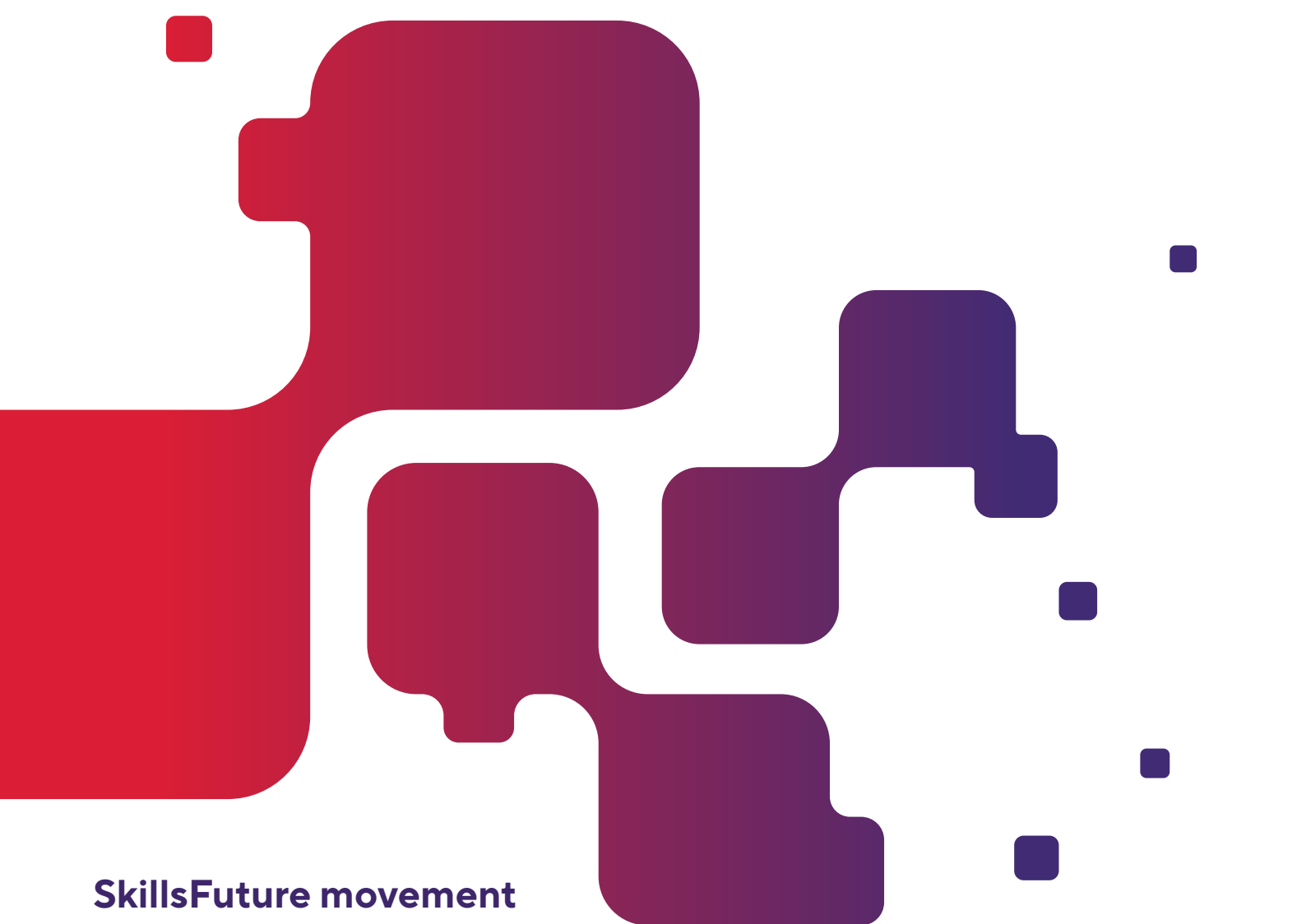


Realising the Skills-First Advantage:

Growing Business and Workforce Together



SkillsFuture movement
10th Anniversary
Jobs-Skills Insights

This publication is brought to you by

SkillsFuture Singapore

SKILLSFuture SG

SkillsFuture Singapore (SSG) drives and coordinates the implementation of the national SkillsFuture movement, promotes a culture of lifelong learning and strengthens the ecosystem of training and adult education in Singapore. Through a holistic suite of national SkillsFuture initiatives, SSG enables Singaporeans to take charge of their learning journey in their pursuit of skills mastery. SSG also works with key stakeholders to ensure that students and adults have access to high quality and industry-relevant training that meet the demands of different sectors of the economy for an innovative and productive workforce. For more information, visit www.ssg.gov.sg.

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Workforce Singapore (WSG) is a statutory board under the Ministry of Manpower dedicated to building a competitive, inclusive, resilient and employable workforce. Our mission is to enable Singaporeans to access good job opportunities and build their careers at every stage of life. WSG strives to cultivate a culture of career planning, where every Singaporean is empowered to take charge of their career health. In partnership with various stakeholders, WSG supports employers in workforce transformation through job redesign and reskilling, enabling them to create good jobs for Singaporeans and develop an agile workforce. For more information, visit www.wsg.gov.sg.

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Situated at the intersection of learning and work, the Burning Glass Institute advances data-driven research and practice on the future of work and of workers. We work with educators, employers, and policymakers to develop solutions that build economic mobility and opportunity through skills.

In support of

SKILLSFuture

Foreword

Tharman Shanmugaratnam

President of the Republic of Singapore

When we launched the SkillsFuture movement ten years ago, we felt it would be transformative in more ways than one.

It would help reshape our economy, society and culture.

Economy: because we can only be as competitive as our skills, and our collective ability to keep upgrading and picking up new skills.

Society: because the opportunity we provide for everyone to keep learning through life will extend chances for social mobility. It helps to create a meritocracy of skills we contribute at every stage, rather than of grades and qualifications we earn early in life.

Culture: because skills are not just about competitiveness, or social mobility, but about something more intangible – how we look at ourselves and at each other. We are quietly shifting our culture, to one where people gain pride and satisfaction from mastering a skill, and are accorded respect for the effort they make on the journey to mastery. And a culture where we each gain confidence by being part of a community of learners, not just by advancing on our own.

We are making progress on each of these fronts.

This report captures the achievements, the stories of courage, and the lessons of the SkillsFuture movement over the decade. It also provides a guide, offering insights into how individuals, employers, unions and society as a whole can respond to the changing nature of work.

Yet, both the challenges and opportunities have only become larger. Advances in artificial intelligence, robotics and other technologies will reshape many more jobs, across the workforce, than would have been thought just a decade ago. The green transition will also make some jobs redundant while creating many new openings, locally and abroad. And at the same time, our workforce itself is getting older.

We must therefore build further momentum in SkillsFuture. We must find practical ways to expand its reach among enterprises large and small, and individuals at every age, including those who take a break to care for their families and want to re-enter the workforce.

As the book highlights, we do this best by joining ideas and efforts – employers, unions, the government, community bodies and individuals themselves coming together, giving each other confidence and inspiring each other.

May the next decade see many more Singaporeans empowered and equipped for a changing world, and a society that gives every job dignity and makes the future promising for all.

Executive Summary

This year marks the 10th Anniversary of the SkillsFuture movement. As we move into a world that is increasingly BANI (Brittle, Anxious, Non-Linear and Incomprehensible), the SkillsFuture movement acts as a stabilising anchor for the workforce and businesses to navigate the waters ahead. SkillsFuture Singapore and Workforce Singapore prepared this special publication, titled “Realising the Skills-First Advantage: Growing Business and Workforce Together” to examine how Singapore’s continuous focus on skills development is important to sustaining its competitiveness and helping businesses transform and innovate.

Chapter 1

56% of the workforce are involved in workplace transformation. These workplaces tend to adopt a high level of complex skills that are required for transformation. Informal and non-formal learning modes are most used in these workplaces.

Chapter 2

No job is left unchanged, with all job roles seeing varying degrees of shifts in the skills required over the years. These changes in skill requirements are occurring in tandem with workplace transformation and emerging trends such as digitalisation and sustainability.

Chapter 3

82% of organisations that participated in job redesign cited workforce reskilling as the top motivation, to ensure workforce readiness to adapt to new technologies and processes. Notably, organisations that invested in reskilling for redesigned roles have experienced improved talent retention contributing to better business outcomes.

Chapter 4

Investing in high-growth and high-ubiquity skills is essential for building a resilient career and staying competitive in today’s job market. The Job-Skills Profile helps individuals at any career stage identify these crucial skills, enabling them to make informed decisions and proactively adapt to future changes.

Chapter 5

Around 260 individuals— who participated in the WSG Polaris programme to receive structured and personalised career planning— reported greater clarity and confidence in charting their careers and implemented steps relating to skills development, career development and career well-being.

To fully harness the potential of our dynamic economy, employers must adopt skills-first practices— making skills a priority in job design, hiring decisions, learning and development, and performance management and reward frameworks. Through proactive career planning, targeted training and considered career development decisions, individuals can enhance their “career health”, ensuring both immediate employability and long-term career resilience.

Call to action: new dashboards

To facilitate employers’ and individuals’ skills-development planning and decision-making, two new dashboards are created and made available on the Jobs-Skills Portal:

JRI Dashboard

Job Requirements (Skills) Index (JRI) Dashboard enables users to track evolving skill requirements across roles.

Job-Skills Profile Dashboard

Job-Skills Profile Dashboard enables individuals at all career stages to identify high demand skills that are widely applicable i.e. transferable across industries.

This report stems from strong collaborations with our expert partners, including the Institute for Adult Learning (IAL) and the Burning Glass Institute (BGI). Through our combined expertise, the report uncovers insights into Singapore’s workforce and skills development landscape, reinforcing the importance of a skills-first approach in driving economic growth and career success.

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Unleashing skills for an inclusive and productive economy



Singapore's economy is transforming rapidly and its workforce is evolving in tandem.

Analysis¹ using the OECD PIAAC data (2014/15 to 2022/23)² demonstrates how Singapore's workplaces and workforce are undergoing transformation. Nearly 6 in 10 workers report significant changes in their work environments, whether in product, technology, workplace practices, or a combination of all three. Such environments are associated with more complex **skills use**, including *Collaboration* and *Influence*, and offer valuable opportunities for learning and growth. Workers in these settings report higher levels of job-related training and workplace learning, creating reinforcing cycles of skills development and application.

