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Report

Upskilling in Newfoundland and Labrador
An Oil and Gas Perspective

Workforce Upskilling Study for techNL

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CLIENT: **Newfoundland and Labrador Association of Technology and Innovation Inc. (techNL)**	CLIENT REF.: **Dwayne Hopkins**
ORGANISATIONAL UNIT: **Aker Solutions Canada Inc.** Digitalization Team, St. John's	CONTRACTOR REF.: **Heather Davis**
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			H. Davis	pp C. George	S. Humber	S. Humber
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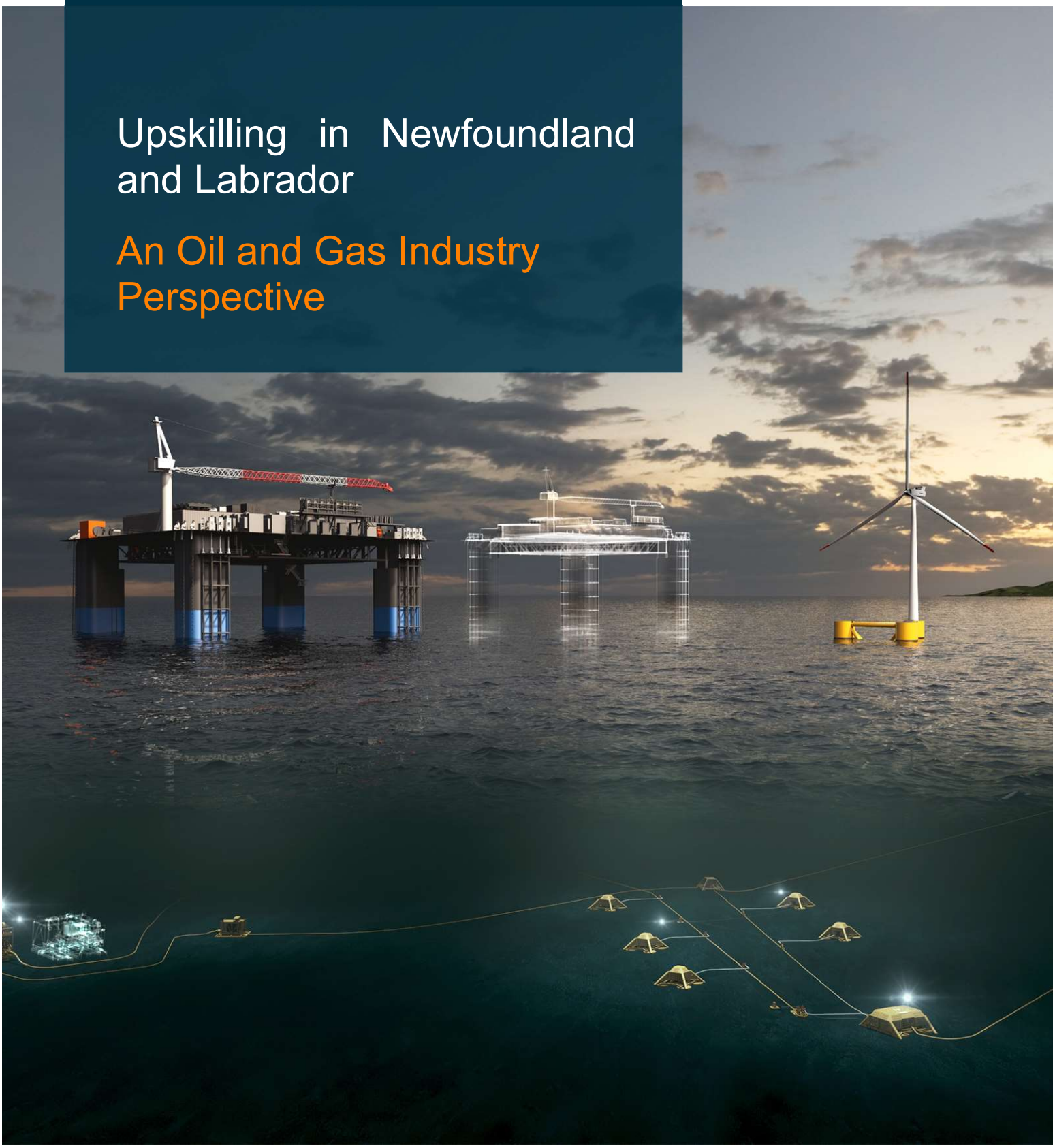
An Oil and Gas Industry Perspective



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1 Executive Summary

Newfoundland and Labrador has been identified as a region where the workforce numbers are in decline. The number of people of an age to potentially enter post-secondary training or newly join the workforce in this region are down roughly 43% since the mid 1980's, and the number of people who are in their final years of high school are down 55% in the same timeframe (1). Compounding the problem is that workers are reaching retirement age at six times the rate of the people now entering the workforce (2). Since the 1980's there has also been a significant tech boom, and younger workers have many more opportunities to work for companies in industries that traditionally never existed. Adding to that, these companies also have a significant advantage in that many workers do not even have to leave the province to be present to work for these companies. Many organizations have shifted to a remote model of working, meaning employees can work from anywhere in the world. Because of this, the potential workforce for the energy industry is shrinking, and we must evolve and find new ways of working in this region that allow us to achieve more with less and remain competitive on the global energy stage. Industries around the world are looking to technology to help close the workforce shortfall.

The focus of this study originated based on a previous study by Aker Solutions conducted in 2023. The Offshore Newfoundland and Labrador Digitalization Technologies Roadmap study determined that digitalization and modernization were key to evolving the industry and making this region more attractive for investment. Digitalization and new technology can enable the workforce to do more with less, but one major issue holding back progress is a lack of upskilling and training which impedes integration of technology by the workforce. Upskilling the workforce empowers employees to expand their knowledge, develop new skills, and utilize technology to solve problems and work in new ways that deliver value and efficiency at scale. This year, techNL selected Aker Solutions to provide perspective on upskilling in Newfoundland and Labrador within the oil and gas industry and to compile information to help move education and training forward in the region.

The benefits of upskilling are significant, with companies that invest in upskilling being 2.6 times more likely to exceed financial targets (3), and 7.2 times more likely to retain and engage the workforce if they offer ongoing upskilling programs. Organizations also see benefits in modernization, higher performance, attraction of new talent, and reductions for hiring. The workforce also benefits significantly from upskilling, gaining marketable skillsets, creating possible paths for career progression, and even seeing an increase in earning potential, with upskilled workers making 8.6% more than their counterparts (4).

Organizational Benefits

- Employee retention
- Protection of institutional knowledge
- Modernization
- Eliminate skills gaps
- Higher performance/engagement
- Talent attraction
- Hiring / onboarding cost reduction
- Lack of skilled labor mitigation

Workforce Benefits

- New, marketable skillsets
- Career progression
- New responsibilities
- Reducing monotony
- Higher earning potential
- Job security
- Higher job satisfaction
- Psychological safety

As part of this study, Aker Solutions conducted a survey of the local workforce to determine their view on upskilling opportunities, effectiveness, priorities, and programs. The survey highlights a number of notable insights, but one of the most important is the sentiment that despite organizations investing money in upskilling, a majority of workers feel that upskilling programs are currently not as effective as they could be. The challenges that contribute to the inhibit the success of upskilling are as follows:

- Undefined skills needs
- Lack of alignment and direction
- Resistance to change
- Lack of framework and structure
- Complex corporate upskilling programs
- Unstructured Mentorship
- Equitability and Accessibility issues
- Allocation of time
- Funding issues

The study also contains a compilation of skills that have been identified as being in high demand for organizations working towards digitalization and modernization (listed below). These skills are divided into human skills and technical skills that can bring significant benefits at scale when the workforce is trained and can incorporate them into their day-to-day activities.

Human Skills

- Analytical Thinking
- Creative Thinking
- Technical Literacy
- Leadership
- Resilience
- Effective Collaboration and Communication

Technical Skills

- Data Analytics
- Artificial Intelligence / Machine Learning
- Cybersecurity
- Low Code / No Code Application Development
- Automation
- Data Science
- Data Presentation and Insight Communication
- Programming languages
- Digital Twins
- Cloud Tools
- Data Privacy Law
- Organizational Behavior

The demand for the skills versus the prevalence of the skills in the workforce is what defines the skills gap. Currently, the skills gap is wide, but it can be closed. The report makes recommendations for how organizations can close the gap and maximize the return on investment for upskilling. A current approach for addressing the skills gap and upskilling involves a focus on moving towards a skills-based organization which gives organizations the agility necessary to effectively utilize their workforce, quickly identify their skills gaps, and hire based on the skills required to fill the gap. The focus areas below help organizations achieve a skills-based approach that brings

upskilling initiatives closer to business goals and objectives and establishes priorities for upskilling. This creates a defined link between learning and performance in an organization.

- Establish the 'Why'
- Cultural Change
- Alignment with Corporate Goals
- Skills Gap Analysis
- Leadership Commitment
- Leveraging Existing Corporate Upskilling Initiatives
- Mentorship
- Equitable and Accessible Training Opportunities
- Allocation of Time, Resources, and Funding
- Rewards and Incentives
- Focused Upskilling
- Flexible Upskilling Models
- Bridging Training and Certification
- Joint Industry Collaboration
- Collaboration with Academia

The study also includes a framework to help organizations assess and implement upskilling initiatives in a systematic and repeatable way. It addresses the challenges by incorporating actions that support the focus areas above to help increase the levels of success in upskilling.

Aker Solutions also conducted interviews with many local academic and learning institutions to understand the current models and programs for upskilling offered. A common insight from these academic institutions and research in this region is that the workforce is shrinking. The number of students who could potentially enroll in post-secondary education is down, and upskilling is an effective way to help boost modernization and drive workforce efficiency. Collaboration with academia can help address the skills gaps through upskilling to overcome issues with the diminishing workforce. The workforce survey also indicated that people were uncertain as to where and how to access upskilling programs. This study contains a matrix to highlight a number of available upskilling resources, and the types of training models offered by each.

This study is intended for any organization, worker, or academic institution who has an interest in upskilling in the region. The content and recommendations apply to everyone, and the goal is to spawn discussion that helps change the way this region looks at upskilling, removes hurdles, and establishes working relationships to close the gaps that exist in the workforce. Establishing a proactive and strategic approach ensures workers are equipped with the skills and competencies to thrive and support growth of industry in this region.

The study report provides recommendations for organizations, the workforce, students and prospective employees, academia, and the region. Based on the survey and research, there is significant opportunity for each of these entities to focus on upskilling for digitalization and modernization individually, as well as identified models with proven benefits that should be explored through regional joint initiatives and collaboration. The joint initiatives can extend beyond the oil and gas industry, reaching power generation, power distribution, mining, hydrogen, wind, fisheries, healthcare, defence, and more, to maximize benefit to the region. This will create a culture of continuous learning and upskilling that will future proof the workforce in this region.

2 Acknowledgements

This study has been prepared by Aker Solutions in St. John's, NL. Aker Solutions delivers integrated solutions, products, and services to the global energy industry. We enable low-carbon oil and gas production and develop renewable solutions to meet future energy needs. By combining innovative digital solutions and predictable project execution, we accelerate the transition to sustainable energy production.

Aker Solutions has prepared this report for techNL. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of techNL or its members.

Aker Solutions would also like to acknowledge the support provided throughout the study by techNL, the workforce who participated in the outreach survey, and the academic institutions that kindly provided information that has been incorporated into this report.

NOTE:
This report is based on Aker Solutions' independent research and internal knowledge and experience. It is written to provide users with an overview of upskilling in the region and recommendations on how to utilize best practices to potentially increase upskilling success. The onus remains on the user of this report to complete further analysis and investigation should any initiative or recommendation be identified as potentially beneficial to the user. Aker Solutions does not accept any liability that may arise from the use of the opinions, findings, and conclusions or recommendations expressed in this publication.

3 Introduction

Through the course of completing a study on digitalization opportunities for this region in 2023, Aker Solutions highlighted significant sentiment indicating that digitalization and modernization initiatives have a high rate of failure, despite having successful trials or pilot programs. A common theme emerged, indicating that the major determinant of success or failure of digitalization and modernization initiatives hinges on the upskilling and digital literacy of all stakeholders involved in implementing a particular initiative.

Upskilling

Activities, training programs, mentorship, and development opportunities that grow employee abilities to utilize modern tools, and increase abilities in areas like critical thinking, collaboration, and leadership to help deliver value, increase safety, and drive efficiency in organizations.

The oil and gas industry is currently undergoing a rapid transformation driven by technological innovation, environmental governance, and changing market dynamics. These factors pose significant challenges and opportunities for the industry, which requires a skilled, adaptable, and technology-enabled workforce to thrive in the new landscape. The industry, however, faces a looming talent gap as many workers are approaching retirement age and the younger generation is less attracted to working in oil and gas. Moreover, the existing workforce needs to acquire new competencies and capabilities to manage the increasing complexity and diversity of the industry. In short, there is a direct relationship between upskilling of resources, and meeting the demands of the evolving industry through the integration of technology.

This study was initiated as a further exploration into the topic of upskilling, to determine the current state of upskilling in the region and to highlight the importance of upskilling the workforce. The intent of the study is to provide recommendations for industry stakeholders (companies, industry organizations, government, academia, and the workforce) to develop and implement effective upskilling strategies that ensure the existing and perspective workforce, have the skills to meet the challenges and opportunities in the industry. Moving towards a skills-based approach allows an organization to better utilize the skills of the existing workforce, identify skills gaps, and quickly determine upskilling needs based on market dynamics and business objectives.

Over the course of this study, Aker Solutions conducted a survey of the workforce in this region to determine how people view the importance of digitalization, modernization, and upskilling as it exists today. The survey also attempts to highlight the methods of upskilling preferred by the workforce to better understand how upskilling programs can be designed and delivered. Simultaneously, Aker Solutions interviewed academic organizations in this region to better understand the models of education and training that are available to the workforce and organizations. The themes of the survey and interviews align very closely with existing research and studies on upskilling in general across many industries. This is very positive, as learnings from other industries can be applied to the oil and gas industry, particularly in this region.

A 2023 study conducted by the World Economic Forum found that technology adoption is a key driver of business transformation in the next five years, and over 85% of organizations surveyed identify increased adoption of new

and frontier technologies and broadening digital access as the trends most likely to drive transformation in their organization (5). The challenge is that adopting and integrating new technologies and modernized ways of working has significant implications for the skillsets and competencies that are required for the current and future workforce. The associated challenges and risks for the industry, especially in terms of skills and competencies are as follows:

- The need to upskill the existing workforce to keep pace with the changing technology and work processes.
- The need to attract and retain new talent with the relevant skills and experience to drive efficiency.
- The need to ensure that workers have the necessary soft skills, such as communication, collaboration, creativity, and critical thinking.
- The need to ensure that workers have adequate digital literacy and cybersecurity awareness, and that the technology is used in an ethical and responsible manner.

Despite these challenges, new technology and new ways of working offer many opportunities for the oil and gas industry to improve efficiency, productivity, safety, and environmental performance. This study is intended for any organization, worker, or academic institution who has an interest in upskilling in the region. It outlines the challenges and benefits of upskilling that will help organizations determine the value proposition for investing in upskilling the workforce, the benefits of workforce engagement in upskilling, and the important role that academia play in supporting upskilling initiatives. The study also highlights best practices for approaching upskilling by understanding the best ways to engage and train the workforce, which can help organizations ensure that money invested produces the best outcomes.

