The Future of Work is Ours:

Confronting risks and seizing opportunities of technological change

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Future OF Work

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Introduction

The world of work is changing rapidly. New technologies are being developed and deployed at a pace that is sometimes abrupt and often alarming. Advanced robotics, automated vehicles, platform applications and artificial intelligence are just a few of the technologies that are transforming our workplaces, our relationships, and our day-to-day lives.

Our workplaces and our work are all susceptible to disruption. Just as in the past, new technology has the potential to affect the quality and quantity of work in Canada in substantive and meaningful ways. Researchers estimate that between one-third and one-half of all tasks performed by workers in Canada's economy today have the potential to be automated in the next 15 years. The expansion of popular services such as Uber and Netflix in Canada have exposed major loopholes in government regulation, leading regulators to simply abdicate their responsibility to ensure a level playing field that protects workers' rights.

Some workers are experiencing increased skill and education requirements that leave them feeling unqualified for their jobs, while others are working in unchallenging positions that do not require them to use the multitude of skills they've acquired over their lifetime. And many workers across the skills and educational spectrum are facing unstable and insecure work leaving them desperate to take any employment opportunity available regardless of its quality or the stability it offers.

The threat of automation and the implementation of new technology in the workplace are being used as a strategic tactic to keep people, both workers and society through their governments, from demanding what they deserve for fear of losing everything to the robots.

New technologies certainly pose a threat to workers, but they also create opportunities. They have the potential to enhance connection between people; disrupt the power dynamics within our workplaces and the country; and allow people to increase their productivity, leaving the potential to either increase one's workload or increase one's leisure time.

The current wave of technological change, sometimes dubbed the 'intelligence revolution', has the potential to dramatically alter, both positively and negatively, how work is organized and significantly impact levels of physical and psychological stress in the global population.

The ultimate goal of our work as a union and as workers on the front lines of addressing technological change is to ensure our workplaces and our society harness the best of what the current wave of technological change has to offer while minimizing and even avoiding the worst. In this way we can imagine a worker who is safer, more educated, properly remunerated, highly skilled, respected for their contribution, and who potentially has more leisure time as a result of increased productivity. We can also imagine a society that is healthier, more equal, less stressed and has easier access to goods and services.

Getting there, however, is no easy task. Moving through the current wave of technological change to a stronger, fairer, healthier workplace and society will require a substantive and sustained effort at the bargaining table, in the public policy, world and come election time.

Preparing for technological change matters in every sector and for every worker

In retail and warehousing — workers in grocery stores, including clerks and cashiers, are in the throes of a retailing overhaul, lead by the growth of e-commerce. For bricks and mortar shops and warehouses, new technologies are being used to automate not only cashiers and tellers but order pickers. Advanced technologies being adopted by firms like Sobeys promise a future where grocery orders are placed on-line, automatically picked and sorted by warehouse robots and then trucked straight to a customer's house. Years of new tech advances has heightened surveillance concerns for retail workers too, as employers are able to utilize a raft of new data software to monitor employee performance.

In manufacturing — in advanced manufacturing including auto and aerospace workers face the continued automation and upgrading of assembly lines. In some instances this has meant fewer workers on the line. It has also meant improved ergonomics, more challenging work with higher skills requirements and even cross training for many Unifor members.

In resources — in the oil sands our members are seeing the implementation of automated vehicles threaten their jobs. In the mining sector, companies have the potential to increase safety by using vehicles enabled with technology similar to drone technology to remove miners from underground mines to remote locations. The potential for a reduction in the workforce is also evident.

In health care — care providers are facing the possibility of having their work augmented by robots which could provide care yet lack the human connection many people in care need. Clinical secretaries have also seen some of their daily tasks become automated through a computer program that can be directly accessed by physicians. But there is potential to avoid job loss and improve quality of care by redirecting work time that used to be focused on the work this program now does to other important aspects of care that were previously underinvested in.

In telecommunications — the telecommunications landscape forms the backbone of our communications tools on-line, over wireless connections and via land-line services. On the infrastructure side, high speed data technology and wireless service continue to evolve and customers are increasingly reliant on higher speed broadband using new fiber-optic infrastructure, leading to new training requirements and adjustments in work load and work location. On the customer service side, increasing technological capabilities and speeds mean work has the potential to be outsourced, performed at a remote location, and is increasingly performed by automated customer service AI leaving workers wondering what their job will look like in the future.

In media — workers performing tasks in every area of the media industry, from journalism to television and beyond, are seeing changes in work organization and a decrease in work. Algorithms now have the ability to write basic stories, previously done by trained professionals. Advances in new online audio and video platform technologies (led by U.S.-based firms like Google, Netflix, Facebook and YouTube) have altered basic industry economics – redirecting ad dollars away from newsroom spending and away from Canadian content. Industry regulators have been slow to catch up. Unlike Canadian media firms, these U.S. web companies have so far skirted domestic regulations and licensing rules. As a result, we have witnessed fewer jobs, less local presence, and a burgeoning crisis in local reporting.

In transportation — in the road and rail transportation sectors, many drivers and engineers are facing increased surveillance with the implementation of in-vehicle cameras promoted as an avenue for increased safety but which also pose a potential for hyper-performance management and micro- management of worker behaviour.

Drivers in many sub-sectors of the transportation industry face the constant threat of being replaced by an automated vehicle. While the technology is not currently ready for large scale implementation, it continues to develop and drivers continue to feel under threat.

In hospitality — workers in hotels and casinos are facing increased surveillance and are seeing their personal data collected and held by their employers. In some hotels, computer programs dispatch room attendants on a job-by-job basis – as one room is cleaned they are directed to another – and time is kept in strict consideration.

In restaurants and bars, robot servers, bartenders, and cooks have become a novelty attraction and may move into more establishments if accepted by the public. In gaming, members face a push towards on-line gaming platforms, with the potential to lead to a decline in use of physical gaming facilities.

The current state of research and analysis on the subject leaves workers, employers and governments in a state of uncertainty. Exactly what will change and when is unknowable. Exactly which businesses will survive and how is unpredictable. What is clear is that in order to rise above the fear mongering, workers must regain control of the discussion and the transition through analysis and preparation. This will ensure that the appropriate strategies are in place to manage the likely changes in a way that benefits workers and society at large.

The intelligence revolution: utopia, dystopia or something in between?

Technological change and innovation are constantly occurring in our economy. During the industrial revolution hundreds of thousands of workers transitioned from working in agricultural industries to working on factory floors. The steam engine and assembly line are known to have set that transition in motion and increased the pace of change. What is different about the current phase of technological change is the speed with which new technology is being developed and the potential it has to replace some of the work performed by the current workforce.

The key trends in the current wave of technological change include terms such as automation, robotics, platform technology, predictive learning, digitization, 3D printing, big data and deep learning. These terms all fall under the general categories of artificial intelligence and automation. As more people become connected and as artificial intelligence becomes increasingly advanced, the rate at which technological change is adopted has increased as well.

