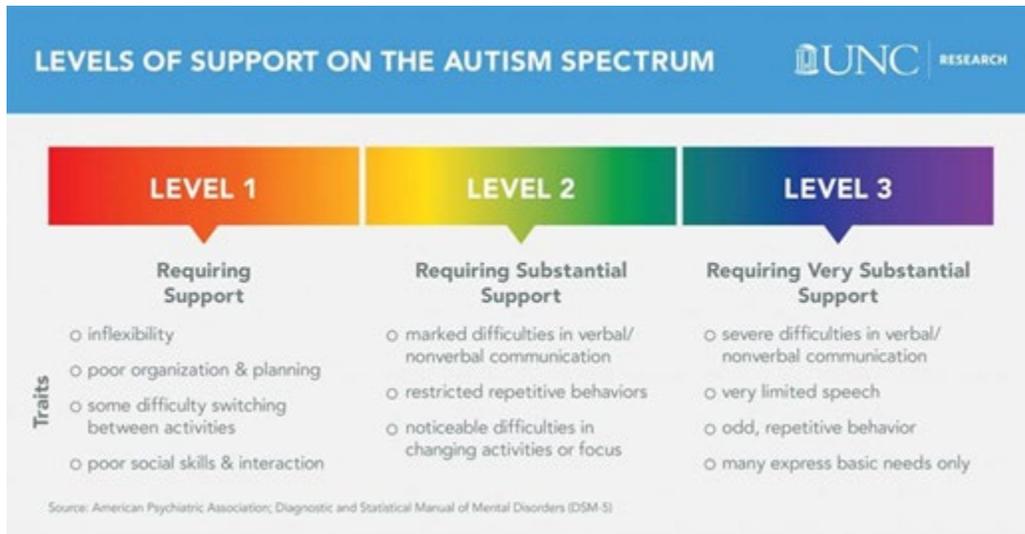
The Challenge to Providing ASD-Inclusive Employment

Canadian and American educational institutions at all levels are mandated to provide an inclusive education for people with disabilities. At the primary and secondary level, individualized education programs tailored for each student with a disability are implemented. These are known as Individualized Program Plans (IPP) in Canada, or Individualized Education Programs (IEP) in the USA. Using a systematic approach to create an individualized plan, family members, teachers, aides, and professionals can provide much-required assistance to students with autism to thrive in educational environments. Post-Secondary institutions provide accommodations to support inclusive learning for people with disabilities. Employers in both these nations are required by law to eliminate discriminatory practices and provide accommodations to employees to be successful on the job. Despite these remarkable advancements, people with autism lack employment prospects, finding opportunities nonexistent or shortlived. Employers, conversely, lack the resources or will to provide accommodations for people with ASD and can easily circumvent the question of accommodation by simply avoiding employing people with ASD. What is needed is an IPP/IEP for employment contexts.

The major challenges to employing people with autism are identified as:

- 1.) public fear and lack of awareness about ASD and ASD-Inclusive employment;
- 2.) higher administrative and overhead cost to support the employment of autistic individuals;
- 3.) lack of assistive technologies in the workplace to address mental health challenges such as continuous disability employee motivation management and task reminder; and
- 4.) lack of integrated end-to-end solutions for the employer to manage an employee's well-being, task progress, and work results.

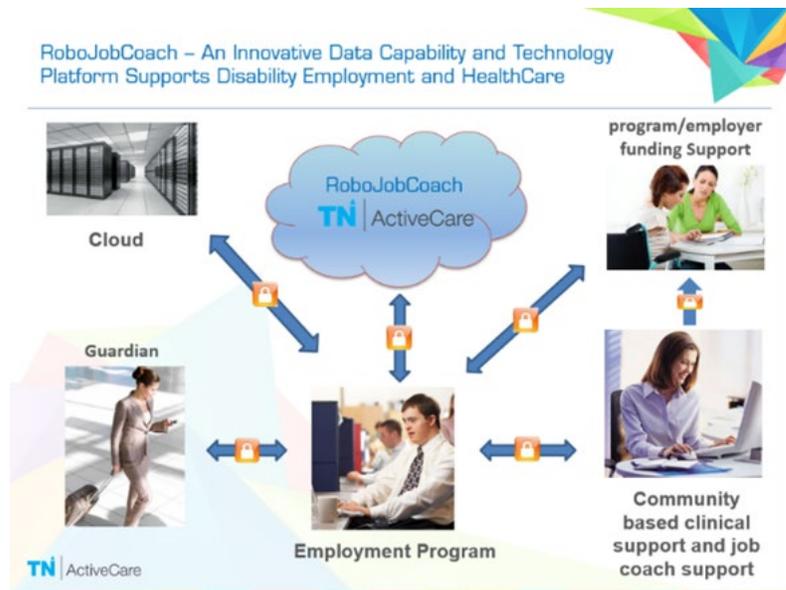
The figure below shows common levels of support for autistic individuals during employment and in daily living.