However, access to these opportunities is uneven. Degree holders are the primary beneficiaries of growing skills use, while non-degree holders show little or no progress. This points to a constraint: transformation advances unevenly when firms fail to fully harness the skills, ideas, and execution power of the broader workforce.

To unlock the full value of business and workforce transformation, businesses could adopt the **skills-first** practices of:

- Designing jobs that better utilise skills across the workforce
- Hiring based on skills, not just traditional academic qualifications
- Developing skills that are aligned to current and future business needs
- Rewarding contributions from skills

Embedding skills strategy within business strategy is essential and supports long-term competitiveness.

¹ Refer to the [methodology section](#) at the end of the report for the details of the full analysis.

² PIAAC stands for the Programme for the International Assessment of Adult Competencies. It is a cross-national study by the Organisation for Economic Co-operation and Development (OECD) that measures the skills proficiency of adults in participating countries, and how the skills are used at work and in daily life. Data used in this chapter is drawn from the OECD PIAAC data for Singapore conducted in 2014/15 and 2022/23, and analysed by the Institute for Adult Learning. Refer to the methodology section for further details.

More than half of workers (56%) in Singapore report significant changes taking place in their work environment.

Over half (56%) of workers in Singapore report significant changes taking place in their work environment. This is higher than the OECD average (54%), though still lagging behind high-innovation countries like Switzerland (60%) and Finland (64%).

This indicates that while business transformation is well underway in Singapore firms, more can be done.

Among the different combinations of innovation activities, the most common (reported by 16% of workers) involves changes across all three areas: technology, workplace, and product. This points to an increasingly complex transformation landscape that is reshaping job roles.

Types of Innovation Activities Reported in Work Environments

Proportion (%)

Analysis only includes Singaporean workers aged 25 to 65 years old

Technology (Tech)

Significant changes in information and communication technologies reported by individuals in their work environment over the last three years.

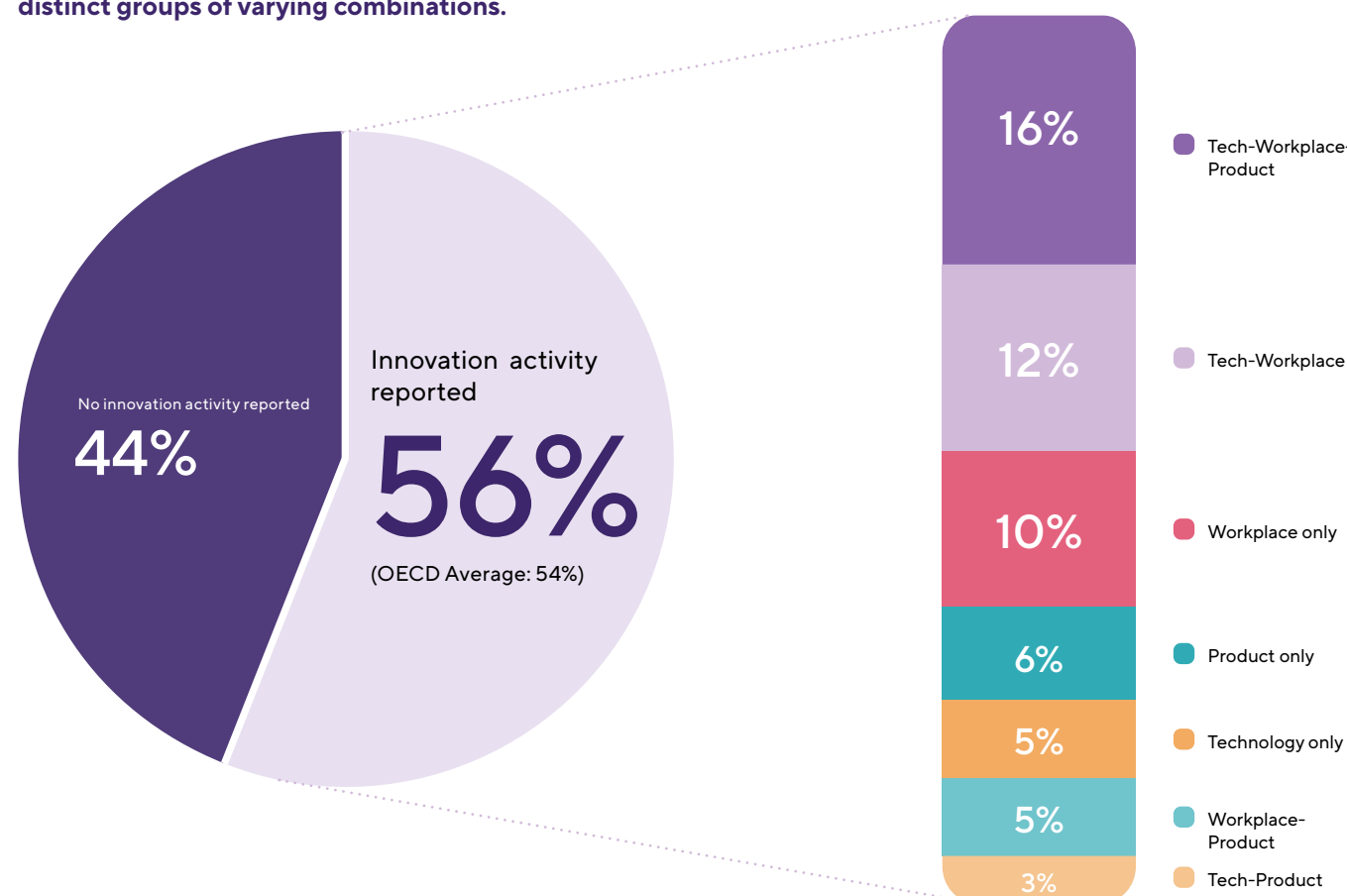
Workplace

Significant changes in working methods or practices reported by individuals in their work environment over the last three years.

Product

Significant changes in products and services reported by individuals in their work environment over the last three years.

This graph categorises the three key innovation activities in work environments described above into eight distinct groups of varying combinations.



Data source: OECD PIAAC, analysis by IAL

Transformation is fueled by how firms design and organise the use of skills.

Among all factors examined, the strongest predictor of innovation activities in work environments was how firms design and organise the use of skills within jobs.

Workers in these environments are regularly required to use a wider range of complex skills, such as *Collaboration* and *Influence*. This correlation holds true even after considering different industries or occupations.

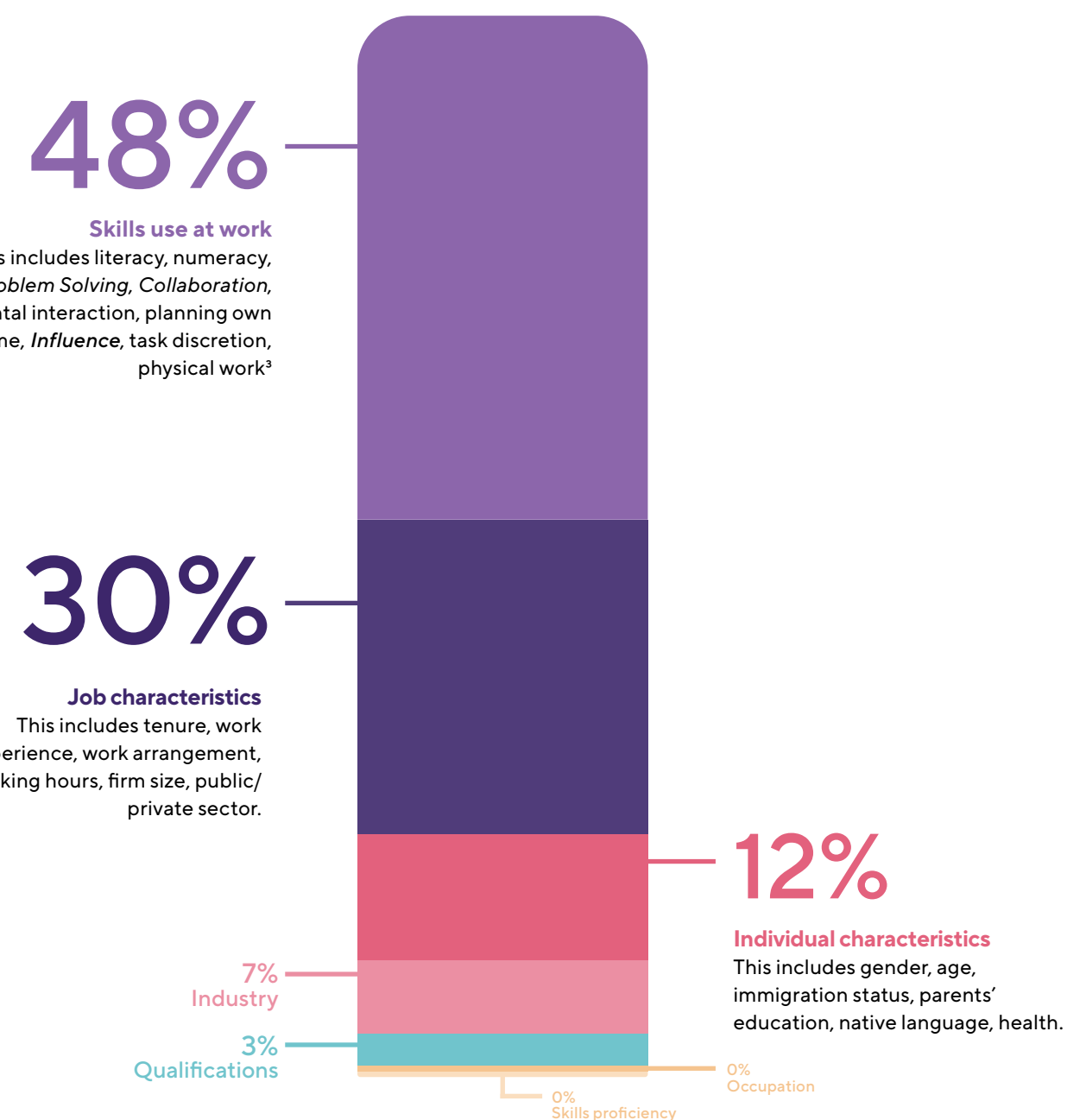
The results suggest that changes in work environments are mainly driven by businesses' strategic decisions to differentiate through transformation.

Other job characteristics, such as firm size, tenure, or work experience, are also important, explaining about 30% of what shapes these environments.