Artificial intelligence (AI), such as facial recognition technology or automated vehicles, is defined by researchers as computer programs capable of behaviour commonly thought to require intelligence. Essentially AI are computer programs designed to process or perform tasks that have previously been performed by humans. This includes robots, algorithms, platform technologies and surveillance related equipment.

Definitions

Technology: the techniques, skills and processes used to produce a good or a service. Technology can be embedded in a machine but it can also be human knowledge and practice.

Artificial intelligence: AI as a technology: computer programs capable of behaviour commonly thought to require intelligence.

Automation: the technique, method or system of operating or controlling a process by a highly automatic means, as by electronic device, reducing human intervention to a minimum.

Algorithm: a set of guidelines that explain how to perform a task. It can include anything from a recipe or driving directions to computer code that instructs an automated trading machine when to buy or sell stocks and bonds. Computer code uses terms such as and, or, if and not to string together single instructions that create sets of guidelines creating an algorithm.

Big data: extremely large data sets gathered through various means for eventual analysis.

Deep learning: An algorithm or set of algorithms with the ability to analyse big data in order to recognize patterns or trends and even predict future behaviour. Deep learning algorithms have the ability to learn from previous analysis and make decisions.

Cloud computing: The delivery of computing services (including servers, storage, networking, software and analytics) from an offsite and remote location. Clouds can be fully private (owned by one company or a private individual) or organizations can access cloud technology by renting or purchasing cloud computing services from a third party provider. This is called a public cloud.

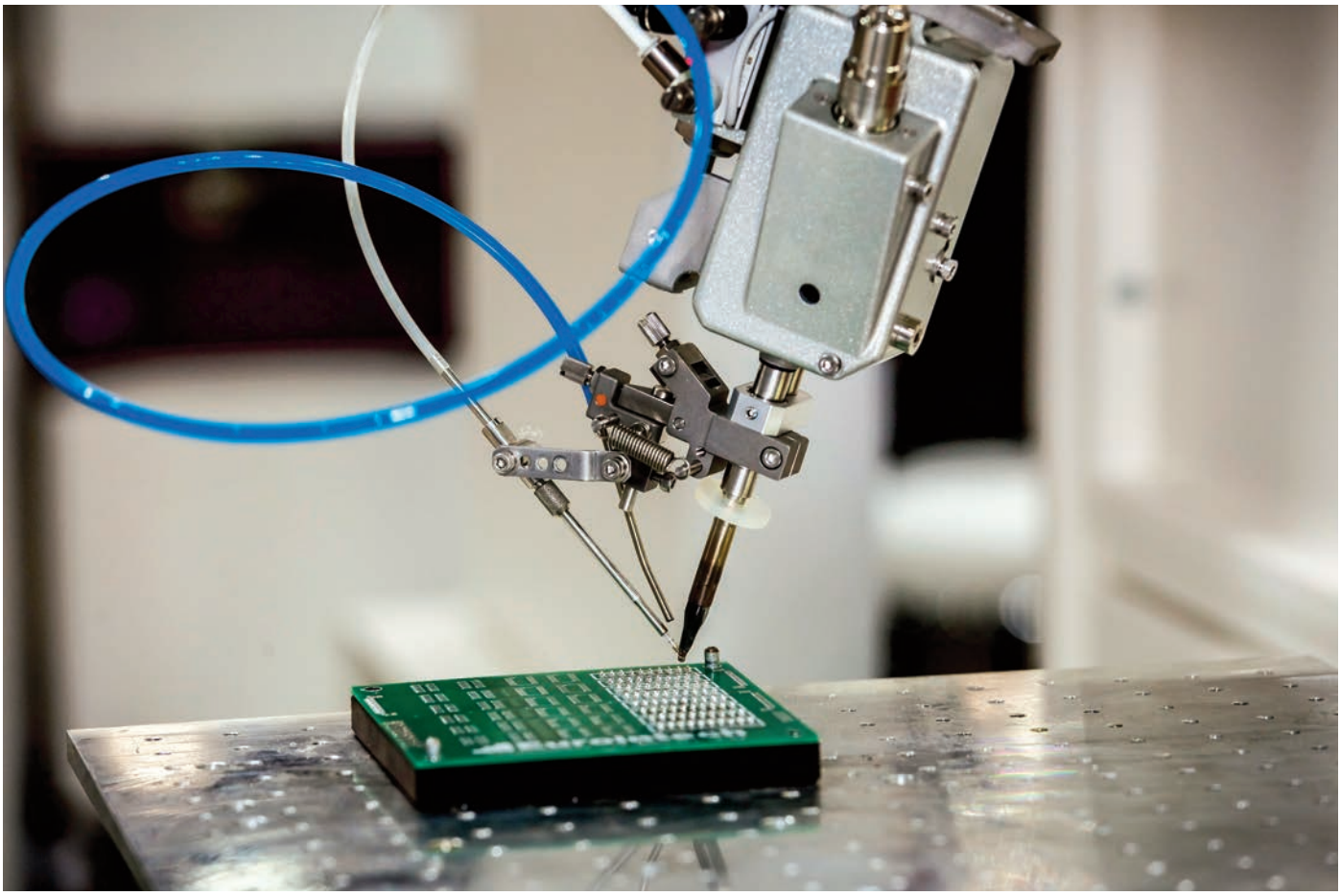
On-line platform: A web-based application (app) or software that connects workers or goods & services providers directly with customers.

Gig economy: A labour market characterized by the prevalence of short-term contract, freelance, or even piecework jobs through on-line platforms as opposed to stable, permanent jobs.

Gig worker: An employee who works on a series of short-term contracts, is precariously piecing work together as a freelancer or even supplying their labour on a piecework basis through on-line platforms.

At the same time as technology is changing, there has been a 30-year trend toward heightened levels of income inequality and increased amounts of precarious work. While it is not inevitable that new technology in the workplace will cause precarious employment, it has certainly been used to legitimize new forms of employment and desperation in the labour market including the gig economy and gig worker.

There is much conversation and hype surrounding both the current capabilities of new technology and the potential future capabilities of artificial intelligence. Technological change can have a range of outcomes in the workplace, from replacing an entire factory or warehouse with robots to installing a surveillance



camera above a work station. Reading the headlines, one cannot be blamed for thinking that artificial intelligence is going to take over the world – imminently. However, the general consensus among researchers and AI experts suggests that humans are far more likely to be working alongside machines during their future work than being entirely replaced, though what one's job looks like could change dramatically in the process.

