



**Project name:** tilr’s upskilling, training and career development platform

**Prepared by:** tilr Canada Corp.

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## Sector Selection

For our Skills Development Fund project, we selected three sectors of focus. While we were very successful in one of the three sectors, the details of which we broke down in our ongoing project reporting, this is an opportunity to elaborate on why we chose each sector from the project outset and what we were hoping to achieve by doing so.

The three sectors our project targeted was:

1. Technology
2. Hospitality
3. Manufacturing

### Technology:

We identified technology as a sector for three reasons. The first reason is this is a sector in which the Executive team has the most experience. For this reason, as a team we have the deepest understanding of this sector and how it operates. We know the skills requirements and how businesses typically run. We also have a professional network in the sector. We knew those relationships would prove to be valuable when it came to identifying employer partners, and we were correct.

The second reason is this is a sector that is known for being early adopters of new technologies and for using agile business practices. Given our knowledge of the sector and this fact, we knew organizations would be more open to adopting skills-first approaches and introducing new technologies into their tech stacks. This hypothesis also proved to be correct.

The third and final reason is that back when we were submitting our grant application, there was a growing demand for labour from the technology sector. During the COVID 19 pandemic, digital services and platforms experienced a growth. The sector was still experiencing rapid growth in its workforce. Amazon, for one, had more than doubled its corporate staff from September 2019 to 2022 that same year (Duffy). All of the big tech companies, like Amazon, Google, Meta and Microsoft, were expanding their head count. The tech sector was well funded and talent was flocking to it.

Not only was the workforce in the technology sector growing, but the skills that this labourforce needed were also changing. While this period of time was prior to Open AI, artificial intelligence, automation and machine learning were all emerging. The need for data scientists, technologists that were innovating in the Web 3 space and people building large language models were on the rise. The sector was a prime target for skills-first technology like tilr. The opportunity to identify transferable skills and leverage those skills to upskill engineers into areas of greater impact, was valuable. This too proved to be true.

## **Manufacturing:**

Manufacturing was experiencing employment growth at the time that we were submitting our application for the Skills Development Fund project. As we looked to Statistics Canada for data about sectors with growing workforces, we saw that “nearly all of the gains in the goods-producing sector were attributable to manufacturing (+35,000)”. This increase was in November 2021, the first employment hike since March that same year. In spite of that growth, employment numbers in the manufacturing sector were still below what it was in March 2021 (-73,000) and February 2020 (-108,000). We looked for sectors that were in demand for workers because we knew that tilr’s skills platform could help employers upskill and reskill according to their needs.

The COVID 19 pandemic shook the manufacturing sector. The disrupted supply chains meant manufacturers faced raw material shortages. The health measures and the increase in sick people resulted in insufficient labour (“Trends in Manufacturing Resulting from the COVID-19 Pandemic and Supply Chain Disruptions”). Yet, the Canadian economy was very much dependent on the manufacturing sector’s rebound to drive a full recovery. According to “Sectors at Risk: The Impact of COVID-19 on Canadian Manufacturing” by Labour Market Information Council, “Even before the pandemic, fulfilling orders was a concern for many businesses, as skills shortages and rising costs kept production levels below capacity. New challenges and priorities have emerged, such as staff and customer safety, and operational upkeep, compounding previous concerns” (*Sectors at Risk: The Impact of COVID-19 on Canadian Manufacturing*). While ultimately, tilr’s solution wasn’t a fit that could be operationalized at manufacturing plants, the idea of understanding skills, identifying skills gaps and addressing them with training very much resonated with the sector.

## **Hospitality:**

The third sector of focus was hospitality. At the time of our grant submission, the hospitality industry was in a dire situation due to COVID 19 pandemic. Per the Labour Market Insights Council, “Tourism jobs fell 28.7% annually in 2020, with most of the drop occurring in the second quarter. All tourism categories were down in 2020, with food and beverage services (-32.3%) and accommodation (-35.2%) contributing most to the overall decline. Tourism's share of employment fell from 3.8% in 2019 to 3.0% in 2020”. That gap in employment opportunities was concerning for young Canadians, who typically rely on hospitality jobs to start their careers (“Impact of COVID-19 on the tourism sector”). And as Canada saw the rollout of the COVID 19 vaccine and anticipated reopening sectors of the economy, like bars and restaurants, there was tremendous attention on the hospitality sector in terms of reattracting its lost talent and rebuilding its service capabilities.

The hospitality industry was a cornerstone of Canada’s reopening. After lockdowns, people looked at restaurants as an opportunity to gather in public spaces. Restaurants and bars represented an opportunity to return to the pre pandemic feeling. Meanwhile, the hospitality industry was dealing with crippling levels of labour shortages. According to Restaurants Canada in October 2021 “Workers

have had to find other employment opportunities in other industries after losing their jobs in hospitality. The pandemic is forcing the industry to reevaluate how they recruit, pay and retain their employees, especially as restaurant owners are struggling to fill their workforce—only 39% of restaurant operators expecting to return to pre-pandemic staffing levels in 2022 and 20% expecting to return in 2023” (“Recovery and Rebirth for Restaurants in a Post-Pandemic World”).

At the same time, the hospitality sector was experiencing a shift in the skills it needed, prior to the pandemic. There were new requirements around health and safety that needed to be considered in hospitality settings. The sector was also exploring and expanding into new business models to support itself, with greater expansion into food delivery and offering outdoor dining experiences.

This idea of a sector with labour demands with an unmet labour supply was compelling for the tilr team. The Skills Development Fund offered us an opportunity to explore how the hospitality industry could leverage skills data to upskill or reskill talent and use skills as a mechanism for talent mobility.

## **Observations and anecdotal information from our conversations with each sector that includes what the struggles are with training employees and where the gaps are for learning & development**

During the course of the project, we learned a lot about these three sectors. While it was apparent at the time that it was an unprecedented moment in the labour market, looking back, it still feels so. The impact of the COVID 19 pandemic and the lockdowns on the labour market cannot be understated. It absolutely shook the foundation of our workforce. And so we had a really interesting moment to look at the sectors and evaluate their training needs and struggles.

Below are our observations and what we gleaned from our conversations.

### **Technology:**

We gained the deepest insights into the technology department, due to our many, enduring and deep partnerships with them.

The major themes that arise in terms of struggles with training employees are:

- Employee retention
- Employee engagement in learning
- Resource constraints

#### **Employee retention:**

There has been tremendous movement within the technology sector in the past 4 years. With the COVID 19 pandemic accelerating the pace of digital transformation, talent flocked to the sector. “21% of those who changed jobs during the Great Resignation now work in tech, a larger percentage than any other sector” (Robb). Then in 2023, the tech sector also experienced mass layoffs. Amazon,

Google, Microsoft and Meta all announced plans to cut more than 50,000 employees from their collective workforces (Duffy). tilr, working directly with the tech sector, saw the impact of this talent movement first hand and the impact it had on training.

During the period of the Great Resignation laid the ground for a term coined “The Retraining” (Robb). 66% of people said access to employer-sponsored training was an important factor in accepting their current job. Offering employee skills development tools and resources was critical. But at that time, employers knew that it was an employee market and employees moved to organizations that offered the best opportunities and compensation.

By early 2023, that changed. “72% of tech workers are worried about job security and how a potential recession could impact their employment status.” Nonetheless, this drives training. “76% plan on taking an online training course or certificate program to broaden their skills and make them marketable to avoid potential layoffs.” Employee retention and movement in the labour market is a major driver of skills development activities.

Tilr has seen firsthand this movement. From across the 46 employer partners that we onboarded as part of the project, more than half of the decision makers, champions or daily point of contact are no longer at the organization. There were nearly 30 organizations that we prospected that did not partner due to critical team members leaving the organization. This type of labour force movement causes disruptions to organizations programs and program planning. Even the programs that are aimed to address the very issue itself.

### **Employee engagement in learning:**

While the data provided in the above section illustrates a strong self-drive for employees’ to drive their own skills development activities, what we actually see happening in organizations does not support this data. In our view, employers struggled with seeing the levels of employee engagement in learning. For the most part, organizations have a small percentage of very self-driven employees who engage in learning. There is a larger middle section that take courses when they are encouraged or instructed to do so by their Manager. And finally, there is a group that never learns. A common theme across all our employer partners is that they want to see greater levels of engagement in learning from their employees.

### **Resource constraints:**

During the course of prospecting, identifying and partnering with our employer partners, the most common reason for not moving forward was resource constraints. Those resource constraints were both in the form of direct costs - the budget allocation for learning licenses, and indirect costs - the time for an employee to run a learning program.

Since these were the most common reasons organizations did not want to adopt tilr, we designed tilr specifically to be low touch and an efficient use of budget. tilr can be deployed as a top-down tool. It also can be a learning program that is entirely employee-driven. We have some employers that run it as such. Additionally, the Coursera learning licenses can be moved around between employees. So organizations can purchase one or two learning licenses and assign them to an employee that has the time and needs for learning at that time. The concern around cost of training is a key concern that we noted as it relates to skills development.

From our vantage point, the biggest gaps for learning and development solutions is a lack of integrated, intelligent, and flexible solutions driven by skills data.

There is no shortage of training content targeting the tech sector. In fact, the options are endless for learners. So much so that it can be overwhelming for People Leaders and employees to identify the right training to take for developing their skill of interest and at the proficiency level they are aiming to gain.

Another challenge is that training content is not flexible enough. The prevailing business model in the learning and development content marketplace is a license per employee. This is not reflective of how employers need to train their employees. The reality is not every employee learning at the same time, and all the time. There are times when a lot of people are learning during business down cycles or when there is a surge in upskilling requirements. There are other times when only a few people are learning. A license per employee model is rigid, expensive and inefficient. A better model is one where licenses can move around to employees based on their learning needs.

The final, but actually the most vital struggle that organizations are facing when it comes to training, is lack of skills data. To put it simply, organizations do not know the skills they need to operate and compete as a business. Organizations do not know the skills that make up their organization. And in turn, they do not know where the skills gaps exist and how detrimental they are to the organization. In absence of this data, it is impossible to properly prioritize learning and development budgets and offer targeted training that address skills gaps.

There are not enough solutions to help organizations to approach the discipline of knowing their skills. From what tilr has seen in the market, there is a desire for organizations to know the skills that exist in their organization. However, taking the first steps to do this are challenging. If it is done as a pen-to-paper exercise, it quickly becomes untenable to scale. Socializing the effort of building an organizational skills inventory across the organization is impossible in a spreadsheet. Further, modern technology tools are integrated, secure, have user permissioning, and market intelligence. All of those elements are critical to conducting a proper skills exercise. The private sector needs to service this demand in a way that is flexible to different organizations needs and cost-effective to address budget constraints.