Autism, as a spectrum disorder, ranges in both symptomology and severity. Individuals with autism typically require support and can be categorized based on the level of support required. People with ASD at Level 1 are the most likely candidates for employment given the more limited need for support.

RoboCoach Approach

To provide a cost-effective responsive toolset for the management of employees with ASD, Technology North and Mexico based Hydralab jointly created masBility Inc. in 2015. masBility focuses on researching, developing, and distributing accessible and technology framework to enhance the employability of persons with disabilities, and has developed RoboCoach (see figure 3, below) to meet those needs. Motivated by TN's CEO Ling Huang, whose vision has been to create enabling technologies and an inclusion framework that provides people like his high-functioning autistic son with meaningfully employment inclusion in society, masBility Inc. is built on the success of similar businesses in the space, the lessons learned by those organizations, and TN's pilot programs.

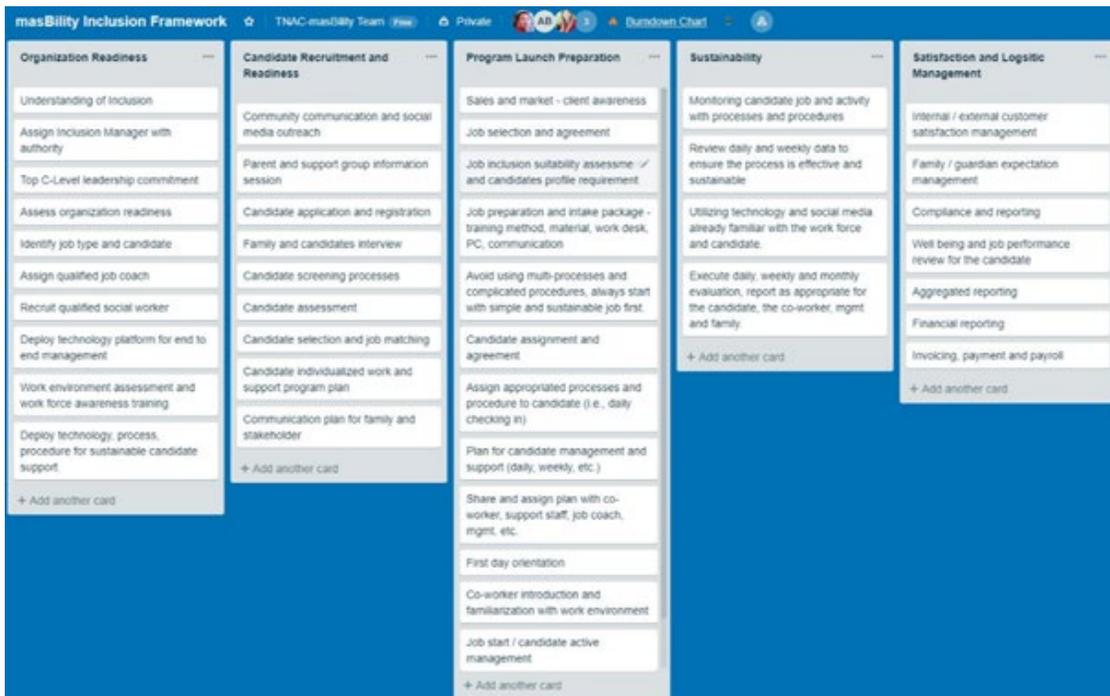




To achieve a global impact for scalable autism employment, masBility’s RoboCoach will be provided to high function autism groups within the top 20% to 40% of the autism spectrum. This group exhibits common disorders at a manageable scale such as:

- Language and communication disorders—these disability types place the autistic employee at a disadvantage in the workplace. Often unable to express themselves in verbal communication, most will internalize frustration, leading to a breakdown;
- Attention or regulation disorder—often, people with autism are unable to pay attention to certain tasks for extended periods. They might do well at the beginning but eventually, shift their attention after a break period.