4 Oil and Gas Industry Evolution and the Need for Upskilling

Drivers for industry evolution summarized:

- Geopolitical uncertainty
- Supply chain constraints
- Increased interest rates
- High inflation
- Environmental targets
- Increasing energy demand
- Aging workforce
- Increased retirement
- Reduced numbers entering the industry
- Attrition to renewable energies
- Increased absenteeism and leave

The oil and gas industry is undergoing an evolution that is driven by a rapidly changing world. Geopolitical uncertainty is stressing energy markets and deteriorating the supply chain, and high interest rates and inflation are slowing the pace of investment decisions. The world has also set emissions reduction targets that are putting focus on environmental emissions and renewable energy sources. Despite this, energy demand continues to rise, and investors expect increased returns on investments (7).

16%+

Increase in oil and gas production costs since 2020 (6)

These changes are shifting the discussions of planning, investment, and execution in the energy sector worldwide. As an example, it becomes difficult to plan or execute new, multi-billion-dollar facilities if price and delivery projections for major equipment are unpredictable, as this can quickly tip the economics of investment and operation into an untenable state. This very scenario happened in this region in 2023 when Equinor placed the Bay du Nord program on hold because global conditions and rising costs made the project undesirable for investment in its current form (8). Because of this, it is important to ensure that investments are in new, modern assets that run efficiently, and it is becoming increasingly important to extend the life of existing facilities to ensure they continue running safely and efficiently well beyond their initial expected life.

21.8%

of the workforce will retire by 2030 (9)

The industry also faces the challenge of attracting and retaining skilled workers as it competes with other sectors for a piece of an ageing workforce. In Canada, there are more people retiring from the workforce than entering the workforce, with an estimated 21.8% of the workforce, who are between 55 and 65, retiring by 2030 (9). In Newfoundland and Labrador, the Oil and Gas industry has been highlighted as one of the industries having the highest percentage of older workers. As these workers retire institutional knowledge is being lost if a company does not have a good mentorship program in place.

The population of Newfoundland and Labrador has also been identified as having a lower number of people joining the labour force as compared to the number of people who are retiring (9), and according to an IOGP study in 2023, 72% of the workforce will be made up of Gen Z and Millennial workers by 2029, and 62% of those workers consider a career in oil and gas unappealing (10). Anecdotally, a local post-secondary training institution has said that the number of people aged 15-29 in the province in 1983 was 67,000, and in 2023, the number was only 27,000. Less than half of people are now available in this age range means there is less are less people preparing to enter post-secondary education, and there are less people to hire, which has a huge impact on growth potential. These numbers highlight the urgency with which the industry must attract, retain, and upskill talent, while simultaneously adopting new technologies to enable leaner projects and operations that can run with fewer workers. Organizations can no longer just rely on new hires to maintain their workforce, they must look at the existing workforce to retain and upskill them to help close the gap.

Absenteeism from work is also increasing. A McKinsey report anecdotally estimates a staff absence rate of 6-8% and an estimated 5-10% absence no-show rate for personnel flying offshore (6), and since COVID-19, there has been a clear shift in the workforce, with people selecting work that provides better work life balance versus more work responsibility or career advancement. The workforce also has a clear preference to have flexible work hours, and some option to work from home, with 31% of workers indicating they would return to work if mandated but would start searching for a job to provide better quality of life (11).

These factors are leading the industry to look towards technology and modernization, as well as skilled leaders and an upskilled workforce to solve complex problems, enhance exploration, optimize production and extend life for existing assets, and reduce the cost and risk of investment.

Traditionally, the Oil and Gas industry has relied on core skills, traditional business, marketing, engineering, technical backgrounds and a risk adverse mindset / culture. These skills include:

- Technical skills: knowledge and ability to use equipment, tools, and methods related to the exploration, design, construction, production, and transportation of oil and gas.
- Operational skills: knowledge and ability to follow standard procedures, regulations, and industry best practices of the industry.
- Contracting and Procurement: Contract development and negotiation, supply chain management, materials and services procurement.
- Managerial skills: knowledge and ability to lead, coordinate, and supervise the work of others, as well as communicate and collaborate with different stakeholders.

While these skillsets are absolutely required for the future of the oil and gas industry, the adoption of new technologies and new work processes will require additions to these traditional skillsets. As an example, designers and engineers generated leaps in efficiency by upgrading their skillsets to adopt CAD software from traditional drafting tools, and subsequently adopting 3D modelling tools to help improve efficiency in generating CAD drawings. Those workers now have to look toward developing abilities that allow them to collaborate more efficiently in design team environments, provide more management oversite of their work, or actively engage with technology like AI and machine learning to enable an even more efficient design and review workflows.

The technologies that enable remote / unattended operation, robotics and drones, real-time continuous sensor monitoring, digital twins, process modeling and simulation, along with problem solving and the ability to analyze

massive data sets and produce actionable insights, are a growing need in the industry. Technology that is actively being piloted and tested today will shape the industry of the near future but will only see benefits if there is a workforce that engages with technology. A workforce that is open to investigating these new tools and new methods of operation can solve problems and make decisions based on data analysis, while ensuring safer, more efficient operations.

The real benefits of technology arise from the people who strive to utilize it.

To fully realize the benefits of new technologies, the workforce needs to be open to new ways of working and be capable of implementing technology to solve problems, and there is a significant opportunity to do this in the industry. Developing core soft skills in the workforce like teamwork, collaboration, adaptability, and problem-solving creates individuals and teams that are resilient, efficient, and more adept at navigating change (12). Teams that possess these skills will be significantly more open to adopting new technology, new ways of thinking, and modern ways of working. Skills that are developed in these areas are everlasting, and the benefits compound over time. When people learn to collaborate and problem-solve effectively, they become better at navigating complex challenges and implementing solutions and technologies that provide measurable benefits.

Employees are also thinking about upskilling and modernization; what it means to them and what it means for the organizations where they work. From a regional survey that was carried out during this study, Aker Solutions asked industry for feedback on their thoughts around the importance of upskilling resources. 98% of people who responded feel that upskilling is important for long term success of their organization, and 73% of people feel that their position would benefit from digitalization. Further, 99% of people feel that upskilling will contribute to their career progression. Organizations should nurture this desire by providing upskilling opportunities that are better aligned with workforce needs, which benefits both the organization and the workforce.

Given all the factors driving evolution in the industry, combined with the fact that the workforce sees the benefits and is willing to modernize and upskill, there is significant opportunity to make the industry more competitive through proper investment in upskilling the workforce.

5 The Benefits of Upskilling

Benefits of upskilling summarized:

Organizational Benefits

- Employee retention
- Protection of institutional knowledge
- Modernization
- Eliminating skills gaps
- Higher performance/engagement
- Talent attraction
- Hiring / onboarding cost reduction
- Mitigating lack of skilled labour

Workforce Benefits

- Marketable skillsets
- Career progression
- New responsibilities
- Reducing monotony
- Higher earning potential
- Job security
- Higher job satisfaction
- Psychological safety

Upskilling provides upskilling ample opportunity and benefit for both organizations and individual workers in the face of an evolving oil and gas industry. The value of upskilling for an organization is generally measured quantitatively through dollar cost savings and hourly efficiencies created by closing the skills gap, retaining employees, and implementing modern processes and technology that enable the workforce to focus on important tasks while removing them from non-value-added work. From a workforce perspective, it is measured qualitatively through feedback on levels of satisfaction and contentedness driven by the opportunity for continuous learning, career growth, and working for an organization that invests in their professional development.

Key benefits of upskilling are outlined below and help provide perspective for both the organization and workforce to support the investment of time and money required to successfully execute upskilling initiatives.

5.1 Organizational Benefits

For employees who are already familiar with company processes, systems, and customers, upskilling can enhance performance and engagement, leading to improved productivity for the overall organization. A structured and targeted upskilling program contributes to creating a motivated and dedicated workforce, reducing the likelihood of employee turnover and ultimately leads to more favorable work environments and increased overall levels of efficiency. Upskilling also allows for the adoption of new technologies and new ways to solve problems, which can lead to significant cost and time savings for an organization. Some of the key benefits and drivers from an organization's perspective are detailed below.

5.1.1 Employee Retention

Given the lack of resources coming into the workforce in this region, retaining employees should be very important to organizations. A report by LinkedIn found that 93% of organizations are concerned with employee retention (13). The same report found that 94% of employees would consider leaving due to a lack of development opportunities, however the vast majority would remain if offered new training opportunities (13). Further, a study by Society of Human Resources Management (SHRM) found that the cost to recover from employee turnover can equal six to nine months of salary per employee (14). If a new role needs to be filled, providing current employees with necessary upskilling and the opportunity for career advancement can keep them in the organization.

94%

of employees consider leaving due to lack of development opportunities (13)

5.1.2 Protection of Institutional Knowledge

Institutional knowledge is expertise and experience that is very specific to an organization. This knowledge is developed over time and is based on the collective work and experience of the entire workforce. The more time workers spend at an organization, the more institutional knowledge grows. When a worker leaves an organization, it is very common to lose large pieces of that knowledge if there are no structural mechanisms in place to ensure that knowledge is shared and retained. Structured mentorship programs can help spread this specific kind of knowledge to other workers and is key to protecting institutional knowledge in the event a worker leaves the workforce.

Organizations should also look to codify institutional knowledge as a way to alleviate burden on the workforce and ensure that knowledge and processes are easily transferred to upskilled employees and new hires to the workforce. This requires training to understand the knowledge and processes that can be codified, as well as the tools and the workflows required to achieve this.

5.1.3 Modernization

Upskilling employees means that they have access to modern skillsets and modern ways of thinking. This could be technical skills that help optimize processes and operations, or it could be softer skills that increase teamwork, enhance problem solving abilities, or help people think in new ways about the work that has been executed the same way for decades. According to a study by the World Economic Forum, six in ten workers will require training for new technical and human skills before 2027, however it is estimated that only half have access to adequate training opportunities (5). This number may seem high when evaluating against the oil and gas industry, however, with emissions targets on the horizon, and technology such as robots and drones, remote operations, and digital twins, many workers may need to upskill and shift their work responsibilities to accommodate the new ways of working. Keeping workforce skills modernized will enable evolution and growth of the industry as technology grows. Enabling the workforce to understand how to modernize their own work processes with technology increases the chance of modernization and provides benefits at scale as everyone is involved.

60%

of workers will require training before 2027 (5)

5.1.4 Eliminating Skills Gaps

Regular upskilling and training programs ensure that employees have the skills that are required by ever-evolving industries. One study indicates that 52% of CEOs feel that the lack of skills in the organization's workforce is a factor inhibiting the company to change the way it creates, delivers, and captures value (15). It is important to regularly evaluate business goals and coming industry opportunities to ensure that any upskilling programs offered are in line with the direction of the organization. A common barrier to filling the skills gaps is the fear that employees will use upskilling to enhance their resume and move on from the company to pursue other jobs. This must be weighed against the fact that employees will leave if they do not have opportunities to upskill. Anecdotally, there are strong opinions that it is more reasonable to offer employees upskilling opportunities with the likelihood they will stay in the organization, which both close the skills gaps and prevents them moving into another industry.

52%

CEOs feel that a lack of skills in the organization inhibits the company (15)

5.1.5 Higher Performance / Engagement

Employees who are learning new skills can tackle new challenges or create new work processes that make work more interesting and engaging. They can also utilize new skills to work in new positions, which can break cycles of monotony and stagnation that can build. A study by the American Institute of Stress states that 50% of workers are not engaged in their work, which leads to a loss of productivity (16). Keeping work interesting helps employees stay focused and engaged in their tasks and responsibilities which leads to higher levels of performance over time. Higher performance and engagement leads to higher productivity and better work outcomes. One study found that 74% of respondents agree / strongly agree that upskilling has increased job performance (17).

5.1.6 Attracting Talent

Having a well-defined upskilling culture can help in attracting new talent. Top talent wants the ability to grow their knowledge, skills, and credentials, so structure and investment in training and upskilling is an attractive quality when selecting a new career or employer. One study found that 21% of Gen Z and Millennial employees are looking for development opportunities during their job search, with learning and development opportunities ranking second only to good work / life balance when it comes to choosing an employer (18). These are significant populations of the workforce that may decline offers for a position based on the availability of learning and development opportunities offered by the employer. People who prefer an organization like this are also likely to stay with the organization.

Additionally, individuals new to Canada may be looking for ways to bridge their existing skillsets into the Canadian workforce. Tapping into this talent pool and providing upskilling to adapt the skillsets of this group to the oil and gas industry is also a great source of new talent that can add diversified skills and experience to the workforce.

Further, digitalization and modernization also allow for new ways of working that can attract talent that would not have typically applied to work in the oil and gas industry in the past. As an example, remote operations, connected worker initiatives, and digital twins allow for more work to be executed onshore without the need for travel offshore.

5.1.7 Hiring / Onboarding Cost Reduction

There can be a significant cost involved in recruiting, onboarding, and training new resources. Anecdotally in this region it is taking longer and longer to find suitable candidates to fill positions requiring skilled labour, resulting in increased resources dedicated to recruitment activities for longer periods of time. For example, multiple rounds of resume reviews and interviews tie up not only HR resources but also technical resources who are responsible for vetting these candidates. The longer these cycles run, the more the costs add up. One study by the Society for Human Resource Management (SHRM) indicates that onboarding costs can be up to three times the hiring salary (19) when all the unseen costs are factored in. Upskilling existing employees is often a more cost-effective way to fill a skills gap while enhancing engagement and performance. For example, it may also be easier to find a resource in the market to fill a position that has a lower skill requirement to backfill for the resource who is being upskilled and promoted.

5.1.8 Mitigating Lack of Skilled Labour

Globally, the oil and gas industry is facing difficulties hiring skilled labour across a wide range of skillsets. A study by Deloitte indicates that 75% of executives and board members see gaps in skills and talent availability as a major source of risk for their organizations (20). Lack of resources to hire is a significant risk to project and operational work and creates complications when planning future work. With people leaving the industry faster than entering, worker shortages and absenteeism threatens capacity for future work and developments. Adopting modern tools that help streamline an organization means more work can be completed by less people. Upskilling would enable the current workforce to adopt new tools and new ways of working which can increase capacity and help mitigate skilled labour shortages.

75%

Executives see skills gaps and talent availability as a major source of risk (20)

5.2 Workforce Benefits

Upskilling can bring many benefits to employees and the workforce in general. Workers will typically take advantage of upskilling opportunities as there are career benefits associated with these activities. Further, when people go to work, they want to know they are contributing, making a difference, and that extra effort to bring efficiency and savings to their organization will be rewarded. Some of the key benefits and drivers from the workforce perspective are detailed below.

5.2.1 Marketable Skillsets

Whether they currently have a job or are looking to enter the workforce, new skills allow workers to invest in themselves to grow and develop both personally and professionally. New skills also make workers more flexible to take on new work assignments and can increase levels of job satisfaction. Working towards a new skill that can be added to a resume is also a very attractive reward for investing in upskilling.

5.2.2 Career Progression

Upskilling is a key component of career progression for employees. Career progression is also a strong driver and motivator for the workforce. In the Aker Solutions workforce survey of this region, 99% of respondents feel that upskilling contributes to their career progression. Employers should work with employees to ensure there are clear paths of progression, and upskilling required to prepare for that progression.

5.2.3 New Responsibilities

New responsibilities can allow employees to grow their skills and abilities without taking on a new position within an organization. Perhaps a temporary work assignment, or an expansion of their existing roles and responsibilities. This can be a great way for employees to test the waters before progressing to a new position, and it can be a good way for employers to validate employees before committing them to a new position. Key to this is ensuring employees do not become overburdened and to ensure they have the correct upskilling and support available for these new tasks.

5.2.4 Reducing Monotony

New responsibilities help to remove monotony in work assignments and can be a good way to help people feel motivated or re-invigorated about their work. It can be difficult to feel motivated about work when the work is the same day in and day out. Breaking a monotonous cycle can reduce stress and increase overall job satisfaction.