Computer programs are capable of performing some functions humans currently perform in the workplace such as driving on private property, recognizing and translating a voice, painting an aircraft, writing a news article or assembling a car or truck. AI also enables work to be performed differently, such as in a remote location, for example, or by eliminating some of the tasks that used to be completed people in the workplace. Artificial intelligence also has the potential to enable organizations and individuals to perform tasks previously not undertaken in a substantive way as they were considered too onerous or expensive, such as employee surveillance or highly specific communications targeting. For the most part, however, AI has a long way to go before tasks are performed without bias, without mistakes, or in a way that doesn't endanger people's lives. For example, facial recognition software does not recognize faces of many people of colour in photos or on screens; automated vehicles are unable to drive on public roads; and voice recognition software continues to leave many things lost in transition. This is not to say that improvements are coming but it does mean we have time to get prepared.

New technology: visible and invisible

Artificial intelligence can sometimes be visible to the human eye but it can also operate completely under the radar. A robot performing a task like stocking a shelf in a warehouse or participating in a game show like Jeopardy is a visual representation of the computer program designed to empower the equipment to perform tasks in a human-like manner.

Much of AI, however, is invisible and is often not under the same type of scrutiny as technology from previous waves of change because it operates in the background, unseen by the consuming public. New technology can sometimes be far more insidious because it operates out of sight.

Tech giants such as Google, Uber, and Airbnb operate using complicated algorithms that are not necessarily understood by the public or by the people who are responsible for designing, implementing and enforcing rules and regulations upon them. As a result, the arrival of many tech giants into a particular market or jurisdiction has in many instances created a regulatory grey area. Large tech companies are able to exploit a regulatory framework that was established before these new forms of service delivery were envisioned and, as a result, are able to operate without fully following the rules, including respecting human rights, following the labour code, or ensuring employment standards are adhered to.

Artificial Intelligence: seen and unseen

The algorithms employed by companies such as Facebook, Twitter, and Google invisibly and automatically collect and sort data on your on-line habits and physical location. That data is then used as a pathway to develop highly specific targeting of communications and advertisements. While seemingly harmless at first, we've seen over the last five years how the technology has disrupted the revenue streams of the journalism industry and had a tremendous (and potentially negative) effect on the functioning of our democracy.

This grey area has meant workers are being forced to refight for rights and protections that were hard won by previous generations of workers. At a time when we should be further enshrining fairness and prosperity into the functioning of our economy and our labour markets we are instead rehashing old arguments and, in many cases, struggling to hold the line.

The potential for automation in the workplace

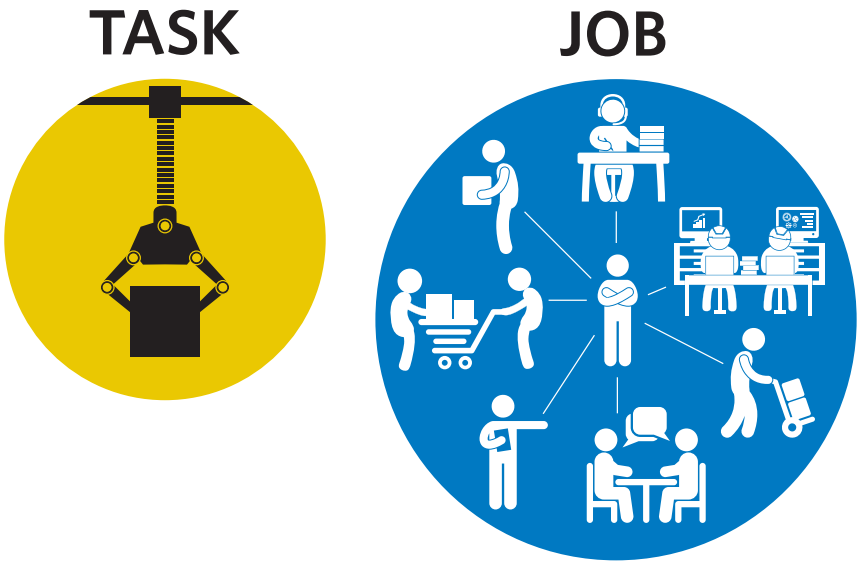
As the sophistication of AI has increased, so too has the potential for AI to replicate work done by humans. As a result, concerns about the impact of AI on the workforce have become a prominent topic of conversation.

There has been much effort placed on estimating the potential impacts of automation and new technology on the amount of work that will be done by humans in the future. In the last five years, many researchers have attempted to estimate the share of the workforce whose work is susceptible to automation.

This work has become increasingly sophisticated over time. Where once researchers talked about the potential for jobs to be eliminated, researchers now talk about the potential for tasks to be taken over by artificial intelligence while the skills requirements of workers who are working alongside artificial intelligence to perform their work increases dramatically. This shift in the conversation highlights the necessity of preparing for the shift in skills requirements through on-the-job training and implementing new tools and systems.

Much of the public discourse on the topic focusses on the potential for mass unemployment. However, in important ways the public is getting the analysis wrong. The difference between a job and a task is of utmost importance to this discussion. A job is a bundle of tasks assigned to a worker who performs those tasks and exchanges their labour for pay. A task is a discrete segment of work done as part of the worker's duties of employment. As new technology continues to be developed and implemented we can expect to see continued de-bundling of tasks leading to different job configurations and new work designs. The estimates completed to date all focus on the tasks that might be automated, not the jobs that will be lost. This means there is opportunity for us to negotiate outcomes resulting in improved conditions of work as opposed to employment loss as new technology is implemented – at the bargaining table and in government policy and employer norms.

While the headlines addressing automation and artificial intelligence warn of broad-based job loss and future joblessness, the reality is far less stark and far less certain. A recent report from McKinsey Global Institute estimates that fewer than 5 per cent of existing occupations are candidates for full automation. Rather than completely eliminating jobs, automation and artificial intelligence will replace some tasks, requiring workers to adjust their level of skills and knowledge used in the workplace.



The estimates you see below refer to the tasks inside a job that are automatable, not the share of jobs that will disappear. People often end up working alongside robots and other artificial intelligence in order to complete a bundle of tasks together. This partnership will have both positive and negative consequences. On one hand, the move is likely to increase skills requirements, and productivity leading to the increased competitiveness of the employer and subsequent increase in compensation for the worker. On the other hand, poor work organization can lead to an increased workload to be completed at an unrealistic or unhealthy pace. This can decrease the autonomy people have over their work-life, causing alienation and reducing pay well-being.

Four notable studies have attempted to estimate the share of tasks in the Canadian economy that are susceptible to automation. Estimates range from 35 to 47 per cent. This does not mean that 35 to 47 percent of all people employed in Canada are at risk of being displaced but that between one-third and one-half of tasks currently being performed by workers in Canada have the potential to be automated at some point in the future. Fortunately, knowing the shift is coming provides an important opportunity to prepare for it. Instead of allowing technological change to lead to employment erosion and loss of jobs, we can organize to ensure technological change leads to service quality improvements and skills enhancement. The use of robots and computer software to lighten the load in the emergency room or in a long-term care facility, for example, does not have to mean fewer nurses and personal support workers, but could instead lead to an increase in the quality of care patients receive in these vital public institutions.