In absence of a skills platform, organizations don't know where their skills gaps actually exist. Based on our conversations, organizations know they have skills gaps. In fact, they are ok with the existence of those skills gaps because in today's labour market some skills gaps might be inevitable. But they cannot pinpoint those skills gaps. Which means, in turn, they cannot prioritize how and when to address them.

Finally, a top of mind need in the technology sector that learning and development needs to do a better job of addressing is talent mobility. The firms that will win in the market over the near terms are those that can effectively move talent to higher impact roles. With the advent of AI and automation in the workplaces, machines are doing tasks previously done by employees. Organizations need to effectively move people from lower impact roles to higher impact ones. This theme of talent mobility will be addressed again in this report.

The other aspect of talent mobility that is a top of mind training concern for tech employers is succession planning. Their focus of succession planning is on the leadership / executive level and ensuring there is a strong bench of talent to move into those roles. tilr has seen firsthand how

disruptive it is to our employer partners when an executive level leader leaves the organization without talent immediately ready to fill that spot. There is tremendous investment on the high performer, retaining them, and ensuring they have the skills necessary for when a leadership role becomes vacant.

## **Manufacturing:**

Since we were not able to identify employer partners to work with, our view into this sector is more limited. That said, through our conversations and by pinpointing the barriers between tilr's solution and implementing it at a manufacturer, we gathered some anecdotal feedback about the state of learning and development in the sector and its struggles.

Firstly, the manufacturing sector itself is not clear on the root cause of its skills shortage and exactly what is causing it. This unknown leaves a critical void in effective solutions. The precise origins of this shortage—whether attributed to educational institutions not aligning curriculum with industry demands or the inadequacy of on-site practical training—have yet to be pinpointed. Consequently, the sector has been unable to formulate targeted strategies to rectify the issue. Some industry associations that we spoke to were hesitant to introduce us to manufacturing employers due to the lack of insight on their part into the root cause of the skills gap. They felt it was “jumping the gun” to move directly to skills profiling and offering on-site training.

Secondly, the lack of web-based devices in the workplace is a substantial impediment to workplace skills assessment and training. Quite simply, employees do not have company email addresses and workplaces do not have computers or ipads for employees to login to a platform to access e-learning. This just means that the right training providers need to service this sector with hands-on demonstrations, coaching, etc.

## **Hospitality:**

Similar to manufacturing, our view into the hospitality sector's challenges is equally limited. That said, we encountered three recurring themes when speaking to the sector about their learning and development needs.

The first challenge is the transient nature of the employees. This is a feature, not a bug, of the sector. The hospitality industry is seasonal and demand waxes and wanes accordingly. As such, there is tremendous movement which can make the relationship between employers and their employees more transactional.

Building on this point, the nature of work in hospitality tends to be shift work. Building the time into shifts for deep training is either really challenging or impossible. Similar to manufacturing, the models for training are more demonstration and in-person based. Like, coaching and shadowing for teaching new skills, like cooking or bussing a table.

## **What we have observed employers need from a training solution that will benefit the company and**

# ensure the employees continue to have gainful employment

Over the course of our Skills Development Fund project, we had the honour and pleasure of speaking with over one hundred companies, not for profit organizations, industry associations from across a variety of sectors to discuss their training needs. And with our employer partners that implemented tilr, we had the opportunity to build deep relationships with the Human Resources departments where we learned about their learning and development programs and their gaps in it. Through this experience, we had the unique opportunity to develop a perspective on the training solutions that will benefit the workforce to ensure continued gainful employment.

The three broad areas that we observed employers need from their training solutions are:

- Support talent mobility
- Anticipate future skills
- Flexible training programs

## Talent mobility:

This report is referring to talent mobility as the movement of employees within an organization, either vertically (upward mobility) or laterally (sideways mobility), to different roles, departments, locations, or projects. There is an opportunity at this juncture of time, for organizations to focus on skills-based mobility for the purpose of moving employees from lower impact roles in the organization to higher impact roles.

To illustrate what moving from lower impact to higher impact roles means, let's look at the time that the tilr team had the pleasure of sitting down with one of Canada's top four accounting and professional services firms to discuss their human capital requirements. The firm cited that a concern for them is emerging technologies, namely AI and automation, and how it is resulting in less human labour needs for their tax audit practice. Tax audit has historically been a pathway for young talent to enter the firm. As such, the firm is keenly focused on moving young talent from tax audit into higher impact areas of the organization, namely cybersecurity. A focus of our meeting was the type of tools and data is required to support this degree of mass reskilling to address these skills shortages.

There are two primary tools that are required to support this level of talent mobility, one is career mapping and the second is learning paths.

Career mapping, also referred to in this report as career journeys, is a system to help employees map their career journey within the organization by seeing the different roles they need to hold to reach their goals.

Fundamental to powering a career mapping system is:

- A searchable database of all the roles in the organization.
- For each role in the organization, documentation of the skills that are required for that role. These skills need to be categorized into degrees of importance to the role (must have, should have, bonus). This categorization is key to a system knowing which skills to focus on. Additionally, each skill should have a required skills proficiency level associated with it.



- The system needs to possess intelligence about skills and their relative relationships to each other. Skills relationships means which skills are transferable with each other, their degree of transferability, how the skills cluster, how they are related to each other, and so on. This skills intelligence is core to how an employee can move from one role to another and what reskilling or upskilling is required for that movement to occur successfully.
- The system needs to be powered by algorithms that map the steps between roles, meaning how can an employee along a career trajectory from role 1, to role 2, to role 3, and onward, with minimal time and steps, while maximizing transferable skills.
- A user interface that allows employees to map themselves along their career journey, avoid roles they do not desire to hold, then share that career journey with their manager to support them with that movement.

A system to map journeys is its own value but that value can only be unlocked with training resources to help employees address their skills gaps along the way. For this reason, going hand in hand with career journeys is learning paths.

A learning path is a structured sequence of learning activities that guide employees in acquiring skills and competencies to achieve career goals. Learning and development teams need tools to build personalized and targeted curriculums that include a variety of learning activities over a period of time. While existing learning management systems have the capability to create curriculums based on their course catalogs, a more intelligent system is required. A system that can pull learning resources from across all the different learning platforms, both digital and in-person, as well as create mentorship matches, and manage work assignments, is the breadth and scope that powers a well oiled talent mobility system.

The firms that will win over the near term are the ones that can effectively deploy their human capital towards the areas of the business that will allow it to compete and win in the market. Talent mobility is essential to that and sophisticated firms know that and are actively working to enable it. Career journeys with enhanced skills intelligence coupled with robust learning paths are the cornerstone of fostering an agile workforce.

## **Future skills:**

Organizations are either adopting, or already practicing, continuous and rapid learning cycles. This is required to keep pace with the rapidly changing skills. This model focuses on the changing skills that the organization requires today and in the near term and ensures that the workforce is equipped with those skills. It addresses skills development with fast training cycles whereby the employee can apply their learnings immediately in the organization.

What the current models and tools are not able to properly capture are the future skills requirements. This is of specific interest because if skills development can be anticipatory rather than reactive, this can be a competitive advantage by ensuring that skills gaps are closed before they occur. As tilr spoke to some of the more sophisticated employers and organizations in the skills space, this idea of anticipating the future skills needs and training for them was a recurring theme.

One way that anticipating future skills and training for them can be addressed is by following these steps:

**Step 1** - Look at organizations' future work.

This is possible because organizations keep track of the work they anticipate in their pipelines. For product-based companies, they have a roadmap for their product. For services-based companies, they have industries that they are targeting. Anticipated projects are housed and planned in project management systems, like Asana and Jira. Anticipated sales are documented and tracked in sales management systems like Salesforce and Hubspot.

The output of this step is a list of the projects that are coming and an anticipated timeline for them.

**Step 2** - Assess the skills that are required to execute the work.

Once future work is known, at least a high level scoping of the skills requirements can be conducted. An analysis of the skills that will be required to address the project. For a service firm, this could mean learning how to service a customer in a different industry. For a product firm, this could mean learning how to code in a new language to build a feature.

The output of this step is a list of the skills that are required to execute the project and a ranking of importance of the skills.

**Step 3** - Compare the required skills for the project to the existing skills within the organization. In order to do this, the organization should already have an up to date skills inventory of the employees skills. This organizational skills inventory should be housed in a modern software system that is easily searchable to find skill.

The output of this step is a list of the skills that already exist in the organization, which employees possess them and at what proficiency level.

**Step 4** - Conduct a gap analysis of the skills that are required and those which already exist.

The delta between the skills that are needed and the skills that exist is the skills gap.

The output of this step is a list of skills that are a gap.

**Step 5** - Address the skills gaps with learning paths

Build learning curriculums that address these skills gaps.

We see one of tilr's customers in the professional service space do this very effectively. This customer is a recruitment firm. As the recruiters focus on new industries to target for business development, the recruiters need to quickly learn about the industry in order to know their hiring needs, the skills they are looking for, the common language and terminology when prospecting new clients, and so on. This recruitment firm has developed learning paths for each industry that it targets so any recruiter can do a shallow, medium or deep dive into any new industry it works on.

While the above process is known, there are still fundamental challenges with organizations anticipating their future skills requirements.

The first challenge is that there are not enough skills intelligence tools on the market that can support some of the steps outlined above. Step 1, most ideally executed, has a skills intelligence platform that automates this step. This could be done with a platform like tilr that integrates with APIs into project management and sales management tools. Theoretically, tilr could read the pipeline and automatically distill those projects into a skills profile. In this theoretical system, then a system like tilr that already houses the organizational skills inventory could very quickly identify which of those skills already exist in the organization and by whom. It could then do the skills gap analysis and connect the appropriate people to the relevant learning paths. As far as tilr has encountered in the market, such a complete end-to-end system does not exist.

The second challenge is that organizations don't know what they don't know. It is wonderful to anticipate skills based on known projects and targeted prospects. But there are unknown and untrackable forces in the market that impact the skills required from the workforce. For example, the pace in which Open AI entered the market was very swift. Policy changes like banning single use plastic. And environmental changes.

Organizations know that if they had better foresight into the skills they will need, they could do a better job of future-proofing their workforce. Addressing skills gaps today is satisfactory but it's not ideal. The implication of skills gaps can be expensive for organizations. It could mean not closing a sale or a longer software development cycle. Anticipating skills and training for them is a missing piece in the training solutions that organizations have available to them today.

## **Flexible training programs:**

In the context of this report, flexible refers to training programs that encompass all of the following components:

- Bottom up driven by employees
- Top down driven by leadership and managers
- Can be quickly and easily scaled up or down, depending on training requirements
- Draw from a variety of training resources

As the tilr team spoke to a broad spectrum of organizations, this idea of flexible training programs continually emerged. This model informed how tilr's product team built our platform to address these requirements. With unpredictable markets, organizations know that they need to be resilient. Foundational to that resilience is an agile workforce that can quickly be deployed to changing demands. And flexible training programs are core to that.

