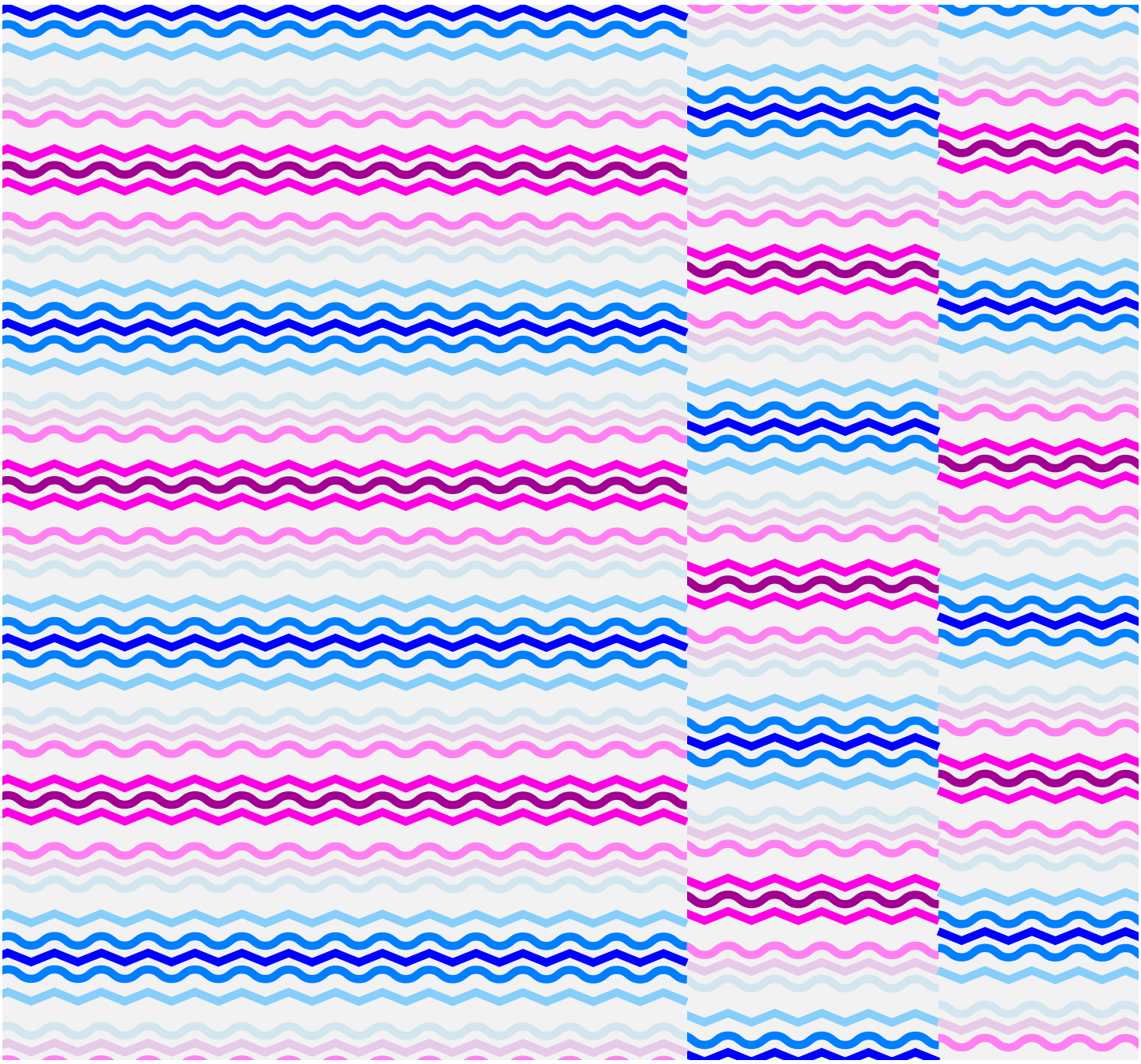


Energy to Digital Growth Education and Upskilling Project (EDGE UP 2.0)

Interim Evidence Report

December 2023

Blueprint

This report was produced as part of a project funded by the Future Skills Centre (FSC), with financial support from the Government of Canada's Future Skills Program.

FSC is a forward-thinking centre for research and collaboration dedicated to preparing Canadians for employment success. We believe Canadians should feel confident about the skills they have to succeed in a changing workforce. As a pan-Canadian community, we are collaborating to rigorously identify, test, measure, and share innovative approaches to assessing and developing the skills Canadians need to thrive in the days and years ahead. The Future Skills Centre was founded by a consortium whose members are Toronto Metropolitan University, Blueprint ADE, and The Conference Board of Canada

Table of Contents

Acknowledgements

About the Future Skills Centre

The Future Skills Centre (FSC) is a forward-thinking centre for research and collaboration dedicated to driving innovation in skills development so that everyone in Canada can be prepared for the future of work. We partner with policymakers, researchers, practitioners, employers and labour, and post-secondary institutions to solve pressing labour market challenges and ensure that everyone can benefit from relevant lifelong learning opportunities. We are founded by a consortium whose members are Toronto Metropolitan University, Blueprint, and The Conference Board of Canada, and are funded by the Government of Canada's Future Skills Program.

Le Centre des Compétences futures (CCF) est un centre de recherche et de collaboration avant-gardiste qui se consacre à l'innovation dans le domaine du développement des compétences afin que toutes les personnes au Canada soient prêtes pour l'avenir du travail. Nous travaillons en partenariat avec des personnes chargées de l'élaboration des politiques, des personnes chargées de la recherche, des spécialistes, des employeurs et des travailleuses et travailleurs, ainsi qu'avec des établissements d'enseignement postsecondaire, afin de résoudre les problèmes urgents du marché du travail et de veiller à ce que chacun puisse bénéficier de possibilités pertinentes d'apprentissage tout au long de la vie. Nous sommes fondés par un consortium dont les membres sont l'Université métropolitaine de Toronto, Blueprint et le Conference Board of Canada, et nous sommes financés par le Programme du Centre des compétences du gouvernement du Canada.

About Blueprint

Blueprint was founded on the simple idea that evidence is a powerful tool for change. We work with policymakers and practitioners to create and use evidence to solve complex policy and program challenges. Our vision is a social policy ecosystem where evidence is used to improve lives, build better systems and policies and drive social change.

Our team brings together a multidisciplinary group of professionals with diverse capabilities in policy research, data analysis, design, evaluation, implementation and knowledge mobilization.

As a consortium partner of the Future Skills Centre, Blueprint works with partners and stakeholders to collaboratively generate and use evidence to help solve pressing future skills challenges.

The opinions and interpretations in this publication are those of the author(s) and do not necessarily reflect those of the Government of Canada.

Preface

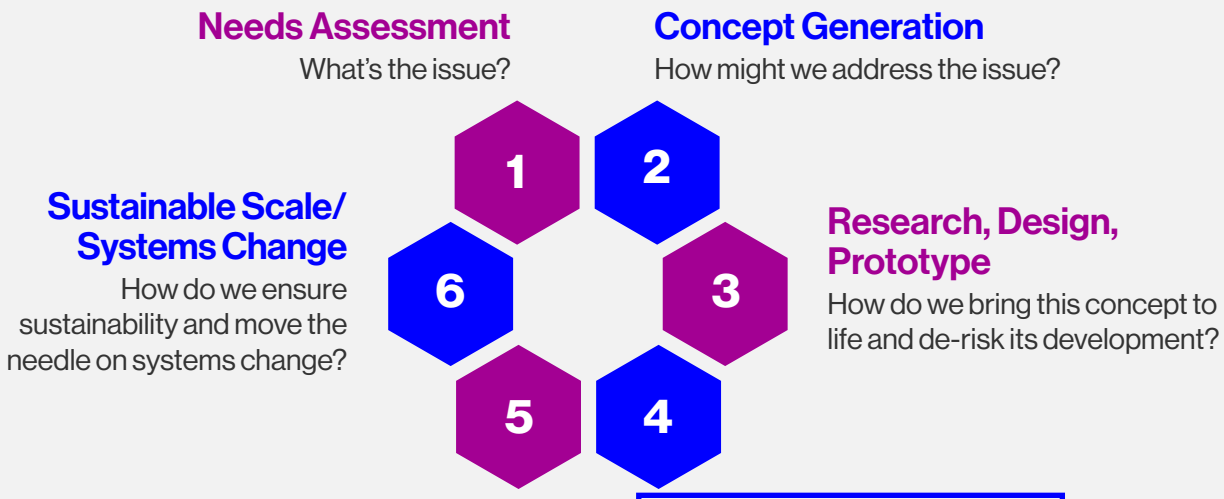
Canada's labour market is rapidly changing. To keep pace with these changes, Canadians need skills development opportunities that respond to demands and apply evidence-informed practices. Many skills development innovations have emerged to meet these needs, but they often face barriers to scaling their interventions beyond a pilot stage.

To address this challenge, the Future Skills Centre (FSC) and Blueprint have launched the Scaling Up Skills Development Portfolio.