The results of these studies are only estimates and they are highly theoretical. If we are to see this degree of automation, it will occur over the long term, if at all. We should treat these numbers accordingly, recognizing that each industry and workplace is different and each potential piece of new technology under consideration today may not ever be commercialized for the Canadian workplace.

Potential for task automation varies across industries – from 30 per cent of tasks in education related employment to 69 per cent of tasks in accommodation and food services. Figure 2 provides a detailed breakdown of the potential of task automation in a cross section of industries across the Canadian economy.

The four industries with the highest share of tasks with potential to be automated are: accommodation & food services; manufacturing; transportation & warehousing; and agriculture, forestry, fishing & hunting. The four categories with the lowest share of tasks with potential to be automated are: education; professional, scientific & technical services; health care & social assistance; and information & cultural industries.

Figure 1: Professional estimates of share of tasks highly susceptible to automation in Canada

Research Institute	Susceptibility to automation	
	High	Mid-low
C.D. Howe Institute	35%	65%
Brookfield Institute for Innovation and Entrepreneurship	46%	54%
McKinsey Global Institute	47%	53%
Organization for Economic Cooperation and Development	38%	62%

These estimates show that the fear of automation in the workplace is certainly not unfounded. However we also know that the choice to automate depends on a number of factors including scalability, commercialization, cost of the technology, the size of the firm, and competitiveness in the industry.

Figure 2: Percentage of tasks with the potential for automation by industry

Industry	Potential tasks to automate
Accommodation and food services	69%
Manufacturing	61%
Transportation and warehousing	61%
Agriculture, forestry, fishing and hunting	52%
Mining, quarrying, and oil and gas extraction	52%
Construction	51%
Retail trade	49%
Wholesale trade	46%
Other services (except public administration)	45%
Utilities	44%
Arts, entertainment and recreation	42%
Finance and insurance	42%
Management of companies and enterprises	42%
Administrative and support, waste management and remediation services	41%
Public administration	41%
Real estate and rental and leasing	41%
Information and cultural industries (including Telecommunications)	38%
Health care and social assistance	37%
Professional, scientific and technical services	35%
Educational services	30%

Source: Brookfield Institute

Even with all of this data available to the public, it is nearly impossible to predict at a micro level which workplaces and which workers will be affected and which won't. This is because the potential for automation of tasks varies greatly between jobs within industries as well as across firms. For example, the manufacturing sector is highly susceptible to automation. However, depending on what type of manufacturing work one does, automation may have already taken place on a large scale or may not be possible at all. For example, advanced robotics was first implemented in the auto sector nearly three decades ago. In Canada, the auto sector purchased nearly 70,000 robots in 2014 alone. Is it possible that automation has reached its limit in

the manufacturing sub-sector or is there still room to introduce new technologies for people to work with and alongside? That question is only answerable by the people who work in and manage the facility. Furthermore, the answer may change as technology advances.

Another industry highly susceptible to automation is accommodation and food services. In this industry, everything from automated room attendants to automated guest services are innovations currently available for adoption. But questions remain. Will these technologies be adopted in the short-term? In the long-term? Are they actually commercially viable or will they be found not useful in boosting productivity or profitability? The answers will dictate whether the intelligence revolution has an undetectable or substantive impact on workers in a particular industry.

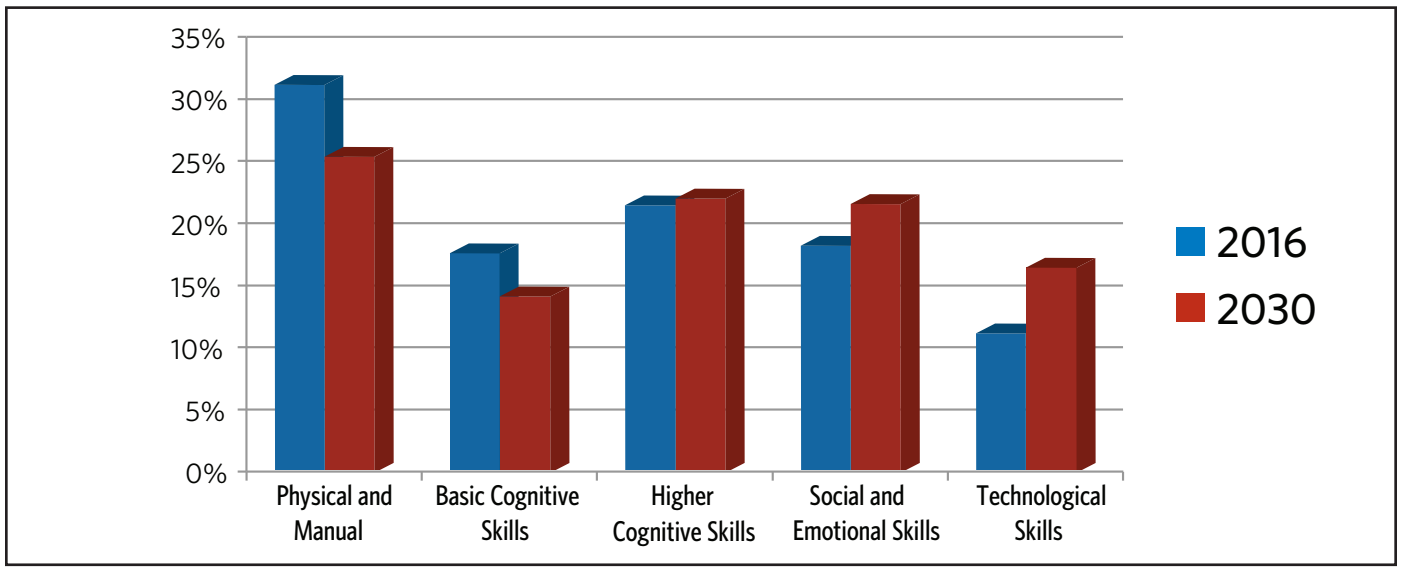
The intelligence revolution will bring about a skills revolution as well

Technological advancements are bringing broad-based changes in the skills required to compete for some jobs in the labour market. As employment shifts to work requiring people to work alongside AI and robots, the skills necessary to be successful in the workplace are likely to shift as well.

Researchers at McKinsey Global Institute have categorized the skills required by workers in the labour market into 5 distinct groups: physical and manual skills; basic cognitive skills; higher cognitive skills; social and emotional skills and technological skills. The Institute predicts a continued shift in skill requirements in the labour market as technological change continues.

The skills shift will mean a slight shift away from physical and manual skills and basic cognitive skills towards requirements for higher cognitive skills, increasing social and emotional skills, and an increase in the need for technological skills. This is not surprising.

Figure 3: Share of work time spent using particular skills (average across job categories)



Source: McKinsey Global Institute, Unifor Research.
Note: this analysis is based on Europe and the United States, a similar analysis for Canada was not available at the time of this writing.