5.2.5 Higher Earning Potential

Upskilling can lead to increased earning potential. Certain sought-after skills can enable promotions or provide opportunities for higher financial or benefits compensation. Gallup data from 2021 indicates that workers who take an upskilling program can make 8.6% more than their peers that do not have the same certification (4). Another Gallup study indicates that 64% of employees feel a significant increase in income or benefits is very important (21), which means employees have a drive to grow their career and increase their level of compensation.

5.2.6 Job Security

Staying relevant is key to securing employment and upskilling is a pathway to remaining relevant. Upskilling equips employees with the skills to adapt to evolving industry demands and technologies, making them valuable assets to employers. Increasing the breadth of knowledge and skillsets also enables employees to be more adaptable and versatile and therefore more capable of taking on diverse responsibilities within an organization.

5.2.7 Higher Job Satisfaction

Upskilling involves learning new skills, taking on new challenges, and both personal and professional growth, which can lead to an increase in job satisfaction. Acquiring new knowledge and skills help people increase efficiency, excel in their role, and fulfil a desire to continually develop, while contributing to increased confidence and a sense of achievement.

5.2.8 Psychological Safety

Psychological safety relates to a respectful environment where speaking up, open conversation, discussion, and disagreement can occur freely without negative reaction or consequence. A culture of psychological safety helps remove anxiety and hesitance so that all workers can comfortably contribute and feel heard about thoughts, concerns, recommendations, or risks. People like to feel included and in control of their work scopes, and providing an environment where anyone on a team can feel comfortable expressing their thoughts is an attractive quality to the workforce. Upskilling on human skills, such as effective collaboration and communication, conflict avoidance and resolution, and resilience, provide a foundation for a healthy and respectful work environment. At the same time, upskilling on technical skills provides employees with the added confidence to express new ideas and explore modern ways of working, while navigating a changing work environment. Upskilling employees also shows an organization's commitment to the growth and development of the workforce, contributing to a more psychologically safe work environment.

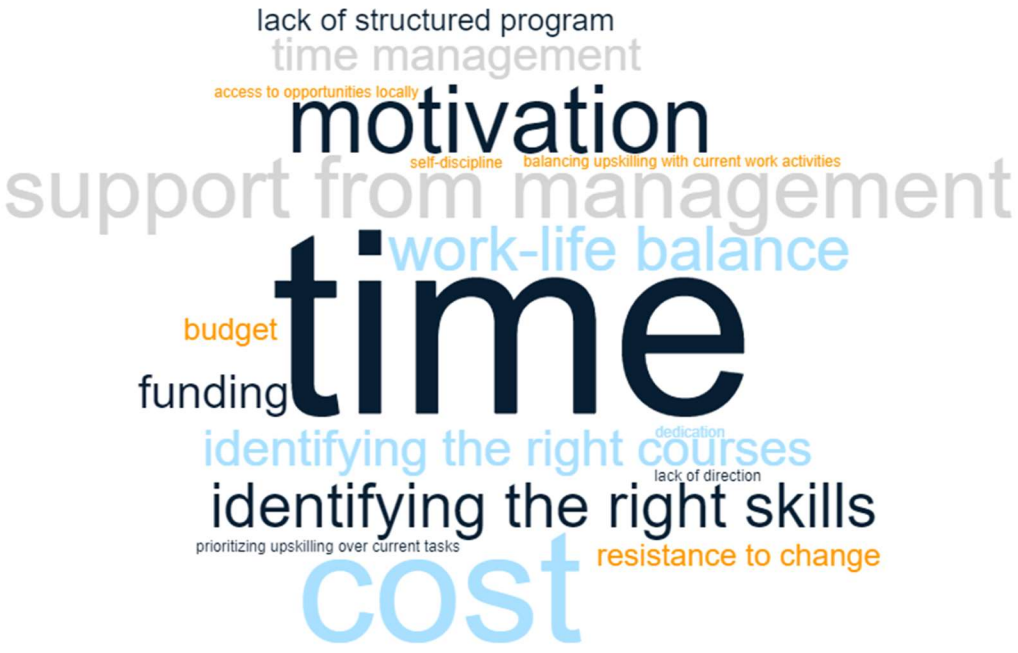
Despite substantial investment into upskilling programs by organizations, the Aker Solutions workforce survey indicates that only 17% of employees feel that their organization's upskilling programs are effective. The question is why?

6 Current Challenges of Upskilling

Challenges of upskilling summarized:

- Undefined skills needs
- Lack of alignment and direction
- Resistance to change
- Lack of framework and structure
  Complex corporate upskilling programs
- Unstructured Mentorship
- Equitability and Accessibility issues
- Allocation of time
- Funding issues

As part of this study, Aker Solutions asked members of the region's energy industry for feedback on the challenges and hurdles of upskilling. The feedback received is summarized in the word cloud below. The results closely align with the research that has been completed for this study, and is common across industries, and regions and seems to be independent of organization size and type when it comes to upskilling.



Time, cost, support, and motivation are standouts, and structure and identifying correct skills are also prevalent. Notably, none of these higher profile topics have anything to do with lack of opportunity. This is another common theme that was relevant in the research. Organizations are investing in upskilling and training, but employees are facing hurdles that prevent them from availing of the opportunities.

From the survey, it was found that the majority of respondents have the opportunity to access learning and development programs within their organizations in this region, however they feel that the programs offered are not effective in fulfilling the needs related to upskilling. In fact, 65% of respondents said that they find it difficult to accommodate upskilling activities during work hours. Providing the time and / or funding is a step in the right direction, however if most of the workforce is not able to avail of the opportunities, then the investment is not effective. Some key upskilling challenges / hurdles are detailed below.

6.1 Undefined Skills Needs

Identifying what skills are required now and what will be required in the future for an organization is a challenge. Rapid changes in technology, changes to job requirements and market demands, and limitations in traditional educational and training systems all contribute to the challenge of identifying the skills gaps. Most organizations, especially in oil and gas, have not traditionally been skills focused. There is often a lack of clear and consistent definition of skills and competencies in these organizations and a disconnect to employees' responsibilities, making it difficult to compare and evaluate skills, and identify the skills gaps within the organization.

Employers estimate that

44%

of workers' skills will be disrupted in the next five years (5)

6.2 Lack of Alignment and Direction

Having no clear direction on upskilling creates friction that prevents the workforce from committing to learning programs. The feedback Aker Solutions has received through survey of the region is that a significant portion of employees often do not know which courses are applicable to their role and which skills they should focus on to provide the most benefit to themselves and their organization, creating a barrier to upskilling. This aligns with a study from Mercer in 2022 that indicated 26% of employees did not learn a new skill due to a lack of clarity of which skills to focus on or a lack of guidance as to which skills would help them progress in their careers (22).

Aker Solutions also asked members of the industry for feedback on whether they are currently participating in any upskilling opportunities. 30% said they are currently participating in organization driven upskilling and 44% said they were currently participating in self-driven upskilling opportunities. While self-driven upskilling is certainly important from a personal and professional growth perspective, it may or may not align with the organization's goals and objectives and is not measurable, therefore there is no way to gauge how effective these upskilling activities are and the associated benefits to the organization.

6.3 Resistance to Change

Transitioning to a new way of working, into a new role, or embracing new skills can be difficult for some individuals, as it requires stepping outside of their comfort zone. Doing things differently requires dedicated effort to overcome the corporate and workforce inertia of doing things the way they have always been done. Resistance to change, especially when it comes to adoption of new technology and changes in work processes, can often involve concerns about workload increase and apprehension in the ability to learn new skills. This can create friction and anxiety around participation in upskilling initiatives. Another sentiment often expressed by the workforce is that

upskilling and new technology will eliminate jobs. The goal of upskilling is entirely the opposite, with the focus on helping people develop into new or upgraded roles where they can perform more value-added work.

For an organization, the challenge is coming to terms that the current models for upskilling may not be effective and investing in building a culture that supports continuous learning and development. This may require changes to an organization's work processes and upskilling methodology which can seem daunting. The current leadership culture may also need to change so that leaders can be more responsible for directing, fostering, and supporting upskilling opportunities. There may also be a resistance from organizations that upskilling will cause workers to move to different organizations once they have completed training therefore exacerbating the challenge with retention.

6.4 Lack of Framework and Structure

The lack of framework and structure around learning and development programs within an organization is a challenge when it comes to upskilling. A lack of structure or framework results in organizations and employees not having a systematic way of acquiring, applying, and evaluating new skills or the skills that are required. This can lead to inconsistency, inefficiency, or ineffectiveness in any implemented upskilling opportunities. Often a lack of framework results in more self-directed upskilling, and while this is one way to upskill, it is not measurable and may not align with the organization's goals and objectives. Also, employees may not gain the full value of the upskilling activity.

A lack of framework and link to company specific needs in terms of skills development often results in learning and development activities falling short on delivering the value and tangible results that were desired. This makes it difficult for employees to see the relevance and personal benefits of participating in the organization's upskilling activities.

A lack of framework also adds complexity and frustration when looking to utilize the existing competencies and skillsets of individuals new to Canada. Closing the gap between their education and local required certifications is not always a well-defined process. This increases the cost, time, and prolongs the period where an organization cannot utilize employees to their full potential.

6.5 Complex Corporate Upskilling Programs

Companies, especially in larger organizations, tend to have complex corporate upskilling programs that require employees to navigate multiple, overlapping, and sometimes conflicting training initiatives, policies, or procedures. Often, these tools are linked to specific training needs and the systems are often not linked, creating confusion and contributing to inefficiencies and ultimately the effectiveness of the upskilling process. Additionally, some training programs may not be well designed, well implemented, or appropriately evaluated, which compromises the quality, relevance, and benefit intended by an upskilling initiative. Knowledge from training programs that are not well connected to an individual's work responsibilities and direct activities tends to falloff or dissipate quickly after learning because the knowledge cannot be utilized or embedded into the work. The result of this is training programs that do not return value to an organization and have little benefit to employees. As an example, there are often blanket corporate process training programs that are rolled out across entire organizations, with the expectation that every employee complete. There is almost no way that this training can be effective because it is so broad and overwhelming when compared to the specific part that may be relevant to any one employee's

responsibilities. The widely accepted ‘Forgetting Curve’ states that if new information is not applied, 75% of the knowledge learned will be forgotten after just six days (23). This leaves a very small window to apply knowledge directly to workplace activities and emphasizes the importance of ensuring upskilling is relevant to an individual and their work or career growth objectives. It is important that the content of upskilling initiatives have direct connections to relevant work scopes/processes, and that any adjustments to work processes or adoption of new technology are timed to coincide with training completion so there is no gap between upskilling and the utilization of the new skill. As an example, if the workforce is trained to make dashboards in PowerBI, but it takes another two months after training to obtain the license for the program from IT, then the benefit of the training is greatly diminished.

Determining what training opportunities are required, effective, current, and relevant, and to which groups of employees, is a hurdle to overcome when looking to develop and scale a learning and development program to address the current skills gaps and mitigate the future skills gaps in an organization.

6.6 Unstructured Mentorship

Organizations often do not take full advantage of mentorship opportunities. When Aker Solutions asked the industry about mentorship, 51% of respondents stated that they are not participating in mentorship opportunities but would like to. This is a significant portion of the workforce that desires to participate in mentorship opportunities which means mentorship opportunities either do not exist or are not valuable in their current form. Further, 68% of respondents also stated that their organization offers informal mentorship. Although informal mentorship has its benefits, it is not measurable and risks misalignment with company goals and objectives. Key institutional knowledge transfer may be missed and skills that once existed within the organization risk not getting transferred. Informal mentorship may also exclude people who are not comfortable fostering mentorship relationships on their own, which means they may not benefit from the coaching and knowledge sharing as intended.

6.7 Equitability and Accessibility

With a diverse workforce, it is a challenge to ensure that everyone has the support required to access upskilling opportunities within an organization. Providing learning and development activities that can be accessed and completed by underrepresented groups, including persons with disabilities, while also considering different work arrangements is a complex task that requires a deep understanding of the workforce within the organization and the associated needs.

A lot of upskilling programs tend to be ‘one size fits all’. This can be very limiting for equity deserving groups that may have specific challenges and learning requirements. As an example, often online training courses require audio to complete and do not have any text option for people with hearing impairments therefore requiring those people affected to provide their own solution to consume upskilling content. Similarly, not being able to change text size or adjust for color perception issues may create barriers to upskilling.

Current upskilling opportunities are often offered outside of work hours without consideration for the wide range of work-life arrangements that exist within an organization. As an example, there is a difference between workers that have family commitments and those that do not have family commitments. Workers without family commitments may be able to avail of more upskilling opportunities after work hours which could put them in line for career advancement or promotion over employees who are not able to dedicate those after work hours.

Another identified point of friction is around the transferability of skillsets for people new to Canada and the complexity of utilizing their education / experience for work in professional roles within the province. It is estimated that approximately 25% of people new to Canada have degrees that are overqualified for the job they have and nearly 60% have a bachelor's degree or higher (24).

6.8 Allocation of Time

When Aker Solutions asked the industry about the challenges and hurdles of upskilling, overwhelmingly, the feedback was lack of time. When asked about allocation of time and funding for upskilling opportunities, 25% of respondents said time was provided for upskilling, 12% said funding was provided for upskilling, and 39% of respondents said both time and funding were provided for upskilling opportunities. When asked however about workload flexibility to accommodate upskilling activities, 25% of respondents said that they have time however the time was allocated outside of normal working hours and 40% said that they find it difficult to fit in the hours required for upskilling activities.

40%

of respondents said they find it difficult to fit in the hours required for upskilling activities

Employees often have busy schedules and competing priorities. This combined with the pressure to balance work responsibilities with personal life makes allocating time for learning new skills difficult. This is particularly relevant to the oil and gas industry which is starting to become stretched for resources. The result of increasing workload is that employees feel the pressure to prioritize work tasks over learning opportunities. Some skills may also require longer-term commitment which can be challenging for employees who have limited availability. On the other side, upskilling requires organizations to set aside time for employees to upskill, which takes time away from production activities and customer committed deliverables.

Time also becomes an added challenge when there is a mix of different workforce models within one organization. For example, it is common in the oil and gas industry to have a mix of office-based personnel and offshore based personnel. A model adopted for the office-based workforce will not necessarily work for offshore based workforce who are working a fixed rotation, e.g. three weeks offshore with 12-hour days followed by three weeks off.

6.9 Funding Issues

Upskilling can be costly depending on the type, level, and skills required. Some skills may require formal education, certification, or accreditation, while other skills may require access to specialized equipment, software, or materials which can be expensive and time-consuming. There is also a risk that cost pressures can reduce funding to upskilling programs which creates performance issues that drive additional cost pressures, and the cycle repeats, making it very difficult to fund new upskilling initiatives.

The challenge with funding can be more difficult to overcome when funding programs come to an end, especially for small and medium sized companies who rely on such programs to offer upskilling opportunities to their employees. The 2024 Federal Budget announcement of the removal of the 2017 top-up funding under the Labour Market Transfer Agreements is one such program that will have implications for many companies in terms of

learning and development programs and initiatives. This will result in a reduction of funding of more than $16.8 million per year for Newfoundland and Labrador and the suspension of the Canada-Newfoundland and Labrador Job Grant for employers and workers (25). Academic institutions have also reported a challenge associated with the lack of funding required to support upskilling programs for people new to Canada, which can delay their participation in the workforce.

7 The Skills Gap

Skills gap summarized:

A skills gap is the difference between the skillsets an employer currently has in their workforce versus the skillsets they need, or will need, to meet work commitments and business objectives.