In the Scaling Up Skills Development Portfolio, FSC is partnering with ten organizations with promising skills development interventions that have moved toward scaling up their impact. As part of the FSC consortium, Blueprint is working closely with each grantee organization to generate evidence to support their scaling journey. This is an opportunity to disrupt the current "one study at a time" approach to evidence building in favour of continuous evidence generation and program improvement. The hope is that this approach will better produce the quality and quantity of evidence needed to help promising interventions progress in their scaling journey. For more information about Blueprint's approach to scaling, see our Scaling Social Innovation webpage. see our Scaling Social Innovation webpage.

Blueprint's evidence generation approach is aligned with the innovation cycle (**Figure 1**). Our focus for the Scaling Portfolio is to work alongside partner organizations to generate evidence that helps move their interventions through **Stage 4** to **Stage 5** with the ultimate goal of supporting sustainable scale and systems change (**Stage 6**).

Figure 1 | **Innovation Cycle**



About this report

Blueprint is working together with each partner organization in the Scaling Up Skills Development Portfolio to continuously collect and monitor data about their intervention, capturing implementation and participant outcomes along the scaling journey.

This report shares interim findings on EDGE UP, a sector-based training model that supports displaced mid-level oil and gas workers to make career transitions into Calgary's growing IT industry. The model responds to long-term trends in oil and gas, which have seen employment in the sector wane over the past decade—a trend that is likely to continue.

While the purpose of this interim report is to share early insights, it is important to note that the impacts of skills development interventions take time to realize, and interim findings may not yet reflect the intervention's full potential.

This report is organized into seven sections:

- **Section 1: Introduction** (pp. 9-10) provides background on EDGE UP.
- **Section 2: About EDGE UP** (pp. 11-15) of the report presents an introduction to sector-based models and an overview of the program model.
- **Section 3: Changing economic conditions** (pp. 16-17) provides an account of the changing local economic conditions in which the model is being implemented.
- **Section 4: Methodology** (pp. 18-20) shares Blueprint's evidence generation approach and the learning agenda and data sources used in this report.
- **Section 5: Early insights on participant experience** (pp. 21-24) contains early findings on program uptake, satisfaction, and early employment outcomes.
- **Section 6: Early insights on program implementation** (pp. 25-29) discusses some of the learnings from program delivery.
- **Section 7: Concluding thoughts** (pp. 30-31) offers some reflections about the findings and future directions.

Executive Summary

Canada's energy sector is undergoing rapid change. Automated technologies have transformed energy production while climate policies will lead to falling demand over the long-term. Automation and machine learning are projected to displace 30% of Canada's oil and gas workforce by 2040.

In response to the long-term decline in the number of oil and gas jobs, and the outlook for jobs in the future, Calgary Economic Development (CED) saw an opportunity to support career transitions into growing industries. They designed and implemented the Energy to Digital Growth Education and Upskilling Project (EDGE UP), a skills development intervention to help displaced mid-career oil and gas professionals move into new careers in the Calgary's growing IT industry. EDGE UP offers participants technical skills training, internship opportunities and support finding employment.

EDGE UP is a sector-based model, which, through its focus on specific industry sectors, is an appropriate response to changing labour market conditions. These models act as on-ramps to good jobs in growth sectors and create hiring pipelines to help employers meet their skills needs. However, sector-based models are difficult to implement because they are vulnerable to changing labour markets, require strong relationships with industry stakeholders and deep sectoral knowledge, and take time to mature.

CED took on these challenges, and following a successful pilot in 2020, received funding for EDGE UP to be one of ten interventions in FSC and Blueprint's Scaling Up Skills Development Portfolio in 2021.

However, two major events have occurred since the pilot phase which have lessened the demand for EDGE UP specific to displaced oil and gas professionals. First, employment in oil and gas saw a sudden, sharp decline in 2020 due to the Covid-19 pandemic, followed by a significant rebound in 2021. Second, the war in Ukraine has increased global oil prices, bolstering recovery in Alberta's competitive oil and gas sector. These events have increased the availability of mid-level oil and gas jobs, which means that there is less incentive for oil and gas workers to pursue career changes.

While the oil and gas industry is currently going through a recovery period, this is almost certainly a temporary bucking of the longer-term trend towards lower sectoral employment. Demand for EDGE UP is anticipated to increase over time and insights on how to improve the model (and other sector-based models) will be important going forward. To capture these insights, Blueprint worked collaboratively with CED and its EDGE UP partners to generate evidence on program improvement in support of continuous learning. This report shares interim insights from cohort 1 of EDGE UP, which had 119 participants and ran from July 2021 to April 2022.

Key findings

CED and its partners successfully implemented a complex sector-based model.

EDGE UP partners have invested considerable time, energy and creativity in forming new partnerships among a diverse set of organizations, including post-secondary providers and employers, each with their own expertise and ways of operating. Bringing together this coalition to design and deliver a highly complex sector-based model to address a pressing regional economic need is a major achievement. The achievement means that the model has been able to demonstrate proof of concept, with strong early recruitment numbers and positive participant outcomes suggesting EDGE UP has potential, even during difficult labour market conditions.

EDGE UP is reaching its target group and participants are satisfied with the training.

EDGE UP met its recruitment target and 113/119 participants completed the training. A majority of participants were unemployed at intake (89%) and had worked in the oil and gas industry before becoming unemployed (84%). Following the training, nearly 70% of respondents were somewhat satisfied or very satisfied with EDGE UP and nearly 90% found it useful in helping them to prepare for future roles in IT.

Employment rate of EDGE UP participants increases over time.

At the end of the training, only 17% of respondents were employed, but this figure rises to 43% at four months post-training and 63% at nine months post-training.

Economic factors have created challenges for incentivizing and maintaining career transitions.

Increased hiring by oil and gas companies had an impact on participant and employer perceptions of transitioning from oil and gas to IT roles. Some program graduates were hesitant to apply to IT jobs, seeing them as for younger people and being disincentivized by the wage gap between sectors and position levels. A few participants from the first cohort have also left their IT jobs to return to oil and gas, which is not unexpected, but did reinforce existing reluctance among employers to hire program graduates.

Local employers faced barriers to offering IT-related internships.

Internships are an effective way for participants to secure IT jobs, yet only 20% of EDGE UP participants were offered internships (a new element added to the program between the pilot and cohort 1). This difficulty may be attributed to Calgary's IT sector being comprised of mainly small and medium-sized enterprises, who face operational and financial capacity constraints for offering internships while they were scaling their businesses. Beyond the IT sector, there may be a general hesitation among employers to provide internships, as regional comparisons show that Alberta employers are also slower to embrace internships than other provinces.[1]

1 Information and Communications Technology Council. 2023. "Final report: EDGE UP 2.0 scaling opportunity".

The successes of EDGE UP reflect CED's innovative and evidence-informed approach, especially when implementing a sector-based model during a major shift in both the oil and gas industry and the broader labour market. Challenges observed in the delivery of EDGE UP are consistent with those commonly seen in sector-based models. Evidence generation on EDGE UP during a major change in economic conditions provides valuable insights into how workforce development interventions operate in real-world labour market conditions.

Next steps

A final report in 2024 will contain more comprehensive data on employment outcomes, as well as updated information on program uptake, satisfaction and implementation. It will also include findings from the second cohort of EDGE UP, which ran from February 2022 to September 2023 and features new streams for additional IT occupations and a new partner. Future reports from Blueprint and CED will also delve into the noteworthy workforce planning and partnerships that make up the EDGE UP model, expanding beyond participant outcomes to reflect on the cross-sectoral collaboration between industry, social services and post-secondary institutions that makes this intervention promising.

1. Introduction

Canada's energy sector is facing unprecedented changes. Automated technologies have transformed energy production while climate policies will lead to falling demand over the long-term. The oil and gas industry is particularly impacted by these changes: employment in the sector has been falling steadily, with over 30,000 oil and gas jobs lost between 2014-2019 alone.[2] While there has been some recovery since this period, the sector is still facing a net loss, with automation and machine learning projected to displace 30% of Canada's oil and gas workforce by 2040 and automate core competencies and manual and routine jobs across the sector.[3] Displacement rates could be as high as 85-95% for some occupations in the oil and gas industry.[4]

Canada's oil and gas jobs are concentrated in Alberta. The city of Calgary has around 61,000 of these jobs, which represents roughly 26% of the national total.[5] Many of these Calgary jobs are mid-level and management roles. In response to the long-term decline in the number of oil and gas jobs, and the outlook for jobs in the future, Calgary Economic Development (CED) saw an opportunity to support career transitions into growing industries. CED is a non-profit that works with business, government and community partners to attract investment, foster trade and grow Calgary's workforce.

Their plan was ambitious: to design and deliver a sector-based model to help displaced mid-career oil and gas professionals move into new careers in the city's growing digital economy. This type of program was a good fit to meet Calgary's needs because sector-based models provide services to prepare individuals for specific industry sectors. They can be powerful tools to create 'on ramps' into new careers because they are targeted and are typically grounded in a deep understanding of what sector employers are looking for, as well as the needs of employees.