As can be seen in the figure above, a shift away from physical and manual skills does not mean those skills will no longer be required, but it does mean that fewer jobs will require a physical and/or manual component to the work. As innovation occurs and new technology is implemented it is imperative that unions and workers keep an eye on the changing requirements and ensure plans are in place to adjust skills and pay of the workforce accordingly.

Even while the risks to society may be overblown, to the individual worker who is affected the changes and impacts are real. No matter what industry you work in and what propensity your employer has to automate, it is of utmost importance to be prepared.

Much of the research done on this topic indicates the potential for further increases in income and wealth inequality as some workers will require upskilling in order to operate in cooperation with machines, while others will see their skill requirements erode as machines take over growing portions of their work without a simultaneous increase in skills requirements.

Unstable, insecure work is not an inevitable result of technological change

The fear of technological change has become a wedge through which employers are empowered to impose increasingly unstable working conditions on workers who fear they must accept poor working conditions in order to ensure they have any job at all.

But unstable and insecure work has been growing despite technological change and is often the result of new technology and platform applications. For example, Uber drivers are categorized as independent contractors; a new app called Hyr is offering to provide a link between on-demand workers and the hospitality industry to cut down on costs and increase working hours for workers. They take between 9 and 30 per cent of workers' wages as a fee for their services.

Unstable and insecure work is not an inevitable result of technological change but it is definitely a symptom of inadequate public policies and corporate norms. As a labour movement we continue to push for policies and norms to correct the downward pressure on incomes and working conditions through collective action at the bargaining table and in the public domain.

Six ways workers' lives can be affected by technological change

As noted above, workers have always been affected by technological change. Some of these changes are transformative and society-changing, while others are small and subtle. Technological change can have positive and negative impacts on workers. It's important to emphasize the role technological change has played in improving worker health and safety while also undermining pay and stability. In order to make this complex subject more manageable, we're going to focus on the following broad types of impact.

Figure 4

6. Changes in pay and employment security

1. Job loss, displacement & estrangement

5. Health & safety and ergonomics

2. Change in work organization & required skills

4. Increased surveillance

3. Productivity enhancement vs. workload increases

1. Job loss or displacement, job estrangement

The most obvious negative impact of technological change is job loss or 'displacement' due to automation or other technological 'efficiencies.' A good example of this would be a round of lay-offs after an assembly line is converted to robotic operations. This is a form of 'labour substitution' where the jobs previously held by people are taken over by machines or other technologies. But technological change can also drive what is known as 'labour obsolescence,' where innovations render entire job classifications obsolete (the way the rise of the personal automobile eventually put the stagecoach driver out of work).

Another, perhaps less obvious, impact is job estrangement, where a worker's role in her workplace changes due to technological change, leaving her feeling alienated from her work. The harm caused might be less acute and immediate, but the longer-term impact is no less real. An aircraft painter who previously took pride in their artistic mastery when painting a fuselage might now find themselves simply pushing a button on an automated painting machine, leaving them without a sense of pride in their work at the end of a long day. Making work less meaningful can have negative psychological and emotional impacts.

The devaluing of labour, both by employers and by the workers themselves, can also have material impacts when it comes to collective bargaining and compensation. With a wage scale often based on the perception of skill, where perceived higher-skill jobs justify higher wages, the programmatic devaluing of work could lead to lower wages over time.

2. Change in work organization and required skills

Canada's labour market is undergoing a transformation due to technological change, and the nature of our work will evolve as well. This transformation will bring with it both challenges and opportunities, and we owe it to ourselves, our co-workers, and our families to take a lead on this issue. One major area of opportunity is the concept of *up-skilling*, where workers displaced by technological change upgrade their skills to fill new roles that complement and support new technologies. This idea of re-training is not new to many Unifor members, but we expect the need for up-skilling to increase as technological change accelerates and spreads to new sectors. Up-skilling requires the commitment of employers, governments, unions and workers themselves to identify, develop and fund appropriate training opportunities for affected workers.

De-skilling is the opposite of up-skilling, and it can take serveral forms. De-skilling can refer to the way some workers, especially marginalized workers like immigrants, women, and people of colour can be trapped in jobs not reflective of their educational or employment experience due to discrimination. In the context of technological change, de-skilling can refer to the slow erosion of skill requirements and experience due to increasing automation. Think of the artistic skill of the aircraft painter mentioned above, or the lost knife skills of the cook who used to chop produce in their hotel kitchen, but now opens plastic bags of machine-cut vegetables.

De-skilling is linked to the problem of job estrangement discussed above. Unifor's response to technological change must emphasize workers' pride in their work and the sense of identity many people take from their work. We must acknowledge the centrality of worker skill and experience to high quality employment. But this doesn't have to mean resisting change and innovation in our workplaces: rather, we must be prepared to look for – and even fight for – new opportunities for education, training and up-skilling.

3. Productivity versus workload

New technology can increase productivity but it can also lead to increased workload. Productivity enhancement is important to competitiveness, but we need to make sure the gains are shared and that the increased production is not resulting in longer hours or increased mental strain. Increased productivity might improve returns for owners and shareholders, but it should also benefit workers. The increasing automation of an assembly line might free up workers to work in more technical roles, such as maintenance or trouble-shooting. Increased productivity could also allow workers to simply work fewer hours in a given week.

Too often, productivity and workload are two sides of the same coin. What an employer might see as an increase in productivity can actually be felt as an increase in workload for workers. One concerning impact of the shift towards increasingly precarious employment has been that many jobs might be less stable, with fewer and less predictable hours which often involve higher and more dangerous workload levels even as technological advancement is taking place.

4. Surveillance

Technological change has also increased the number of worker surveillance options available to employers. This raises questions about the balance between an employer's desire to monitor its employees, and a worker's right to privacy, even in the workplace. In addition, there are important questions about how this data is gathered, stored, secured, and safely destroyed when no longer useful, that should not go unanswered.

Responding to data collected at work: 10 principles for workers' data privacy and protection

> *"Data collection and artificial intelligence are the next frontier for the labour movement. Just as unions established wage, hour, and safety standards during the Industrial Revolution, it is urgent that we set new benchmarks for the Digital Revolution,"*
>
> UNI General Secretary Philip Jennings

Employers and corporations are increasingly collecting, storing and analysing data – on clients and on workers. As citizens we provide large swaths of data without even knowing it: from the taxi rides we take to the google searches we make and many such actions in between. As workers we are being asked to provide increasing amounts of data: from Biometric data (such as fingerprints or iris scans) to workflows and resumes, our employers collect and store our data at an alarming rate. The ability of this data to affect our employment prospects, whether or not we receive a promotion and whether or not we are employable in the future is unprecedented and startling. Without rights and protections embedded in law and in collective agreements, workers may feel that they have no choice but to give this data away and have no control over how it is used or whether it can be changed, blocked or erased.

In response to the growing concern over worker data, UNI Global Union developed 10 principles for Workers' Data Privacy and Protection that can serve as a guide to unions in advocating governments for policy action and creating protections directly in their collective agreements.