Human Skills

- Analytical Thinking
- Creative Thinking
- Technical Literacy
- Leadership
- Resilience
- Effective Collaboration and Communication

Technical Skills

- Artificial Intelligence / Machine Learning
- Data Analytics
- Digital Twins
- Cloud Tools
- Organizational Behavior
- Data Presentation and Insight Communication
- Cybersecurity
- Automation
- Data Science
- Low Code / No Code Application Development
- Programming languages
- Data Privacy Law

A skills gap is the difference between the skillsets an employer has in their workforce versus the skillsets they currently need, or will need, to meet work commitments and business objectives. Understanding the skills gap in an organization is an important activity as it helps determine and guide upskilling and hiring objectives. It also acts as a baseline measurement to indicate the effectiveness of upskilling programs, and it mitigates the risk of not having the right skillsets in place when required.

Skillsets can typically be categorized into two categories: human skills and technical skills. Human skills are focused in areas like communication, analytical and critical thinking, and teamwork. These skills are everlasting and evolve with use. Human skills allow the workforce to be more open to developing and implementing new ways of working and investigating and adopting new tools to solve problems. Technical skills are more tangible, and task based, like programming and data analytics. They are tools / technology based and require regular updating or replacement as newer, more efficient technologies or ways of working are implemented. A balance between the two types of skills is essential as they are both required to effectively bring benefits to the industry.

This section highlights some common skillsets that are and will be required for the oil and gas industry, and the workforce in general, based on current trends and technologies. It is also important to be mindful that many people in the workforce could also benefit from training in the basics of computers, emails, scanning, messaging, and excel. The skills outlined are not necessarily comprehensive, but they are key to meeting the goals and business

objectives that are common in the industry. It is important to understand where the workforce stands in terms of skillsets, before planning upskilling initiatives.

7.1 Human Skills

Human Skills

Cognitive and behavioral skills that are used to communicate and collaborate with others, solve problems, manage complex situations, and cope with challenges and change. They are subjective and are often learned from experience, or direct study and practical application.

Human skills are the non-technical skills that allow people to work together more efficiently, communicate more effectively, solve problems in new ways, adopt new tools to complete work, become self-motivated, and to work with and even lead others more effectively. These skills enable teams to be rapidly adaptable, resilient, and adept at solving the challenges of the evolving oil and gas industry. These skills also create a work environment that is psychologically safe, which is key to retaining and attracting new employees. Organizations that focus on training the workforce with various soft skills are reported to have a 90% better growth trend than competitors (27), and in one study, the training of human skills had an estimated 250% return on investment (26). Human skills are foundational to unlocking efficiency, and they should have equal focus with the training of technical skills. Evaluating each of the human skills below will help identify any personal or organizational gaps that may exist.

250%

Return on investment for training human skills (26)

7.1.1 Analytical Thinking

Analytical thinking is data driven and involves the ability to rationally analyze information to come to a concise, data supported decision, judgement, or conclusion. Analytical thinkers can solve problems before they evolve into larger issues, are often ones who develop successful strategic plans, and can rationally and objectively make decisions in stressful situations. Analytical thinking is also identified as one of the most important skills for workers today and in the near future, with a majority of companies indicating it is a core skill that they are looking for (28).

7.1.2 Creative Thinking

Creative thinking skills enable workers to develop new processes, tools, or utilize data sets to make decisions and execute work. Creative thinking leads to growth, innovation, and promotes diverse modes of thinking, which can lead to increased efficiency and productivity for organizations. Creative thinking is another top tier skill identified by employers (5).

7.1.3 Technical Literacy

Technical literacy is the ability of workers to learn and adopt new technologies. Technically literate individuals can often rapidly self-learn new tools and processes which leads to more rapid adoption, and increased efficiency.

Individuals with high technical literacy can also perform as subject matter experts that can train and support others on the team while they learn and grow their own level of literacy. This type of self-learning and teaching of peers can create a very powerful, unstructured culture of upskilling.

7.1.4 Leadership

Building leadership skills allows people to increase their level of self-leadership, and their ability to lead others. This can increase levels of drive and motivation and can enable workers to participate in career advancement. Leadership skills can help people to organize and implement new ways of working or adopt new tools to complete work more efficiently. Strong leaders also motivate teams to drive better levels of performance and safety. Upskilling individuals in leadership can help ensure employee retention and promote the sharing and preservation of institutional knowledge.

7.1.5 Resilience

Focusing on human skills training creates more resilient teams. Teams that can openly and safely communicate, share, lead, and work together more effectively are generally more flexible, agile, and have an increased level of readiness for change are resilient to external pressure. Resilient teams are capable of efficiently switching between tasks when work demands and priorities rapidly change and can navigate setbacks with reduced impact. When problems arise, resilient teams address them quickly and effectively to minimize consequences. It is also important to develop a work culture that tolerates failure of initiatives. This will give people the confidence to try new technologies or ways of working without the fear of negative impact. Failing fast is also an efficient way to monitor the success of initiatives and make adjustments if things are not providing expected results.

7.1.6 Effective Collaboration and Communication

Effective collaboration and communication is essential to effective teamwork. Effective teams are more productive and promote knowledge sharing while working together to achieve common goals and objectives. Strong communication skills enable the sharing and understanding of different perspectives. This helps contribute to the development of innovative solutions and effective adoption of new tools and processes. Strong communication skills also enable concise reporting. Effective written, verbal, and presentation reporting backed up by data is a necessity to effectively escalate insights and recommendations through the workforce and levels of management.

7.2 Technical Skills

Technical Skills

Specific, measurable, and teachable skills typically acquired through formal and informal education, training, hands-on experience, or certification, that are needed to perform a certain job or task (29)

Technical skills cover a broad range of topics and vary widely depending on the level of subject matter expertise, experience, and subject matter topic. These skills can be developed through learning channels like formal or self-directed training, and mentorship. Skills can be learned and acquired by individuals, or groups, and are usually geared towards solving specific types of problems.

On the more experienced part of the spectrum, there are technical skills that can be acquired through the knowledge and experience of someone who has worked their entire professional career in a particular area. On the other end, are simpler sets of skills that can be rapidly acquired by almost anyone. Skills like data security, use of AI, and automated reporting are applicable to almost all employees in an organization and would result in companywide efficiencies. More specialized skills such as programming AI models, automating data analysis, and configuring robot and drone missions are typically targeted towards more specialized groups and teams, so they can drive efficiencies with specific opportunities. It is up to individuals and organizations to decide how and when to acquire different types of technical skills, and which technical skills are required to complete particular jobs. The following survey data collected by Aker Solutions indicates the skills that the workforce feel will be important in the coming years for the industry in this region.

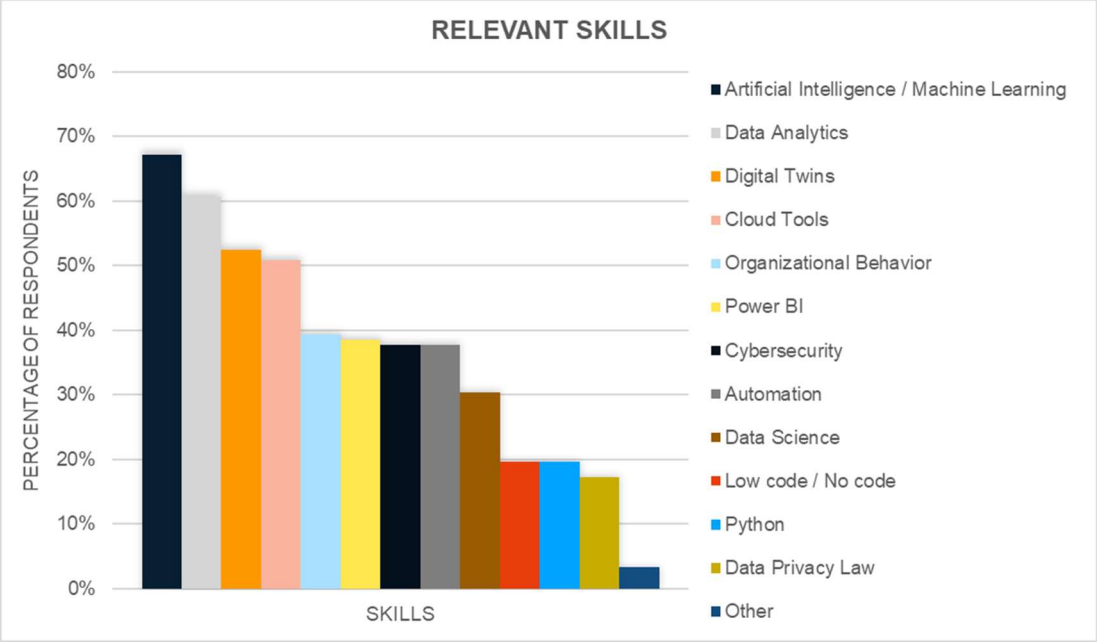


Figure 7-1 Relevant Skills Results from Aker Solutions' Questionnaire

7.2.1 Artificial Intelligence

Artificial intelligence (AI) is a rapidly developing field of technology that is showing proven benefits to the industry. AI is focused on teaching machines to make decisions about data in a way that is similar to how humans make decisions based on data. The advantage is that AI is scalable and can assess data that is magnitudes larger than anything humans can interpret, and it can do it almost instantly.

A recently popular form of AI is known as Generative AI. This type of AI can generate text, photos, and videos, and it can summarize meeting minutes and reports, generate new reports or presentations, and can also produce insights based on simple questions and descriptions provided by a user. The models used in Generative AI are trained on various large data sets. As an example, organizations can deploy this technology to query and summarize all studies and reports completed through the entire data history of the organization to instantly provide answers and insights. As another example, the same technology can also create a PowerPoint presentation based on a single report or study.

Training the workforce to be proficient in using this one type of AI that has dozens of different use cases, can very quickly provide sizable savings and efficiencies to any organization.

More complex AI models can be trained based on existing data sets to make decisions and derive insights from new data sets. An example of this would be training an AI model to analyze vibration data to predict equipment failure. Bringing personnel into an organization, or upskilling people in an organization to help train and use these types of AI models can also provide significant benefit to any operation or organization. In this case, it could significantly reduce equipment and process downtime, which saves money, increases safety, and extends equipment life.

7.2.2 Data Analytics

Data Analytics refers to techniques and tools related to the analysis of large data sets. The oil and gas industry has a lot of very large data sets that are readily available for analysis. There is also a significant opportunity to add new sensors in the field that will generate even more data sets. These data sets are full of insights that are waiting to be discovered and utilized as part of a data-driven decision-making process. Insights supported by hard data significantly derisks and adds certainty to the decision-making process. The data available is so large and complex that it is not practical for humans to analyze. Modern tools are an absolute requirement to process the data efficiently and produce insights. Upskilling individuals to become data literate enables the workforce to make use of insights from large data sets.

7.2.3 Digital Twins

Digital twins are typically a cloud-based platform that act as a visualization medium for many kinds of production, operational, and maintenance data. These data sets are typically siloed and only accessible by a few. Digital twins allow workers to quickly find and analyze information from many sources through a single tool. This significantly reduces the time required to manually search through different data sets and while trying to build relationships to garner insights. In a digital twin, all data relationships are built in advance, making it quick for users to access through 3D models, dashboards, or search and filter functions. Users trained in digital twins will save a lot of effort when looking for data, and they will also come up with new use cases that unlock future efficiencies.

7.2.4 Cloud Tools

Cloud tools are tools that exist on a 3rd party online platform. Well known cloud tools are applications like Office365, Google apps, Azure, and Amazon Web Services. Tools like digital twins, robotics and drone control software, and data aggregation platforms, are often cloud based. Utilizing these tools means that some kind of data from operations will exist on a third-party platform. It is essential that the risks of this are well understood and mitigated by anyone using online tools before uploading any data into any online platform. There are also many legal considerations and cybersecurity implications involved in utilizing cloud tools. Organizations should have evaluation and monitoring policies and procedures for the utilization of cloud tools, and further to that, all users of cloud tools should have proper training to ensure that data in the tool is never compromised.

7.2.5 Organizational Behavior

Organizational behavior is the study of how individual workers interact with other individuals, teams, managers, and organizations, and how those interactions can affect overall productivity, efficiency, and performance towards goals and objectives of teams and organizations. These interactions are typically evaluated through study and can be measured, assessed, changed, and continuously measured for improvements in efficiencies. Having resources knowledgeable in organizational behavior will bring structure, measurability, and certainty to training efforts.

7.2.6 Data Presentation and Insight Communication (ex: PowerBI)

A key skill when working with data is being able to quickly, reliably, and concisely communicate the insights that have been derived from data sets. The communication of these insights might also change over time, and tools like custom dashboards and applications to view and communicate insights can be created to allow for continuous and automatic update of insights, without having to rebuild presentations or visuals manually. Having skills in using tools like PowerBI and Tableau, allow the workforce to create automated visual reporting tools that can keep everyone up to date always based on the latest data without having to manually adjust reports on a regular basis.

7.2.7 Cybersecurity

As industry and organizations evolve, they look toward data and technology to make more informed decisions and run operations more efficiently and the cloud, data connectivity, and data access are becoming a necessity. This is driving new requirements, processes, and technologies for protecting data. Anyone in the workforce can be a potential source to exploit to gain access to data. Humans in the workforce are often a target for attackers, as gaining login credentials from a worker is often the easiest way to gain access to larger data sets and systems. Upskilling resources so that they are informed and educated around cybersecurity will allow organizations to securely share data to expand the types of tools and analysis that can be actioned on the data, without compromising the security of the organization. Ensuring the workforce has access to regular data security and privacy training will help mitigate the risks of data being captured by bad actors or leaked out into the public domain. This is an absolute requirement in order to invest in modernization.

7.2.8 Automation

Automation upskilling allows workers to automate highly manual and repetitive tasks. As an example, Industrial automation and data collection is very well established in industry, however, extracting insights from these data sets and communicating findings remains a highly manual set of tasks. Developing automated analytics, or

automated reporting tools and dashboards significantly reduces manual workload, directly increasing efficiency and time on tools. Automation can also significantly reduce office-related reporting by making manual tasks automatic. Workers who think in terms of automation can significantly transform any operation.

7.2.9 Data Science

Data science is generally considered an umbrella to be a more advanced form of data analytics. Data science seeks to uncover broader insights from data sets and refers to activities and techniques that are utilized to collect, organize, and cleanse data so it can be more reliably and efficiently analyzed. Organizations often have many large data sets that may have relationships with each other, but the data sets are segmented. Data science skills bring those data sets together, identify any gaps that may exist in the data, and can also cleanse the data to remove any errored or statistically non-relevant data. These activities significantly simplify the work of data analytics.

Depending on the type of data available, there may be existing tools, however there is also the possibility that no tools exist, and custom tools, algorithms, or predictive models may need to be developed to effectively extract insights from data.

7.2.10 Low Code / No Code Application Development

Low code / No code application development refers to technologies and frameworks that allow the development of custom applications without the use of traditional programming languages, tools, and skillsets. This type of application development can be learned relatively quickly by any user, who can then develop custom applications and workflows that, for example, automate and speed up workflows or data management activities. The Microsoft PowerApps platform is an example of a low code / no code technology that allows for rapid development of these custom applications with minimal training.

7.2.11 Programming Languages (ex: Python)

Traditional programming languages, such as Python, can be utilized to perform advanced data collection and analysis or to create custom applications. They can also be used to program routines for robot and drone inspections and process the associated data they collect. Developing skills with these types of programming languages can require some effort, so it’s not a skill for everyone to acquire and master, but it is certainly manageable to learn if you need to do more advanced or automated actions with large data sets. Also, learning how to program to interact with Application Programming Interfaces, or APIs, is an important skill that allows for the movement of data from one system to another, which helps remove the traditional data silo blockers so that more advanced functions like data correlation and data analysis can be executed. For more advanced projects that require programming development, it may be better to outsource or hire experienced developers to complete work cost effectively and efficiently.