### **Bottom up:**

It is well documented and known that organizations that invest in employee development benefit from a more engaged workforce with less employee turnover. A 2021 Gallup Survey conducted on behalf of Amazon identified this. "When workers were asked if they would switch to a new job if that new employer offered upskilling opportunities, 48% indicated they are "extremely" or "very" likely to do so. Among those who specifically report being interested in upskilling programs, 69% are "very" or "extremely" likely to leave their job for upskilling opportunities provided by another employer. For workers impacted by COVID-19, 56% say they are likely to switch jobs for an upskilling opportunity, compared with 26% of those not impacted by the pandemic" ("The American Upskilling Study: Empowering Workers for the Jobs of Tomorrow"). According to SHRM Organizations also know that

properly fostering high performers is the key to building a back bench of executive talent. That is why having an employee-driven component to a training program is critical.

Giving employees the tools to identify their skills and the skills they aspire to develop, know the skill requirements of other roles in the organization, maps their career journey, discover and enroll in courses or learning paths of their choice, find relevant mentors, and so on are all a component that should exist in a training program. Employees need the tools and resources to drive their own growth. Otherwise they will go somewhere else that empowers them to do so.

### **Top down:**

Having a leadership driven element to training programs is essential. At the end of the day, a training program with a high return on investment is predicated on employees quickly developing the skills that are most essential to the organization in a cost effective manner. In a model where all learning is employee driven, it can result in employees and organizations growing away from each other because employees are developing the skills that they are passionate about but not the ones that are most critical to the organizations success.

As the tilr team has closely analyzed learning metrics, and discussed these metrics with our employer partners, we have come to appreciate that there will always be a group of employees that only engage in training when it is assigned to them by a leader. For these employees, having a Manager sit down with them and identify a set of training that will help them in their role is effective. It can be a very powerful approach to ensuring employees are acquiring the skills that are most relevant to the organization.

### **Scalable:**

The truth about every organization is that 100% of the organization is not training 100% of the time. Training needs fluctuate with the business. It might be seasonal - summer is a slower time. Or it might be based on market cycles. Training programs need to be able to ramp up and down to address needs. And the scalability should ideally be built into the pricing.

One aspect of tilr's product and pricing model that was successful was our integration with Coursera. Learning management systems like Coursera, Udemy, and LinkedIn Learning require employers to purchase a license per person. This is expensive. And it's wasteful because, again, 100% of employees are not training 100% of the time. tilr's integration with Coursera allowed Leaders and Managers to assign licenses to employees based on their training needs. When an employee completes their courses, that license can be assigned to someone else. The result is a much higher return on investment into learning licenses because those licenses can have 100% utilization over the year term. This is especially attractive to small businesses that don't have the employee count to support purchasing licenses at any scale that would result in reduced pricing.

### **Variety of training resources:**

There is no such thing as a one size fits all approach to training. An organization is composed of teams with a variety of skills. Different skills are better addressed with different training methods. And people have different learning styles. Therefore, organizations need an arsenal of training resources and approaches that can each be deployed appropriately.

The organizations with the most sophisticated training programs know this. Their training programs look something like this: There is an employee driven component and a leadership driven component.

Each department is equipped with learning licenses from different learning management systems whose course catalog has content that is most relevant to their skill set. There are mentorship programs that are employee driven and mentors can be assigned at a leadership level. There is a culture of continuous learning that is so ingrained that it is a feature the talent acquisition team looks for during the hiring process. Metrics are assessed on a variety of levels - individual and team based. Skills gaps are known and investment is made based on the skills gaps that are most detrimental to the organization's growth and success.

By empowering employees to navigate their career trajectories, explore diverse opportunities, and acquire new skills, organizations can unleash the full potential of their workforce. Furthermore, the integration of data-driven insights, employee engagement, and a supportive learning culture can amplify the benefits of talent mobility, resulting in improved productivity, higher retention rates, and a thriving culture of continuous learning. Embracing talent mobility as a fundamental element of human capital management is a forward-thinking approach that will position organizations at the forefront of innovation and adaptability in the years to come.

Our Skills Development Fund project was marked by insightful interactions with over a hundred companies, non-profit organizations, and industry associations spanning diverse sectors. This collaborative endeavour provided us with a privileged glimpse into the training needs of these entities. Moreover, our close partnerships with the employers who embraced the tilr platform allowed us to delve deep into their Human Resources departments, gaining valuable insights into their existing learning and development initiatives and identifying areas of improvement. Through this multifaceted experience, we have gained a unique vantage point that informs the development of effective training solutions poised to sustain and enhance gainful employment opportunities. The culmination of our endeavours has illuminated three overarching domains that underscore the demands of employers from their training solutions: the imperative to foster talent mobility, the need to forecast future skills, and the call for adaptable training programs. As we transition from this project, we are working to build these components into tilr's software platform. We stand poised to contribute significantly to the evolution of workforce development, armed with a comprehensive understanding of the intricacies that drive organizational growth and employee success.

## **Our recommendations for how these needs can be met in Ontario**

This report has laid out a lot of different challenges and gaps that organizations face when it comes to training the labour force. The report has also illustrated how it is not a one-size-fits-all solution for different sectors. Even within the sectors, organizations have their own nuanced needs when it comes to training.

That said, at a broad and Province-wide level, tilr proposes two recommendations for addressing some of the training needs facing our labour force:

1. Fund e-learning for knowledge workers
2. Fund a grant for organizations to implement a "hire and train" model

### **Recommendation #1: Fund e-learning for knowledge workers**

Given tilr's depth of insight and expertise with the knowledge worker sector, we can lay out a recommendation to fund e-learning for knowledge workers. E-learning is the ideal method for delivering training to this sector because knowledge workers are already at a desk with web-based tools and internet connection. This makes accessing electronic training materials seamless. E-learning can be self-driven and self-directed. With Manager input, this can be an ideal way for knowledge workers to learn. The skills gaps that need to be addressed with training are well delivered through e-learning. And with the abundance of materials and catalogs, the content to address the skills needs exist.

The challenge with delivering e-learning at scale is the cost of resources. As referenced earlier in this report, the business model for these learning systems is a license per person. This is simply cost prohibitive, especially for smaller businesses that are in the early scale up or innovation phase of its existence, when skills development requirements could be the greatest. Knowledge workers have different training requirements depending on their area of expertise. If the government can help remove funding as a barrier, we anticipate there would be an increase in the uptake of training.

## **Recommendation #2: Fund a grant for organizations to implement a “hire and train” model**

A “hire and train” model refers to organizations having the tools, resources, and most importantly the wherewithal, to hire candidates that are not a perfect skills match for a role. Once hired, they are trained for the skills gap so that they quickly upskill to have the requisite skills to do the job.

This can be an effective model to address the imbalance between the skills organizations need and the supply of those skills on the market. Skills required of the labour market are changing at a rapid pace. As new skills emerge and the demand for skills change, there will not be a perfect supply of those skills. Employers can react and participate in solving this supply-demand imbalance by being the training providers for these emerging skills.

The “hire and train” model gives organizations access to a wider talent pool, however it is expensive to execute. The costs involved are having the training resources, namely training content, tracking and feedback tools, and peoples' time away from work. A grant could help job seekers access to the workforce while equipping those job seekers with employable, in-demand skills.

## **Our methodology for how we think about career ladders both from an employer and employee/job seeker perspective**

Career ladders are a crucial aspect of an organization's talent development and employee growth strategy. The concept of a career ladder centres around the idea that career progression is not just about moving up the hierarchical ladder but about acquiring and developing specific skills that align with an individual's aspirations and the needs of the company.

At the core of the career ladder system is the skill graph. This graph is a representation of the various skills within the organization and their relationships to each other. It is constructed using market data

and insights gathered from employee profiles, job roles, and industry trends. By mapping out skill relationships, the system gains an understanding of which skills are foundational and lead to other skills, creating a network of interconnected abilities.

One of the significant challenges in constructing the skill graph is dealing with the bidirectional nature of skill relationships. As mentioned earlier, knowing one skill might imply knowing another, but the reverse might not be true. For instance, a person skilled in financial charting is likely to know how to use Excel, but proficiency in Excel does not necessarily mean expertise in financial charting. Accounting for these complex relationships is essential in building accurate and effective career paths.

The career pathing engine utilizes the skill graph to provide personalized recommendations to employees based on their current skills and desired career goals. When an employee expresses interest in career growth or a particular role, the system takes into account various factors to find the optimal path for advancement.

The three primary options for constructing career paths - shortest path, reduced gap, and fastest path - address different aspects of career progression.

- The "shortest path" option minimizes the number of job transitions required, enabling employees to move quickly toward their desired roles.
- The "reduced gap" approach identifies roles that require minimal additional skills, reducing the need for extensive upskilling or training.
- The "fastest path" combines both career opportunities and the urgency of filling vacant positions within the organization. This approach not only benefits the individual employee by facilitating faster career growth but also benefits the organization by addressing critical talent gaps promptly.

When executing a search for an optimal career path, the system considers several parameters to make well-informed recommendations:

- **Current Skill Set:** The system assesses the employee's existing skill set to identify strengths and weaknesses, determining which skills need improvement to progress along the desired career path.
- **Skill Set for Current Role:** Understanding the skills required for the employee's current position provides context for potential lateral moves or vertical advancement within the same domain.

- **Skill Set for Desired Role:** The skill requirements of the target role are crucial in determining the necessary skill development and potential career moves.
- **Aspire Skills:** These are the skills an employee aims to acquire, aligning their personal aspirations with the company's strategic objectives.
- **Company Needs:** Analyzing the skills critical to the organization's success allows the system to recommend career paths that not only benefit the individual but also fulfill the company's talent requirements.

By considering all these factors, the career ladder system offers valuable insights and recommendations, fostering a culture of continuous learning and development within the organization. It helps employees make informed decisions about their career paths while supporting the company's talent management initiatives and ensuring a skilled and motivated workforce.