1. Workers Must Have Access To, and Influence Over, Data Collected on Them
2. Implementing Sustainable Data Processing Safeguards
3. The Data Minimalization Principle Must be Applied
4. Data Processing Must be Transparent
5. Privacy Laws and Fundamental Rights Must be Respected Throughout the Company
6. Workers Must Have a Full Right of Explanation When Data is Used
7. Biometric Data and Personally Identifiable Information (PII) Must be Exempt
8. Equipment Revealing Employees' Location
9. A Multi-Disciplinary, Inter-Company Data Governance Body Should be Established
10. All of the Above Should be Implemented in a Collective Agreement

These 10 principles are not the entire solution (see UNI Global Unions Top 10 Principles on Ethical AI for more information) but they serve as a guide to a first step for workers who are experiencing surveillance in their workplace and the potential for data to be collected, stored and used in an unethical manner in the future.

UNI Global Union is based in Nyan, Switzerland. The organization is a global union representing 20 million workers in some of the fastest growing industries including skills and services.

Whether it's digital cameras in all corners of the workplace, GPS trackers in work vehicles, wearable devices or gas mileage trackers, employers have an ever-expanding range of methods to measure the performance of their workers, in many instances leading to hyper- performance management. This increasing surveillance represents a potent symbol of the power of employers to insert themselves into every moment of workers' lives both on and off the job, raising the constant threat of discipline and termination. The psychological impact of constant surveillance of workers by our employers might be hard to measure, but it is certainly felt, and we have an obligation to confront this growing problem.

5. Workplace health and safety, and ergonomics

Another area where technological change has had a clear impact on the nature of work has been workplace health and safety. Technological change has sometimes led to safer workplaces, whether it's cleaner air in our workplaces due to improved air quality systems, better worker safety mechanisms on heavy shop-floor machinery, or safer operations due to advances in ergonomic sciences (for example, better control systems for heavy machinery that reduce the risk of repetitive strain injuries).

The move to more automation will likely mean more workers transitioning from physical labour-intensive jobs towards less physical work. At the same time, workers in both physically and non-physically intensive industries may face increased psychosocial loads, increased pace of work, and higher levels of risk to personal health and safety on the job. In addition, workers in the gig economy are facing increased pressures associated with insecurity and low-wages.

What will it mean to have more workers sitting at a desk, or computer work stations? With a move to work focused more on social and emotional skills, how will we address the need for increased focus on maintaining and improving robust mental health for workers in all industries. The transformation brought about by technological change will likely bring new and different health and safety challenges that will need to be addressed, if the labour movement is to continue to lead the way for protecting and promoting worker health.

6. Changes in pay and employment security

Implicit in discussions around the future of work is the slow and often painful drive towards increased precarity and instability in the labour market. Technological change is driving work to become increasingly unbundled and worker expectations around what workers can reasonably expect from a job have declined from a life-long career, to contract work and even micro-tasks (faced by some of our freelance members).

An increasing share of workers in Canada experience involuntary part-time work, temporary and contract work, hours that vary week to week, misclassified self-employment, or the necessity of working multiple jobs to make ends meet.

Middle income, medium-skill jobs have been declining over the last two decades while low- and high-skill and income jobs have been growing. This polarization of income and stability is cause for concern. Canada

has become a more unequal country over the last 20 years, with 50 per cent of workers earning approximately $30,000 a year or less while CEOs and the runaway one per cent have seen their incomes grow dramatically.

There is a growing consensus that new technology, including automation and artificial intelligence, are increasingly contributing to the polarization of income and an increase in the "gig economy" around the world.

True flexibility leaves workers in the driver's seat

The lean towards on-demand workers is often touted as a request by workers for more flexibility in their lives. The reality is on-demand provision of labour often leaves workers in a state of constantly looking for work and responding to requests as opposed to controlling their schedule in a way that meets the needs of their own lives.

Flexibility looks very different for an on-demand worker desperate for hours who is required to bend over backwards to meet the demands of employers, than for a self-employed individual who takes on multiple contracts as a way to decide when and where to work as long as the job they have committed to is completed within agreed upon time limits.

Getting the best of technological change and avoiding the worst

No campaign or strategic initiative can be successful without first setting a goal. We need to know what we're aiming for and why. When it comes to Unifor's strategy to address technological change, we think it makes the most sense to think of an individual worker who has experienced some version of technological change or disruption in their work. Maybe they had their job duties radically altered by automation, or perhaps they have an employer who sought to collect their personal biometric data in order to improve their productivity.

Whatever strategy we develop, we know we want that worker – and any worker confronting technological change – to have the agency, adequate laws and policies, tools, and training so they end up safer at work, better educated, highly skilled, fairly remunerated, and engaged in their work, with a feeling of ownership over their own labour. Rather than feeling threatened or challenged by technological change, how could we create the conditions that lead to this outcome?

There are a number of ways we, as workers, can address technological change. Some responses will take place at the very micro-level, perhaps on the shop floor in our own workplaces. Other responses will require a society-wide approach, and the engagement of all three levels of government. As Unifor continues to develop our strategy to address technological change, we know our members will be at the centre of the discussion. All across our union, we're going to come together to talk about how to take advantage of this opportunity, and we want to hear from you. Some possible suggestions to address technological change might include collective bargaining, regulatory solutions, Just Transition principles, an inclusive growth framework and advocating for good jobs and decent work.

Collective bargaining

One of the most obvious ways we can address technological change in our workplaces is through the collective bargaining process. In fact, as anyone who's been involved in bargaining knows, we've been doing this for years. Our union has bargained provisions in our collective agreements to ensure workers have the right to actively participate in the implementation of new technology and to negotiate the terms as they related to technological change. The fundamental principle underlying this approach is that workers deserve to have early notice of upcoming technological changes, the right to participate in and benefit from new opportunities, and the right to negotiate new language arising from those changes.

Using the collective bargaining process in this way means keeping workers at the centre of decision-making when it comes to technological change in the workplace. This could mean including 'just transition' policies for displaced workers, but it could also mean minimum hours requirements for casino workers confronting an increasingly automated gaming floor. We could consider bargaining language that addresses workload and between-room travel time for hotel housekeepers confronting their employers' new productivity apps, or

language to ensure workers whose productivity increases as the result of robotics being implemented on the assembly line also see an increase in their hourly wages.

For consideration: How can we best harness the power of the collective bargaining process to address technological change in automation in our workplaces and across sectors? What role can/should Unifor's Industry Councils play in developing a coordinated strategy? Can we use the bargaining process to outline solutions and strategies to manage technological change to support organizing work?

Unifor has a long history of confronting and responding to technological change.

The first major technological change in the automobile industry would have been the introduction of the assembly line. The new production system dramatically changed work and set the stage for human struggle. The assembly line increased productivity but the price was paid in speed ups, downgraded skills and dangerous jobs.

Workers responded by demanding better wages, improved conditions and union recognition.