7.2.12 Data Privacy Law

Like data security, data privacy laws are also a very important consideration as we modernize and evolve the industry. Data privacy is primarily focused on rules and policies that prohibit the collection and storage of personally identifiable information, and defining explicit rules and policies around collection, retention, security, and

destruction when that type of information must to be collected. It is important to ensure that all employees understand the importance of data privacy from an organization's point of view, but also important that individuals understand their own rights around data privacy. Every employee will encounter privacy sensitive data at some point, and they need to understand the importance of the related safeguards.

Skills needs are changing too fast for companies to keep hiring the way they have been, to calibrate jobs based on past needs, or "the way we've always done it" (22)

8 Filling the Gap – Focus Areas for Successful Upskilling

Considerations for upskilling summarized:

- Establish the 'Why'
- Cultural Change
- Alignment with Corporate Goals
- Skills Gap Analysis
- Leadership Commitment
- Leveraging Existing Corporate Upskilling Initiatives
- Mentorship
- Equitable and Accessible Training Opportunities
- Allocation of Time, Resources, and Funding
- Rewards and Incentives
- Focused Upskilling
- Flexible Upskilling Models
- Bridging Training and Certification
- Joint Industry Collaboration
- Collaboration with Academia

Given the hurdles associated with upskilling, the gaps that need to be filled, and the need for a modernized workforce, it is important to understand the areas of focus that will help achieve the best results for the money, time, and effort that is invested in upskilling. A more modern approach to upskilling involves working to build a Skills-based Workforce.

A skills-based workforce is a new approach to talent acquisition and retention that focuses on a person's skills and competencies rather than degrees, job histories, or job titles (31). Breaking down an organization's capabilities into specific skills and skill groups and mapping those into roles helps to determine what skills exist within an organization and what skills are required. This also assists employees and their leaders to determine what skills and knowledge areas should be focused on for upskilling and professional development opportunities, creating a future ready workforce. This approach has the potential to create healthier talent pipelines, contribute to higher retention rates, and address skills shortages. A study by Deloitte found that skills focused organizations are 107% more likely to place talent effectively and 98% more likely to retain high performers (30).

Skills focused organizations are:

107%

more likely to place talent effectively (30)

A skills-based workforce also supports mobility which enables HR/People and Organization members, leaders and employees to identify opportunities for new positions / projects and who would be best suited to take on a new role. This enables agility and increases resiliency within an organization, especially when trying to establish growth and respond to market demands.

The sections below outline some of the focus areas that foster a skills-based workforce and help to overcome the hurdles that are associated with upskilling, as outlined in Section 6. These focus areas are just the start of the

process, but organizations can utilize them to begin enhancing or creating upskilling programs that yield positive results to the workforce and the organization.

8.1 Establish the 'Why'

Upskilling Challenges Addressed: Lack of Alignment and Direction, Resistance to Change, Lack of Framework and Structure

One core theme that organizations must consider throughout the process of evaluating their upskilling programs, is establishing and promoting the 'why' for training. There must be a purpose for any training initiatives that are put forward, and the workforce needs to understand that purpose and how it directly relates to their current position, or future career positions. The 'why' is how everyone becomes invested in upskilling. It determines what skills gaps need to be addressed, it determines who needs to be upskilled, and when that upskilling needs to occur. It becomes the foundation that ensures organizations, and the workforce see initiatives through to completion and completely realize the benefits of investment. Organizations and the workforce should collaborate on creating a documented source of all training initiatives, and the explicit drivers, outcomes, and benefits of executing the training which helps to reduce resistance to change, as everyone will understand goals and importance of the initiatives. The framework in Section 9 outlines the process of defining and capturing this type of information about training programs.

8.2 Cultural Change

Upskilling Challenges Addressed: Lack of Alignment and Direction, Resistance to Change, Unstructured Mentorship, Equitability and Accessibility, Allocation of Time, Funding Issues

Cultivating a culture of continuous learning is a key component to the successful implementation of any learning and development program. This culture encourages the workforce to stay current with new technologies and digitalization initiatives, and adapt to new knowledge and skills, ensuring engagement in the upskilling opportunities provided, thereby helping to close the skills gaps within the organization.

Establishing a culture of continuous learning allows employees to pursue professional development opportunities without having to feel like they are sacrificing their normal responsibilities. For the organization, it means looking at upskilling as a long-term investment into overall productivity, retention, and modernization, which pays returns in the form of resiliency and efficiency. Organizations are likely already investing in upskilling, however it is important to ensure that funding is thoughtfully allocated to support the upskilling initiatives and equally important to ensure that there is way measure the outcome and successes.

A culture of continuous learning and development within an organization goes beyond just offering a training program, however. Effective collaboration and communication throughout the organization and amongst employees is critical. Creating regular touchpoints between leaders and the workforce, ensuring equitable and accessible opportunities, communicating organizational objectives, and ensuring that the workforce understands how their personal and professional development and growth supports organizational objectives, helps to support this new culture. This also fosters an environment that encourages innovation, knowledge sharing, and creates effective and productive teams within the organization. Regularly surveying the workforce will also provide the organization with the information required to better shape upskilling initiatives.

8.3 Alignment with Corporate Goals

Upskilling Challenges Addressed: Undefined Skills Needs, Lack of Alignment and Direction, Resistance to Change

Corporate goals drive the overall direction of an organization, and any activities related to upskilling should support and align with these objectives. Providing broad access to time and money for upskilling is only part of the equation. Mapping corporate goals and objectives to skills gaps and upskilling programs provides the workforce with direction and motivation to pursue relevant upskilling opportunities that provide both personal development and benefit the whole organization. To do this organizations must determine what skills currently exist within the organization and the skills required to drive the organization's objectives. Organizations should create roadmaps that identify the specific skills and define the upskilling journey for each role. Clear communication of these roadmaps ensures alignment with corporate goals and provides employees with the confidence that their upskilling efforts will provide benefits to themselves and the organization. This also helps to anchor the corporate culture around continuous learning and development which contributes to a future ready workforce that establishes a competitive edge for the organization.

Organizations should also create comprehensive KPIs to measure progress and successes in these areas. This helps to ensure that investment and effort in upskilling initiatives are yielding results or if adjustments need to be made. KPIs that are attached to performance evaluations of leaders and employees can help to fuel participation and completion of upskilling initiatives. Examples of KPIs could be number of hours spent upskilling per employee per year, number of skills gaps identified and closed, number of digitalization or modernization activities completed, number of hours saved through modernization, etc.

8.4 Skills Gap Analysis

Upskilling Challenges Addressed: Undefined Skills Needs, Lack of Alignment and Direction

Identifying what skills are present within an organization and what skills are required to support new technology, work processes, or to achieve business objectives and goals is essential input into the development of a successful upskilling program. A skills gap analysis can be performed to assess the status of the competencies / skills within the organization and to determine which will be required in the future.

Organizations should put a focus on building out a skills taxonomy, which is a hierarchical system to classify and map relationships between different and related types of skills and subsets of skills. This can then be used to help identify what skills are necessary for an organization and can be compared to the skills that exist in an organization. The level of detail of this taxonomy will be organizationally dependent but should be granular enough to link back to specific upskilling initiatives that an employee could undertake. An example of a comprehensive skills taxonomy was created by the Government of Canada and can be found here: Taxonomy - Canada.ca (esdc.gc.ca). Skills can be mapped back to broader categories such as digital, commercial awareness, leadership, Environmental and Social Governance (ESG), technical, etc., helping create a link back to the corporate goals and objectives. The taxonomy should include both human and technical skills.

Utilizing the skills taxonomy, leaders should start to identify the skills, competencies, and experiences that currently exist in their teams. This helps establish a baseline of available skillsets. Simultaneously, leaders need to look at the coming work, changes in the market, and new technologies to start identifying the skills required to meet the future demands of the organization. The results of these activities can then generate a skills gap analysis profile

for each team, group, and the organization, which can then be used to start planning and mapping the execution of training programs that will help close the gap. Some larger organizations may be able to use software in the marketplace that can consolidate and analyze employee resumes to determine the existing workforce skillset. Employees should be provided with the opportunity to weigh in on the outcome to ensure their skillsets are well represented. This can be utilized to set a baseline that is always up to date as people join and leave the organization.

An important aspect of any learning and development program is to ensure that the data related to skills and competency is kept up to date. Review of skills and competency levels can be included in the performance review process for each employee. During this time any additional skills or changes to competency levels for existing skills, as a result of upskilling activities throughout the year, can be captured and fed back to the organization.

8.5 Leadership Commitment

Upskilling Challenges Addressed: Undefined Skills Needs, Lack of Alignment and Direction, Resistance to Change, Allocation of Time

Leaders, at all levels, must be aligned and committed to upskilling within an organization. Upskilling goals and objectives must be aligned with corporate goals and objectives and should flow down through all levels of leadership in an organization so that upskilling is driven uniformly at all levels. This shows a commitment to employees which can drive productivity and engagement. Also, helping employees understand what skills they need to learn, how those skills align with their role or career path, and how they enable corporate goals and objectives, enables them to pursue upskilling with confidence.

The organization's commitment to, and requirements for, upskilling need to be communicated clearly to the workforce. This should be done at regular intervals, where management and leaders can articulate the status and importance of upskilling initiatives and explicitly relate these to the organization's goals and objectives. All leaders should have measurable KPIs tied to their performance so that upskilling becomes embedded in the organization. Driving efficiency is a measurable goal and upskilling is one way to deliver tangible results.

Leaders can also encourage employees to investigate new ways of working and how to apply new technologies and skills to their work. This helps alleviate issues around resistance to change and helps employees be comfortable with new ways of working. Leaders of front-line workers should track the skills required for their workers to do their jobs as new technologies are introduced and promote the upskilling of these skills to their employees while also ensuring upskilling aligns with employee job and career growth trajectories. Employees should also have yearly goals and objectives set to ensure upskilling is embedded in their work responsibilities. Clear communication and linking back to employee job responsibilities allows for employees to understand the benefit of upskilling and become invested in such activities. Leaders also need to protect the time required for employees to complete upskilling activities by ensuring that upskilling is built into workload planning.

8.6 Leveraging Existing Corporate Upskilling Initiatives

Upskilling Challenges Addressed: Complex Corporate Upskilling Programs

In many organizations, especially within the oil and gas industry, priority is given to regulatory / mandatory training. These training courses are targeted at specific groups who have been identified as employees required to complete these courses, they are measured and tracked, and continuously updated to reflect the latest in industry standards / requirements. This same approach can be leveraged and applied to other skills required to fully realize the benefits of upskilling and help to close the skills gap within an organization. Applying the same change management standard to upskilling that is applied to mandatory training would ensure that skills gaps are adequately closed.

Another area to evaluate is the number of channels for upskilling and communication of such within the organization. During interviews with workers and organizations, there were several indications that internal training opportunities were not well communicated, or that the internal channels to plan and participate in upskilling are sometimes numerous and complicated to navigate. One organization evaluated their methods of upskilling and reduced the number of channels from upskilling from seven down to two, making it straight forward for employees to explore and complete upskilling initiatives.

Evaluating existing upskilling initiatives and challenges allows organizations to keep their existing foundation of training, but making small changes and simplifying channels removes some of the barriers that employees face when they try and upskill within an organization.

8.7 Mentorship

Upskilling Challenges Addressed: Lack of Alignment and Direction, Unstructured Mentorship, Equitability and Accessibility, Allocation of Time

Mentorship programs are intended to promote the sharing of knowledge within an organization to capture and retain valuable institutional knowledge and aid in effective collaboration between employees and teams. Mentorship is also an excellent way to build networks and foster communications within large and diverse organizations. Organizations typically have some form of informal mentorship that is built organically through close working relationships and teamwork, but while these relationships are somewhat effective in transferring knowledge and upskilling resources, there is no way to determine the effectiveness of knowledge transfer activities, and if the right information is being transferred and maintained. Creating a structured and measurable mentorship program is key to ensuring mentorship is successful for upskilling, and institutional knowledge is protected.

Organizations must first identify institutional knowledge or skillsets and experience that is to be passed on and preserved to new employees. As an example, employees who are new to the oil and gas industry are served well with mentorship on applicable codes and standards related to offshore safety and regulation, similarly, leadership communication, and problem-solving skills are also well transferred through mentorship pathways.

Organizations must then identify people who are experienced and able to mentor effectively. They must also be given the time to mentor, and likewise, mentees must be given time to learn. Next, establishing formal activities and regular checkpoints and goals for each mentorship opportunity allows for measurement of progress and

confirmation that knowledge is being transferred and maintained. It is also essential that organizations review mentorship pathways to ensure that the program is not interrupted by career progression employee attrition. Structuring the mentorship engagement provides employees with the opportunity for rapid growth towards mastering the skillsets needed to complete their jobs. It also helps build a resilient network of subject matter expertise within an organization.

There are also benefits to reverse mentorship structures where younger professionals can provide fresh perspective on new ways of working and solving problems, to more experienced industry personnel, especially when it comes to the application of digital tools.

Organizations should also strive for equitable representation in any mentorship program. A study by Cornell University School of Industrial and Labor Relations found that minority representation at management levels increased 9 – 24% as a result of mentoring programs, compared to -2% - 18% with other diversity initiatives. The same study found that mentoring programs drastically improved retention and promotion rates (15% - 38%), for minorities and women, as compared to non-mentored employees (32). Visibility and representation help remove barriers and empower those who may not participate in programs to leverage skills from more senior individuals. This also ties into a physiologically safe work environment where people feel more comfortable speaking up or asking questions related to their scope of work.

9% – 24%

boost in minority representation at management level as a result of mentoring programs (32)

8.8 Equitable and Accessible Training Opportunities

Upskilling Challenges Addressed: Unstructured Mentorship, Equitability and Accessibility, Funding Issues

Providing equitable and accessible mentorship and training opportunities as part of an upskilling program is important in order to remove significant barriers and enables all workers to avail of the benefits of upskilling. Surveying the workforce to determine their needs helps inform the development of equitable and accessible programs. For programs to be equitable, this means more inclusive curriculum design, content, and delivery methods that are tailored to the needs of the workforce. Inclusive upskilling programs should have considerations for affordability, flexibility (ex. accommodations for family status, work-life balance, etc.), and accessible learning platforms (ex. accommodations for visual / hearing impairment, neurodivergence, learning differences, etc.). Engagement with local community organizations that represent equity deserving groups is required to ensure that training programs are inclusive and meet the needs of the entire workforce. These local groups may have knowledge of, or access to, funding to assist in increasing equitability and accessibility to training opportunities.

8.9 Allocation of Time, Resources, and Funding

Upskilling Challenges Addressed: Lack of Framework and Structure, Allocation of Time, Funding Issues

Organizations are investing significant amounts of time and money into their upskilling programs and initiatives, but feedback and evidence suggests that a lot of employees are not able to take advantage of these opportunities because they do not have the time to participate. Upskilling is often expected to be executed outside of work commitments, which competes with the growing desires of the workforce to have a better work-life balance. For

an organization to benefit from upskilling programs, there needs to be an adjustment of how learning and development programs are administered. Offering employees the ability to participate in approved upskilling during work hours helps ensure that everyone can grow their knowledge. This is often referred to as 'Learning in the flow of Work', and organizations should look to build dedicated learning time into work schedules so that workers can upskill without feeling like they are doing a disservice to their current work obligations. Organizations can also look at backfilling a person's role when upskilling opportunities may require more of an extended time commitment.

Organizations that offer ongoing skill development at work can reduce workforce stress by up to 47% (33). Organizations should also monitor and measure the time being spent on upskilling to ensure that employees are utilizing the time to meet organizational goals and objectives on upskilling.