## Examples of career ladders for the top 10 in demand skills along with specific training Ontarians can use to gain the specified skills

### 1) Career ladder: Data Analytics

**Training offered by:** Google

**Skills:** Data Cleansing, Data Analysis, Data Visualization, Data Collection, SQL, Data Aggregation, R Programming

**Course name:** 8 courses, Google Data Analytics Professional Certificate

1. Foundats: Data, Data, Everywhere
2. Ask Questions to Make Data-Driven Decisions
3. Prepare Data for Exploration
4. Process Data from Dirty to Clean
5. Analyze Data to Answer Questions
6. Share Data Through the Art of Visualization
7. Data Analysis with R Programming
8. Google Data Analytics Capstone: Complete a Case Study

### 2) Career ladder: Sales

**Training offered by:** Hubspot Academy

**Skills:** Sales Management, Sales



**Course name:** 4 courses, Sales Training for High Performing Teams

1. Sales Training: Building Your Sales Career
2. Sales Training: Techniques for Human-Centric Sales Process
3. Sales Training: Sales Team Management
4. Sales Training: Inbound Business Strategy

**3) Career ladder:** Cybersecurity

**Training offered by:** IBM

**Skills:** Cybersecurity, Cyber Attacks, Operating System Security, Database Vulnerabilities

**Course name:** 4 courses, IT Fundamentals for Cybersecurity Specialization

1. Introduction to Cybersecurity Tools & Cyber Attacks
2. Cybersecurity Roles, Processes & Operating System Security
3. Cybersecurity Compliance Framework & System Administration
4. Network Security & Database Vulnerabilities

**4) Career ladder:** Leadership

**Training offered by:** University of Michigan

**Skills:** Vision Alignment, Talent Management, Motivate Employees, Leadership

**Course name:** 5 courses, Leading People and Teams

1. Inspiring and Motivating Individuals
2. Managing Talent
3. Influencing People
4. Leading Teams
5. Leading People and Teams Capstone

**5) Career ladder:** Digital Marketing

**Training offered by:** Meta

**Skills:** Performance Advertising, Digital Marketing, Brand Management, Social Media Marketing, Content Marketing

**Course name:** 6 courses, Meta Social Media Marketing Professional

1. Introduction to Social Media Marketing
2. Social Media Management
3. Fundamentals of Social Media Advertising
4. Advertising with Meta
5. Measure and Optimize Social Media Marketing Campaigns
6. Meta Social Media Marketing Capstone

**6) Career ladder:** Sales

**Training offered by:** Salesforce

**Skills:** Sales Development, Sales, Cold Calling

**Course name:** 5 courses, Salesforce Sales Development Representative Professional Certificate

1. Groundwork for Success in Sales Development
2. Foundations for Interviewing with Confidence
3. Conversational Selling Playbook for SDRs
4. Boosting Productivity through the Tech Stack
5. Practical Guide to Navigating Professional Relationships

**7) Career ladder:** Agile Project Management

**Training offered by:** Learn Quest

**Skills:** Project Management, Agile Methodologies, Scrum

**Course name:** 4 courses, Scrum Master Certification Specialization

1. Introduction to Scrum Master Training
2. Scrum Master Certification: Scrum Methodologies
3. Scrum Master Certification: Scaling Agile and the Team-of-Teams
4. Combining Scrum with Other Agile Methodologies

**8) Career ladder:** User Experience

**Training offered by:** Google

**Skills:** User Experience, User Research, Wireframe, Prototyping, User Experience Design, Mockup, Figma, Usability Testing

**Course name:** 7 courses, Google UX Design Professional Certificate

1. Foundations of User Experience (UX) Design
2. Start the UX Design Process: Empathize, Define, and Ideate
3. Build Wireframes and Low-Fidelity Prototypes
4. Conduct UX Research and Test Early Concepts
5. Create High-Fidelity Designs and Prototypes in Figma
6. Responsive Web Design in Adobe XD
7. Design a User Experience for Social Good & Prepare for Jobs

**9) Career ladder:** Cloud Developer

**Training offered by:** Amazon

**Skills:** Cloud Development, Software Engineering, Amazon Web Services, Serverless Computing

**Course name:** 3 courses, AWS Fundamentals Specialization

1. AWS Cloud Technical Essentials
2. Migrating to the AWS Cloud
3. Architecting Solutions on AWS

## 10) Career ladder: Management

**Training offered by:** University of Illinois

**Skills:** Strategic Management, Negotiation. Leadership, Business Strategy

**Course name:** 7 courses, Strategic Leadership and Management

1. Leading Teams: Developing as a Leader
2. Leading Teams: Building Effective Team Cultures
3. Designing the Organization
4. Managing the Organization
5. Business Strategy
6. Corporate Strategy
7. Strategic Leadership and Management and Capstone

# Recommendations for job seekers/employees looking to gain digital skills as digital acceleration continues to be a large trend

Acquiring and enhancing digital skills has become an imperative for job seekers and employees alike. With the rise of artificial intelligence, automation and machine learning, the labourforce will be increasingly working alongside robots as they conduct their jobs and complete tasks. Digital literacy is a fundamental skill for the labourforce. Here are some recommendations for how job seekers and employers effectively gain digital skills and stay competitive:

- **Online resources:** Through building integrations and partnerships with learning management systems like Coursera, Udemy and Open Sesame, we have come to appreciate the vast landscape of digital e-learning. People can develop a vast degree of skills through these platforms. While cost may be a hindrance, there are free resources. LinkedIn Learning, for example, can be accessed with a library card.
- **Certifications:** Some of these online learning management systems, like Coursera, offer certifications from credible institutions, which are still strong signals to employers of validated skills. We have seen, for example, the Scrum certifications from Scrum Alliance to be very effective for tech leaders.
- **Skill specific platforms:** Our technology platforms want us to increase our digital literacy so they offer skills that are specific to their platforms. Some examples are Codecademy for coding, Hubspot Academy for digital marketing, Google for a variety of digital skills, Webflow University for building a website.
- **Practice:** Contributing to open source communities and initiatives is an excellent way to develop digital skills. A quick Google search of open source project to contribute to quickly reveals

projects that are welcoming input, including all of the different methods and skills that can be contributed to it.

- **Projects:** There are times when learning is best done by doing. For people that best learn this way, taking on a project that enables them to use and develop their skills is a good one. For example, if a person wants to increase their digital literacy skills, they might start a website. Choose a content management system to gain exposure to that. On the website, have a blog and leverage Chat GPT to help write the blog posts. Create a free account on Canva and use it for content creation. Once the main skeleton of the website is standing, that can act as a portfolio to demonstrate validated skills to potential employers.
- **Mentorship and Coaching:** Seek mentorship from experienced professionals in your desired digital field. They can provide guidance, share insights, and offer advice on your skill development journey.

## Explanation of why skill-based strategies are best to power training and how it benefits the company and the employees/job seekers

The first step to approaching this is to define skills management and its advantages. Then to apply that methodology to training to demonstrate how it benefits companies, employees and job seekers alike.

### What is skills management?

Skills management refers to the process of identifying, assessing, developing, and deploying the skills and competencies of an individual or a group of employees within an organization.

Skills management involves monitoring and tracking skill sets, providing training and development opportunities to enhance them, and aligning these skills with the goals and objectives of the organization to optimize productivity and performance.

Skills management is an ongoing and dynamic process that requires continuous evaluation, feedback, and adaptation to changing business needs and individual career goals.

### How does a skills-based strategy power training?

A skills-first approach to managing a learning and development strategy offers organizations a more targeted, strategic, and efficient way to fund building the necessary capabilities for success.

These are some of the benefits:

- **Prioritize training needs** - by identifying the most important skills to the organization and then pinpointing where the gaps exist, organizations can create targeted and personalized training programs to address those skills gaps. They can also address those skills gaps in order of the ones that are most detrimental to the organization. This empowers organizations to be strategic and efficient with their limited training resources. This is the opposite of a traditional model that might take a one-size-fits-all approach.

- **Align individual development with organizational success** - by distilling people and roles into skills, organizations can help and ensure that their employees connect with the training materials that are most relevant for their growth plan. A scenario that organizations are working to avoid is that their employees develop skills that the organization does not need. A skills-based approach enhances alignment between employees, the organization and the growth plans.
- **Greater agility and adaptability** - by operating at the skills level puts organizations and their people in a better position to adapt to market changes. Knowing people's skills and anticipating future skills puts organizations in a position to identify and emphasize the transferable skills and leverage them for talent mobility and reskilling purposes.

## How does a skills-based strategy support job seekers?

Skills-based approaches generally support job seekers, more so than the traditional training models. Firstly, a skills-based approach puts less emphasis on formal education and degrees. Of course, for regulated industries and highly specialized disciplines, formal degrees and certifications are a prerequisite. But organizations are increasingly removing the requirement for a degree from job descriptions because it is exclusionary and limits their recruitment pool. A skills-based approach supports a training program and resources in place for constant skills updating for the employees, including new hires. These approaches lower the barriers of entry for job seekers into roles. It also greatly benefits the entire market by organizations actively participating in educating the workforce and investing in their ongoing skills development.

## How to implement a skills-based training program

Based on our expertise, this is a step by step guide that we have developed for organizations to follow to implement a skills-based approach to training.

### Step 1 - Define organizational goals

Engage with senior leadership and key stakeholders to gain a clear understanding of the organization's strategic goals and objectives. This shouldn't just be an inward exercise. It's also important to evaluate the market and industry landscape, including competitors, and other factors that can influence changes like emerging technologies, policies, etc.

In identifying the key skills the organization will require to achieve its goals and compete, consider both hard/technical skills and soft skills. Also account for the organization's mission, vision, values and align them.

### Step 2 - Build the organizational skills inventory

Create a skills profile for every employee in the organization. This gives organizations a baseline understanding of the skills that exist in its workforce.

### Step 3 - Identify the skills required for roles

Just as every employee has a skills profile, so too should every role. Having a framework for the skills required for each role, agnostic of the employee(s) in that role, paints the bigger picture of the skills that the organization requires. This, together with the skills inventory, serves as the foundation for conducting a skills gap analysis and identifying areas where skill development is needed to align with organizational goals.

#### **Step 4 - Conduct a skills gap analysis**

This is the crux of the training strategy. Because by analyzing the skills gap, properly assessing the severity of it, and its impact on the organization, only then can it be addressed strategically.

A skills gap is the delta between the skills currently available in the workforce and those needed to achieve the organization's goals. This analysis forms the basis for prioritizing skill development initiatives and designing targeted learning programs that address the identified gaps.

First, prioritize the skills gap. This means, evaluate the impact of the skills gap on the organization and the urgency in which it needs to be addressed. That urgency is based on how it is impacting the organization's ability to achieve its goals and be competitive over time. Factors to consider are the criticality of the skills for success, and the availability of external resources or expertise to fill that gap. As well as the potential risks associated with the gaps.

Second, determine the skills development needs for each of the skills gaps. Evaluate the depth and breadth of knowledge and proficiency required for each skill. And identify which training approaches and resources are best suited to address them.

Third, validate the analysis with input from relevant stakeholders such as department heads, team leads and/or subject matter experts. Incorporate their insights to ensure a comprehensive and accurate skills gap analysis.

#### **Step 5 - design training programs**

With those prioritized skills gaps and targeted proficiency required for them, develop personalized learning programs based on the nature of the skills and employees learning preferences.

#### **Step 6 - Provide resources and support**

Allocate the necessary resources to support the training programs. This can mean helping employees to carve out regular slots of time during their work week to engage in training. Invest in appropriate learning technologies, platforms, or tools that enhance the learning experience and facilitate skill development. And provide access to relevant training materials, job aids, or resources that support skill acquisition and practice.