Factors in Predicting Innovation Activities in Work Environments

Percentage of influence (%) based on factors examined, excluding residuals

Analysis only includes Singaporean workers aged 25 to 65 years old



Data source: OECD PIAAC, analysis by IAL

³ The analysis uses 10 PIAAC 'skills use at work' measures; three of these (*Problem Solving*, *Collaboration* and *Influence*) align with the Skills Framework nomenclature.

'Collaborative Innovators' are in demand in transforming workplaces.

Of the ten workplace skills measured in PIAAC, five are consistently associated with transformation in work environments, regardless of occupation or industry.

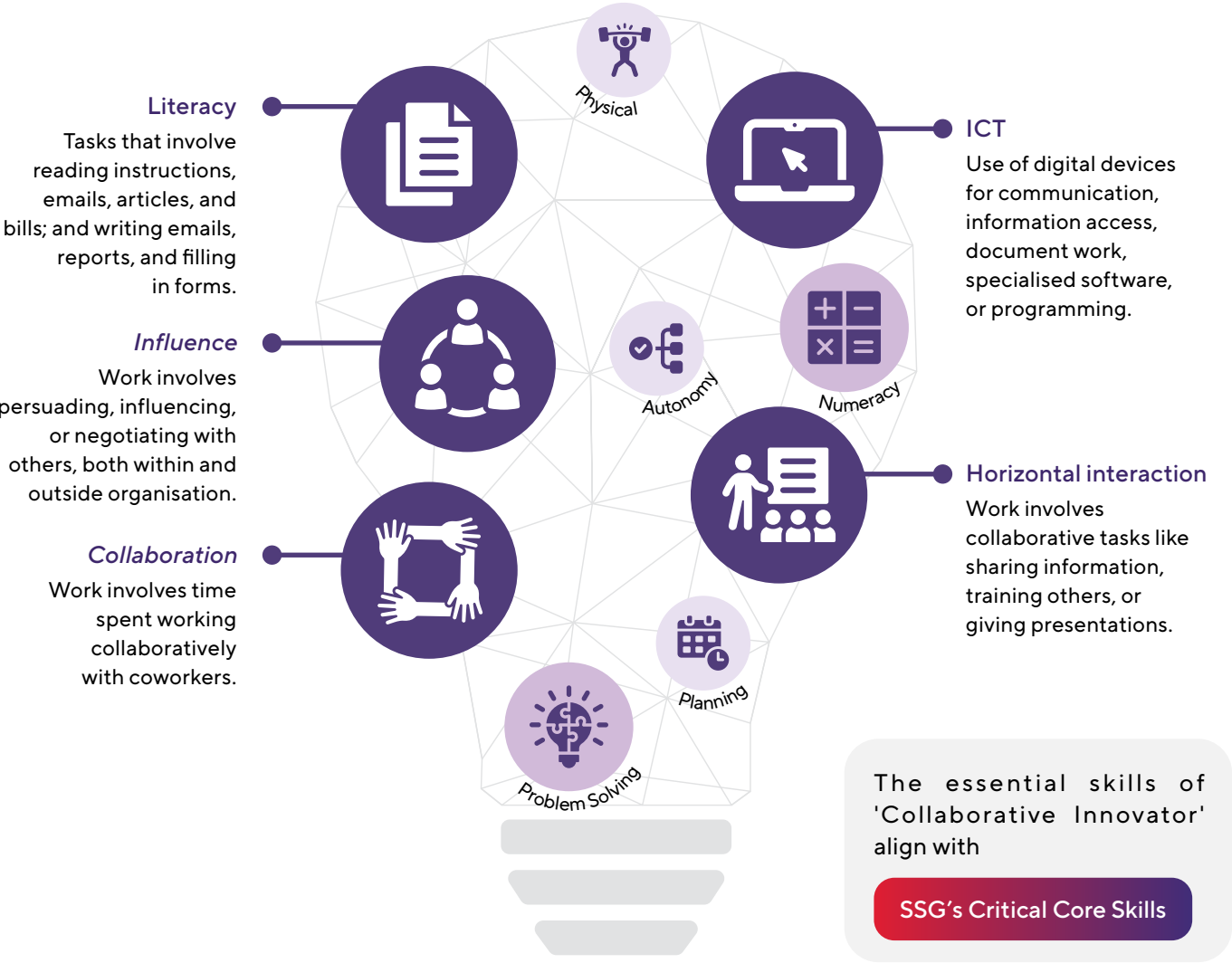
- These are:
- Literacy skills use at work
 - ICT skills use at work
 - Horizontal interaction at work
 - *Influence* skills use at work
 - *Collaboration* skills use at work

These are the five essential skills of the 'Collaborative Innovator', the catalyst who brings people together to co-create ideas, build shared solutions, and adapt with purpose in a fast-changing world.

They are critical enablers who allow ideas to be turned into practice and help firms realise their transformation goals more effectively.

Top Five Skills Use at Work for Transformation

Analysis includes only Singaporean workers aged 25 to 65 years old



Data source: OECD PIAAC, analysis by IAL

Note: Analysis includes innovation activities in technology, workplace, product and the combination of all three. A total of ten skills used at work were examined: 1) Literacy, 2) Numeracy, 3) *Problem Solving*, 4) ICT, 5) Horizontal interaction, 6) Task discretion, 7) Planning, 8) *Influence*, 9) *Collaboration*, and 10) *Physical*.

Transformation fuels learning and creates reinforcing cycles of skills development and application.

In workplaces undergoing transformation, workers are nearly twice as likely to participate in structured training. They are also more likely to participate in workplace learning.

In fact, in work environments that combine technology, product and workplace innovation activities, workplace learning reaches up to 99% of workers.

This relationship is two-way: learning supports transformation, and transformation creates new opportunities for learning. As workers encounter new tools, challenges, and ideas, they acquire new capabilities and become more agile in responding to future changes.

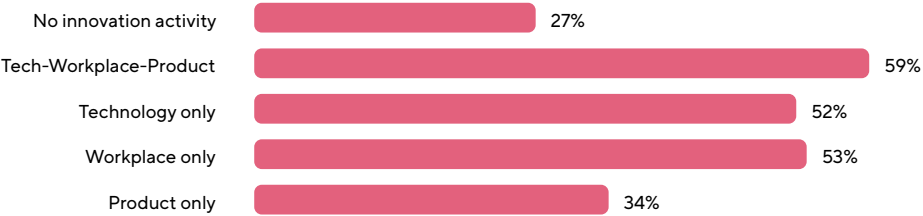
Percentage of Participation in Job-Related Training/Learning by Innovation Activities

Proportion (%)

Analysis only includes Singaporean workers aged 25 to 65 years old

Structured training

Organised learning in a formal setting (such as a course or workshop) that is either short-term or does not lead to formal qualifications.



Workplace learning

Informal learning at work through doing tasks, picking up new things on the job, and staying up-to-date with new products or services.



Data source: OECD PIAAC, analysis by IAL

More occupations need to be recognised for their potential to contribute to transformation.

While physical tasks have declined across all job roles, many non-PMET jobs still demand low skills use and have not grown in complexity. This suggests that there is potential to redesign these jobs to support transformation activities.

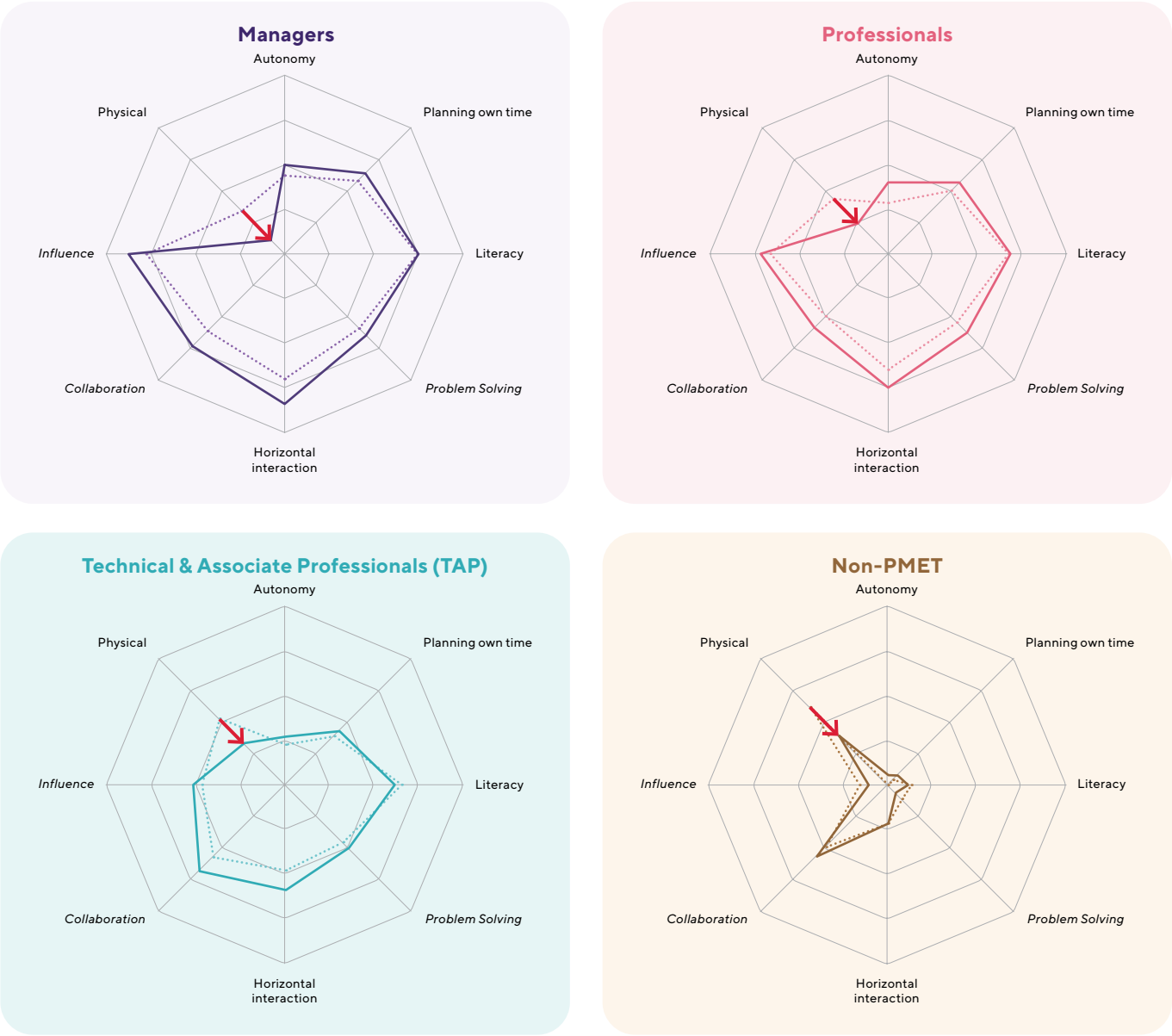
If the gap is not addressed, Singapore risks developing a two-speed workforce, where some jobs advance and others remain stuck in under-stimulating work. This may weaken business resilience and constrain growth.