47%

reduction in workforce stress in organizations that offer ongoing skill development (33)

Work-life balance also needs to be considered to ensure that all employees have equal access to opportunities and can complete the desired upskilling initiatives without impacting commitments and responsibilities outside of work. One way to achieve this is to provide time for upskilling during work hours so employees can implement professional development into their goals and be accountable for successful completion. Reference is also made to Section 8.8 for further discussion on considerations for work-life balance and upskilling.

For organizations that have offshore employees, if upskilling cannot be built into their offshore workflows, then another option is to offer paid time for upskilling during onshore time. This is a common practice for required training and certifications but can also be applied for upskilling initiatives.

While scheduling upskilling during work time has significant benefits for an organization, the time for upskilling is not directly contributing to bottom line sales and production. For this reason, it is important to consider the investment costs during budgeting and quoting of work. Further, there is potential that certain types of upskilling may qualify for funding opportunities offered by government and development agencies. Reference Section 10.1 for examples of potential funding sources.

Funding is integral to creation, delivery, and execution of upskilling programs and initiatives. Organizations, the workforce, and academic institutions have all benefited from external funding through government upskilling grants and training programs. Maintaining continued dialog through industry associations and government organizations helps highlight the need and benefits of investment into these programs. There are many unique upskilling opportunities in this region that can be realized through proper funding of joint industry programs and leveraging the incredibly talented and dedicated workforce. Reference Section 11 for examples of initiatives that could benefit the region.

8.10 Rewards and Incentives

Upskilling Challenges Addressed: Lack of Alignment and Direction, Resistance to Change, Lack of Framework and Structure, Funding Issues

Rewarding and incentivizing the workforce to drive upskilling is a proven way to promote engagement and completion of programs. In order to maximize value, organizations may need to look beyond simple positive recognition of upskilling achievements and consider other methods of rewards and incentives. Some will struggle to justify the needed investment towards rewards and incentives, however, structuring these programs appropriately can deliver measurable return on investment.

"One of the best investments we made as a company. We delivered one hundred times more than what we paid." (34)

Structuring the payout of incentives and rewards after measurable benefit has been achieved not only promotes completion of the activities within the workforce, but also removes the need to secure overhead to fund the initiatives in advance. One company indicated that a $50 million investment in transformation and upskilling returned $1 billion in recurring value beyond the regular production value (34). The incentive payments were structured in a way that the company more than offset the cost with immediate realization measurable benefit to company financial objectives.

There are also non-monetary models for incentivization that have shown success. The issuance of certificates or badges at the completion of any upskilling initiative provides employees with tangible evidence of their knowledge and credibility around a certain skill that also provides the learners with a sense of accomplishment. These types of rewards can also be added to strengthen a resume which allows the workforce to show their upskilling commitment and level of knowledge but can also be used by the organization to prove competency and depth of organizational knowledge to clients.

Randomized drawings for gift cards or rewards through a point system are also valid ways to help incentivize. As an example, a global company that operates in this region offers a comprehensive points-based system, where employees earn points based on upskilling accomplishments and other achievements. These points can then be redeemed towards other academic or upskilling initiatives, team building activities, or can even be used as rent for various cabins or condos enabling employees to have access to executive style accommodation for vacations and work-life balance activities, like a corporate AirBnB model, or travel rewards incentive program.

Also, incentivization based on connecting upskilling initiatives directly to an employee's career development should not be overlooked. Many people will successfully participate in learning activities if there are clear benefits to their career, such as expanded responsibilities, salary increases, or promotion within the organization. Organizations should ensure that these rewards and incentives are factored into yearly budget considerations.

Organizations should develop and measure key performance indicators related to incentives to ensure that methods chosen are effective for workforce engagement in upskilling opportunities and achievement of corporate objectives. These metrics can highlight areas where fine tuning or new approaches may be required to boost benefits and outcomes.

8.11 Focused Upskilling

Upskilling Challenges Addressed: Resistance to Change, Complex Corporate Upskilling Programs

Connecting upskilling to specific needs and day-to-day responsibilities of the workforce is essential to anchoring any new learnings within individuals. Being able to readily put new skillsets into practice for a particular job or role is a very powerful way to embed and retain that knowledge within an employee, as well as the larger organization.

Upskilling initiatives undertaken should be aligned with employee professional development plans, or with the skills gaps that an employee could fill with training. Additionally, projects or situations where the knowledge can be put into use should be identified early so that an employee can quickly put the learnings into practice. This significantly increases retention of the knowledge gained from upskilling and can provide early returns on investment. This is supported by the Learning Pyramid model that suggests 75% retention can be achieved by practicing what is learned (35).

8.12 Flexible Upskilling Models

Upskilling Challenges Addressed: Lack of Framework and Structure, Equitability and Accessibility

Aker Solutions' questionnaire to the industry found that most respondents (64%) preferred a combination of virtual and in-person learning opportunities. There was also an even split between self-directed, peer-to-peer, and group settings when it came to preferred delivery models. This emphasizes the importance of offering different upskilling delivery methods. Assessing the workforce of an organization will help map the requirements and needs of each group. As an example, the onshore workforce will need a different model of upskilling than what offshore rotational workers will require, or some people will do best with self-directed learning, and others will do best learning online, or within groups. This assessment will provide a profile of which models of learning are most effective, and offering a selection of these models will increase levels of success and will be more accessible and inclusive to the workforce. Some of these methods are detailed below. These methods can be executed as part of an organization driven upskilling program but also can be self-driven, allowing for employees to make flexible selections of which learnings they would like to complete and when. With all these delivery methods, it is important to trust where the content and programs are coming from, as this will help ensure that material is up-to-date, and of sufficient quality to meet the needs of an upskilling initiative.

Gamification

Gamification is the integration of game design features into non-gaming contexts (36). Executing learning programs through gaming structures puts unfamiliar information into a familiar platform. The benefits of gamification in learning should not be underestimated. One study suggests that using gamification in employee training can result in a 62% increase in motivation, a 29% decrease in boredom, and an 88% increase in happiness at work (37). This concept builds engagement by creating an environment that is interactive, competitive, and entertaining, which drives motivation and knowledge retention. As younger people enter the workforce, gamification can be a great way to connect people to learning concepts and material. However, it should also be noted that gamified content can become repetitive, so extra attention should be given to regularly updating the content.

Self-paced Learning

Self-paced learning allows individuals to define their own schedules for execution of learning activities. This allows for upskilling to be completed asynchronously as an employee's time and schedule permits, providing a lot more flexibility. The challenges with self-paced learning however are time management, motivation, and accountability. A specific training can fail if it is allowed to continue for an extended period, which makes it less effective, significantly increasing the risk of completion. Creating start and end points as well as milestones along the way can keep learnings relevant and employees on track to complete in a timely manner.

Peer-to-Peer

Peer-to-peer or one-to-one learning can be an effective way to foster collaboration in the workplace building on the concepts of equality and mutual growth. It is an excellent way to transfer knowledge from more experienced to lesser experienced employees through mentorship, and it also provides an opportunity to build leadership, communication, and teaching skills. One study showed that employees, when needing to learn something new, are 69% most likely to ask their leader or mentor and 55% likely to ask their colleagues for recommendations or support (39). Applying a formalized structure to peer-to-peer learning, such as regular check-in points or milestone deliverables, can enable monitoring and tracking to ensure effective and comprehensive knowledge transfer.

Online and Virtual Learning

Online and virtual learning offers an accessible and flexible way for employees to improve their skills. There are a wide variety of ways for virtual content to be structured. A self-paced structure allows for training regardless of location and can be rolled out to a wide group of individuals at once. This is useful for compliance-based training courses and/or organization specific material. This structure does have challenges in that it is difficult to drive completion across large groups of individuals. A schedule driven structure, such as instructor-led virtual courses or courses that have structured completion dates, also allows for training regardless of location. The benefit is that it has guardrails to ensure completion and delivery and offers the opportunity to closely monitor progress and measure outcomes throughout the program. This structure is a common and proven method for delivering content that may be more challenging or required deeper learning or levels of understanding.

Classroom and Group Learning

Classroom and group learning can be utilized as part of an upskilling program through courses offered by academic institutions or organization specific offerings. This method offers the opportunity for employees to learn at an offsite environment, with focused sessions and little distraction from day-to-day office activities. This setting allows for collaboration and relationship building, fostering the exchange of ideas and the opportunity for hands-on learning. Short-form or long-form offerings that consist of a day long course or multi-semester programs with varying levels of complexity. As an example, a two-day course on wind and hydrogen can provide a base level of knowledge so that anyone who is curious can further explore the topic on their own. Another example could be a six-week program focused on details of AI and machine learning concepts that helps embed practical knowledge and experience through the solving of real-world problems. This structure provides a range of upskilling opportunities for individuals that promote teambuilding, communication, problem solving, and cross-collaboration between participants, and with instructors. Something to consider is this structure can be more costly to administer, there may be minimum enrollment requirements, and it requires specific, dedicated time for individuals to participate.

Micro-credentials

Another emerging model of education is centered around micro-credentials. These are flexible, short-duration, targeted, competency-based learning courses that enable the workforce to quickly pick up a relevant skillset. In contrast to larger degree programs, micro-credentials focus on one skill, or a subset of a skill, to attain proficiency over a short period of time. Micro-credentials lend well to upskilling within the oil and gas industry as most tend to be self-paced and are often accessible online. Since they are targeted learnings, material can be adapted relatively quickly and therefore keep pace with evolving technologies relevant to industry. With micro-credentials, there can be a limit to the depth of knowledge that can be attained, so it is important to understand the content, and the intent of these types of programs to ensure they meet the desired outcome for upskilling.

Custom Learning

Many upskilling resources offer custom learning programs that tailor courses to specific requirements and requested delivery models. All the local academic institutions interviewed by Aker Solutions provide some form of course, content, and delivery customization. Custom programs offer the opportunity to include organization specific material and course content to the level of detail required by an organization for the specific group being upskilled. These can also be well tailored for delivery as part of a joint industry engagement. There are also many online services that offer content creation and delivery both locally and globally.

8.13 Bridging Training and Certification

Upskilling Challenges Addressed: Lack of Framework and Structure, Equitability and Accessibility, Funding Issues

There exists a labour pool which may have the skills required to address the specific needs of the industry, however these individuals may not necessarily meet the qualifications for open positions due to gaps in certification required in this province. For example, an individual with a degree in engineering from a university outside of Canada may have the education required to fulfill an open job position however they may not be able to register as a Professional Engineer until they meet the requirements of the governing body. Adding clarity to these processes and providing well defined pathways to achieve the required upskilling to close the gaps and obtain certification and registration would enable them to utilize their trained skillsets. Working with organizations like the Association of New Canadians, industry organizations, upskilling institutions, certification bodies, and employers can help to define the pathways and upskilling required to allow individuals to more easily integrate their skills into the workforce. To better understand what is required for this process, Employment and Social Development Canada has a guide and support resources (39) to help with recognition of credentials for those who are new to Canada. This guide also contains possible sources of funding to help individuals through this process.

8.14 Joint Industry Collaboration

Upskilling Challenges Addressed: Undefined Skills Needs, Lack of Framework and Structure, Funding Issues

Collaboration with government, industry organizations, and other companies can play an important role in bridging the skills gap in the oil and gas industry. Combining the knowledge and expertise of these organizations can result in skill development programs that benefit employers, the workforce, and help strengthen the knowledge in the region. The questionnaire sent out by Aker Solutions found that 91% of respondents were willing to participate in joint industry upskilling offerings.

Non-profit industry organizations, such as techNL, Energy Research and Innovation NL (ERINL), Energy NL, econext, etc. have the ability to facilitate discussions and determine interest from both the workforce and industry employers, as well as local, provincial, and federal government entities, and professional associations, such as Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL). They are a good source to start having discussions and building programs and partnerships that would benefit the workforce in the region. While these organizations can facilitate conversations or discussions, they often rely on industry and employers to highlight and drive the need and direction of these activities. It is therefore important for all groups to be involved. These types of collaborations can also help identify the skills needs within the region.

Conversations with industry and academic organizations indicate some successes with joint industry upskilling initiatives. Feedback from academic institutions that Aker Solutions interviewed highlighted the successes of techNL's Find Your Future in Tech program. In contrast to this however, there are also stories of initiatives that have failed after successful piloting due to lack of funding, commitment, and follow through. It is therefore important to plan and structure these initiatives utilizing models that have proven success. Communication and advertising of program opportunities was also identified as an essential component to success. Joint industry collaboration in the past have also accessed funding to provide upskilling and training opportunities, as they tend to target broad sections of the workforce.

Joint industry collaboration also opens the door to cross industry collaboration where upskilling initiatives can benefit multiple industries in this region, or even transfer skills between industries in the region, for example from the high-tech industry to the oil and gas industry. Joint industry collaborations are also a good method to bring in skilled experts from outside the region to transfer knowledge into the region. A good example of this is the recent Digital Offshore conference where many experts were brought into speak, kicking off further discussions and knowledge explorations in the province. There is also potential to look beyond the oil and gas industry to identify successes, case studies, and models that can be replicated for faster adoption.

8.15 Collaboration with Academia

Upskilling Challenges Addressed: Lack of Alignment and Direction, Lack of Framework and Structure

Academic institutions are the experts in the creation and delivery of education and upskilling programs. They understand the best way to deliver upskilling content to address the range of needs of people and organizations. Organizations can rely on these institutions to successfully deliver upskilling content without the need to create their own content, program, and delivery methods to deliver upskilling programs to the workforce.

Close collaboration with industry allows academic organizations to identify required skills and address potential gaps through updated programs and curriculum. This helps ensure that people joining or within the workforce benefit from these programs and gain the knowledge to address the needs of industry.

All the academic institutions that Aker Solutions interviewed communicate regularly with industry organizations and companies to gain feedback on their course offerings to address the future needs of the industry. The organizations also indicated that they have created custom learning content in the past and are more than willing to work with organizations or groups to develop and deliver upskilling offerings.

Custom courses and programs that target specific needs of an organization is beneficial for administering training that aligns with upskilling goals and addresses specific gaps in knowledge using content that is tailored specifically for the work carried out by the organization. This makes the knowledge more relatable to the people being upskilled, which in turn creates better outcomes for the application of the training.

9 Upskilling Framework

By a wide margin, surveyed companies report that investing in learning and training on the job and automating processes are the most common workforce strategies which will be adopted to deliver their organization's business goals in the next five years (5).

As part of this study, Aker Solutions has developed a framework for upskilling that could be used to evaluate, structure, and execute upskilling initiatives in any organization. The framework is intended to spur thoughtful discussion and consideration to best determine the skills gaps within an organization, the needs of the workforce, and to define measurable KPIs that ensure the outcomes meet the goals and objectives of the organization. It addresses the challenges associated with upskilling by considering and incorporating best practices/focus areas for successful upskilling from Section 8. Organizations should have open discussions around this framework to determine if there are any gaps or improvements to be made to existing upskilling programs. The upskilling framework was developed based on the Digitalization Roadmap framework that has proven successful for assessing and implementing digital initiatives in a systematic, measurable, and testable manner. That framework also establishes how to build new technology into existing work processes. This is very similar to how upskilling should be evaluated, executed, and integrated into an organization's culture.