#### **Step 7 - Monitor progress and evaluate impact**

Regularly track the progress of employees' skill development initiatives. Use metrics and key performance indicators to measure the effectiveness of the training programs.

Collect feedback from participants, managers, and other stakeholders to assess the impact of acquired skills on individual and team performance. Analyze the data to identify areas of improvement and make informed decisions for future training initiatives.

#### **Step 8 - Continuously iterate and adapt**

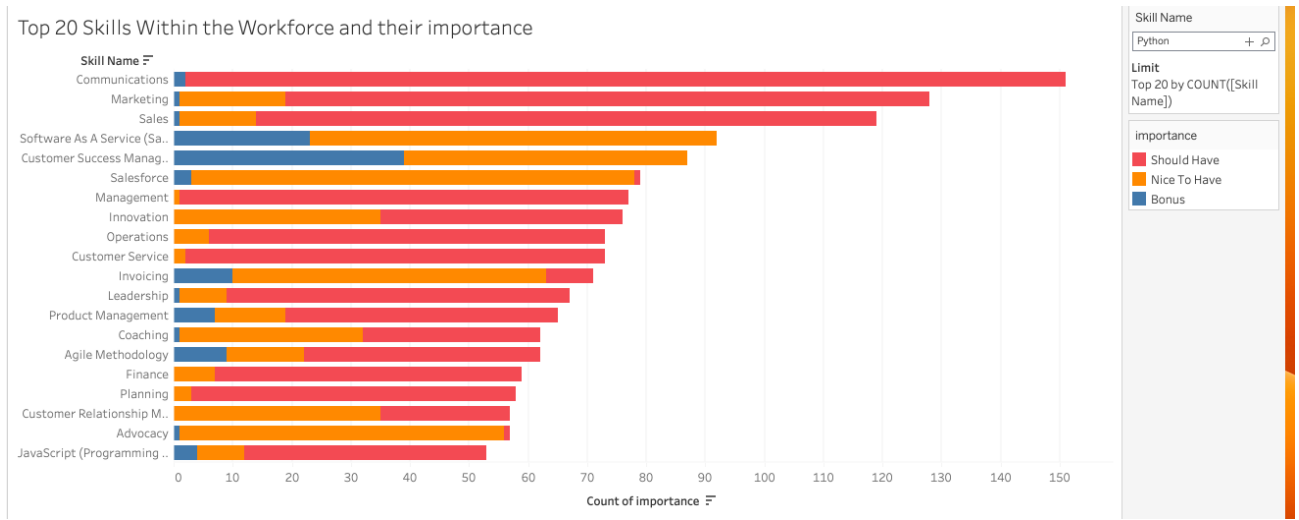
Stay abreast of industry trends and changes to identify emerging skill requirements. Adapt the training strategy as needed to address evolving skill needs and align with changing business priorities. Encourage employees to provide feedback and suggestions for improvement to ensure the strategy remains dynamic and responsive to their needs.

# Data report

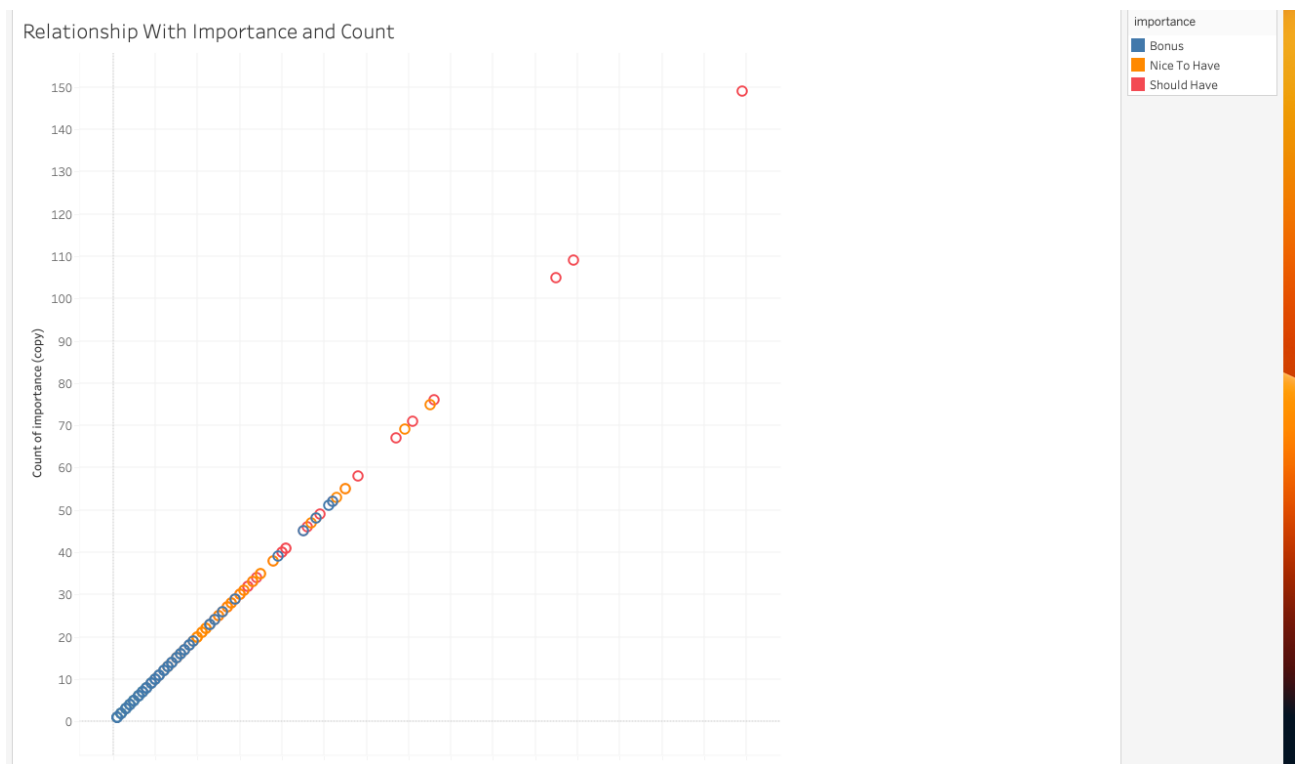
## Demand skills

Demand skills refers to skills that are required by the labour market.

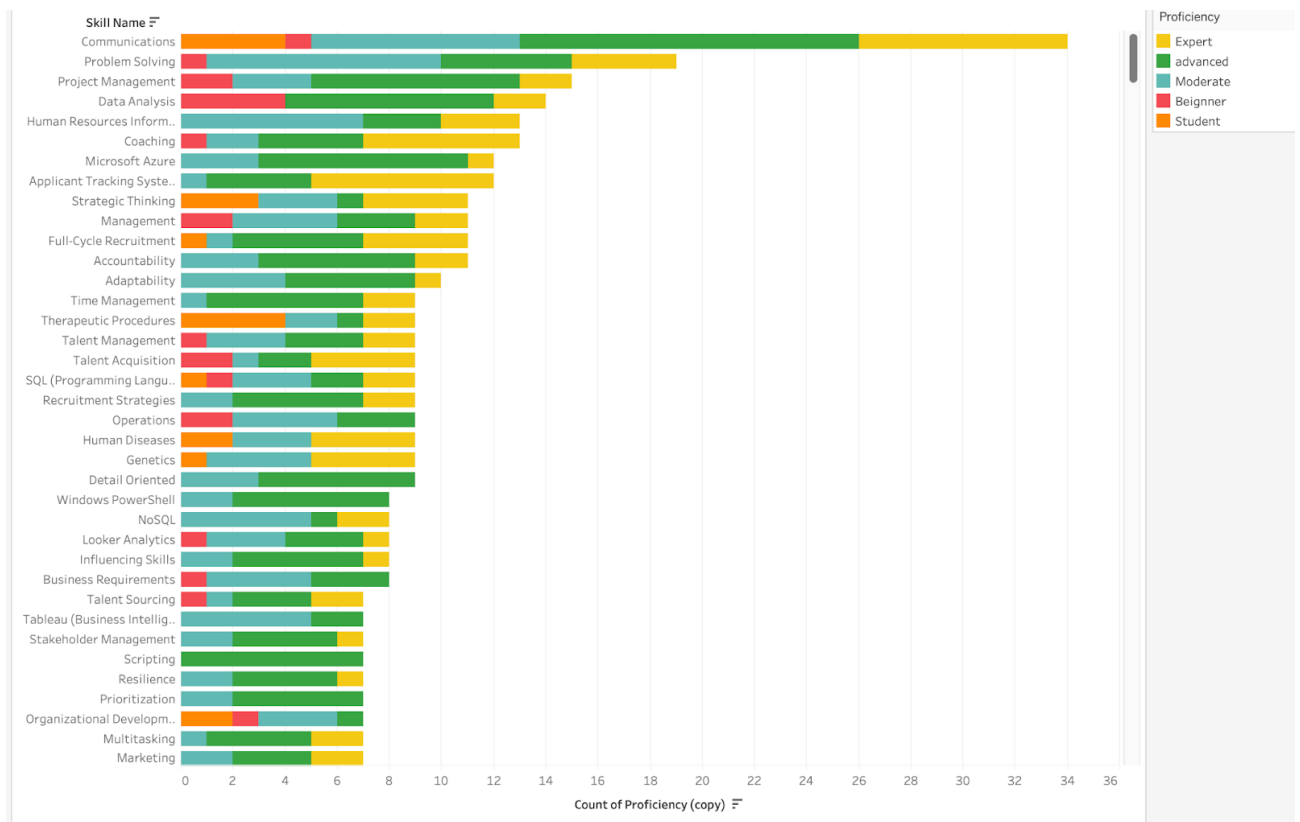
The analysis begins by focusing on the demand side of skills across a variety of roles. The initial graph presents a comprehensive view of the top twenty skills sought after by companies across the Ontario region, along with their respective levels of importance.



The key takeaway from this data is the high correlation between the high demand for a skill and its importance. Noted in the three skills highest in demand - Communications, Marketing and Sales - are also of greatest importance.



Looking at the same data but from the perspective of demand for the skill and its importance (indicated by colour), as the demand for a skill increases, so does its importance.



This graph looks at top 20 skills that are in demand by tilr’s employer partners, and the proficiency level that these employers require for that skill.

tilr uses the following 5 point proficiency scale and definitions to categorize the proficiency of a skill.