Employers can act by making job redesign a strategic business transformation lever.

Non-PMET job roles can be enriched through increased autonomy, *Problem Solving*, and *Communication*. Together with targeted upskilling, reskilling and inclusive practices, this opens pathways for all workers to contribute meaningfully to business change, and ensures that firms are equipped with adaptable talent for the future.

How the Use of Skills at Work Is Changing Across Occupations

Mean standardised scores
Analysis only includes Singaporean workers aged 25 to 65 years old



•• Cycle 1 — Cycle 2 ↓ Statistically significantly decrease between cycles by occupation
(All other changes between cycles are not statistically significant)

Data source: OECD PIAAC, analysis by IAL
Note: Comparison between cycles for numeracy and ICT skills use at work measures are not available due to cycle comparison issues.

Looking beyond traditional academic qualifications is essential to unlocking untapped talent.

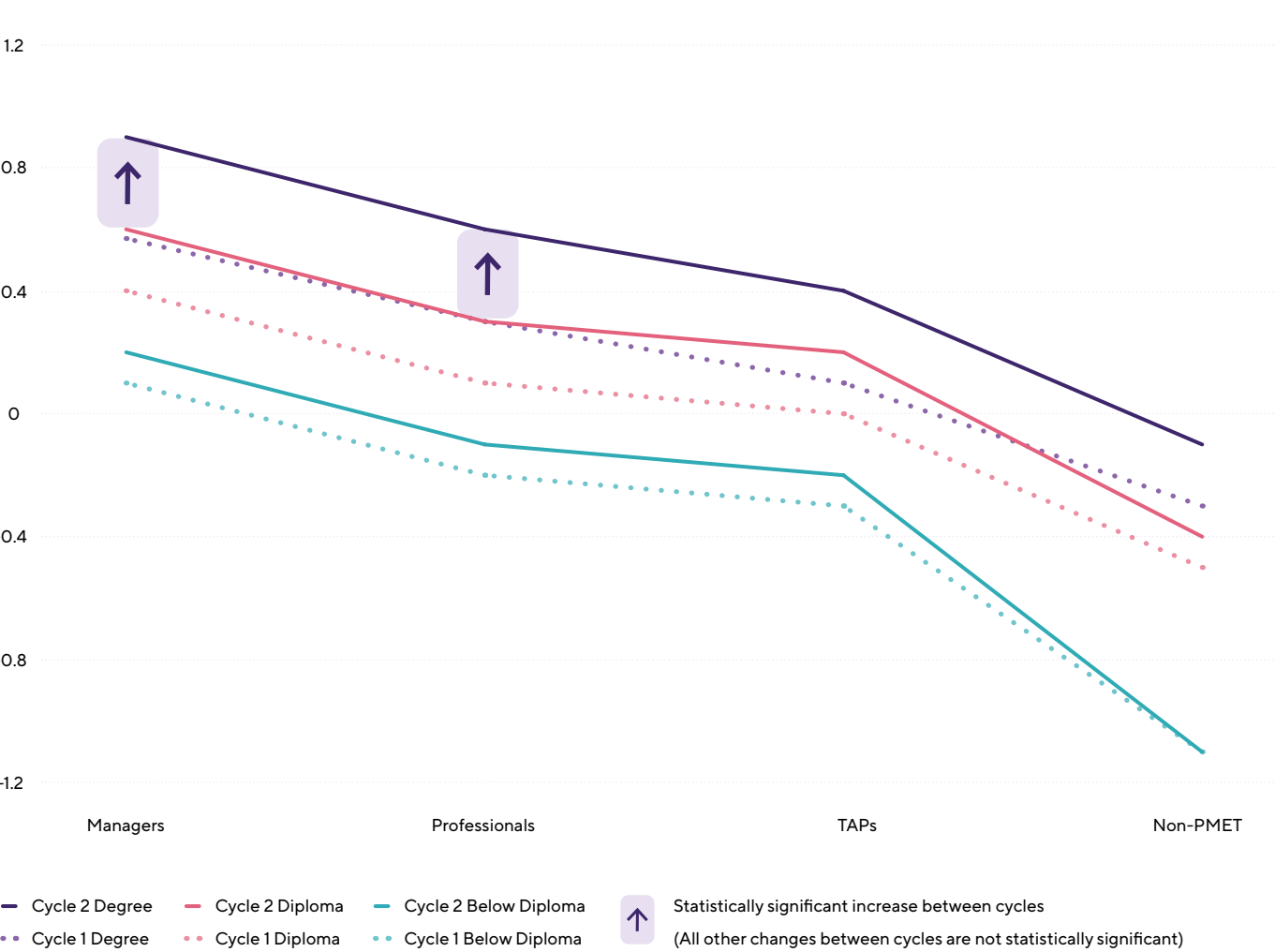
Between 2014/15 and 2022/23, the largest increase in skills demand is seen among degree-holding managers and professionals.

In contrast, for workers with diplomas and below, jobs remain simpler, with fewer growth opportunities and limited growth in skills demand. This is in spite of the fact that nearly 40% of them have high skills proficiency⁴. Their jobs remain simpler with fewer growth opportunities.

This widening gap shows a talent pool that could be better utilised through improvements in job design. Without taking action, firms risk continuing to fall short in fully leveraging their workforce to achieve business objectives.

Changes in Skills Use at Work by Occupation and Qualification

Mean standardised scores
Analysis only includes Singaporean workers aged 25 to 65 years old



⁴ High skills proficiency is defined as scoring at Levels 3 to 5, based on the literacy and numeracy scores attained by individuals who participated in the OECD PIAAC assessments.

Data source: OECD PIAAC, analysis by IAL
Note: Comparison between cycles for numeracy and ICT skills use at work measures are not available due to cycle comparison issues.

When employers hire based on skills instead of traditional academic qualifications, they get access to a wider talent pool.

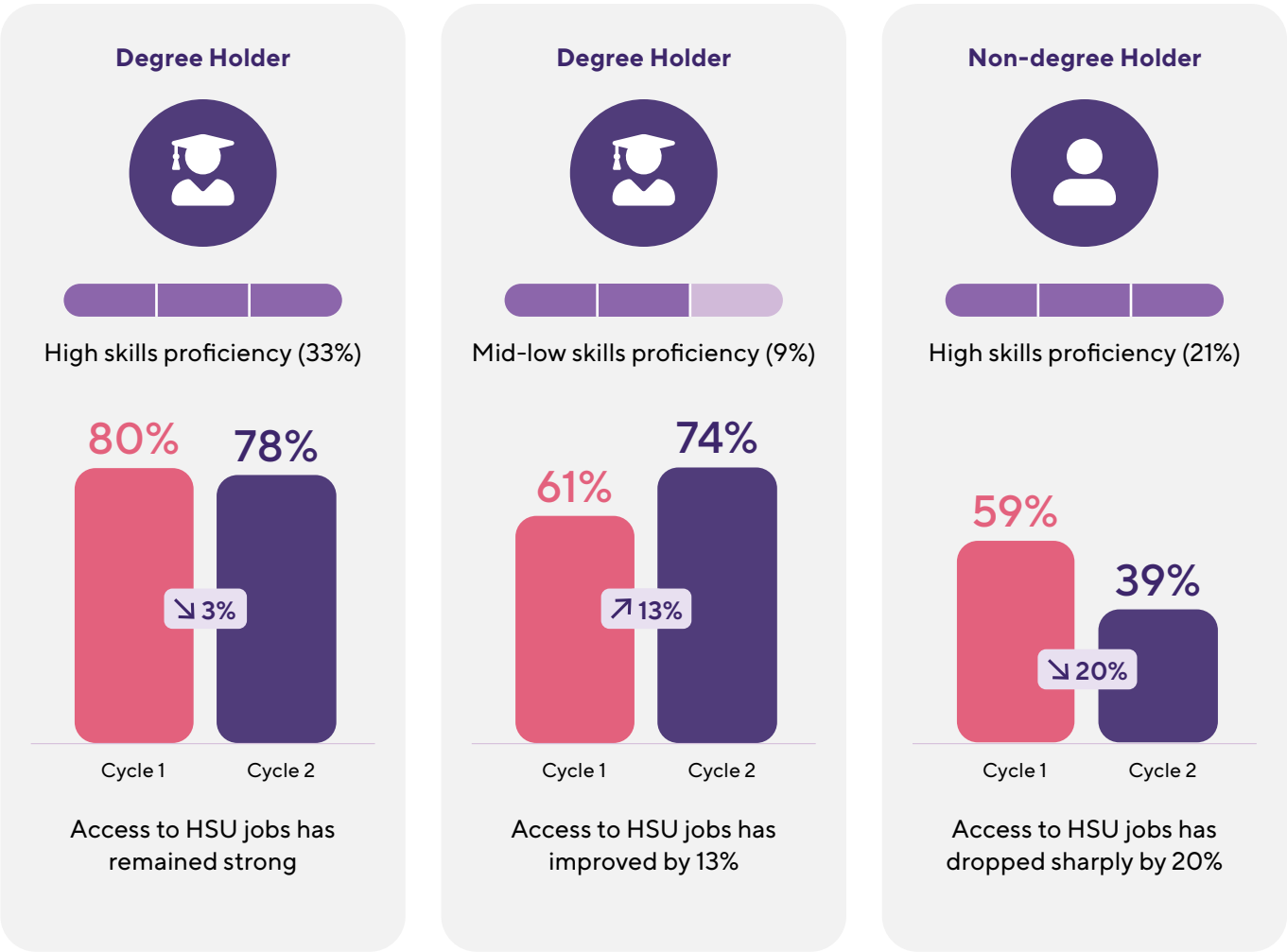
What the OECD PIAAC data (2014/15 to 2022/23) shows:

- Not all degree holders have high skills proficiency⁵, and not all high-skilled individuals hold degrees
- Degree holders with mid-to-low skills proficiency have seen their chances of securing high-skill-use jobs rise from 61% to 74%. At 74%, they are almost as likely as degree holders with high skills proficiency (78%) to get these jobs
- In contrast, non-degree holders with high skills proficiency have seen their chances of obtaining high-skill-use jobs decline from 59% to 39%

Employers should look beyond traditional academic qualifications and adopt skills-first practices by clearly defining, assessing, and signalling the capabilities they need rather than relying on qualifications which may not fully reflect an individual’s skills. Firms that embrace skills-first hiring can better identify high-skilled talent and build capabilities that drive value in complex work environments.