CED took a particularly rigorous, ground-breaking approach to developing their sector-based model. They conducted skills-mapping to ensure a good match between oil and gas workers and their new sector and a needs assessment in collaboration with their program design partner, the Information and Communications Technology Council (ICTC). They found that oil and gas professionals already have many of the skills and competencies required to perform in a range of occupations in Information Technology (IT) and that these IT jobs are in high demand.[6]

2 Stanford, Jim. 2021. "Employment Transitions and the Phase-Out of Fossil Fuels." Centre for the Future of Work. Available at: https://centreforfuturework.ca/wp-content/uploads/2021/01/Employment-Transitions-Report-Final.pdf

3 Mortlock, Lance. 2020. "Rethinking the oil and gas workforce in 2040." EY. Available at: https://www.ey.com/en_ca/oil-gas/rethinking-the-oil-and-gas-workforce-in-2040

4 O'Reailly, Breanne. 2019. "How Automation and Data Analytics Will Affect Jobs in Canada's Energy Industry." CERIC. Available at: https://ceric.ca/2019/02/how-automation-and-data-analytics-will-affect-jobs-in-canadas-energy-industry

5 Mertins-Kirkwood, Hadrian. (2018). "Making decarbonization work for workers." Vol. 12. Canadian Centre for Policy Alternatives.

6 Cutean, Alexander, and Davidson, Robert. 2018. "Mapping Calgary's Digital Future: Tech Employment Opportunities for Displaced Workers." Information and Communications Technology Council (ICTC), Ottawa, Ontario.

Drawing from this work, CED designed the Energy to Digital Growth Education and Upskilling Project (EDGE UP) as a streamlined sector-based training program to fill the remaining skills and knowledge gaps and prepare mid-career oil and gas workers to make this career shift. EDGE UP offers mid-career oil and gas workers technical skills training, internship opportunities and support finding employment. It is a dual-client model: it aims to help mid-career workers transition into new careers while also developing a hiring pipeline for employers in Calgary's IT industry. To align with participant competencies and job availability, EDGE UP's first set of training streams targeted roles in IT project management, data analytics, and software development.

The design of EDGE UP is ambitious. Sector-based models are difficult to implement because they are vulnerable to changing labour markets, require strong relationships with industry stakeholders, particularly employers, and deep sectoral knowledge, and take time to mature. CED not only took on the challenge of designing and implementing a sector-based model, but also doing so for a new target population. EDGE UP participants are workers coming from mid-level, well-paying jobs, which is not the typical target group for sector-based models. As such, there is little evidence to help guide practice in this context.

Following a successful pilot in 2020, EDGE UP was selected as one of ten interventions to form FSC and Blueprint's Scaling Up Skills Development Portfolio in 2021. It was selected because of its potential to meet Canada's pressing skills needs and its feasibility to scale. As part of the Portfolio, CED received funding from FSC to progress EDGE UP in three ways:

1	2	3
Adding an internship component	Delivering five new training streams for additional occupations in IT	Engaging one new post-secondary partner

The first of these scaling activities (the internship component) was implemented for cohort 1 (July 2021 to April 2022), while the other two (new streams and new partner) are being implemented in cohort 2 (February 2022 to September 2023). Adding new streams and partners has made the program more complex but will also allow it to respond to a wider range of participant interests and employer skills needs. See **Appendix A** for an overview of the scaled model being implemented in cohort 2.

2. About EDGE UP

2.1 Sector-based models

Sector-based models provide services to prepare individuals for specific industry sectors. They address the needs of both employers and workers. For employers, sector-based models align training with in-demand occupations by working with stakeholders in a specific sector to identify their skills needs and then to design training that responds to them. For workers, sector-based models try to provide an entry point into 'good quality' jobs in growth industries, which offer decent wages, secure tenure and opportunities for career progress.

Sector-based models typically have some, or all, of the following features:

- Intensive screening of participants pre-enrollment to check for motivation, suitability and readiness
- Sector-specific pre-employment and career readiness services to ensure participants are prepared for employment in the target sector
- Sector-specific occupational skills training to equip participants with skills employers need
- Job development and placement services to help program graduates find jobs in the target sector
- Retention and advancement services to help participants keep their jobs and make career progress

EDGE UP is a sector-based model. It has the first four of the features outlined above and targeted employment in a specific sector (IT) as a key outcome. However, rather than offering an 'on-ramp' into entry-level jobs for un- or underemployed worker with lower levels of education and training like most sector-based models, it helps highly educated, high-income mid-career workers displaced from a sector that is undergoing significant changes.

There is strong evidence to show that sector-based models can be effective at delivering outcomes for workers and employers.[7] However, there is also evidence that shows sector-based models are highly challenging to deliver. They require a broad range of expertise, including how to serve participants with complex needs, how to work with employers, deep industry knowledge, training design and delivery, and cross-organizational collaboration and coordination skills. Implementation of sector-based models can be so complex that even experienced, high-capacity service providers with strong industry relationships take time to reach full delivery maturity.[8]

7 Myers, Karen., Harding, Simon., and Pasolli, Kelly. 2021. "Skills Training That Works: Lessons from Demand-Driven Approaches." IRPP. Available at: https://irpp.org/research-studies/skills-training-that-works-lessons-from-demand-driven-approaches/

8 Hendra, Richard. et al. 2016. "Encouraging Evidence on a Sector-Focused Advancement Strategy Two-Year: Impacts from the WorkAdvance Demonstration." MRDC.

2.2 Building on the sector-based model

CED's motivation for designing and delivering a sector-based model was to help displaced oil and gas workers in Calgary re-engage with in-demand jobs in the economy. As explained more fully in **Section 3**, employment in the oil and gas sector has been falling over the past decade. There are also strong indications that the link between production and employment has been significantly weakened by automation, which means that any increase in oil and gas production will not generate as many jobs as it once did.

CED was aware that many of Calgary's oil and gas sector jobs are mid-level positions, often done by professionals with post-secondary education, and use skills and competencies transferable to roles in other sectors. For example, many management skills can be transferred from one industry to another: a manager in one industry can sometimes move to a similar role in a different industry, if the overlap in skills is big enough. Sensing an opportunity, CED identified IT as a target sector. Calgary's IT industry is expanding and offers good quality jobs with security of tenure, opportunities for career progression and decent salaries (although still lower than most jobs in oil and gas).

Together with its industry partner, ICTC, CED set about assessing the extent to which there was a viable pathway between management roles in oil and gas and those in IT. As part of their needs assessment, they hosted Pivot Tech, an event with more than a thousand oil and gas professionals to gauge their openness to pivoting to tech careers. CED and ICTC also used cutting-edge skills mapping techniques to estimate the skills overlap between management roles in these two sectors. They found that oil and gas professionals already have around 50-60% of the skills needed to do a range of IT occupations.[9] For instance, the average geoscientist has nearly 60% of the core skills and competencies needed to become a data analyst, while the average engineering manager has about half the necessary skills to transition into a project manager role.

Having identified a substantial skills overlap, CED turned to the existing evidence on sector-based models to design a training program to bridge the remaining 40-50%. Because there is little evidence on sector-based models for mid-career professionals or targeting specific sector-to-sector transitions, there was no clear roadmap for CED to follow.

EDGE UP staff must also navigate participant and employer expectations. On the participant side, mid-level oil and gas workers earn more than their counterparts in IT.[10] Moving from an oil and gas job to a comparable role in IT comes with a significant pay cut. CED faces the task of motivating displaced oil and gas workers to embark on career transitions that come without a strong, immediate economic incentive. On the employer side, the longer-term ebbs and flows of the oil and gas sector have led Calgary employers to be wary of hiring oil and gas talent, for fear that they will leave abruptly when the oil and gas economy heats up. This means EDGE UP staff are tasked with convincing employers that highly specialized talent from the oil and gas sector could be well-suited for tech jobs following training.

9 Cutean, Alexander, and Davidson, Robert. 2018. "Mapping Calgary's Digital Future: Tech Employment Opportunities for Displaced Workers." Information and Communications Technology Council (ICTC), Ottawa, Ontario.

10 A survey caried out by ICTC during the research phase found nearly 70% of mid-level oil and gas workers earn more than $81,000 compared to just 47% of mid-level IT workers (Cutean and Davidson, 2018).

In this sense, EDGE UP is breaking new ground. Unlike most sector-based models, which focus on the general question of how to connect workers to better paying jobs, EDGE UP is a highly bespoke instrument designed to respond to a specific local labour market issue. It is an innovative 'made in Calgary' solution to one of the city's pressing labour market issues, that nonetheless offers evidence and lessons for other natural resource reliant regions that are at risk of disruption.

2.3 About the EDGE UP model

CED and ICTC performed rigorous research to understand the need for the EDGE UP model. The research aimed to understand the skills of displaced oil and gas workers, the skills needs of employers in IT, and identify overlaps and gaps. The research then focused on finding strategies to link the two effectively and efficiently.

This research drew on a large-scale survey of local employers, key informant interviews and focus groups with employers, industry associations and displaced oil and gas workers, and data analytics to identify in-demand jobs and the skills needed to perform them. An advisory committee comprising representatives from government, industry associations, economic development agencies, academic institutions and industry validated findings and provided guidance.[11]

Based on the findings from this research phase, CED and ICTC designed the EDGE UP model to help displaced mid-career oil and gas workers move into careers in the IT sector.[12] The diagram below (**Figure 2**) provides an overview of the participant pathway through the model, including its components, the organizations responsible for each component, timelines and target outcomes. More details about the project partners are available in **Box 1**.