1. **Student:** You have studied or trained but yet to use this skill
2. **Beginner:** You have some professional experience but still learning and asking questions
3. **Moderate:** You can operate independently but may require support from time to time
4. **Advanced:** You can confidently execute and understand nuances without support
5. **Expert:** You can coach, mentor, train and unblock others

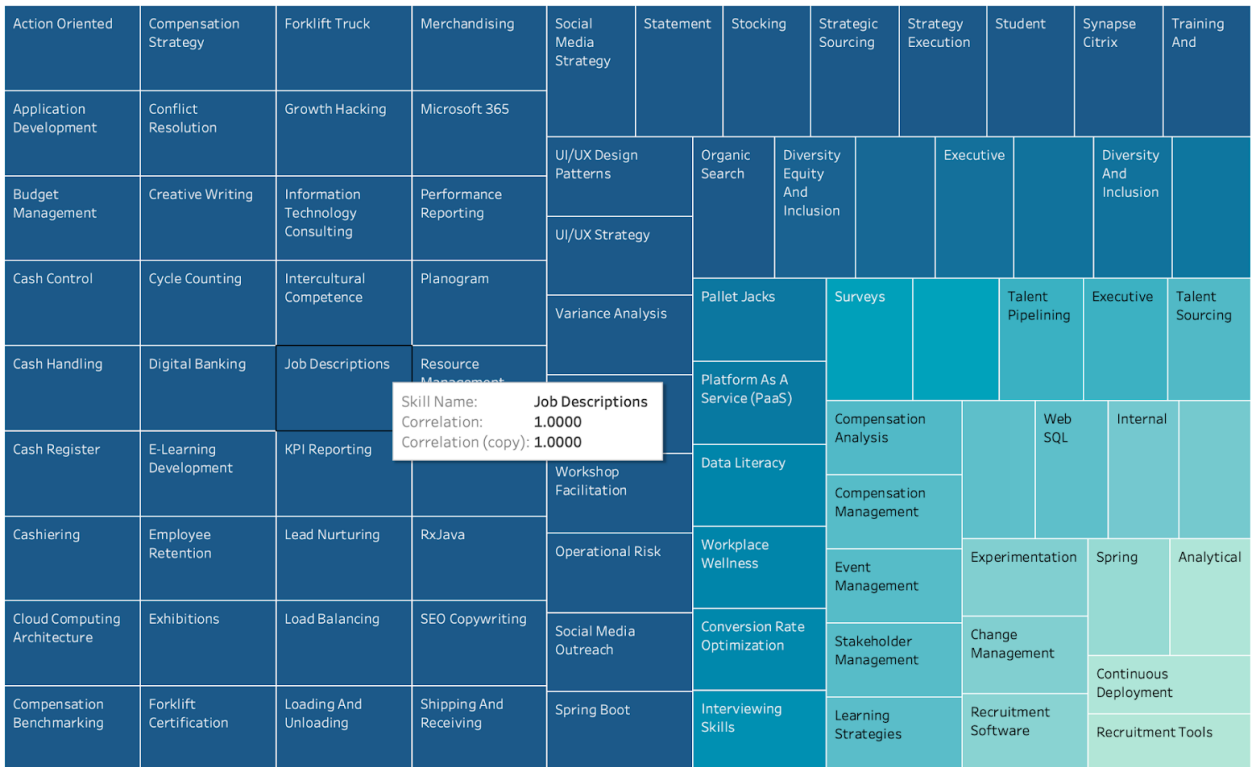
The data reveals a relationship between a skill's importance and the proficiency level required for it.

While there is no clear overall trend across all skills, we noticed strong trend lines at the individual skill level. What we deduce is that a skill can be very important but the proficiency required for that skill varies across organizations. Then, zooming into specific skills, there are noticeable associations between their importance and proficiency levels.

By understanding these skill-specific trends, we can gain valuable insights into talent development



and resource allocation, helping organizations make informed decisions to enhance their workforce's overall proficiency and meet the demands of a dynamic and evolving job market.



This figure is a list of skills that show a very (>.8) relationship between importance and proficiency.

In summary of the demand side of skills, the correlation between "skill importance" and "proficiency levels" in the provided data sets gives us insights into how the perception of skill importance aligns with employees' proficiency levels in those skills. A positive correlation indicates that skills considered more important by employers are also more likely to be mastered by the employees, while a negative correlation would indicate the opposite.

## Supply skills

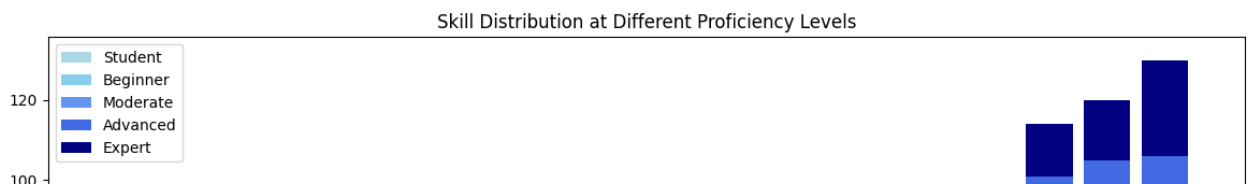
Supply skills refers to the skills the workforce possesses.

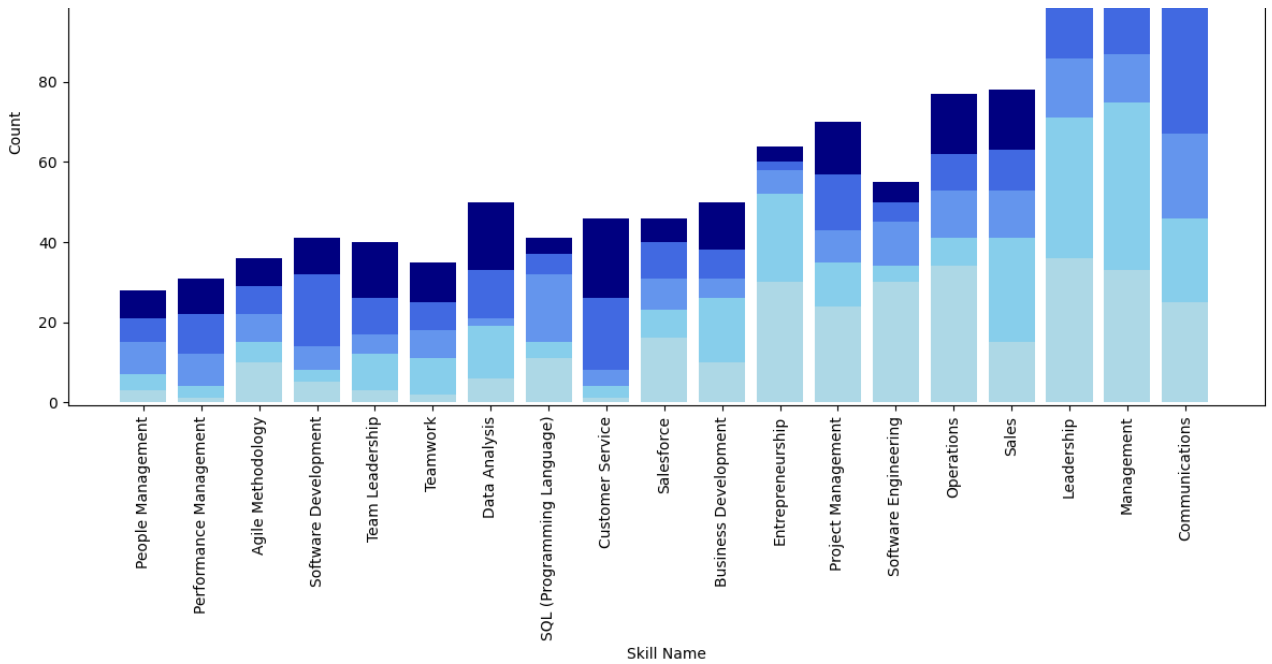
This section will look at the top skills from a supply side perspective.

**Leadership** skills are a clear leader with **Data Analysis** skills tracking closely behind.

### Top skills, overall:

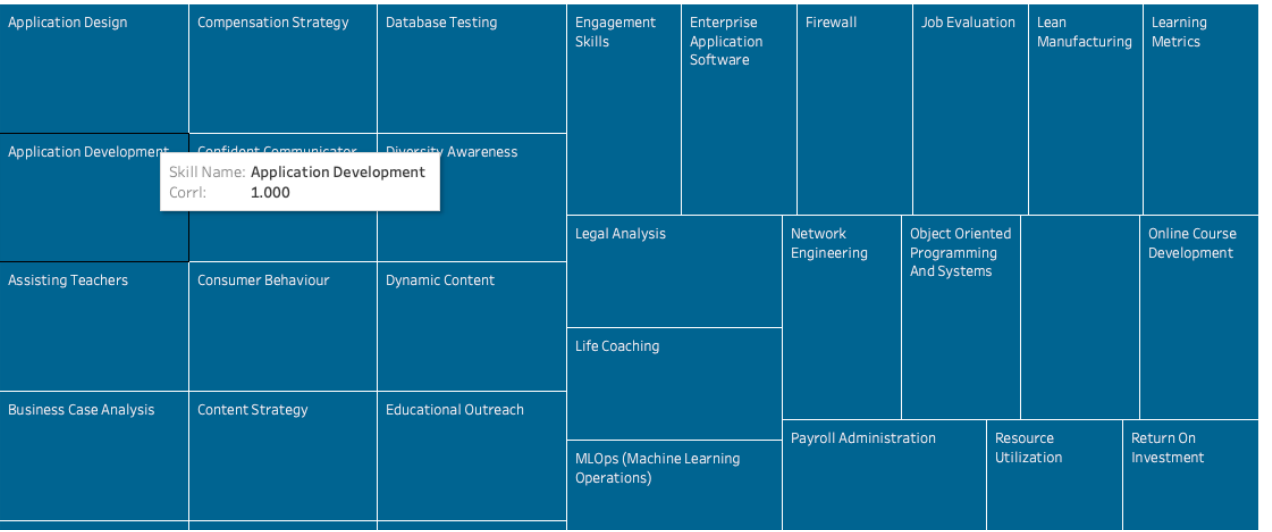
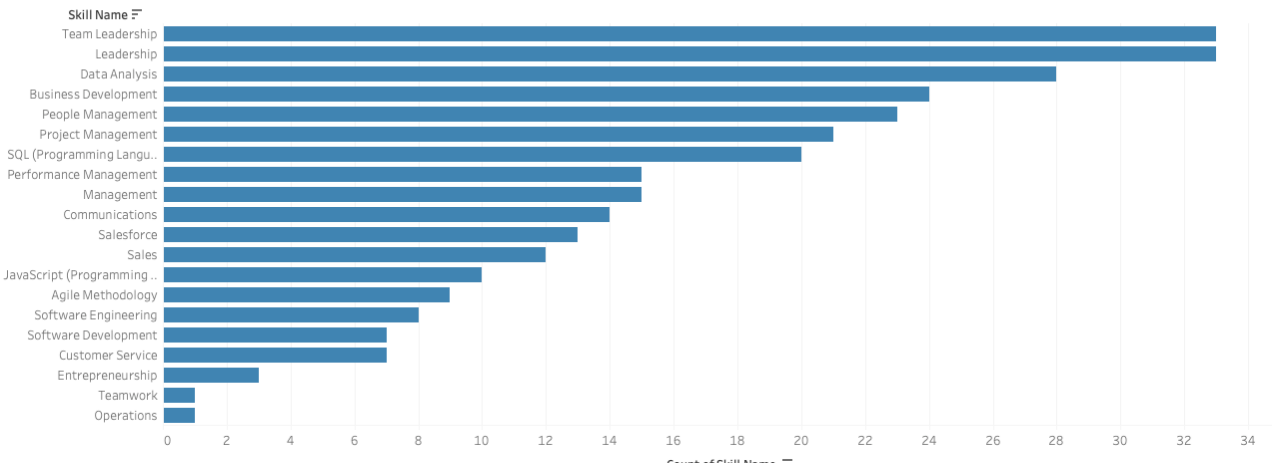
Top skills possessed by tilr's employer partner's employees, including their proficiency levels.