Access to High-Skills-Use (HSU) Jobs

Proportion of qualification-skills combinations in HSU jobs over cycles
Analysis only includes Singaporean workers aged 25 to 65 years old



5 Skills proficiency refers to individuals’ test-based performance on OECD PIAAC assessments for key information processing skills in literacy and numeracy assessed on a 500-point scale. Refer to the [methodology section](#) for a detailed description.

Similarly, workers should be recognised and rewarded for what they contribute through the skills they use, not just for their traditional academic qualifications.

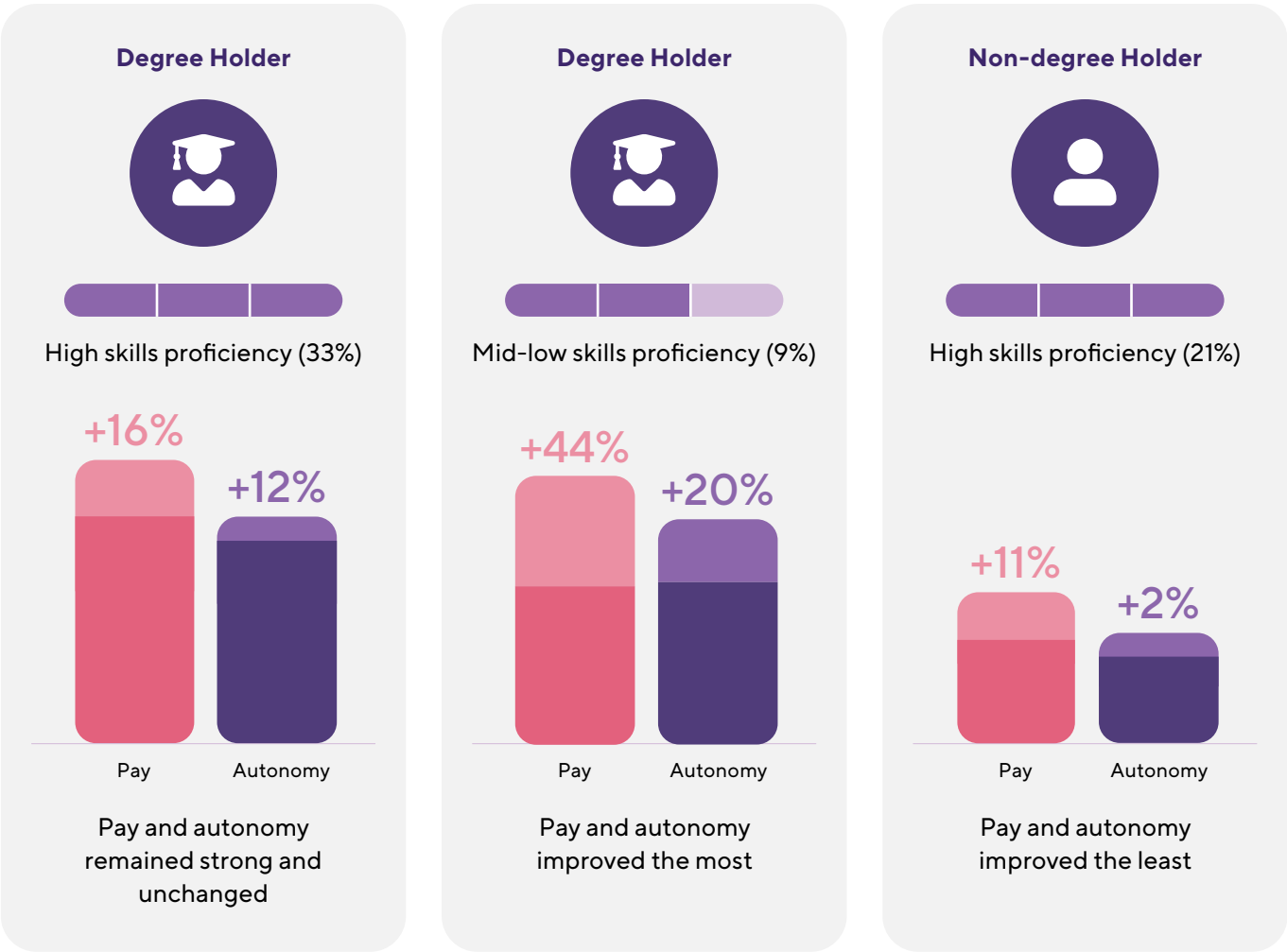
What the OECD PIAAC data (2014/15 to 2022/23) shows:

- Degree holders with mid-low skills proficiency have seen the biggest gains in both pay and autonomy, matching those of high-skilled degree holders
- High-skilled non-degree holders, however, have seen minimal improvement, despite having a similar skills profile as high-skilled degree holders

It is vital that employers close the value gap by rewarding contributions from workers’ skills. Recognising workers for their skills impact helps to ensure workers continue to build skills, sustain motivation and unlock the full value of their capabilities.

Rewards in High-Skills-Use (HSU) Jobs

Pay and Autonomy (%) change by qualification-skills combinations in HSU jobs over cycles
Analysis only includes Singaporean workers aged 25 to 65 years old



Data source: OECD PIAAC, analysis by IAL

Conclusion

6 in 10 workers reported significant changes in their workplace, while 4 in 10 did not. This highlights a clear opportunity for leaders to extend transformation more broadly across the workforce.

As businesses transform, the need to leverage the full range of workers' skills becomes increasingly crucial. However, many businesses have yet to embrace skills-first practices to redesign jobs for a wider range of workers, and to shape hiring and rewards so that skills are valued too, beyond traditional academic qualifications. As **artificial intelligence** (AI) supports more analytical tasks, uniquely human strengths such as creativity and collaborative problem solving become even more valuable. By not recognising and fully utilising the skills of the workforce, firms risk overlooking the very capabilities that will fuel their competitiveness.

The path forward demands bold change that encompasses skills-first practices: redesign roles to embed higher-order skills, build inclusive talent pipelines that recognise skills and ability alongside traditional academic qualifications, and foster continuous, agile learning that keeps pace with rapid economic change.

The future belongs to firms that transform smartly by maximising their people's skills and capabilities.

Business transformation: driving change in jobs and skill requirements

Singapore's workforce is undergoing a fundamental transformation.

As highlighted in Chapter 1, innovation is becoming the new norm. Product, technological, and workplace innovations are driving business transformation and reshaping business models. This, in turn, is transforming the nature of work. It raises a critical question: how are job roles and skill requirements evolving in response?

This chapter examines changes in individual job roles by analysing how **defining skill clusters** (i.e. clusters of skills that make up the core of the job) have evolved as job responsibilities shifted between 2019 and 2024. To capture the nature and intensity of these changes, a **Job Requirements (Skills) Index (JRI)** was also developed. The JRI reflects the degree of change in a job role's defining skills, indicating whether it has experienced high or low change.

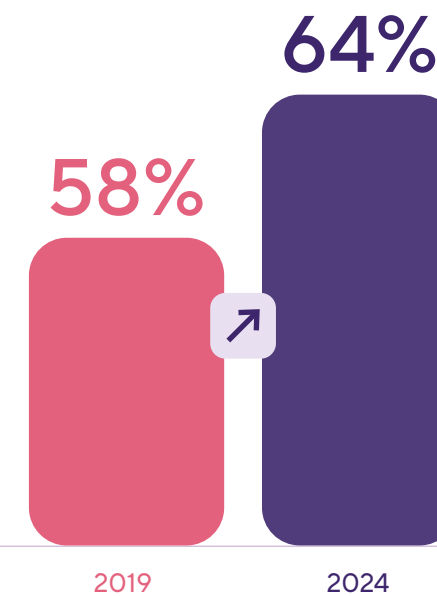
Ultimately, the analysis revealed that no job is immune to change, although the degree of change varies across job roles.

In tandem with the evolving economy and workplace, the proportion of Professionals, Managers, Executives, and Technicians (PMETs) in Singapore's resident workforce has increased.

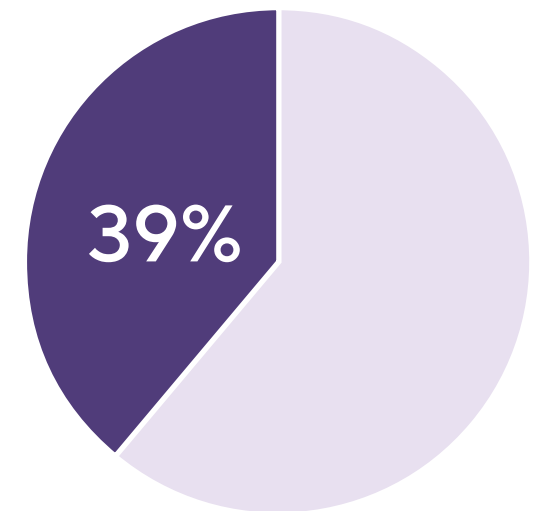
Meanwhile, workers will continue to experience changes to their skills, particularly with the rise of megatrends like generative AI (GenAI), digitalisation and green transition.

In 2024, 64% of Singapore's resident workforce were in PMET roles, up from 58% in 2019, reflecting the changing job mix in Singapore's economy.

By 2030, 39% of the global workforce's core¹ skill are expected to change.