Before the full roll-out with cohort 1, the model was piloted. The findings were encouraging: demand for the model was high among displaced oil and gas workers, and participants reported positive experiences in the program. Based on feedback from the pilot phase, CED and its partners added an internship component and modified orientation sessions to add content to ensure participants had realistic expectations about workload, employment opportunities and salaries.

11 Cutean, Alexander, and Davidson, Robert. 2018. "Mapping Calgary's Digital Future: Tech Employment Opportunities for Displaced Workers." Information and Communications Technology Council (ICTC), Ottawa, Ontario.

12 In addition to EDGE UP, CED also used the research findings to develop CalgaryUpskill.ca, a website that demonstrates how oil and gas talent can identify the in-demand tech jobs most closely aligned with their skillsets.

| Box 1 | EDGE UP local and national partner organizations

Program lead

- Calgary Economic Development (CED): CED is a non-profit organization that works with business, government and community partners to position Calgary as the location of choice for attracting business investment, fostering trade and growing Calgary's workforce.

Founding/design partner

- Information and Communications Technology Council (ICTC): ICTC is a non-profit national centre of expertise for the digital economy. ICTC is the trusted source for evidence-based policy advice, forward-looking research and creative capacity building programs for the digital economy.

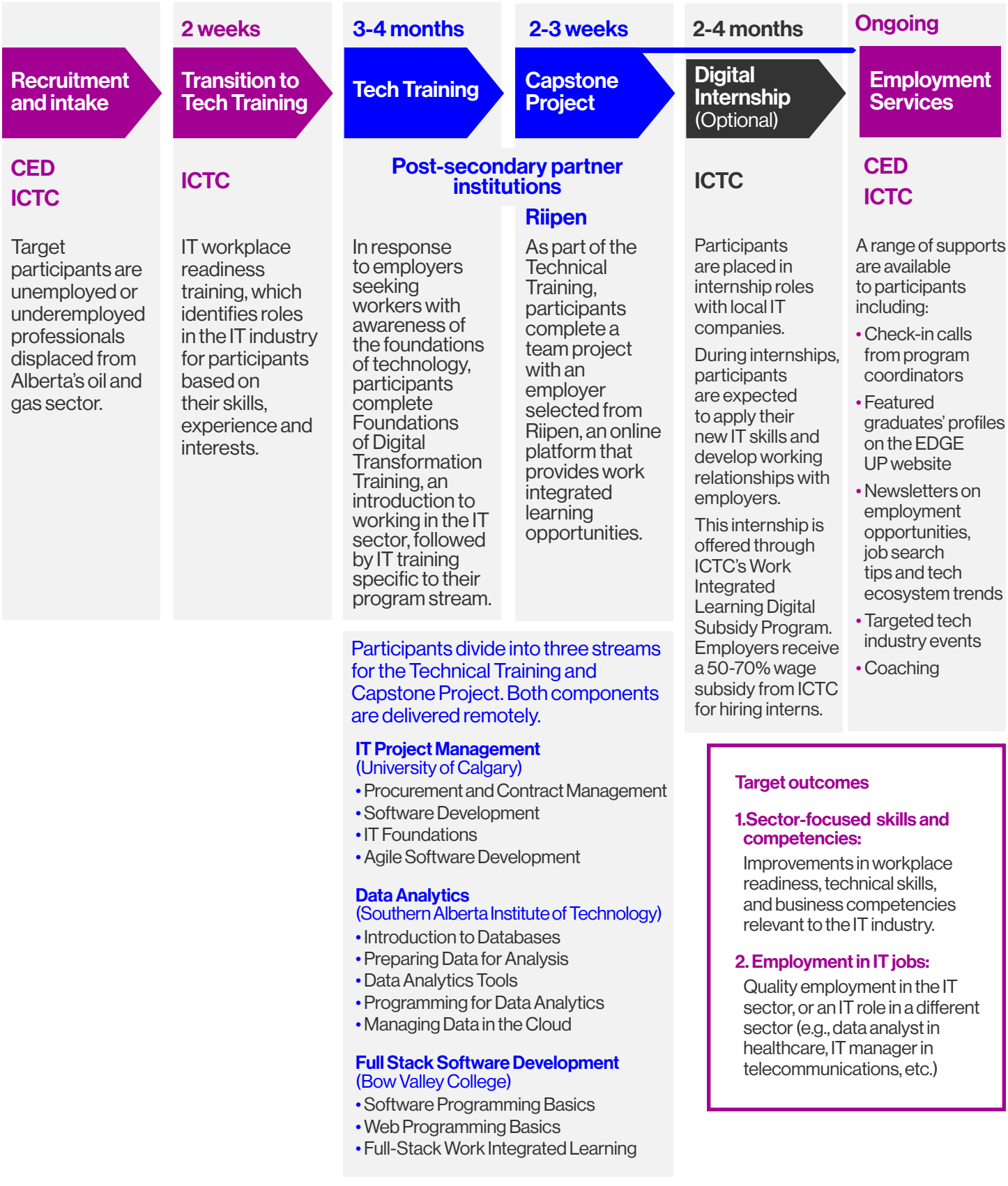
Post-secondary institution training partners

- University of Calgary: University of Calgary Continuing Education delivers *Information Technology Project Management*, designed to introduce participants to a variety of project management tools and techniques for an IT project context.
- Southern Alberta Institute of Technology (SAIT): SAIT delivers Data Analytics, which prepares participants to apply fundamental principles of data analytics to support business decision-making processes, creating accurate and meaningful data to provide actionable insights.
- Bow Valley College: Bow Valley College delivers *Software/Full Stack Development*, where participants develop strong programming skills in both front-end and back-end programming with a strong skill in full stack development.

Capstone Project platform

- Riipen: An experiential learning platform that helps educators, organizations and learners collaborate on real industry projects to bridge the gap between higher education and employment. Both learners/instructors and employers can post about project opportunities that they are seeking or offering.

| Figure 2 | EDGE UP Participant Journey



3. Changing economic conditions

Sector-based models are vulnerable to changes in the labour market. It is not uncommon for labour market conditions to change multiple times between the initial design phase and optimal model delivery where project partners are working together effectively and efficiently to deliver the model.

While labour market conditions are inherently dynamic, the period between 2020-2022 was particularly turbulent and had significant implications for EDGE UP.

CED and ICTC carried out the background research for EDGE UP in 2018-2019. At this point, Canada's oil and gas industry was experiencing a period of decline. Alberta had lost around 20,000 oil and gas jobs in the economic downturn of 2015. Calgary makes up around one-third of Alberta's population, businesses and total employment, so the downturn was "felt deeply" in the city.[13] The research found that some of the highest displacement rates were experienced by professional, mid-career workers, such as engineers and geoscientists.

While oil and gas jobs were in decline in 2018, Calgary's IT sector was growing. Job titles like software developers, data analysts, UX/UI designers, QA testers and full stack developers were in high demand. CED found that a significant proportion of displaced oil and gas workers already had many of the skills needed to perform in these roles. Skills mapping findings showed that oil and gas workers could access these good quality jobs with a short skills training course, and, given the slim chance of finding another job in oil and gas, they had ample incentive to do so. This is evident in the high levels of demand for EDGE UP in the pilot phase (January to July 2020).

However, two major events have occurred since the pilot phase, which have profoundly altered Alberta's economy and labour market:

1. **Oil and gas decline and rebound from the COVID-19 pandemic:** Employment in oil and gas saw a further sudden, sharp decline in 2020 due to the COVID-19 pandemic. Reduced demand for oil and gas and falling prices meant that the industry shed 17,500 jobs in a single year, greatly accelerating the long-term downward trend in sectoral employment. This greatly increased demand for the program during the pilot phase as displaced oil and gas workers sought career changes. However, as demand recovered in 2021, the oil and gas industry began hiring again, adding 14,000 jobs. This has created a rebound in employment in the sector.
2. **War in Ukraine:** The war in Ukraine has increased global oil prices, which makes Alberta's relatively high-cost oil more competitive on the global market. This has worked to further bolster the recovery in the province's oil and gas sector and strengthened the recent upturn in hiring.

The rebound in oil and gas jobs has significant implications for demand for EDGE UP. The availability of mid-level oil and gas jobs means that there is less incentive for oil and gas workers to pursue career changes. By choosing to return to a newly resurgent oil and gas industry, instead of shifting to IT, displaced workers avoid the need to re-train, do not face the disruptions

13 Cutean, Alexander, and Davidson, Robert. 2018. "Mapping Calgary's Digital Future: Tech Employment Opportunities for Displaced Workers." Information and Communications Technology Council (ICTC), Ottawa, Ontario.

involved in a career change and, critically, do not have to accept lower IT salaries. These factors may also incentivise program participants to return to oil and gas once they complete the training. While this will not deter all participants – some oil and gas workers may be motivated to switch industries despite the oil and gas recovery – it is likely to have a dampening impact on recruitment and employment outcomes, at least while the uptick in oil and gas persists.