There are different options when deciding to implement a framework for upskilling; utilize an external company to build a program for the organization or build a program internally utilizing externally available learning opportunities and/or development of organization specific training. Regardless of the route taken, an upskilling framework should include the following core tasks:

- Regular assessment of the current and future skills gaps
- Implementation of a learning strategy that aligns with the business objectives
- Provision for a variety of learning opportunities and methods that cater to different learning styles, preferences, and needs of the workforce
- Establisment of partnerships/collaborations with external stakeholders such as academia, industry associations, and technology providers to maintain access to the latest research and innovations while leveraging best practices
- Measurement and evaluatation the impact of the training and development programs on the performance, productivity, and satisfaction of the workforce

The roadmap below is a systematic way to ensure that the above core tasks are achieved. It is important to note that not all steps of the framework presented below need to be executed each time a new upskilling opportunity is required. The work performed in the first two steps form the foundation for building out an upskilling program for the organization and do not need to be repeated frequently. Metrics from previous upskilling pilots and

implementations can be used to build a case for or against other upskilling opportunities, simplifying the process. The workforce survey can be performed at regularly defined intervals to keep the foundational information up to date and Key Performance Indicators (KPIs) can be adjusted based on feedback from ongoing upskilling activities.

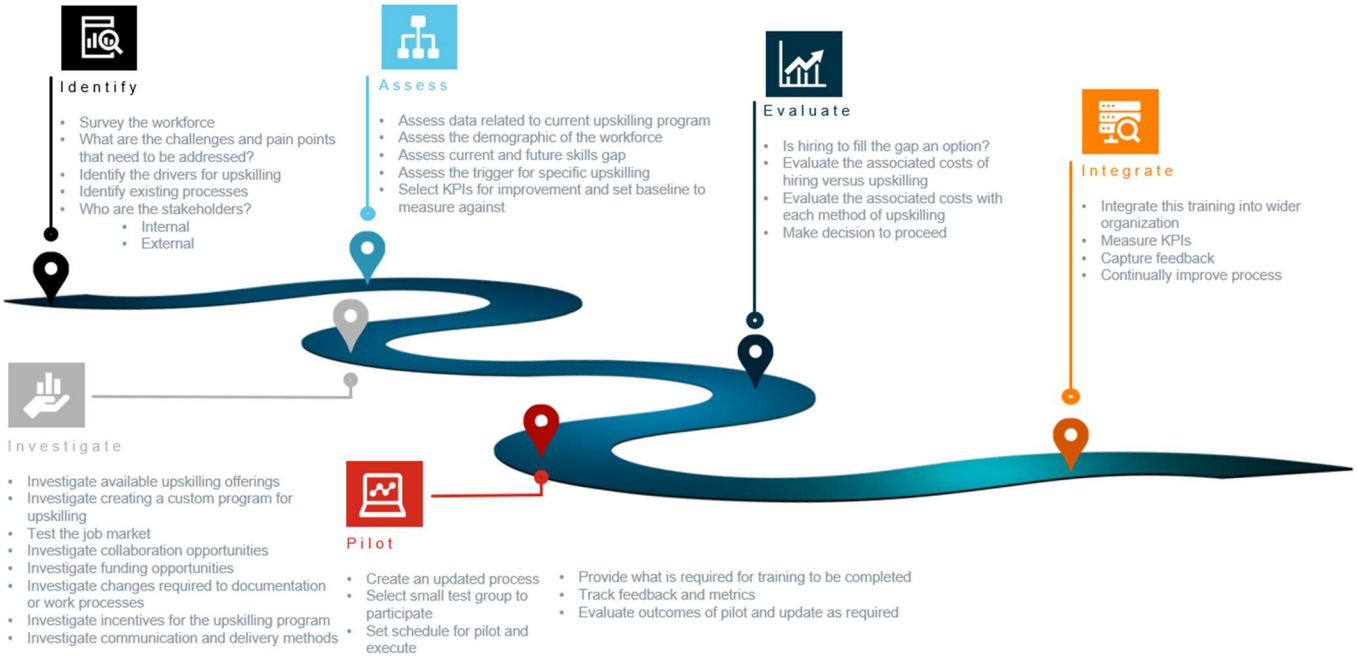


Figure 9-1 Framework for Upskilling Program Development

9.1 Identify

Identifying the drivers for upskilling is an important first step. These drivers often relate to the difficulties in finding available talent to hire, an aging workforce, the changing landscape of skills required within the organization, and the desire to retain and invest in the organization's employees. Drivers may also be organizational goals and objectives or benefits.

Identification of the challenges related to upskilling within an organization is equally important. These challenges are often related to the allocation of time for resources to complete training, establishing an appropriate method for upskilling, ensuring an inclusive upskilling program appropriate for all types of employees, etc.

Once the drivers and challenges are identified, it is important to examine the existing processes related to upskilling and how / if upskilling is currently performed within the organization. During this stage it is also important to identify the stakeholders who would benefit from a structured upskilling program, the different groups of personnel, including any necessary accessibility accommodations required, and the involvement of different management levels within the organization.

During the Identify stage a survey of the workforce should be completed. This survey can help to frame the challenges associated with upskilling in the organization, identify the efficacy of any ongoing upskilling

initiatives/programs, desired delivery methods for upskilling opportunities, and accommodations required to effectively deliver those opportunities. The workforce survey is an important step in the employee engagement process and enables the organization to target important upskilling issues highlighted by employees.

9.2 Assess

Once the challenges and drivers have been identified, the assessment of the current and future skills gaps and needs of the organization can be detailed. When determining the skills gaps, it is important to assess the current skills that are required, and the future skills required to align with the goals and growth objectives of the organization.

It is also important to assess who in the organization is currently participating in an upskilling program or mentorship activity. There may be other individuals or groups that could also benefit from these existing engagements.

An assessment of the current methods used by the organization for upskilling and mentorship as well as an assessment for the demographic of the workforce should be performed at this stage. Questions around the uptake of these opportunities within the organization currently, are the opportunities offered to everyone in the organization or just certain groups of employees, are any available opportunities adequately communicated within the organization, etc. should be asked.

During this stage it is also essential to identify existing KPIs that can be used to establish a baseline to measure improvements and successes against. Consider aspects such as investment, performance, productivity, satisfaction, efficiency, and work process hours when thinking about which KPIs should be measured.

9.3 Investigate

Once the skills gap analysis has been completed, the target groups and associated skillsets identified, and the baseline for measurements has been set, then available upskilling offerings and best models of delivery can be investigated. Opportunities to collaborate with other organizations/groups and available funding opportunities should also be investigated at this time. Investigating the impact on any documentation or work process changes required because of upskilling should also be performed.

Available learning opportunities should include investigating existing courses and training opportunities applicable to the identified skills and include consideration to develop organization specific training. The delivery of these trainings should also be a focus area and should ensure that the methods available fit the needs of the individuals identified to be upskilled.

Included in this stage should also be an investigation into incentives for the upskilling program and the communication methods available for rollout to individuals or the greater organization.

9.4 Evaluate

This step in the framework involves understanding the cost/benefits associated with upskilling. This helps determine if a gap should be filled by an upskilled worker, or a new hire. This evaluation should include all the

costs associated with hiring a new resource, including job role definition, advertising, interviewing, onboarding and training, and cultural fit versus upskilling an existing resource to fill the gap. It should also consider the costs associated with each upskilling delivery model option as well as the cost involved if incentivizing resources is needed to help motivate upskilling. The commitment from the organization, time invested to implement, the time allowance, funding, backfilling required, etc. should also be included in the cost evaluation associated with the upskilling opportunity. This can also help prioritize when each skills gap can be addressed and can also determine which model may be the most financially beneficial, without diminishing effectiveness. As an example, if there are a group of ten or more individuals that need a particular type of upskilling, then a dedicated group or classroom type training may be more beneficial and cost effective than one-on-one training.

At this stage, a decision on whether to proceed with a pilot of the upskilling program, including the particular skills and delivery models to focus on, can be made.

9.5 Pilot

A pilot program may not be necessary for smaller organizations or for training aimed at a small subset of the workforce. In this case, training can be directly administered to those individuals. Pilot programs are beneficial for organizations that may need to upskill larger portions of the workforce. A pilot program would highlight benefits without the need for full investment or disruption of the larger workforce. Piloting the upskilling program requires selecting the skill or skills to be piloted and a representative group that cover all the workforce that will be required to upskill those specific skill(s). Pilot projects lower initial investment, use a small deployment team, and allow for efficient capture of lessons learned and wins that can be incorporated into a larger rollout, if deemed successful.

Communication is key to this step. All participants should be aware of the KPIs that will be measured, and feedback should be effectively collected. A schedule for the pilot should be defined and participants should be supplied with everything required to complete the upskilling activities. Evaluation of the outcomes will determine if the delivery model and content have been successful in meeting the goals and objectives determined in the first stage. Adjustments can then be made from this information to improve the course offering before further rollout, or if the pilot was successful, then the initiative can be terminated so that it can be re-evaluated.

9.6 Integrate

If the pilot is deemed successful, a plan should be put in place to roll out the upskilling opportunity more extensively across the organization. Training of the remainder of the identified workforce for the specific skill can take place and continuous feedback should be captured and reviewed to continually improve the training material, implementation, schedule of offering, and continuous measurement of success.

Continuous monitoring for the initiative should also be established. This should include activities like scheduling formal reviews of the training, evaluation/update of the training material content, an update to the workforce roles that should attend the training, as examples. The timing of these reviews will be dependent on how fast the skill and curriculum will need to evolve. Skills that are more technology based may need to be updated more frequently than some human skillsets for example.

10 Available Industry Upskilling Resources

Upskilling resources summarized:

Local

- Memorial University of Newfoundland
- Marine Institute
- College of the North Atlantic (CNA)
- Academy Canada
- Keyin College
- Gardiner Centre
- ACENET
- Get-Coding
- Bluedrop

Non-local

- Coursera
- LinkedIn Learning
- PetroSkills
- Amazon AWS Certifications
- Microsoft Certifications
- Online University courses
- Lighthouse Labs
- Palette Skills

Through the course of this study and based on the results of the survey, it is evident that both the workforce and organizations may not necessarily know what opportunities and resources are available for upskilling. Aker Solutions has compiled a list of some of these resources based in the region or accessible through online platforms that can be utilized by workers and organizations in the region. A list of the academic institutions and upskilling resources interviewed by Aker Solutions has been included in APPENDIX C – Interview Participants.

Upskilling offerings through these education and upskilling resources include traditional in-person group sessions, online learning that is structured and scheduled, online learning that is flexible and self-paced, and in some cases, one-on-one guided learning. Programs also vary in length ranging from a more traditional semester-based to short courses or multi-day sessions. The majority of these regional upskilling resources also offer programs in both technical skills and/or human skills categories, which is a more holistic approach. Most of these regional resources will also work with organizations to develop and deliver customized training programs, meeting specific content requirements and delivery requests, for example, adapting programs to accommodate a mix of offshore and onshore workforce.

All upskilling resources that Aker Solutions interviewed survey the market similarly, through existing and past program participants, not-for-profit industry organizations, local companies within the industry, and partner networks to ensure that their offerings are covering the current and near future requirements of the industry are continuously updated.

All regional education and upskilling resources interviewed also have Diversity, Equity, Equality, and Inclusion (DEEI) considerations embedded in the development and delivery of upskilling programs. This ensures that there is an opportunity for everyone to participate.

There is also a willingness to collaborate and participate with industry in the region to create joint industry upskilling initiatives amongst all interviewed resources. Regular discussions between academic institutions/education resources and industry will help meet the needs of the current and future workforce.

The matrix below details some of the available academic institutions/education resources to the workforce in the region. There are a mix of online services and local entities that address a wide range of upskilling models and content.

	Virtual	In-person	Peer-to-peer (one-to-one)	Group	Self-paced	Custom Content	Human Skills	Technical Skills	Local Presence
Memorial University of Newfoundland		■		■				■	■
Marine Institute	■	■		■		■	■	■	■
College of the North Atlantic (CNA)	■	■		■	■	■	■	■	■
Academy Canada	■	■		■	■	■	■	■	■
Keyin College	■	■	■	■	■	■	■	■	■
Gardiner Centre	■	■		■		■	■	■	■
ACENET	■	■		■	■	■		■	■
Get Coding	■		■					■	■
Bluedrop	■	■		■	■	■	■	■	■
Coursera	■				■		■	■	
LinkedIn Learning	■				■		■	■	
PetroSkills	■				■			■	
Amazon AWS Certifications	■				■			■	
Microsoft Certifications	■				■			■	
Online University courses	■			■	■		■	■	
Lighthouse Labs	■	■		■				■	
Palette Skills	■	■		■				■	

Figure 10-1 Matrix of Available Upskilling Resources – focused on regional offerings (sample only)

In addition, SkillsPassNL (https://www.skillspass.com/) is a free service in Newfoundland and Labrador that provides online training for a mix of human and technical skills relevant to industry such as: Basic Computer Literacy, Building Accessibility Awareness, Communication, Customer Service, Dealing with Difficult People, Problem Solving, Teamwork, Time Management, and Using Numbers on the Job.

There are also numerous regional organizations and peer groups that offer various levels of support, mentorship, and upskilling. These groups allow for the opportunity to network, connect, and upskill with other individuals in the region and can help build skills but also offer support and direction.

Regional organizations and peer groups:

- techNL
- econext
- PEGNL
- Trades NL
- Women in Science and Engineering (WISE NL)
- Tequity+
- Canada Learning Code
- Association of New Canadian

Creating a central location that tracks all educational, upskilling, networking, and support organizations in the region would be very useful to help people and organizations understand who is doing what, and when in the area of upskilling.

10.1 Funding Sources

Through the course of this study, there have been many different instances of feedback around challenges associated with funding sources for upskilling. Sentiments of non-existent funding, general difficulty in finding funding programs, and funding programs that are very hard and time-consuming to navigate, all present difficulties for organizations, the workforce, and academia. Organizations that invest time into finding funding sources and navigating the processes of obtaining external funding for upskilling will tend to have a competitive advantage over peers who self-fund, so there is a benefit to investing the time into this process.

To help kickstart the search for funding, Employment and Social Development Canada (ESDC) has a site to search active funding and grants programs for Jobs, Skills Training, and Social Development projects. Other government organizations such as the Atlantic Opportunities Agency (ACOA), and the National Research Council (NRC) provide funding and it is advised to reach out and discuss potential funding programs to help develop the workforce. The various programs are geared towards specific types of projects and activities and will need to be assessed on an organization by organization and project by project basis.

Larger investments in models for education and upskilling have also shown proven success. The Centre for Research and Innovation (CRI) in Corner Brook is currently working with the pulp and paper industry to help assesses existing skillsets, make jobs more accessible through training, and help improve employee retention through training opportunities with College of the North Atlantic (CNA).

Another notable investment program with excellent success is the Find your Future in Tech program (findyourfuturenl.ca) by techNL. The program is aimed at training and upskilling opportunities throughout the province, to raise awareness around Newfoundland and Labrador's technology ecosystem. Funding from this program was largely provided through the Government of Canada's Sectoral Workforce Solutions Program which

is designed to help key sectors of the economy implement solutions to address current and emerging workforce needs. The Find your Future Program has been a huge success, involving eleven project partners to deliver training to learners throughout NL with workshops, courses, and diploma and degree programs. There were 30 different types of training delivered across 3,900 learners between January 2022, and March 2024. Programs focused on topics like software development, advanced computing, cyber security, and artificial intelligence, and workshops to raise awareness around opportunities for training.

Focusing funding on these larger joint industry initiatives is an excellent way to help ensure the workforce is prepared to face the challenges of an evolving industry. It is important that everyone involved in the industry openly discuss the coming needs of the workforce, so that programs can be created to address the skills gaps.

Finally, it should also be noted that several academic institutions and organizations have highlighted the impacts that will be felt due to removing the Canada Jobs Grant funding. This funding has helped organizations train and upskill employees and has helped fund workers to attend courses at academic institutions. There should be a focused effort to ensure this type of funding returns to the ecosystem.