**Top aspire skills:**

Top Aspire skill



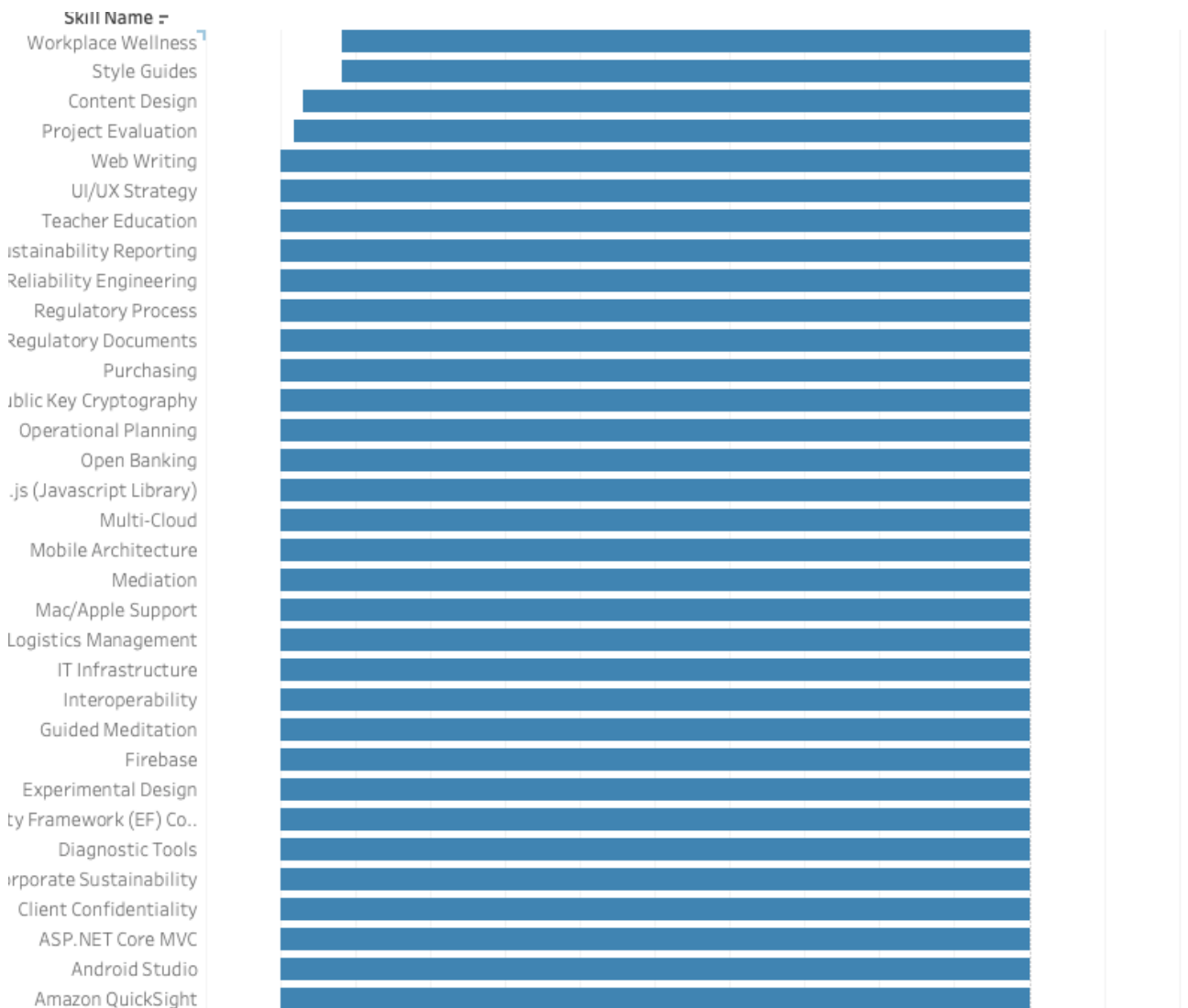
Cash Management	Corporate Governance	Electronic Medical Record	Mobile UX Design	Payroll Practices	Social Entrepreneurship
Collaborative Design	Curriculum Planning	Endpoint Security	Musical Theater	Programming Environments	

tilr analyzed the relationship between passion and proficiency.

tilr hypothesized that if an employee is passionate about a skill then they will possess it at a high level of proficiency.

This hypothesis proved false. We analyzed the broad data and did not find this trend.

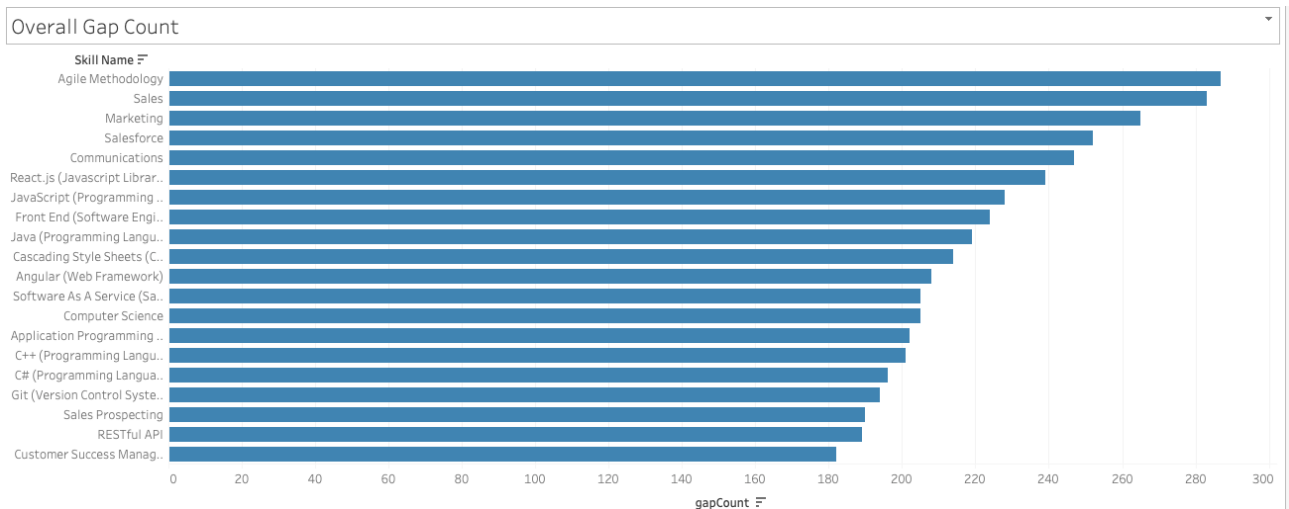
We have compiled a list of the top 40 skills that exhibit a robust correlation. Conversely, we also present a chart showcasing the 20 skills that show no correlation between proficiency and passion. This exploration provides valuable insights into the interplay of personal interest and skill proficiency within the workforce.



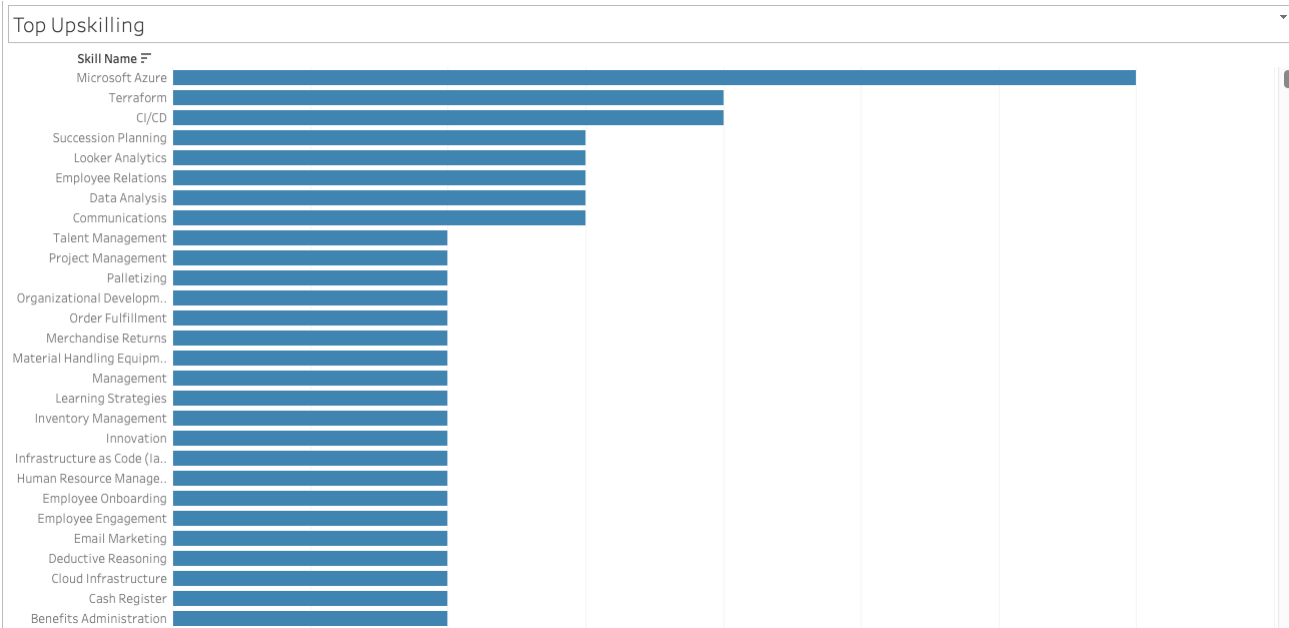
# Gap analysis

A gap is the delta between the skills an the Province needs and the skills that it possesses in its workforce.