Source: MOM Labour Market Statistics and Publications



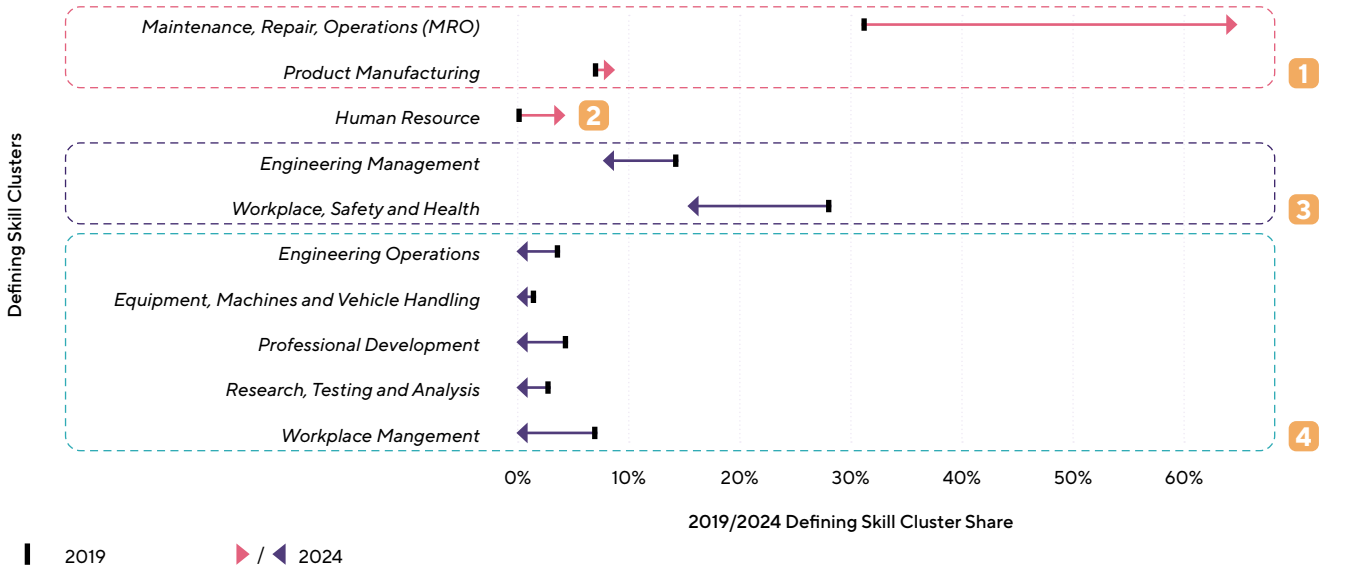
Source: Future of Jobs Report 2025. World Economic Forum (WEF), January 2025

¹ The WEF defines "core skills" as the fundamental skills required in today's workforce, spanning analytical problem-solving, creative and critical thinking, adaptability, leadership, interpersonal communication, and technical literacy.

All job roles are undergoing some form of change. This could mean that new work functions are emerging, existing work functions are getting more emphasis, or there is a reduced reliance on certain functions due to shifting job tasks. As tasks evolve, the defining skill clusters of a job shift accordingly. These changes are captured by the JRI, reflecting how the nature of work is continuously being reshaped.

The JRI measures the extent of change in a job’s defining skill clusters on a scale of 0 to 100. Using job posting data of 2019 and 2024, we derived the JRI for 849 job roles and analysed the magnitude and nature of change in these job roles.

Example: JRI captures critical changes in an Engineering² role via four aspects of change in its defining skill clusters



Skill Cluster Share = $\frac{\text{Total frequency of skills in the defining cluster}}{\text{Total frequency of all defining skill clusters}}$

- 1** Increased emphasis on skill clusters
(Proportion of these two existing defining skill clusters in the job requirements increased from 2019 to 2024)
- 2** New defining skill clusters
Human resource was a defining skill cluster in 2024 but not in 2019)
- 3** Decreased emphasis on skill clusters
(Proportion of these two existing defining skill clusters in the job requirements decreased from 2019 to 2024)
- 4** No longer defining skill clusters
(Five skill clusters are no longer defining skill clusters in 2024)

Higher JRI scores reflect greater change in the skill clusters of a job, often due to the above four aspects of change. It helps us to understand where transformation is happening, which defining skill clusters are changing and how to respond in a targeted and timely way.

2 Engineer/supervisor (operations and maintenance)

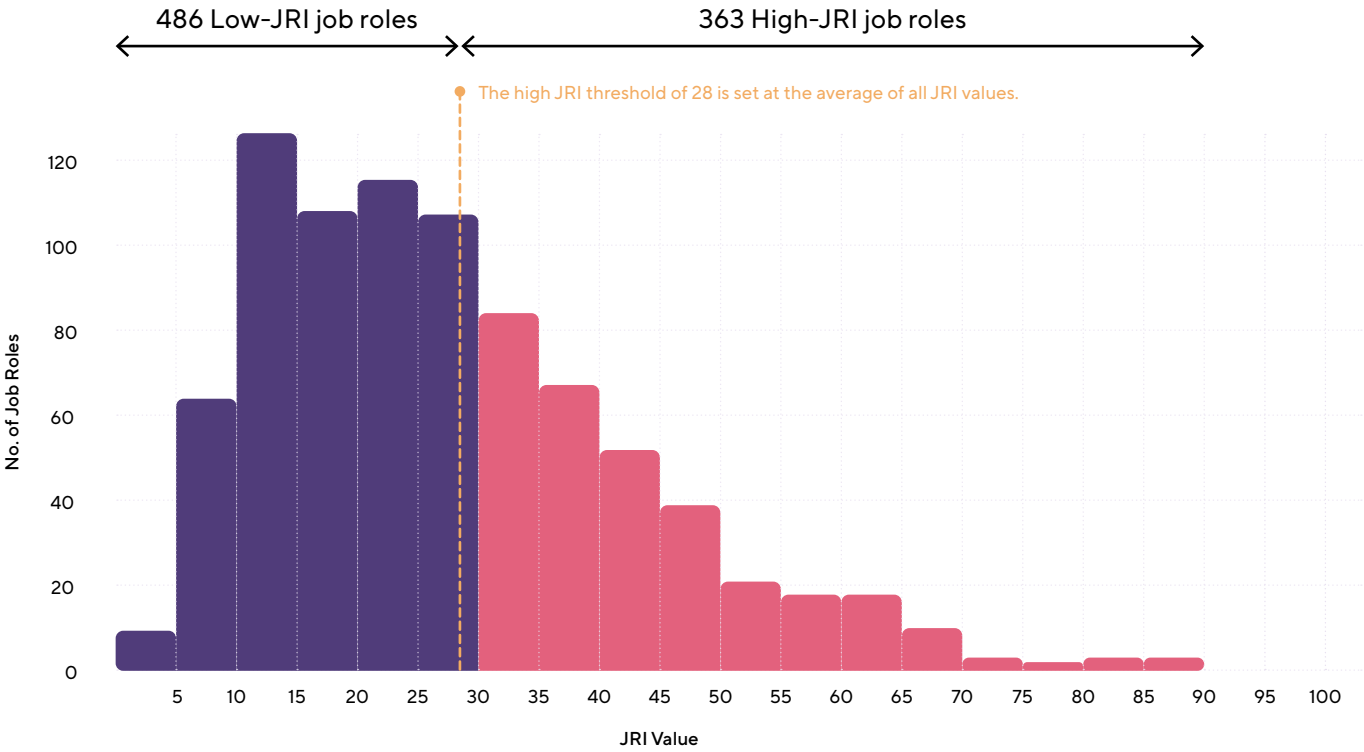
No job is left unchanged, and skills disruption affects job roles differently.

Every job has experienced changes to its defining skill clusters. Some defining skill clusters have been newly added, others have become more or less important, and some are no longer part of what defines the role.

43% of job roles have a high JRI, reflecting substantial shifts in their defining skill clusters between 2019 and 2024. This likely happened because their work tasks changed significantly. The remaining 57% also experienced shifts in their defining skill clusters, though with less intensity.

The intensity of these changes varies considerably, ranging from as low as 2, to as high as 89 on the JRI scale.

Distribution of Job Roles by JRI Value

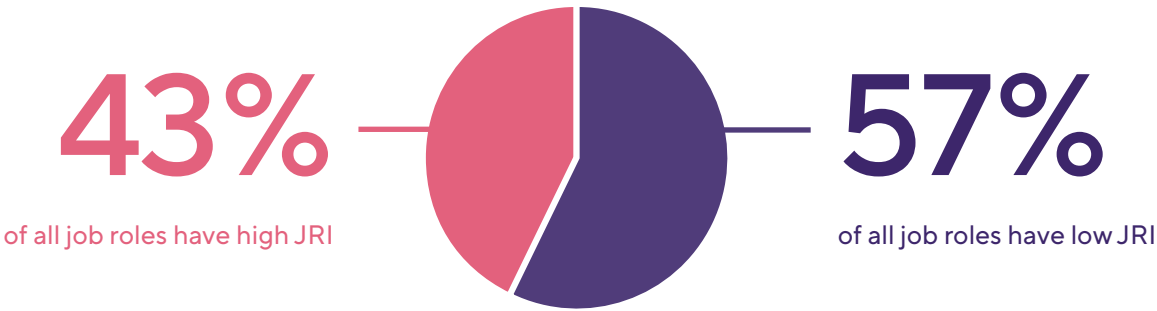
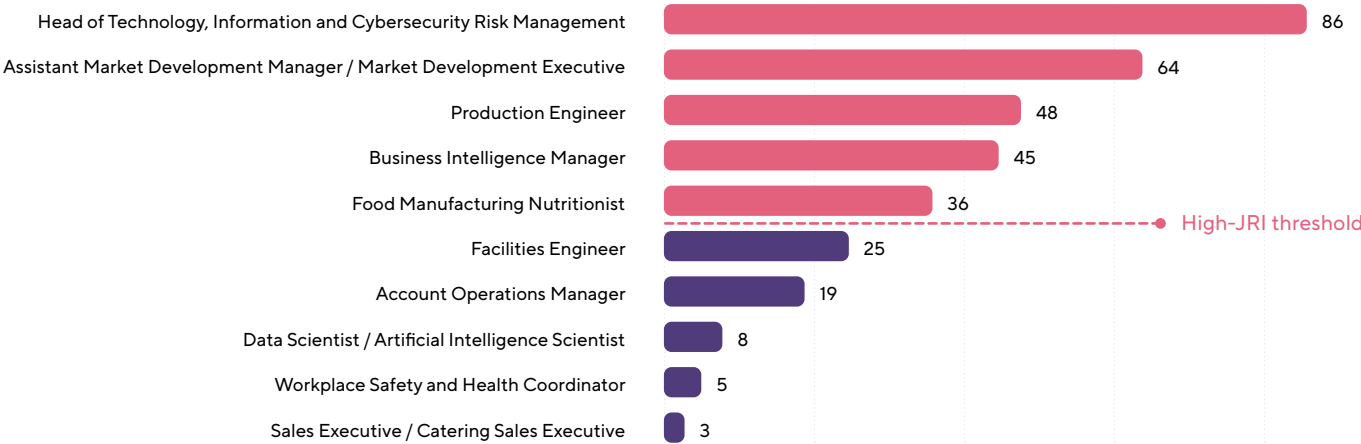


Explore the JRI values and shifts in defining skill clusters across Skills Framework (SFw) job roles to gain insights into how business transformation is reshaping skill requirements.