However, while the oil and gas industry is currently going through a recovery period, this is almost certainly a temporary bucking of the longer-term trend towards lower sectoral employment. Even without the transition to net zero, the oil and gas industry is still moving towards increasing automation and decreasing employment as the industry focuses on cutting costs, repaying debt and producing the same levels of output with increased efficiency.[14] It seems likely, therefore, that the demand for EDGE UP, and its outcomes for participants, could increase over time and more closely resemble the rates seen in the pilot phase.

14 Government of Canada. 2023. "Alberta sector profile: Mining, Quarrying, Oil and Gas." Job Bank. Available at: https://www.jobbank.gc.ca/trend-analysis/job-market-reports/alberta/sectoral-profile-mining-oil-gas

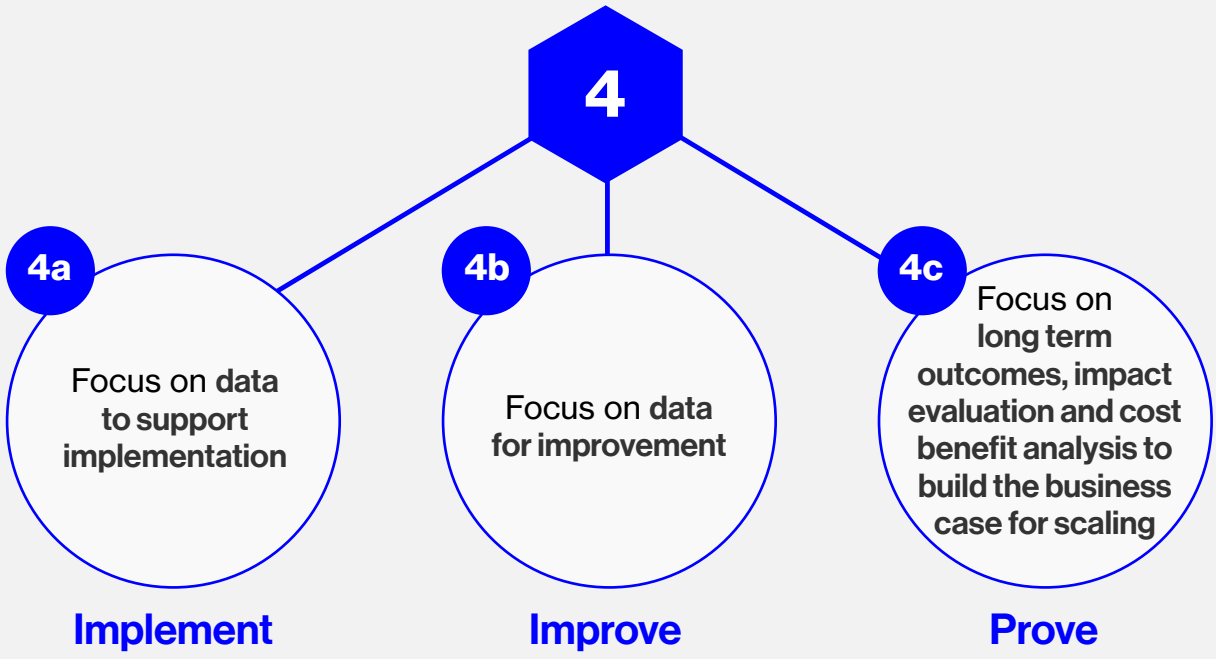
4. Methodology

4.1 Blueprint's evidence generation approach

To support the scaling up of promising interventions, Blueprint developed a novel approach to evidence generation that fits within the stages of the innovation cycle (see above, pg. 18). By understanding an intervention's stage of development, we can determine the most appropriate tools to advance it to the next stage. More details on our evidence generation approach can be found in **Box 5** and the Scaling Design Report.

Like all other interventions in the Portfolio, EDGE UP is in Stage 4 of the innovation cycle, **Delivery and Iteration**. Stage 4 is further broken down into 3 levels of delivery maturity: Implement, Improve and Prove (**Figure 3**). Because EDGE UP has already been delivered and is adding a new component, we categorized it at Stage 4b of the innovation cycle, **Improve**, where evidence generation is focused on data to support continuous improvement. Other sector-based models in the Portfolio are at different stages of maturity and will provide complementary evidence on program improvements and longer-term impact.

| **Figure 3** | **Phases of delivery Maturity**



| Box 2 | Common Outcomes Framework

Our measurement approach includes indicators that are specific to an intervention as well as a set of common indicators that are measured for every intervention in the Portfolio.

These common indicators are drawn from Blueprint's Common Outcomes Framework, which was developed in consultation with our partners and was informed by review of employment-related outcomes frameworks and measurement approaches both within Canada and internationally. They include:

- **Intermediate outcomes** that reflect 'in-program' participant experiences and gains (e.g., program satisfaction and skills development).
- **Long-term outcomes** such as employment and educational attainment.

Using a consistent approach to measuring outcomes is part of our commitment to understanding how each intervention in the Portfolio is reaching people across Canada and allows us to measure long term outcomes using Statistics Canada's Social Data Linking Environment. For more information on Blueprint's Common Outcomes Framework, see **Appendix B**.

4.2 Learning agenda

This report covers the period July 2021 to April 2022, in which the EDGE UP model was delivered to the 119 participants in cohort 1.

We report on two areas:

1. **Participant experience and outcomes:** Who is EDGE UP reaching? Do participants complete the program? Are participants satisfied with the program? What are the employment outcomes for participants?
2. **Program implementation:** What are we learning about successes, challenges and opportunities in program delivery?

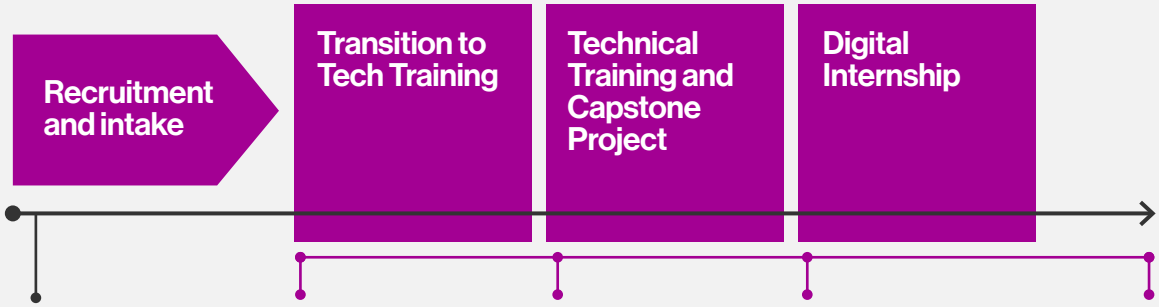
The final report in 2024 will contain more comprehensive data on employment outcomes, as well as updated information on uptake, satisfaction and implementation. It will also include findings from the second cohort, which features new streams and a new partner.

4.3 Data sources

Figure 4 maps the data collection points onto the participant's journey through the EDGE UP program. Sample size decreases over time as not all participants responded to each survey. Due to sample size limitations, we do not present findings by program training stream. Throughout this report, the "Post-Technical Training Survey" refers to the survey administered during the last week of the Capstone Project, which was the final component of the Technical Training.

In addition to participant data collection, Blueprint also carried out interviews with ten staff members from CED and its five partner organizations between June and November 2022.

| Figure 4 | Data Collection Across Participant Journey



Participant administrative data:

Data on program enrollment, dropout, completion and post-training employment status.

N = 119

July 2021 – November 2022

Baseline Survey:

Survey administered by Blueprint during the first week of the Transition to Tech Training to capture participant socio-demographic characteristics.

N = 111

August 2021

Post Technical Training Survey:

Survey administered by Blueprint during the last week of the Technical Training to capture participant program satisfaction.

N= 80

December 2021

4-month follow up:

Surveys administered by Blueprint four months after the Technical Training (i.e., end of the Digital Internship, if applicable) to capture participant program satisfaction and outcomes.

N = 66

April 2022

Participant interviews:

Semi-structured interviews conducted by Blueprint approximately four months after participants completed the Technical Training.

N= 13

May 2022 – August 2022

9-month follow-up survey:

Survey administered by Blueprint nine months after the Technical Training to capture participant program satisfaction and outcomes.

N = 54

September 2022

5. Early insights on participant experience and outcomes

5.1 Program uptake and completion

EDGE UP is meeting its recruitment target, with 119 participants recruited, just one short of its 120-participant target. Overall, EDGE UP appears to be reaching its target population: mid-career professionals displaced from the oil and gas industry.

- **Participants are unemployed at intake:** 89% of participants were unemployed at intake and had been without work for an average of 16 months. This is a significant period of unemployment, as each month after 6 months of being without work drastically affects a person's ability to secure employment. Participants who were employed at intake (11%) were assessed by CED to be working in survival jobs in order to be eligible for the program.
- **Most are mid-career professionals:** 84% of participants had worked in the oil and gas industry before becoming unemployed.[15] 73% of participants were aged over 40 and 91% held a bachelor's degree or above.

In addition, although EDGE UP did not specifically target these groups, 63% of participants were immigrants to Canada. This is unsurprising for two reasons. First, the Canadian oil and gas sector employs a large number of professionals from outside Canada, particularly engineers. Second, as a result of the industry downturn, many recent immigrants with the necessary qualifications had not been able to connect to oil and gas jobs. Additional participant socio-demographics can be found in Appendix C.