Initially, we examine the overall gaps in the skill landscape:

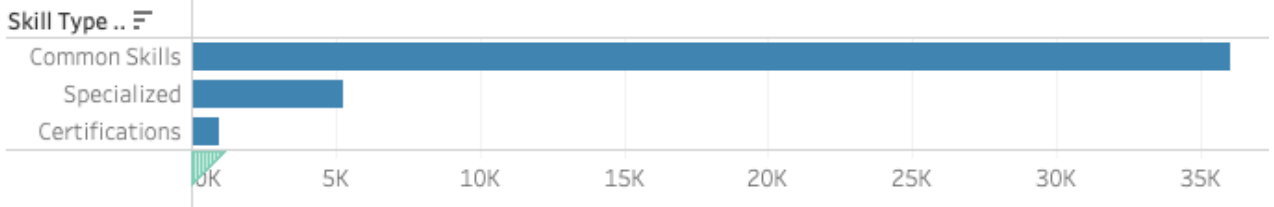


Following the analysis of the overall gaps, the next step involves investigating specific Upskilling opportunities within the workforce.



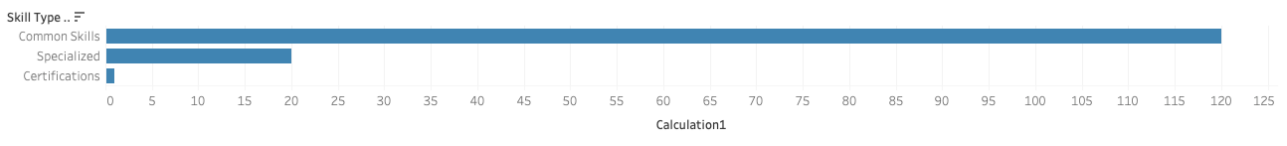
Another significant observation is that common skills are the most prominent in terms of gaps within the workforce. These widely used skills exhibit substantial disparities, indicating the need for targeted efforts to address and bridge these gaps effectively.

## SKILLS By type



The trend of common skills being the most gapped remains consistent even when considering upskilling opportunities. In the context of upskilling, these commonly used skills show notable discrepancies, further highlighting the importance of focused interventions to enhance proficiency in these areas.

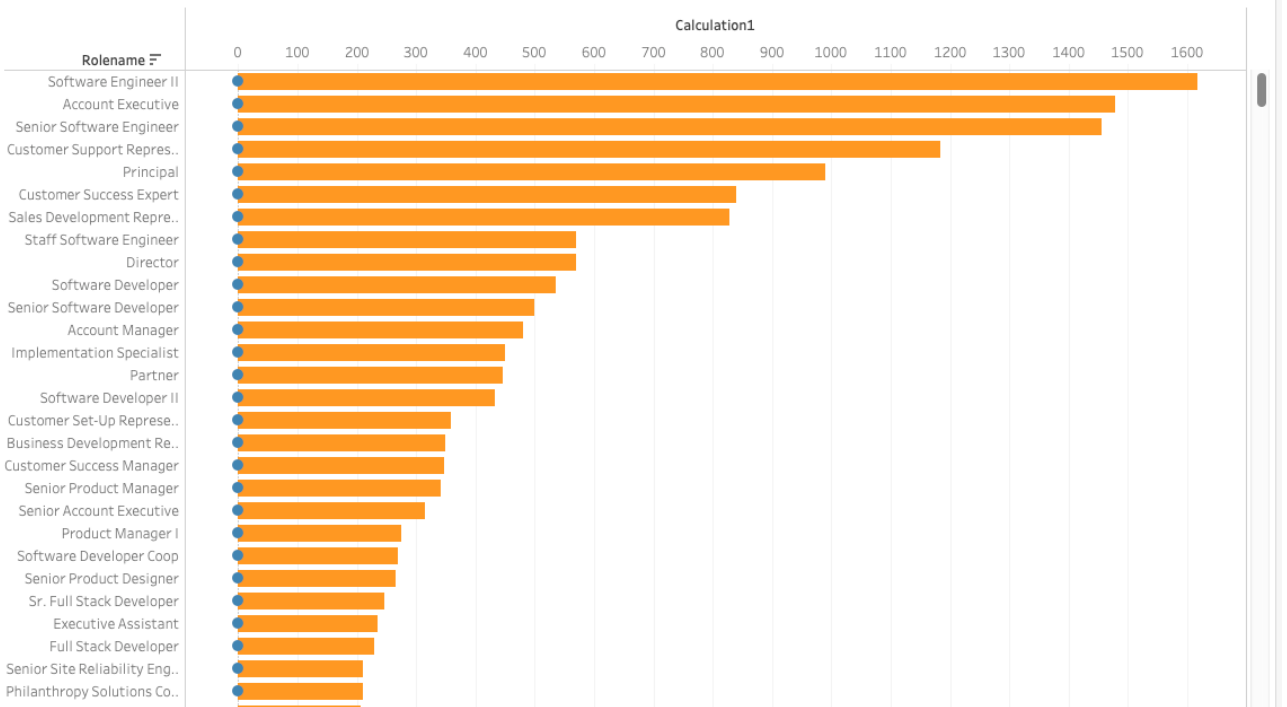
## Skills By type



Finally, these are the top roles with gaps in their required skills.

These roles demonstrate a significant disparity between the skills they demand and the proficiency levels available in the workforce. Identifying and addressing these gaps will be crucial in optimizing workforce capabilities and ensuring the alignment of skill sets with job requirements.

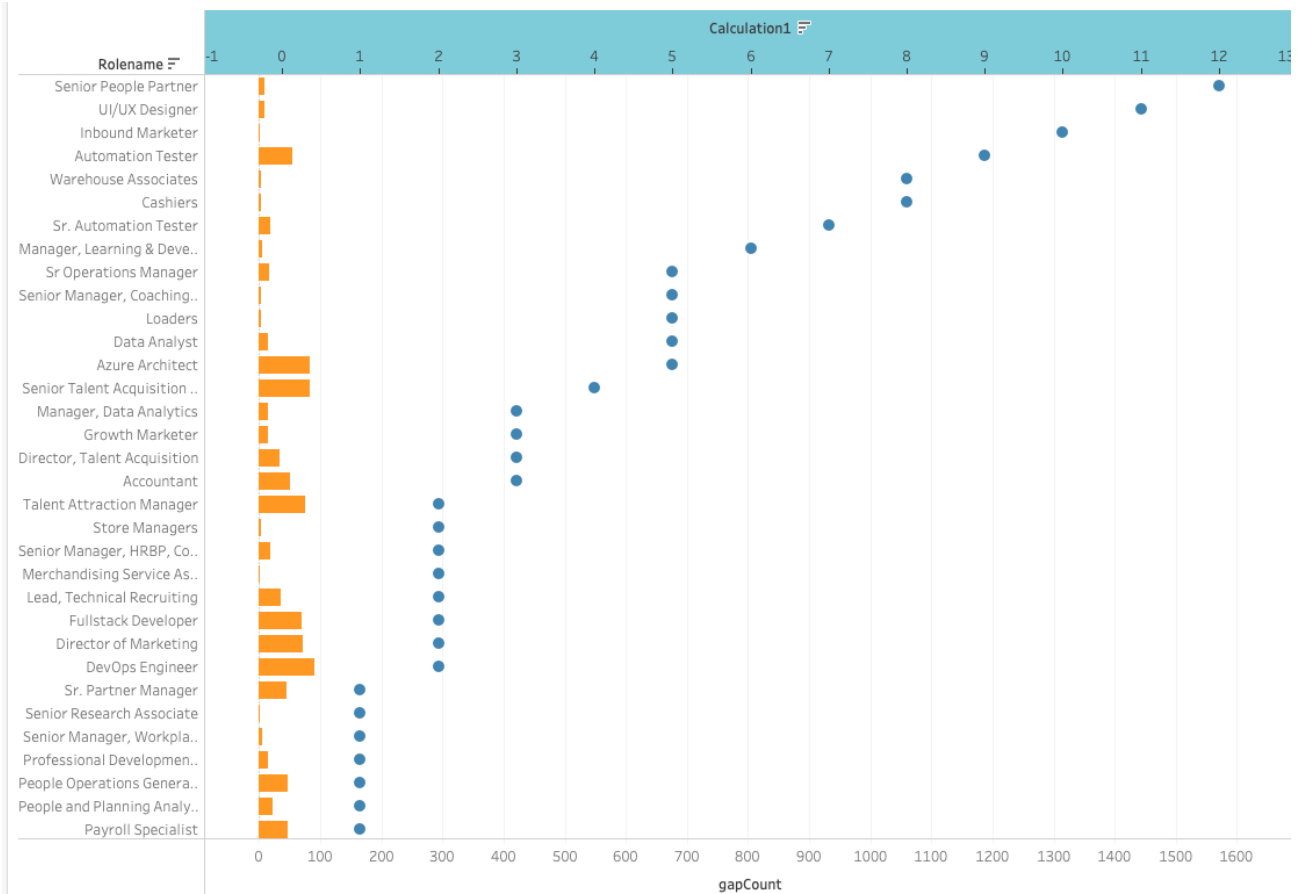
## Gaped Roles



Using the blue dot to represent upskilling opportunities, our analysis reveals an interesting finding: there is no discernible relationship between a skill being gapped and its potential for upskilling. These two aspects appear to be largely independent of each other. This implies that a skill's presence in the gap does not necessarily correlate with its potential for improvement through upskilling initiatives.

The independence between these factors highlights the complexity and multifaceted nature of addressing skill gaps and exploring upskilling possibilities within the workforce.

Moving on to the examination of the top Upskilling roles, we identify the key positions that present significant opportunities for upskilling within the workforce. These roles demonstrate potential for enhancing existing skills, making them a focal point for targeted upskilling efforts to meet the evolving demands of the job market.



The relationship between the top Upskilling roles and the presence of skill gaps does not demonstrate a significant correlation. Similar to the previous observation, the absence of a strong connection suggests that the roles with the most potential for upskilling do not necessarily align with the ones experiencing the most significant skill gaps. This highlights the nuanced and distinct nature of skill development opportunities across different roles within the workforce.

## Recommendations

Based on the data analysis, the following key areas of focus have been identified for upskilling and reskilling campaigns in the province:

Upskilling Program Focus:

- Microsoft Azure
- Terraform
- CI/CD (Continuous Integration/Continuous Deployment)
- Succession Planning
- Looker Analytics

## Reskilling Program Focus:

- Agile Methodology
- Sales
- Marketing
- Salesforce
- Communications
- Reactjs

## Target Roles for the Programs:

- Software Engineer 2
- Account Executive
- Senior Software Engineer
- Customer Support Representative
- Principal (Software)

These insights provide valuable guidance for the province's workforce development initiatives, directing attention toward the most relevant skills and roles to address the evolving demands of the job market.

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