11 Key Actions and Recommendations

Organizations, the workforce, and academia are key stakeholders in upskilling, and all have a role to play when looking to improve effectiveness in this region. A collaborative approach towards upskilling can also help drive funding and delivery of relevant programs within the region. Through the course of this study, it has become evident that there are key actions that can help determine where this region stands with upskilling, and a potential path that brings increased value to upskilling initiatives, driving benefits for both the workforce and organizations. The matrix below is an example of mapping identified challenges to potential focus areas which can help bring direction to upskilling initiatives. As an example, if there are challenges with time, then focusing on cultural change, leadership commitment, mentorship, and allocation of time, resources, and funding recommendations can help identify how to address these challenges.

		Challenges								
		Undefined Skills Needs	Lack of Alignment and Direction	Resistance to Change	Lack of Framework and Structure	Complex Corporate Upskilling Programs	Unstructured Mentorship	Equitability and Accessibility	Allocation of Time	Funding Issues
Focus Areas	Establishing the 'Why'		■	■	■					
	Cultural Change		■	■			■	■	■	■
	Alignment with Corporate Goals	■	■	■						
	Skills Gap Analysis	■	■							
	Leadership Commitment	■	■	■					■	
	Leveraging Existing Corporate Upskilling Initiatives					■				
	Mentorship		■				■	■	■	
	Equitable and Accessible Training Opportunities						■	■		■
	Allocation of Time, Resources, and Funding				■				■	■
	Rewards and Incentives		■	■	■					■
	Focused Upskilling			■		■				
	Flexible Upskilling Models				■			■		
	Bridging Training and Certification				■			■		■
	Joint Industry Collaboration	■			■					■
	Collaboration with Academia		■		■					

Table 11-1 Upskilling Challenges versus Focus Areas

Beyond this, there are key next steps for organizations, the workforce, and academic institutions to evaluate and execute based on their current upskilling initiatives to help improve on upskilling in Newfoundland and Labrador.

For Organizations

To establish a baseline, organizations should examine their current upskilling practices and programs to determine current level of investment, effectiveness within the workforce, and the current relationship with business goals and objectives. Some organizations may be well versed in upskilling their workforce, while others may only be starting the journey. Understanding where an organization sits on this path will help highlight specific organizational challenges and help determine specific recommendations to help overcome these challenges. Surveying the workforce is one action that is integral to establishing where an organization is on their upskilling journey and provides information that directly informs the development or enhancement of an existing upskilling program. The survey should address the below questions (reference is also made to Aker Solutions survey sent out as part of this study and included in APPENDIX B - Survey):

Workforce survey focus:

- Who is participating in current upskilling program?
- How effective is the current upskilling program?
- What skills does the workforce feel are relevant?
- What are the preferred methods of upskilling?
- Are there accessiblity issues that need to be addressed to participate in the upskilling program?
- Does the workforce feel that they have the time to upskill?
- Who is participating in current mentorship program?
- How effective is the current mentorship program?

Another area of focus should be around skills gap within an organization and performing a skills gap analysis. This will determine the existing skills and competency levels within an organization which can then be compared to the organization's goals and objectives, highlighting the gaps that need to be addressed with upskilling. Key elements to be addressed in the skills gap analysis are as follows:

Skills gap analysis elements:

- Create a skills taxonomy that includes the current skillsets of the workforce
- Determine which new skills are required based on organizational strategy and objectives
- Include these new skills in the taxonomy
- Compare the workforce skills to the new skills required and identify the gaps
- Utilize the gaps to understand what upskilling will be required

Once these two elements are completed, an organization will have a better understanding of where to focus their efforts and investments on upskilling. Organizations are ultimately the drivers of what skillsets are required in the region. Starting discussions early around possible joint industry initiatives and collaborations as well as having discussions with local academic institutions, helps to communicate the needs around skills development and upskilling opportunities.

For the Workforce

There is an onus on employees to drive their own upskilling journey. Feedback to leadership around skills and technologies that can help improve workflows, participation in upskilling activities, and taking an active role in the adoption of new technologies all help to drive benefits within the organization but also furthers professional development, builds marketable skillsets, and can open up potential career advancements. It is very important to participate in feedback surveys around new technologies and upskilling initiatives as these provide input to the organization on what is working and not working to help improve training and upskilling opportunities and better enable the adoption of new technologies, which drives efficiencies and can improve work-life balance.

People in the workforce should try to think more openly and creatively about their work. There are often improvements that can be made to most workplace processes by introducing technology into workflows. For example, someone working manually in spreadsheets and creating reports can significantly reduce the manual effort by automating the process, providing more time for value-added work. The skills required to do this could easily be acquired in a one or two day course on PowerBI and could save up to 8 hours a week based on work that Aker Solutions has completed.

Actions for the workforce:

- Communicate specific needs for upskilling to leadership
- Proactively investigate upskilling opportunities
- Align upskilling activities with the goals and objectives of the organization
- Utilize mentorship opportunities or volunteer as a mentor
- Follow through and complete upskilling initiatives
- Participate in region level engagements such as hackathons and conferences, lunch and learns, or relevant group trainings

There are also activities that students, those entering the workforce, or those changing careers can pursue. Without the guidance of organizational upskilling programs, perspective employees can do the following:

Actions for students and prospective employees:

- Consult with academic institutions to understand upskilling programs and training opportunities
- Consult with industry organizations, such as techNL, econext, EnergyNL, Trades NL, PEGNL, etc., about upskilling and training programs, but to also gain an understanding of what technologies or skills gaps exist in various industries
- Reference the skills gaps in Section 7 to identify areas where new skills could be built to enhance resumes and improve chances of hire
- Look at free online trainings, especially those that provide certificates, and utilize those for upskilling
- Look at available funding opportunities to take advantage of local upskilling opportunities
- Participate in region level engagements such as hackathons and conferences, lunch and learns, or relevant group trainings

For Academia

Interviews with local academia shows that there is an active and healthy effort to engage with industry and the workforce to offer relevant upskilling programs with up-to-date curricula. Joint initiatives, like the recent Find Your Future in Tech program, where the investment and reach are broad, are an excellent example of how joint funding and collaboration can benefit large portions of the workforce. Taking these models and diving deeper into the technologies and applicable skillsets, can add further value to the industry, while providing workers with the level knowledge required to truly evolve the operational processes of organizations.

Actions for academia:

- Engage regularly with industry through advisory committees
- Engage with alumni for feedback
- Survey students for relevancy of training content
- Ensure content is regularly kept up-to-date
- Ensure curricula is mapped to solve specific industry problems so students can directly apply their knowledge
- Ensure offerings are well communicated on various marketing channels to reach the industry
- Work with organizations to develop comprehensive joint industry programs
- Lobby all levels of government to help promote the need for upskilling and training funding support

For the Region

As referenced in the Offshore Newfoundland and Labrador Digitalization Technologies Roadmap study report performed in 2023, there are significant opportunities to utilize existing collaborative research and test facilities to further explore joint industry initiatives for modernization and upskilling. Facilities such as The Launch and the Co. Innovation Centre, could potentially provide more opportunities for digitalization and modernization upskilling. Replicating existing models from Norway and the UK that establish initiatives between industry, academia, and government to build and fund onshore development and testing facilities have proven benefits for upskilling the workforce. These facilities, consisting of typical process, power, communications, and monitoring equipment, all replicating industrial processes, can be a place to help, not only to test new equipment and technologies, but also to be a hands-on learning and training environment that embeds technological and industrial experience as well as industrial readiness into the workforce. These facilities are also a great opportunity to upskill the existing workforce on new technologies before deploying into the field. There is also a significant opportunity to involve the start-up community to help develop and test new technologies.

A facility like this has benefits to multiple industries outside of oil and gas, such as power generation, power distribution, mining, hydrogen, wind, fisheries and could even have benefits for healthcare and defence. Such a project would provide continuous benefits to the region; as technology evolves, the facility will also evolve to ensure it meets the needs of the region into the future.

The region could also benefit from holding dedicated joint sessions with an Organizational Behavioral specialist. These sessions would help further explain the methods and define the benefits of restructuring organizational culture to support successful models of upskilling and embed digitalization and modernization into the workforce. These sessions would provide insight into how to motivate, retain, and hire to meet the evolving needs of the industry.

Beyond these steps, it is extremely important to work together in the region to help maximize investment and effort into upskilling. Newfoundland and Labrador has a brilliant and incredibly hard working population that will thrive and grow the energy industry in the region for years to come. Careful planning, funding, and execution of upskilling programs to embed skills that solve industry challenges will help create a culture of continuous learning that benefits industry, organizations, and the workforce today, and through the future.

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APPENDIX A – Upskilling Framework Key Actions

The following table provides some key actions to be taken in each step of the Upskilling Framework. More details can be found in Section 9.

Framework Step	Key Actions
Identify	
	Identify the challenges and pain points to be addressed
	Identify the drivers for upskilling
	Identify the existing processes around upskilling
	Identify the stakeholders (internal and external)
	Survey the workforce (reference APPENDIX B - Survey for sample questions)
Assess	
	Assess any data related to current upskilling and mentorship programs/initiatives including: - Who is participating - Who is not participating - The current methods used - Are the opportunities available to everyone in the organization - How are the opportunities currently communicated within the organization
	Assess the demographic of the workforce
	Assess current and future skills gap
	Establish KPIs that can be used to establish a baseline to measure improvements and success. Consider aspects such as: - Investment - Performance - Productivity - Satisfaction - Efficiency
Investigate	
	Test the job market for the identified skills gap
	Investigate available upskilling opportunities applicable to the identified skills. Consider - Level of detail of existing opportunities - Delivery methods
	Investigate creating a custom, organization specific training applicable to the identified skills
	Investigate collaboration opportunities with other organization/groups
	Investigate possible funding opportunities
	Investigate changes required to current documentation or work processes as a result of upskilling
	Investigate incentives for the upskilling program
	Investigate communication methods available for rollout to the organization
Evaluate	
	Is hiring to fill the gap an option? What were the results from the market test?
	Evaluate the associated costs of hiring versus upskilling to fill the identified skills gaps. Evaluation should include costs associated with hiring a new resource, including: - Job role definition - Advertising - Interviewing - Onboarding and training

	Evaluate the costs associated with each method available for upskilling for the identified skill(s). Consider: - Costs associated with incentivization if required to help motivate upskilling - Time invested to implement - Time allowance - Any available funding - Is backfilling required
	Decide whether to proceed with a pilot of the upskilling program, including the skill(s) and delivery model(s)
Pilot	
	Select a small test group to participate
	Set schedule for the pilot
	Provide what is required for training to be completed
	Track feedback and metrics
	Evaluate outcomes of the pilot and update as required
Integrate	
	Integrate the training into the wider organization
	Measure and track KPIs - Schedule formal reviews of the training (timing dependent on how fast the skill and curriculum needs to evolve) - Evaluate/update training material content as required - Keep workforce roles up to date to ensure training is provided to those who need it
	Capture feedback for continuous improvement

APPENDIX B - Survey

1. Which industry do you work in?
    a. Oil and Gas
    b. Renewables
    c. Mining
    d. Tech
    e. Marine
    f. Supply and Service
    g. Business Services
    h. Other

2. How many years of experience do you have in your respective industry?
    a. 1 – 5 years
    b. 5 – 10 years
    c. 10 – 20 years
    d. 20 – 30 years
    e. 30+ years

3. Which best describes your role type?
    a. Technical
    b. Management
    c. Non-technical

4. Are there offshore / field based workers or just office personnel within your organization?
    a. Just office based personnel
    b. Just offshore / field based personnel
    c. A mix of office and offshore

5. What does upskilling mean to you?

6. Is digitalization or modernization being discussed within your organization?
    a. No
    b. Somewhat
    c. Yes

7. Do you feel that your current position would benefit from digitalization or modernization to improve efficiency or reduce frustration in your day-to-day work?
    a. No
    b. Maybe
    c. Yes

8. Does your organization offer formal upskilling opportunities (i.e. structured information sessions administered by the organization and / or accredited education body such as courses, webinars, trainings, etc.)?
    a. Yes

b. No

9. How effective do you think your organization is at upskilling?
    a. Not effective
    b. Somewhat effective
    c. Very effective

10. Are you currently participating in any upskilling opportunities? (select all that apply)
    a. Yes, organization driven
    b. Yes, self-driven
    c. No, I am not currently participating, but would like to
    d. No, I do not feel upskilling is important to me at this time

11. Does your organization offer any mentorship opportunities where skills and experience can be transferred between employees? (select all that apply)
    a. Yes, formal mentorship program
    b. Yes, informal mentorship
    c. No
    d. Other

12. Are you currently participating in a mentorship opportunity? (select all that apply)
    a. Yes, formal mentorship program
    b. Yes, informal mentorship
    c. No, I am not currently participating, but would like to
    d. No, I do not feel mentorship is important

13. Do you feel that upskilling contributes to career progression?
    a. No
    b. Yes, somewhat
    c. Yes, definitely

14. How important do you think upskilling is in terms of long-term success for your organization?
    a. Not important
    b. Somewhat important
    c. Very important

15. What skills do you think will be relevant to you in the next few years for your position? (select all that apply)
    a. Data Analytics
    b. Artificial Intelligence / Machine Learning
    c. Data Security
    d. Low code / No code application development
    e. Automation
    f. Data Science
    g. Power BI

h. Python
i. Digital Twins
j. Data Privacy Law
k. Organizational Behavior
l. Other

16. What is your preferred method for upskilling?
    a. Virtual
    b. In-person
    c. Combination of virtual and in-person

17. Do you prefer group, peer-to-peer, or self-directed?
    a. Group
    b. Peer-to-peer
    c. Self-directed

18. What methods are currently offered by your organization for upskilling? (select all that apply)
    a. Company driven upskilling
    b. Facilitation of outside developed upskilling
    c. Options for self-driven upskilling (i.e. LinkedIn Learning, Coursera, etc.)
    d. Academic institution upskilling offerings (tuition reimbursement)
    e. N/A
    f. Other

19. Does your organization allocate time / resources for upskilling?
    a. Yes, time is provided for upskilling
    b. Yes, funding is provided for upskilling
    c. Yes, time and funding are provided for upskilling
    d. No, neither time nor funding are provided for upskilling

20. Do you feel your workload is flexible enough to accommodate the hours required to upskill?
    a. Yes, I have time to complete these upskilling activities during work hours
    b. Yes, however upskilling activities are outside normal working hours
    c. No, I find it difficult to fir in the hours required for upskilling activities

21. In your opinion, what are the challenges / hurdles around upskilling?

22. Would you participate in a joint industry upskilling session
    a. Yes
    b. No

23. Are you aware of any upskilling offerings in your regions outside those offered by your organization? If, yes, What are some of those offerings?

Diversity, Equity, Equality & Inclusion (DEEI) Questions:

24. Do you identify as a member of an underrepresented group?
    a. No
    b. Yes – Member of an Indigenous group
    c. Yes – Visible Minority (that is persons, other than Indigenous persons, who are non-Caucasian in race or non-white in color)
    d. Yes – Member of the LGBTQ2+ community
    e. Yes – Person with a disability
    f. Yes – I identify as a member of an under-represented group not mentioned above
    g. Prefer not to say

25. Have you faced any DEEI related barriers to accessing upskilling opportunities? If yes, please explain.

26. If you answered yes to the above question, were accommodations provided to support your participation in upskilling activities when required? If yes, please explain.

APPENDIX C – Interview Participants

College of the North Atlantic (CNA)	https://www.cna.nl.ca
Marine Institute	https://www.mi.mun.ca/
Academy Canada	https://www.academycanada.com/
Keyin College	https://learnmore.keyin.com/
Gardiner Centre	https://www.mun.ca/gardinercentre/
Get Coding	https://www.getcoding.ca/