TN realized the current offerings to support disability employment focuses on training and job placement only. Servicing the needs of autism employment without additional assistive technologies in place is unlikely to allow disability employment to become mainstream. TN’s vision is to create a ground-breaking approach to address the major challenges of disability employment by introducing an end-to-end inclusion framework coupled with assistive technologies to streamline the management of employees with ASD at a fraction of the cost of one-to-one management. We have developed preliminary assistive technology and the masBility autism program based on existing offerings in the marketplace such as those developed by companies such as Specialisterne and Meticulon Consulting. masBility is an additional tool to assist autism employment by providing assistive technologies and processes for the high-functioning autistic population requiring extra help striving in employment.





Since July 2018, TN has been operating masBility pilots in Canada and Mexico with one autistic candidate in Canada and two autistic candidates in Mexico. With our pilot candidates, we have developed the masBility Inclusion Framework (Figure 3, below).

Key stakeholders include autistic employees, their family members, their job coach, and their line managers (paying customers; see figure 4, below).



TN has demonstrated the masBility Inclusion Framework with assistive technology concepts provide a more-than-satisfactory ROI. During the pilot phase, we engaged autistic employees with typical server monitoring, either on a scheduled or an ad-hoc basis. We recorded the autistic employee attending to work tasks with a success rate of between 5% and 10% without assistive technologies. Work task success climbed to between 80% and 90% with RoboCoach, the culmination of TN’s assistive technologies and adaptive processes.

RoboCoach is an innovative integrated, end-to-end assistive technology enabling persons with disabilities to be successful in the workplace. It addresses common challenges in employment, including easing public fears of disability, reducing the high costs associated with supporting employees with disabilities, and providing the enabling infrastructure to manage work tasks and employer satisfaction effectively.

RoboCoach is built on prior investment and the success of TNAC, our masBility Inclusion Framework and pilots, the collective knowledge and experience of the IT and psychology programs of our local academic research partner, NorQuest College and Concordia University of Edmonton (CEU), TN’s years of experience in assistive technology development and commercialization, as well as the experience of a coalition of partners and participants in the disabilities marketplace.



RoboCoach addresses challenges for autistic employees in the workplace by reformulating the IPP/ IEP framework for employment to ease progress and track behavior. RoboCoach has the capability to:

- Reduce supporting costs and autism employment overhead;
- Detect mental health conditions through behaviors in a just-in-time intervention to avoid escalation; and
- Provide necessary, evidence-based measurements for stakeholder satisfaction management.

RoboCoach, the meeting point of our research, masBility Inclusion Framework, assistive technologies, and TN ActiveCare-backed individualized support, provides the most cost-effective approach to support autistic employees to strive and thrive.

RoboCoach in Action—The Story of Bryan

Bryan is a 20-year-old high-functioning autistic adult. He is a high school graduate with 2 years of college-level ICT administration training. Bryan, however, is unable to find stable work due to his lack of communication abilities.

With the breakthrough RoboCoach and masBility Inclusion Framework, Bryan will be able to find a job as a junior ICT administrator for a local management ICT service provider.



Bryan’s job will include a daily routine monitoring 500 or more physical and virtual servers, workstations, and network environments, applying predefined work procedures to known issues and preventing an escalation of serious issues to more senior ICT resources. This is the type of work task typically assigned to neurotypical junior ICT specialists. This work is commonly found to be unappealing due to its repetitive nature, resulting in high employee turnover. It is, however, a perfect fit for people on the autism spectrum, who excel at repetitive tasks.

Each morning, an integrated smart bot, “Robby” (a chatbot or a physical robot, similar to Anki’s Vector or Sony’s Aibo Robot dog), on Bryan’s desk greets him when he arrives at his workplace. Bryan looks forward to seeing Robby every day. Not only does the robot provide

Bryan with an updated work task list, Robby also detects when Bryan is not paying attention to work or is self-talking. When Bryan needs attention, Robby sends a friendly reminder to Bryan's computer screen or iWatch. Robby continuously tracks information about Bryan's well-being and behaviors, including data about his daily work progress. Robby sends the data to the backend system and to Bryan's social worker and/or line manager for management purposes.

RoboCoach solves a significant employment challenge in the ICT industry and a global challenge for people with ASD. People with ASD can be employed to fulfill the role of junior ICT specialist managed through RoboCoach technologies operating within the masBility Inclusion Framework. This increases the employability of people with ASD and decreases, simultaneously, the dearth of available junior ICT specialists for server monitoring at a reasonable ROI.

Bryan's family is very happy and hopeful. They expect Bryan's new job will provide him with long-lasting stable employment at an income level consonant with neurotypical individuals, social engagement opportunities amongst peers, and a quality independent lifestyle mediated by assistive technologies designed to keep him on track and on an even keel.