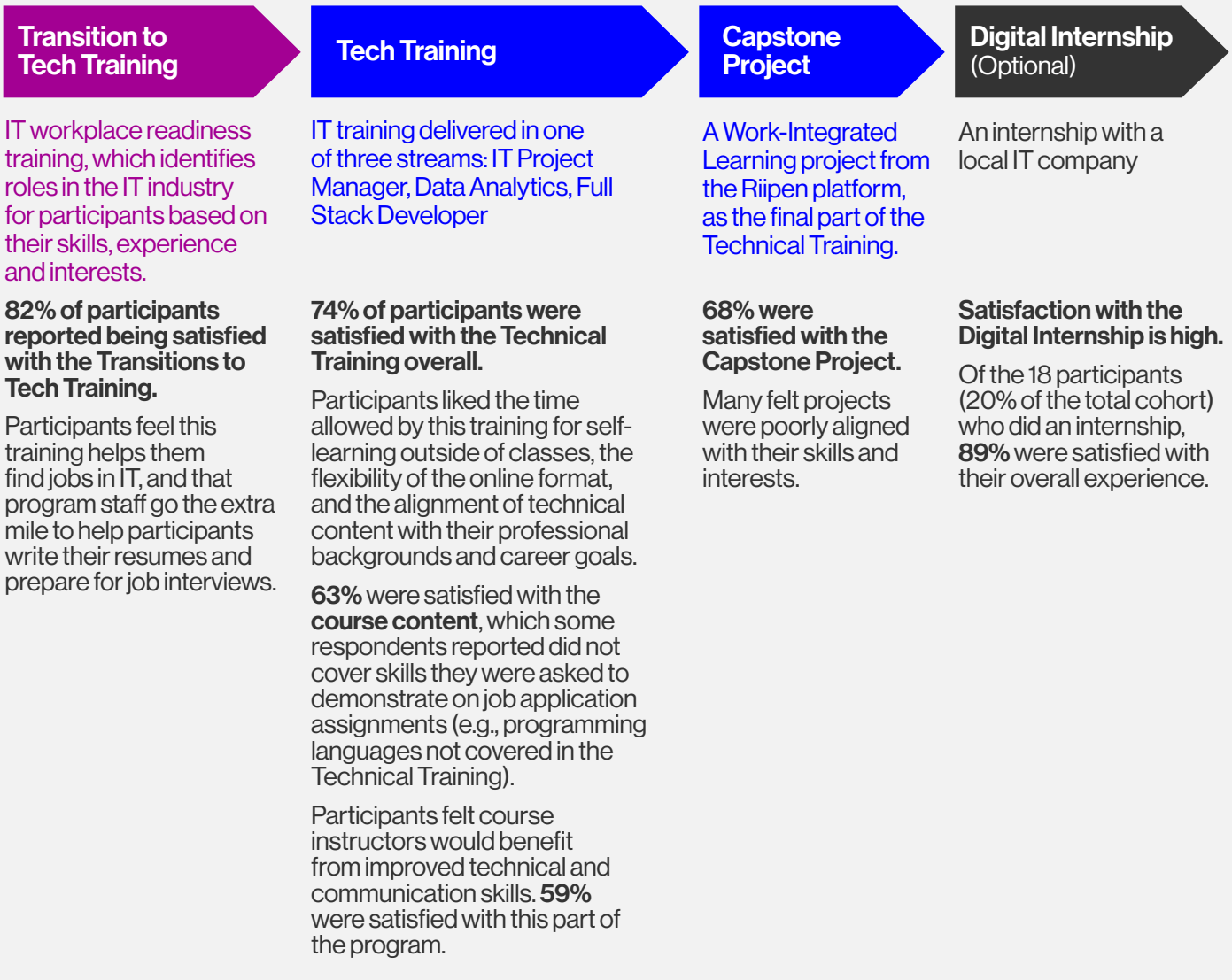
Completion rates were high. Six participants dropped out either before the technical training or during the first few weeks of it, leaving a cohort of 113 participants who completed this component (including the Capstone Project). However, due to difficulties in securing enough internship places, only 20% of participants were able to take up an internship. This is discussed further in the next section on implementation learnings.

15 Participants who reported working in other sectors had been displaced from oil and gas jobs previously, and then found themselves under-employed in or most recently unemployed from other sectors, often in survival jobs.

5.2 Program satisfaction

Early indications show that most participants are satisfied with the program, but there are areas in which their experience could be improved. Figure 5 (below) shows participant satisfaction across four key components of the model as reported in the post-Technical Training survey.

| Figure 3 | Program Satisfaction



Satisfaction rates may change over time. **Table 1** below shows falling satisfaction rates from the completion of Technical Training to the 4-month follow up.

Following the Technical Training, nearly 70% of respondents were somewhat satisfied or very satisfied with EDGE UP and nearly 90% found it useful in helping them to prepare for future roles in IT. The decline could be related to difficulty finding an IT job. Forty-two percent of respondents agreed or strongly agreed that they felt confident about finding an IT job 4-month post-training.

| Table 1 | Program Satisfaction

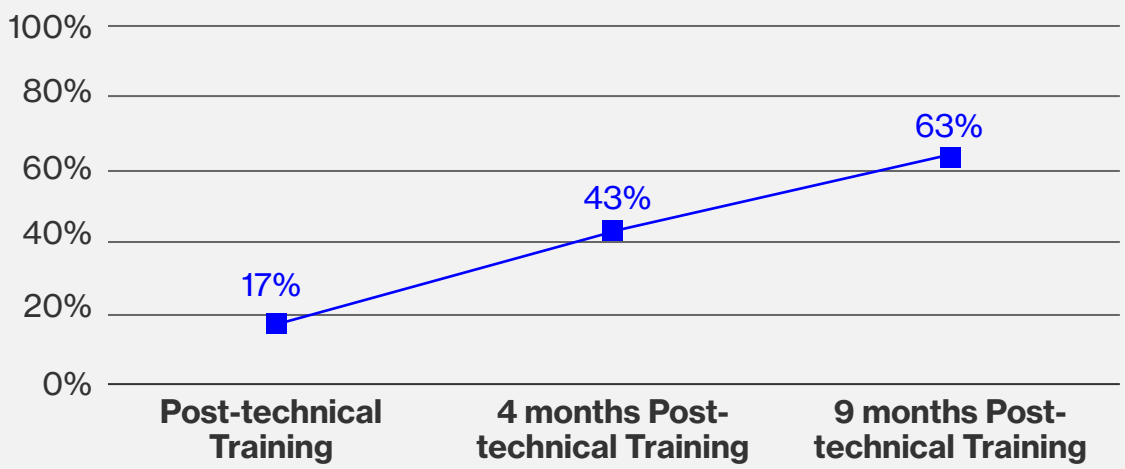
	Post-Technical Training survey At the end of the Technical Training (i.e., post-Capstone Project)	**4-month follow-up survey** 4-months after completion of Technical Training (i.e., post-Capstone Project). At the completion of the internship, if available
	% satisfied	
Somewhat or very satisfied with EDGE UP overall	**69%** (54/78)	**66%** (43/65)
EDGE UP was somewhat or very useful in helping prepare for future employment in a digital/tech role	**87%** (68/78)	**68%** (44/65)
Likely or very likely to recommend EDGE UP or have already recommended it	**82%** (64/78)	**69%** (45/65)
	% agree or strongly agree	
I feel confident about finding an IT related job	N/A	**42%** (27/65)
I feel confident in my ability to carry out duties of an IT related job	N/A	**60%** (39/65)

5.3 Employment outcomes

Early employment outcomes show a mixed picture. While employment outcomes improve over time, only a minority of program graduates had found work in an IT role at the end of the Technical Training (i.e., post-Capstone Project), according to program administrative data.

- **Employment rate increases over time:** After the Technical Training (i.e., post-Capstone Project), program administrative data shows that only 17% of participants were employed. This figure rises to 43% at four months and 63% at nine months (see Figure 6, below).
- **Employed participants are generally satisfied with their jobs:** Rates of satisfaction with jobs and opportunities for career advancement increase slightly over time, while worries about losing new jobs fall (see Table 2, below). However, the small sample sizes restrict the conclusions that can be drawn from this data.

| Figure 3 | Employment Rate Over Time (N=104)[16]



| Table 2 | Job Satisfaction Over TIme

Job Satisfaction (agree or strongly agree)	4-month follow up survey (n=43)	9-month follow up survey (n=37)
Overall, I am satisfied with my job	81%	86%
In my current job, I think I will be able to advance in my career	72%	84%
I worry about losing my job	21%	16%

- **Around one-third of employed participants are working in IT jobs:** In the 9-month follow-up survey, only 35% of employed respondents reported working in an IT role. However, 73% of employed respondents reported using at least some of the skills learned in EDGE UP in their new jobs even if they were not in an IT role.

Overall, these early findings suggest that EDGE UP is broadly reaching its target population and that participants are satisfied with most aspects of their experience in the program, although there are areas for improvement. While employment outcomes improve over time and most employed participants use at least some skills learned in the program, fewer participants than envisioned end up in IT jobs. As these findings are based on relatively small sample sizes, the final report will present a more comprehensive account, including any trends in which participants remain unemployed.