In the 1990's, workers were again confronting technological change but this time it was computer technology. Board rooms were demanding cost reductions and efficiencies and technological innovations rolled through the workplace. In their wake, workers faced significant challenges very similar to the challenges many of our workplaces are facing today: will technological change mean job security or job loss? Training or de-skilling? Safer workplaces or increased workload and dangerous activity?

Again workers responded by asking important questions:

- How do we translate demands for higher productivity into greater control over working hours and higher hourly wages?
- How do we turn around management's deep rooted preference for eliminating jobs?

And then craft bargaining language to ensure workers saw the benefits while experiencing fewer detrimental impacts of technological change.

The role of regulation

All three levels of government must continue to play a role in making sure the right laws and policies are in place to protect working people from the adverse effects of technological change, while still embracing the need to be competitive and innovative in the global economy. In many cases, that means governments need to get ahead of technological change and be on top of the latest breakthroughs and 'disruptions.' Governments need to ensure there are no cracks in the regulation that can be exploited by technological innovation allowing companies to get a leg up on the competition by undermining rights and requirements as opposed to offering superior service.

For example, we've recently seen a great deal of controversy and mixed success as governments have tried to address so-called platform capitalism, with companies like Uber and Airbnb taking advantage of legislative and regulatory grey areas to find new sources of profit. These grey areas are allowing companies to misclassify workers as independent contractors who end up with minimal pay and uncertain hours and are permitting the

exploitation of holes in our tax system to increase profit at the expense of the public services their customers and workers rely on every day. As this situation continues so too will the downward pressure on wages and working conditions that are keeping too many people living in a state of instability and uncertainty.

Our governments must address these legislative and regulatory grey areas, and we must be prepared to help them to do so, by reaching out to elected officials, sharing our experience and knowledge, and presenting effective policy options.

All three levels of government must be prepared to deny the call to de-regulate and under-legislate in the name of 'innovation.' Rules and regulations have been established over the years to protect residents, workers and consumers, and we must encourage our elected officials to establish a level playing field for existing and new technologies that doesn't diminish hard-won protections for everyone. For example, by treating an Uber driver like a private contractor with an app on their phone, we are stripping that person of their rights and protections as a worker, and eroding the job security of workers in the taxi industry and public transportation sectors.

Applying Just Transition principles

The Canadian Centre for Policy Alternatives describes a Just Transition as a social justice framework designed to ensure workers' rights and needs are protected as work is shifted from carbon intensive industries to green industries. This approach was germinated by the global labour movement and continues to be adjusted and advocated for today. The same framework can be applied to protect workers' rights and needs as technological change brings both advancements and pitfalls to the current and future labour market.

While there is no one Just Transition policy, the framework has been used by multiple stakeholders groups to design and advocated for a set of policies that fit the needs of its workforce and industrial make-up. The list of policy areas includes:

- Income security
- Retraining and career support
- Job Transfers
- Pension Bridging
- Workforce transition plans
- Protecting labour rights and employment standards
- Labour market modelling
- Targeted skills training
- Industrial transition support
- Geographically targeted public spending

In addition to the principles listed above one might also see an opportunity to discuss job sharing, an accompanying increase in leisure time as productivity improvements are made, rules around the use of e-mail after working hours or protections from surveillance as discussed above.

These principles are just as appropriate when thinking through the process of implementing technological change at the large and small scale. In 2017, the International Labour Organization began advocating for the implementation of Just Transition Principles in workplaces and labour markets that undergo technological change. In addition, there are important steps that must be taken to think through the jobs that can be created to deal with the residual waste and other environmental considerations that result from the increasing sophistication of the technology that is used today.

The future of work and climate change

In July 2017, we released our Unifor Energy Policy. Titled *A Progressive Vision for Canada's Energy Future*, the policy states that Canada's energy resources ultimately belong to Canadians, and so they should be managed and developed in accordance with basic principles in ten areas: good jobs, employment stability, deepening industrial linkages, environmental stewardship, green energy, just transition, respect for First Nations, macroeconomic regulation, fiscal and regional balance, and resource revenue and social development

In terms of 'Just Transition,' the Unifor Energy Policy states

> *The industrial dislocation associated with the adjustment to green energy and clean technology should be counteracted by the suite of policies referred to as Just Transition, which includes labour market impact assessments, skills upgrading, retraining, flexible employment insurance and pension bridging, among others...*

Clearly, as we confront the global crisis that is climate change, the adjustment to green energy and clean technology will include many challenges and opportunities for workers in the energy sector and beyond. We have already seen job displacements taking place in this sector: for example, Suncor Energy's recent announcement that it plans to replace 400 ore-hauling truck drivers with automated vehicles. We need to develop a plan to anticipate change, and activate Just Transition policies to make sure our members, and non-union workers, are not left behind.

For consideration: how can we build on the work done through our climate policy to further develop and expand our position on just transition and advocate for implementation at the federal and provincial level? Are there natural partners with whom we should be working to move just transition from idea to reality? Are there campaigns that already exist or that we've supported in the past that could/should be revived?

Embracing "inclusive growth"

In their report for the Mowat Centre (titled *Race to the Top: Developing an Inclusive Growth Agenda for Canada*) Sunil Johal and Armine Yalnizyan argue in favour of a concept called "inclusive growth" as a solution to the problems of income inequality, precarious work, and wage stagnation partially resulting from technological change. Johal and Yalnizyan observe that these have been the negative outcomes of decades of prioritizing tax cuts, de-regulation and privatization.

While there is no simple definition for inclusive growth, Johal and Yalnizyan claim that several economic metrics could act as a guide to judge whether economic growth is sustainable, equitable, and more fairly distributed. These metrics include:

- labour share of GDP (the amount of income in the economy that goes to wages),
- income inequality,
- income polarization,
- relative size of the middle class,
- average and median household incomes,
- wages by decile (comparing wage growth of higher and lower income earners)
- average and median hourly wages,
- labour force participation and employment rate, and
- the gender wage gap, by educational attainment

The report provides "a playbook of actions that individuals, communities, businesses and governments could consider to improve market performance (predistribution measures) and government policy development (redistribution measures)." Some suggested predistribution measures include wage transparency policies, community benefits agreements, living wage requirements for government jobs, and anchoring the minimum wage to 60 per cent of the average wage. Suggested redistribution measures include reforming tax rates for corporations and high-earners, a corporate "withholding" tax (targeting corporations' accumulation of cash reserves), and a possible "robot tax." In addition to collecting revenue, we need to discuss the best ways of redistributing that revenue including subsidizing post-secondary education, providing additional income supports, investing in wellness and additional initiatives.

Finally, Johal and Yalnizyan recommend that the Canadian government develop an inclusive growth scorecard, indexed to those of other G-7 nations, with a specific plan to improve Canada's performance on that scorecard.

For consideration: Are there opportunities for Unifor to advocate for inclusive growth policies in Canada and globally? What are the most important predistribution measures and efforts necessary to ensure equal opportunity and prosperity for the many in our changing economic environment? Can we identify priority tax and transfer areas to be targeted to ensure strong and sustainable investment by government in the infrastructure necessary to build prosperity?