JRI Dashboard

High-JRI job roles are undergoing the most intense transformation. Low-JRI roles, though relatively stable, are not exempt from change arising from changes in work processes, role refinement, and the use of Apps & Tools.

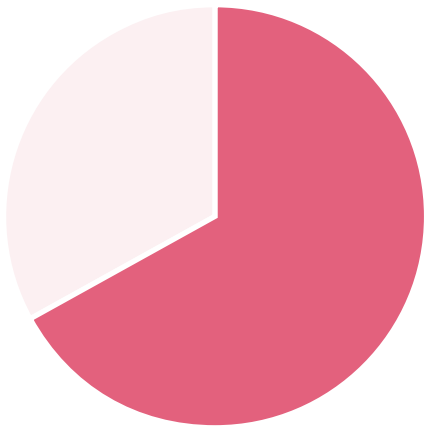
Examples of Job Roles and their JRI



- High-JRI roles exhibit the greatest shifts in defining skill clusters. This is driven by evolving technologies, business models, and customer expectations
- These roles are being redefined, potentially through job redesign to support innovation and business transformation. Workers in these roles need to continuously reskill

- Low-JRI roles, in contrast, have seen minimal change in their defining skill clusters
- Defining skill clusters in these jobs could be more enduring
- This stability should not be viewed as immunity. These roles may still require some level of upskilling and redesign before broader changes take hold. Delayed action may risk businesses and workers falling behind or exposed to sudden shifts in role demands
- Job roles such as data scientists and artificial intelligence scientists see a lower JRI score, possibly due to our analysis being focused on skills and not Apps & Tools, which may have a greater impact on their work

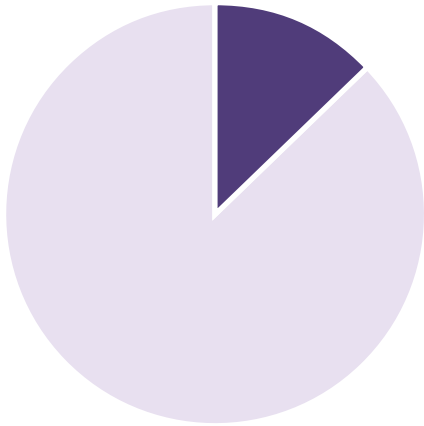
High-JRI roles are driven by defining skill cluster replacement, while some low-JRI roles have no new defining clusters.



67%

of high-JRI jobs saw over half of their defining skill areas either newly added or removed, showing a major shift in skill requirements.

This likely reflects task changes as employers redesign roles to respond to technological innovation (e.g. associate security analysts), workplace innovation (e.g. senior process engineers), and product innovation (e.g. landscape architects).



13%

of low-JRI jobs had no new defining skill clusters introduced between 2019 and 2024.

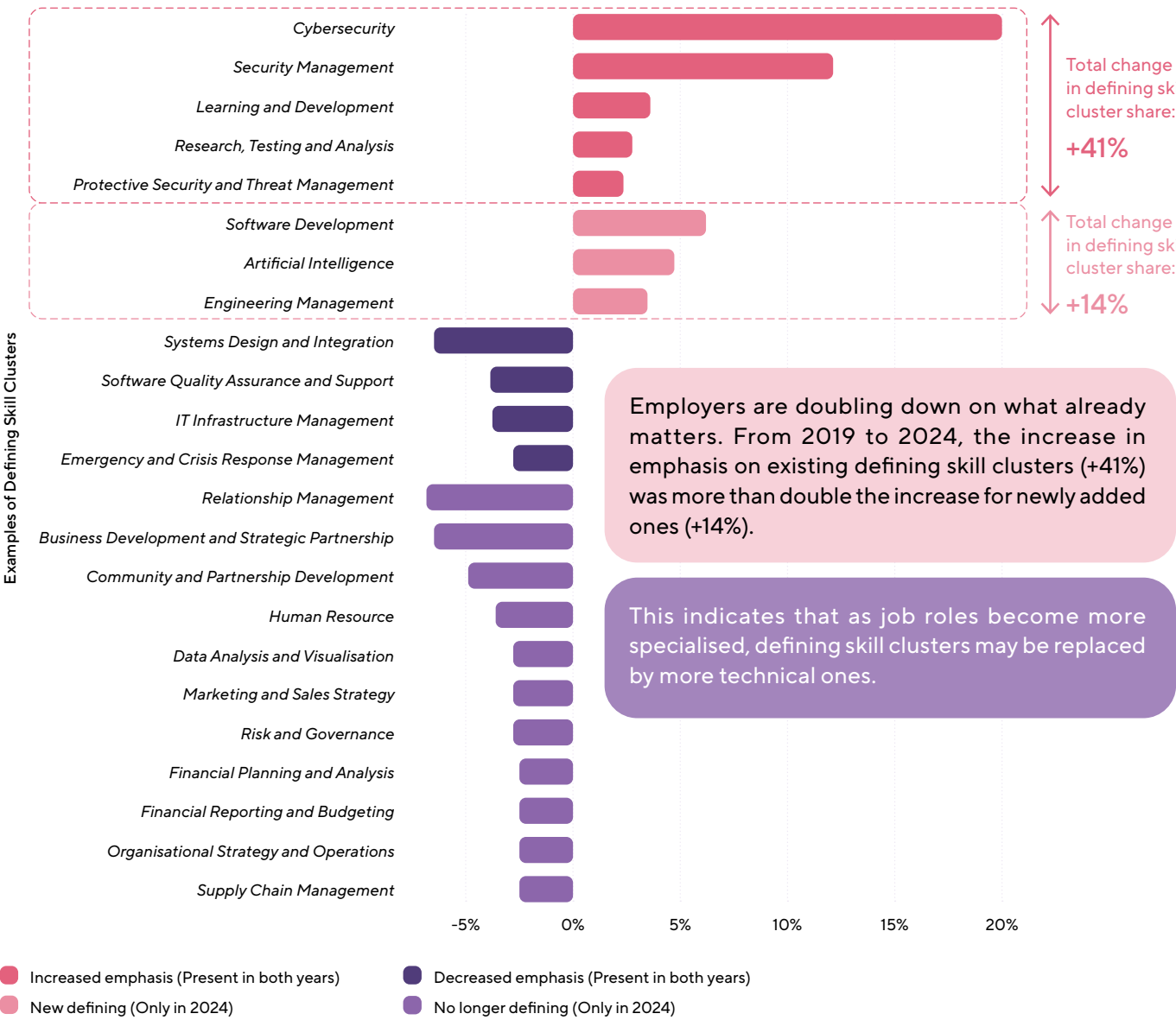
While operationally stable with little change in tasks, roles like cooks/kitchen assistants present opportunities for employers to re-examine and redesign it for future relevance.

CASE STUDY 1:
Associate security analyst
(JRI = 58)

The associate security analyst role used to focus on supporting security operations and monitoring systems. Now, it requires deeper specialisation in core cybersecurity functions. Workers need deeper cyber defence skills and more targeted expertise to protect digital assets.



Change in Defining Skill Cluster Share (2024 vs 2019)



How technology transformed the associate security analyst: from passive threat monitoring to proactively embedding security in systems

New technologies like cloud computing, AI, and real-time monitoring have changed how companies manage security. Instead of being added as an afterthought, security is now part of how systems are built and run.

Associate security analysts (JRI = 58) now take on new responsibilities like designing secure systems and preventing issues before they occur. Their defining skill clusters have shifted towards more specialised and integrated security capabilities.

How work looked like in 2019	How work looked like in 2024	Defining Skill Cluster Example	Drivers of Defining Skill Cluster Shift
Responded to incidents and implemented basic security protocols.	Embedded security from the start; managed risk proactively in cloud environments.	Cybersecurity	Share increased as cloud and automation became widespread, requiring security to be built in from the start and analysts to proactively prevent threats.
		Security Management	
-	Applied AI tools to detect threats and optimise security operations.	Artificial Intelligence	Share increased as analysts began working with intelligent systems that detect threats automatically, and took on roles in coding and designing safer, more automated tools.
-	Contributed to secure-by-design software, including automated threat responses.	Software Development	
Designed and configured integrated IT systems to support business operations.	Oversaw automated system integration workflows and troubleshooted only when automation fails.	Systems Design and Integration	Share declined due to real-time monitoring and automation replacing support/testing functions and routine processes.
Conducted routine software testing and supported tasks.	Reviewed exception reports and addressed quality issues that automated testing tools could not resolve.	Software Quality Assurance & Support	
Engaged stakeholders and communicated incident reports or compliance issues.	-	Relationship Management	Shifted away from generalist or support-oriented responsibilities.

- Increased emphasis (Present in both years)
- New defining (Only in 2024)
- Decreased emphasis (Present in both years)
- No longer defining (Only in 2024)

CASE STUDY 2:
Senior process engineer
(JRI = 43)

Traditionally, the senior process engineer analyses and improves manufacturing processes, resolves product defects, ensures quality compliance, and leads cross-functional improvement projects.

Now, the role increasingly demands defining skill clusters such as ‘engineering design and production management’ to optimise operational efficiency and drive smart manufacturing initiatives.



Change in Defining Skill Cluster Share (2024 vs 2019)



Employers are increasingly prioritising new defining skill clusters, which are growing nearly five times as much as existing clusters.

This shows that the role is evolving primarily through new capabilities, rather than through the heightened demand for existing skills.

As engineering work becomes more complex, the defining skill clusters of the senior process engineer also evolve, through shifts in emphasis and the emergence or disappearance of defining skill clusters.

Workplace innovation has transformed how engineering work is organised. It is now more connected, data-driven, and focused on continuous improvement. With this shift, the senior process

engineer has moved beyond simply maintaining processes to leading cross-functional efforts that redesign and optimise workflows.