The following section discusses what we are learning so far about implementing EDGE UP.

16 CED reduced the participant administrative number from 119 to 104 to exclude six participants who dropped out of the program within the first six weeks of the Technical Training and nine participants who were not actively looking for jobs after the training (as confirmed through staff reaching out to each participant) despite the employment support provided to them.

6. Early insights on program implementation

This section draws on interviews carried out by Blueprint with ten staff members from CED and its five partner organizations between June and November 2022. The interviews focused on the design and implementation of the program. Additional insights come from our interviews with 13 program participants (May to August 2022). We also draw on our own experiences working in the skills development field to locate EDGE UP's achievements and challenges within the wider context and history of designing and delivering sector-based models. This is particularly useful when determining its successes.

These engagements with program staff and participants identified three key successes and four areas that posed challenges for EDGE UP delivery, as well as opportunities and strategies for improvement:

Successes

1. Partners operate in strong collaboration
2. Model is being fully delivered
3. Model has demonstrated proof of concept

Challenges

1. Changing economic conditions creating low demand for the program
2. Challenges securing enough digital internships
3. Participants feel course content could be better aligned with practical applications
4. Communication issues

6.1 Partners operate in strong collaboration

Delivering a sector-based model requires a range of skills and expertise too broad for a single organization to fulfill. Recognising this, CED and ICTC have invested considerable time, energy and creativity in forming new partnerships with a diverse set of organizations, including post-secondary providers and employers, each with their own expertise and ways of operating. Bringing together this coalition to design and deliver an ambitious, highly complex, 'non-standard' sector-based model to address a pressing regional economic need is a major achievement. We have heard from other grantees in the Scaling Portfolio that coalition building has been a challenging and time-intensive part of their work, where they must navigate differing organizational cultures, goals and motivation.

6.1.2 Model is being fully delivered

Project partners have been able to work together to deliver all components of the model, with the exception of the digital internship, which was only implemented with 20% of participants. This is significant as sector-based models often stretch the abilities of even high-capacity providers and can take years to fully implement. For example, in WorkAdvance, a landmark sector-based demonstration project in the US, it took one year for the large, high-capacity providers to fully implement the model as planned.[17]

Successful implementation means that insights about what works and what needs attention are accumulating and driving continuous improvement. This has been aided by strong early recruitment numbers, which confirm that CED and ICTC had correctly identified a clear opportunity for an intervention in the local labour market.

6.1.3 Model has demonstrated proof of concept

Participant outcomes, at this early stage, suggest the model has potential despite the considerable disruption EDGE UP has experienced. Early findings show that EDGE UP is heading in the right direction. Displaced mid-career oil and gas workers have largely positive experiences in the program and report using many of their new IT skills in subsequent employment. Some program graduates do move into IT jobs, despite a resurgent oil and gas sector. Overall, these early findings show proof of concept during difficult labour market conditions.

6.2 Challenges

6.2.1 Incentivizing and maintaining career transitions

Program staff (from CED and partner organizations) told us that in their view, the recovery in the oil and gas sector has had some impacts on the program. Increased hiring by oil and gas companies has created two broad challenges for EDGE UP:

- **Reluctance to apply to IT jobs:** Staff felt that even those who completed the program were sometimes reluctant to apply for IT jobs, instead choosing to apply to jobs in the oil and gas sector. This reluctance seems to stem in part from the idea that IT jobs are for younger people. It is also a product of the wage gap between IT and oil and gas jobs, especially for individuals transitioning from mid-career to entry-level positions.
- **Job retention:** Staff explained that a few participants left their IT jobs after a short period to return to oil and gas. While this is not unusual, it had an impact on employer perceptions of hiring program graduates. Employers who had graduates leave their roles became more reluctant to hire future graduates because it reinforced existing hesitation about hiring workers transitioning out of oil and gas jobs.

17 Hendra, Richard. et al. 2016. “Encouraging Evidence on a Sector-Focused Advancement Strategy Two-Year: Impacts from the WorkAdvance Demonstration.” MRDC.

In response to the changing economic conditions in Calgary, program staff are conducting ongoing research on the provincial labour market in order to understand these trends in more detail. With a finer-grained picture of local hiring trends, program staff can then go about developing strategies to ensure the model responds to changing circumstances.

6.2.2 Challenges securing enough digital internships

The internship component of EDGE UP is delivered through ICTC's Work Integrated Learning Digital Subsidy Program. The program was only able to offer digital internships to 20% of participants. Program staff are still investigating the causes of this shortfall; however, early indications suggest that it is linked to the characteristics of the IT industry in Calgary.

Calgary's IT industry is growing fast. However, a large number of the city's IT companies are small and medium-sized enterprises, many of them recent start-ups. Program staff reported that this creates several barriers to offering internships:

- **HR capacity:** Many local IT employers do not have the human resources capacity to engage with the program. They do not have sufficient capacity to handle the administration tasks involved in providing an internship.
- **Operational capacity:** Small IT companies are often working at full capacity and do not have the time or resources to provide supervision and instruction to an intern.
- **Finances:** Even with a wage subsidy, few IT employers have the financial resources to provide compensation to an intern.

Internships are an important part of EDGE UP. Nearly 90% of participants who did an internship were satisfied with it, and almost all the internships resulted in a job offer. Participants felt the internships helped them get work experience aligned with their interests and helped them to get a "foot in the door" in the industry. They may also help to counter the idea, expressed by many participants, that IT jobs are for "younger people." Internships may be an effective way to secure IT jobs for participants who are motivated to make a career move into IT, despite the recovery in oil and gas.

In response, CED is pursuing three strategies to increase the number of internships and develop alternatives:

- **Employer symposium:** CED is currently exploring approaches and practices to increase the engagement of local employers. As part of this effort, they hosted a September 2023 symposium for project partners and employers on the topic of employer engagement in Work Integrated Learning. The event helped to identify strategies to increase employer involvement in EDGE UP and increase the number of internships available to participants.

- **Enhanced employment supports:** CED is strengthening its employment supports by organizing monthly networking sessions for program graduates to share success stories, advice and common job search challenges. These sessions will help program graduates who did not receive an internship to find IT jobs.
- **Second Capstone Projects:** Program partners are also considering offering second Capstone Projects to selected participants who do not receive an internship. Participants would receive a stipend to complete this second project. Program staff also reported that more time could be spent on Capstone Projects (extending the timelines from 2-3 weeks to 6-8 weeks) to further enrich practical experience and promote job readiness in lieu of an internship.

6.2.3 Participants feel some course content could be better aligned with practical applications

Program participants identified two areas where course content could be better aligned with the practical opportunities and job search that follow the Technical Training:

- **Capstone Projects:** Instructors identified Capstone Projects through Riipen, by both (a) posting course pages for employers to respond to with project proposals and (b) responding to project postings shared by employers. Using this platform and approach meant that project topics and deliverables were constrained by needing to match with employer needs. Participants reported that the Capstone Projects selected from the Riipen platform did not always align well with their interests and often felt poorly aligned with course content. Program staff reported that there were a limited number of projects on the Riipen platform that aligned well with the training. While some groups were able to do suitable projects, others were left with less well aligned projects.
- **Job application assignments:** Participants felt the course content did not prepare them sufficiently for junior-level job application assignments, which often involved using programming languages not covered in the training.

Both the Capstone Projects and the course content will take a deep knowledge of the IT sector and time to get right. This process will involve continuous learning and improvement in order to pick projects and cover content relevant to changing industry needs. However, a 3–4-month Technical Training course cannot cover all the coding languages and IT skills required by employers across a large city like Calgary. This is not a realistic expectation for any sector-based training model and might be something that could be better communicated to participants in the orientation sessions to better prepare them for the job application process.

6.2.4 Communication issues

The working relationships between partner organizations was generally perceived as smooth. Project partners identified the monthly committee meetings as a valuable space for sharing learnings and communicating updates. However, staff at partner organizations did point to areas for improvement in communication and coordination:

- **Need for more rapid communication channels:** Staff felt the program would benefit from channels that enabled rapid communication outside of the regular monthly committee meetings.
- **Real-time data updates:** Program staff were eager to see ongoing reporting on program data, especially information on participant outcomes like employment.
- **Hesitance to share information:** Some staff reported that partner organizations were sometimes reluctant to share program information due to organizational proprietary concerns.

As a result of these issues, staff reported that group decision-making could be time-consuming. They also reported that a lack of accurate and timely information on program activities may have led some partners to have doubts about the effectiveness of some program components, particularly participant screening. These issues sometimes led to participants receiving inconsistent messaging and confusing information about program content, components and logistics.

These types of communication issues are also keenly felt by many multi-organizational coalitions, particularly among partners who are relatively new to working together. In addition to working with new partners, many of the organizations involved in delivering EDGE UP have little experience working with an online Work Integrated Learning platform (Riipen) to deliver training. Similar coordination and communication issues have been identified as common issues in other skills interventions in FSC's Scaling Up Skills Development Portfolio. Grantees operate within a complex network of funders, service and delivery partners, employers, community organizations and evidence generation partners that requires time and resources to navigate.