Advocating for good jobs, decent work and an equitable future

Creating and sustaining good jobs is of utmost importance in this time of transition. The modern labour movement was born out of the industrial revolution in the early 1900s as a means to improving the lives of working people – at work and in their communities – through collective action. The Winnipeg General Strike took place nearly 100 years ago. Workers walked off the job protesting the combination of excessive war

time profits and dismal wages and working conditions. Workers demanded a measure of control over how their work was organized and the conditions in which they found themselves on a daily basis. The same sentiments are true in workplaces around the world.

The worker movements of today are rooted in the same notions of economic fairness and prosperity for all. The Fight for $15 and Fairness has expanded across North America as a response to low pay and insecure employment in service industries. The tendency to create insecure employment in the race to return shareholder profits has sprung up in goods and services industries alike. The need to prevent permanently temporary employment, contracting out, two-tiering and misclassification of workers as self-employed is a struggle faced by low- and high-waged workers in industries that were once thought of as sustaining middle-class jobs working families could rely on to pay the bills.

The fight for these rights and protections often pits worker against employer as if there can only be one winner in the movement for decent work and prosperous communities. However, there is a growing body of evidence that suggests good jobs and stable working conditions are a win-win for employers and workers alike. Furthermore, despite some policy efforts and action, we continue to see the results of discrimination in our country through the continued over representation of women, people of colour and people with disabilities in insecure, unstable and low-waged work. Advocating for good jobs means advocating for access to those jobs for everyone.

KPMG, MIT professor Zeynep Ton, and The Better Way Alliance each provide some good examples of how investing in the quality and quantity of labour leads to productivity and profitability improvements even as the cost pressures that lead to bad jobs and underinvestment in labour remain difficult to resist. Decent work strategies include paying a living wage, providing predictability in hours and scheduling, offering professional development opportunities, providing health and disability benefits, and ensuring paid sick leave to name a few.

Unconventional wisdom shows that employers pay a price for their low-wage and insecure work strategies. But that price is not as obvious on the balance sheet in the short term. In the short term it may look like low-wage, insecure work strategies boost the bottom line but in the long-run they don't. Over the long run businesses pay for these strategies with the cost of higher turnover, increased recruitment costs, employee disengagement, lower productivity, consumer frustration and customer dissatisfaction that leads to brand resentment and lower same store sales.

In today's climate, advocating for decent work and good jobs means supporting $15 and Fairness initiatives, promoting living wage policies, advocating for labour laws that make it easier for workers to form and join a union, promoting research showing the value of good jobs in a capitalist economy and ensuring workers have a say in the design of their work from start to finish – whether on the shop floor, from their home office or in front of the camera.

For consideration: How can we build on the successes we've had in jurisdictions across the country to raise the floor for workers experiencing low wages and instability? Can we identify strategies that focus on creating middle-income jobs to reverse the trend of eroding wages and working conditions for middle class workers? How can we ensure equality of opportunity for everyone in our country regardless of race, religion, gender, age or sexual orientation?

Harnessing new tech to build worker power

The advancement of communications technology ushers in a new era for workers in providing new avenues for communication and organizing out of sight of employers and across wider distances than was previously possible. This offers opportunities for unions to engage with members (current and future) in new and more meaningful ways. For example:

In New York City, a group of cleaners working as self-employed individuals created a worker cooperative that allowed them to purchase cleaning and other organizational supplies in bulk and at wholesale prices.

At UC Santa Cruz, a Workers Lab-supported hackathon resulted in the creation of an app called WorkIt. WorkIt helps people working in hourly jobs get answers to questions about workplace policies and rights from trusted and trained peer advisors. Currently, WorkIt is advancing the collective power of workers at WalMart through organizing, education and communication from coast to coast.

During their union organizing drive at the Trump Hotel Toronto (now the Adelaide Hotel Toronto), workers communicated with each other using a free texting app. By creating private chat groups within the app, workers were able to communicate freely with each other in order to advance their goal of having more voice in their workplace.

In the Pacific Northwest, the Workers Lab supports organizing efforts and enterprises that build scalable and sustainable power for working people in the 21st century economy with 21st Century communications technology. The organization has incubated multiple efforts to increase worker power that have grown into substantial models to incite change.

These are important examples of how tech can be used to build worker power (over their own lives and in their workplaces) to bring change. Unifor can harness this power by choosing to strategically invest in new systems and processes that bridge the gap for workers across the union - for workers who have common employers across the country; for workers in the same industry; and for workers facing similar challenges across industry lines. Some key questions for consideration:

1. What are the opportunities for Unifor to build worker power for current and future members through the use of 21st Century communications technology and AI?
2. Are there opportunities to use new tech to better organize and communicate with our members?

In this approach, it is important to recognize that an app does not solve everything. It is one tool to transmit and receive information, but those apps are only as strong as the systems in place for entering data, processing requests, and ultimately handling the needs of workers and the organization. Good tech makes the system look easy, but getting to that point is a complicated, messy endeavour that requires buy-in and participation from potential users on both ends of the communication line.

We have the opportunity to harness new tech to build a stronger, more versatile, union, but it won't happen at the push of a button: it requires resources, focus, and determination.

Next steps:

There is no denying that automation, artificial intelligence and other forms of new technology will continue to be challenges faced in workplaces and industries around the world. Our responsibility as workers and as a union is to take control of the conversation and move from a position of fear and defence to a position of power and action.

We have the power to take back control of the conversation. We have the power to ensure our employers and our governments know that we can create a system that ensures society benefits from the best of what technological change has to offer while avoiding the worst. We have the power to ensure that our collective agreements put workers first while our social programs are people-centred and focused on progress for the many, not the few.

This paper and our conference are just the first step. The following is a list of some of the ways Unifor can engage and prepare members for the important conversations we must have to ensure workers take back control and prepare for new technology in the workplace:

1. Develop a framework through which individual bargaining units can analyse the potential for technological change in their workplace and discover the areas that require the strongest focus including up-skilling, potential job displacement, or surveillance, to name a few.
2. Collect an arsenal of case studies to provide an in-depth understanding of how new technology can affect the workplace and provide pathways to solutions.
3. Create a checklist for use by local unions when they decide they want to take action to be prepared for technological change. That checklist will include items such as contacting the research department to access the available tools and resources, and conducting an assessment of the potential impacts of technological change in the workplace.
4. Support Unifor Industry Councils as they develop industry wide strategies and tactics to prepare for and respond to technological change.
5. Establish educational modules to be accessed by local unions in order to learn how to assess the potential for technological change in the workplace and share the tools available to ensure workers benefit from the best of what technological change has to offer while avoiding the worst.
6. Generate a suite of public policy initiatives and programs for which we can advocate at all levels of government to build a stronger social infrastructure to support people through transition.

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