7. Concluding thoughts

This interim report has focused on findings from how EDGE UP has been delivered to its first post-pilot cohort of participants. Early indications show that the model is reaching its target group and that participants are generally satisfied with the training, although there are areas for improvement. Employment rates increase over time and many program graduates find employment in jobs where they can apply skills from the program, but currently fewer participants than expected go into IT jobs, likely due to the oil and gas recovery. However, these findings are based on small sample sizes. Evidence from the second cohort (to be presented in the final report) will add further insights and nuance.

The EDGE UP model has been successfully delivered to its first post-pilot cohort of participants with some encouraging early results. Delivery challenges observed are not distinct to EDGE UP but, rather, are part and parcel of scaling an ambitious and innovative model or program. Doing innovative work means being alive to challenges that emerge and responding intelligently. Blueprint is seeing all of the projects in the Scaling Up Skills Development portfolio adjust and course correct as they move towards implementation at a new scale.

At this point, EDGE UP faces two ongoing challenges: 1. it must address implementation issues that may affect its ability to achieve outcomes for participants and employers and; 2. it must also consider how it could adapt to weather the current economic climate, which is reducing demand for the model and incentivizing participants to return to the oil and gas industry. Persistence is important as the oil and gas sector is both volatile and vulnerable to automation, which means that EDGE UP will likely have a role to play once the current upturn passes.

EDGE UP and its partner organizations are already building on strengths and addressing design and implementation challenges through continuous improvement cycles. They are also actively striving to better understand changing dynamics in the wider economic context and working to increase the number of internship placements available. By continuously refining the model, EDGE UP partner organizations are iterating towards an efficient and effective pathway into IT for displaced oil and gas workers seeking a career change.

Workforce development organizations like CED and sector councils like ICTC, can be highly effective partners in delivering services to help workers transition careers. However, no organization can reliably predict and plan for large-scale, external shocks to the economy and labour market. Their only realistic course of action is to identify implications of these broader shifts as early as possible and proactively work to mitigate their impacts.

Reacting to the wider economic context will require strategic thinking, foresight tools and real-time Labour Market Information analysis and skills demand forecasts. While the current oil recovery is unlikely to persist long-term, it will continue to dampen demand for the model and

supress outcomes for the next cohort and beyond. In response, the EDGE UP team is considering how to better position the model given the changing context. This could involve revisiting some of the initial assumptions about who the model targets: for example, could participants from outside the oil and gas industry be eligible, providing they can demonstrate the necessary skillsets through, work experience, skills assessments, and/or credentials?

The question of how to pivot in the face of economic disruption is likely to be a focus for many sector-based models spanning the COVID-19 pandemic and post-pandemic recovery. The pandemic caused a range of economic impacts: some sectors grew rapidly, often contracting post-pandemic, while others went into an initial rapid decline, before rebounding sharply. Some remained stable but were transformed (e.g., more online delivery). Evidence on how sectoral models adapt will be useful as the pace of economic change quickens: what do successful pivots look like? And what common features do they have? In the future, CED will be focusing on identifying core in-demand competencies that will allow its workforce to be more agile and better able to adapt to economic shifts in its increasingly diversified economy.

EDGE UP has achieved some early successes against a background of serious disruption. These include successfully bringing together a powerful coalition of partners, delivering a challenging and innovative model, and starting to produce somewhat promising outcomes for participants. This is a considerable set of achievements, and because of this project's inclusion in the Scaling Up Skills Portfolio, we are able to learn from these successes and think about how to replicate them.

The final report, expected in 2024, will offer more details on longer-term outcomes for participants and overall program effectiveness. It will also include scaling insights relating to the addition of the five new training streams and one new post-secondary partner (see Appendix A for an overview of the scaled model implemented for cohort 2). The report will also delve into the noteworthy workforce planning and partnerships that make up the EDGE UP model, reflecting on the cross-sectoral collaboration between industry, social services and post-secondary institutions that makes this intervention promising.

Appendix A

The scaled-up EDGE UP model

Cohort 2 (target n=200) will have a choice of eight training streams delivered by four post-secondary institutions.

The three streams delivered to cohort 1 are coloured blue.

Post-secondary partner	Streams delivered	Course content
University of Calgary	IT Project Management	Procurement and Contract Management Software Development Foundations Agile Software Development IT Foundations + A range of soft and management Skills
	Product Manager with Specialization in Digital Product Marketing	Product Management Digital Marketing Marketing Fundamentals Essential Soft Skills/Business Skills Project Management Information Systems
Southern Alberta Institute of Design	Data Analytics	Introduction to Databases Preparing Data for Analysis Data Analytics Tools Programming for Data Analytics Managing Data in the Cloud Professional & Leadership Skill Development
	Cyber Security for Today's World	Network Security Protocols Programming Foundations for Cybersecurity Security Tools Enterprise Network Security Cybersecurity Frameworks Risk Identification and Management Vulnerability, Threats and Attacks Cyberspace and Cyber Domain
	Data Analytics with Cleantech Foundations	Data Literacy Business Context for Data Analysis Data Visualization and Reporting Tools Programming for Data Analytics Data in the Cloud Professional and leadership skills sessions Innovative cleantech industry presentations with ARIS experts

Post-secondary partner	Streams delivered	Course content
Bow Valley College	Full-Stack Software Development	Software Programming Basics Web Programming Basics Full-Stack Work Integrated Learning
	IT Network Management	Introduction to Networks Switching Routing and Wireless Essentials Enterprise Networking, Security and Automation
Mount Royal University	AWS Cloud Computing	Cloud Foundations AWS Core Services

Appendix B

Common Outcomes Framework

	Outcome	Indicators
Socio-demographics	Sex & Gender	Sex at birth
		Self-identified gender
	Age	Age
	Location	Province
		Region & Municipality
	Marital status	Marital status
	Children & Dependents	Children Dependents Household size
	Household Income	Household income
	Education	Highest credential obtained
		Location of highest credential attainment
	Indigenous Identity	Self-identified Indigenous identity
	Francophone status & languages spoken	First language spoken
		Official languages
		Language spoken at home
		Other languages spoken (At home)
	Citizenship Status	Place of birth
		Year of arrival
		Citizenship status
	Racial identity	Self-identification as member of racialized group
	Disability	Self-identified disability

	Outcome	Indicators
Employment status and history	Employment	Employment status
		Nature of employment (permanent, temporary, full/ part-time)
	Earnings	Hours worked / week
		Wages
		Annual earnings
	Industry and occupation of employment	NAICS code of job
		NOC code of job
	Work history	Time since last employed
		NOC code of job
		NAICS code of job
	Income source	Income sources
Intermediate outcomes	Program completion	Successful completion of planned activities
	Participant satisfaction	Satisfaction with program
		Perceived Utility of Program
		Likelihood to recommend
Customized intermediate outcomes	Skills gains	Measured gains in specific skills
	Program-specific credential attainment	Attainment of program-specific credentials

Appendix C

Participant socio-demographic characteristics

Participant Socio-Demographics		Data Analytics	Full-Stack Software Development	IT Project Management	TOTAL
No. of Respondents to Baseline Survey		44	33	34	**111**
Gender	Woman	30% (13/44)	30% (10/33)	19% (6/32)	**27% (29/109)**
	Man	70% (31/44)	70% (23/33)	81% (26/32)	**73% (80/109)**
Age	Under 40	29% (12/42)	34% (11/32)	19% (5/27)	**28% (28/101)**
	40-49	50% (21/42)	38% (12/32)	41% (11/27)	**44% (44/101)**
	50+	21% (9/42)	28% (9/32)	41% (11/27)	**29% (29/101)**
	Average age	44	44	49	**45**
Highest level of education	Below Bachelor's level	5% (2/44)	12% (4/33)	12% (4/33)	**9% (10/110)**
	Bachelor's level	43% (19/44)	61% (20/33)	64% (21/33)	**55% (60/110)**
	Above Bachelor's level	52% (23/44)	27% (9/33)	24% (8/33)	**36% (40/110)**
Racialized		36% (16/44)	42% (14/33)	28% (9/32)	**36% (39/109)**
Immigrant		58% (25/43)	61% (20/33)	73% (24/33)	**63% (69/109)**
(Among immigrants) Newcomer		16% (4/25)	20% (4/20)	9% (2/23)	**15% (10/68)**
Unemployed at intake		84% (37/44)	85% (28/33)	100% (33/33)	**89% (98/110)**
Industry of last employment	Oil and gas	81% (30/37)	82% (23/28)	88% (28/32)	**84% (81/97)**
	Other	19% (7/37)	18% (5/28)	13% (4/32)	**16% (16/97)**
Length of last employment	0 – 2 years	50% (18/36)	39% (10/26)	26% (8/31)	**39% (36/92)**
	More than 2 years	50% (18/36)	62% (16/26)	74% (23/31)	**61% (56/92)**
	Average years	5.4	5.2	7.1	**5.8**
Time since last employment	0 – 12 months	46% (17/37)	46% (13/28)	53% (16/30)	**49% (46/94)**
	More than 12 months	54% (20/37)	54% (15/28)	47% (14/30)	**51% (48/94)**
	Average months	17	20	11	**16**

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