How work looked like in 2019	How work looked like in 2024	Defining Skill Cluster Example	Drivers of Defining Skill Cluster Shift
Managed isolated process lines and made occasional improvements.	Led cross-functional process improvement instead of managing isolated repair tasks.	Process Improvement	Newly emerged as work shifted to leaner terms and more agile operations.
Followed standard procedures and focused on keeping things stable.	Redesigned workflows regularly instead of maintaining static processes.	Project & Operations Management	Newly emerged to support continuous improvement and better coordination across departments.
Performed manual inspections and addressed issues reactively after they occurred.	Used analytics and automation to optimise performance and prevent issues.	Maintenance, Repair, Operations	Share decreased because automated and predicted systems took over routine maintenance tasks.
		Engineering Management	Share increased as process engineers started to use analytics and automation to optimise engineering performance and align technical systems with business goals.
Maintained existing processes with minor tweaks and focused on local fixes within set systems.	Designed and adapted end-to-end systems using engineering standards and safety strategies to meet changing operational demands.	Engineering Design	Share increased as process engineers focused on tweaking existing setups to design complete, cross-functional systems that are safe, efficient and future-ready.
Conducted on-the-job training, delivered safety briefings, and enforced compliance with safety standards.	Conducted on-the-job training, delivered safety briefings, and enforced compliance with safety standards.	Learning & Development	Such responsibilities were outsourced or reassigned to allow process engineers to focus on higher-value, strategic work.
		Workplace, Safety and Health	

- Increased emphasis (Present in both years)
- Decreased emphasis (Present in both years)
- New defining (Only in 2024)
- No longer defining (Only in 2024)

CASE STUDY 3:
Landscape architect
(JRI = 65)

The landscape architect oversees the entire design process, from concept to implementation, to deliver cohesive and functional landscape and architectural plans.

Landscape architects of today are also expected to develop innovative and functional solutions that look good, work well, and are environmentally sustainable, which is why employers place a greater emphasis on design and visual development, process improvement, and engineering design.



Change in Defining Skill Cluster Share (2024 vs 2019)



Beyond managing site-specific projects, landscape architects today have to think about scalable solutions as well.

Landscape architects (JRI = 65) used to design one space at a time: they drew the plans, managed the build, and moved on. Today, clients want green solutions they can reuse, scale, and apply across different places, not just one custom park or garden.

In response, landscape architects are now developing scalable and smart solutions that deliver faster, cost less, and have greater impact.

How work looked like in 2019	How work looked like in 2024	Defining Skill Cluster Example	Drivers of Defining Skill Cluster Shift
Delivered custom landscape plans tailored to each site.	Developed modular, reusable green space design kits.	Design and Visual Development	Share increased, as it is essential to turn ideas into digital visuals that can be shared and reused.
Visited each site to study conditions and prepare unique designs.	Used digital data and pre-defined site typologies to reduce site-specific tailoring.		
Addressed environmental factors mainly as constraints, not as central goals.	Actively managed and integrated environmental systems into designs.	Environment and Climate Action	Share increased because designing for climate resilience is now essential, driven by stricter green mandates and climate changes.
Used 2D drawings and slides to present ideas.	Created 3D models, concept mock-ups, and digital walkthroughs.	Engineering Design	Newly emerged as digital design tools and 3D models are now essential for developing concepts, visualising ideas, and testing, pitching, and delivering scalable designs.
Delivered bespoke design packages that evolved during implementation.	Delivered digital design kits and visual assets for scaled rollout.	Software Development	
Oversaw project on-site, resolved issues with vendors.	Delegated or outsourced execution using standardised design templates.	Contract and Vendor Management	Share decreased, as execution is outsourced and decoupled from the design role.
Managed on-site production timelines and contractor outputs.	Relied on third parties or turnkey solutions for implementation.	Production Management	

- Increased emphasis (Present in both years)
- New defining (Only in 2024)
- Decreased emphasis (Present in both years)
- No longer defining (Only in 2024)

CASE STUDY 4:

Cook/kitchen assistant (JRI = 18)

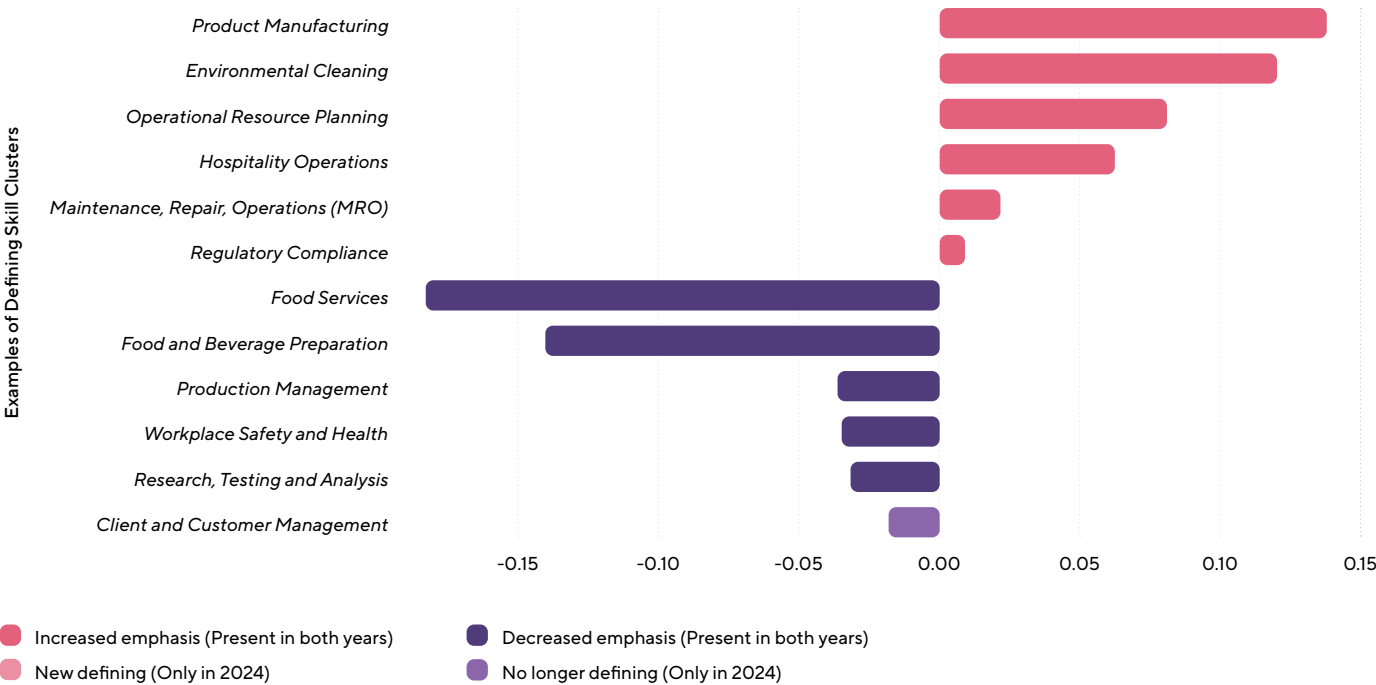
The cook/kitchen assistant’s job role has evolved from 'doing current tasks differently' to doing them better.

Between 2019 and 2024, this low-JRI role (JRI = 18) saw no new defining skill clusters. This shows that the core responsibilities have remained largely unchanged.

The defining skill clusters with higher emphasis still focus on basic, hands-on kitchen duties: a clear sign the role has not evolved to adopt automated cooking and ingredient preparation automation for productivity gains. Without efforts to upgrade skills or redesign the job, it could become more vulnerable to automation in the future.



Change in Defining Skill Cluster Share (2024 vs 2019)



Conclusion

For many roles, job titles may remain unchanged, but job requirements are changing. Each role consists of a continually shifting combination of defining skill clusters, reflecting the changing tasks and skills demanded by employers.

Job posting data indicates that defining skill clusters of jobs are shifting in response to business transformation. As highlighted in Chapter 1, in a fast-changing world, employers must redesign roles and invest in targeted upskilling and reskilling, and those who have not yet begun to do so must act decisively.

This is critical to building a workforce that can drive innovation, adapt quickly, and deliver business value. The Job Requirements (Skills) Index (JRI) and shift patterns in skill clusters provide a compelling, data-driven impetus for action. These tools help employers prioritise which roles to redesign, identify which skills to strengthen, and highlight new skills to potentially introduce to their workforce.

The next chapter uncovers how some companies have proactively pursued job redesign and reskilling, resulting in positive workforce outcomes.

Job redesign: a proactive approach for an optimised workforce



As outlined in Chapter 2, skill requirements across job roles are changing, and job redesign is essential for employers and employees to stay ahead and meet evolving business needs.

Over the last two years, Workforce Singapore (WSG) has reskilled more than 4,300 individuals across more than 640 firms and 23 sectors through the Job Redesign Reskilling Career Conversion Programme (JRR CCP). This chapter zooms into five high- or medium-impact job roles¹ covering close to 950 individuals across around 75 participating firms under WSG's JRR CCPs from 2023 to 2024.

These redesigned job roles were mainly from the following seven sectors:

- Electronics, food services, logistics, precision engineering, professional services, retail, and wholesale trade
- PMET roles: engineering professionals, administrative associate professionals, and sales, marketing, development and customer service managers
- Non-PMET roles: waiters and bartenders, cashiers and ticket clerks

Bubble chart of job roles, sized based on number of JRR CCP applications



¹ Job role titles were extracted using MOM's SSOC Autocoder. The nature of job roles (high- or medium-impact) referenced WSG's Jobs Transformation Maps (JTM's).

Employers are redesigning their jobs to meet business and workforce needs. They are also reskilling their existing workers to support this transformation. The majority of employers who embarked on the JRR CCP cited the adoption of new technologies and processes as the main reason for reskilling workers.

The top three reasons to reskill workers were:

1. To adapt to new technologies and processes, ensuring workforce readiness for evolving job demands ('workforce reskilling': 82%). All sectors cited adapting to new technologies and processes as their top reason, showing universal recognition of how technology is transforming job demands, and how workers will need to be reskilled to stay up-to-date
2. To integrate technology and automation to streamline processes, reduce manual tasks, and enhance overall operational efficiency ('process automation and streamlining': 65%)
3. To address inefficiencies in operations to enhance productivity and improve service delivery ('operational efficiency improvements': 38%)

Overview of employers' motivations for JRR CCP; percentages are based on the number of unique companies (out of the 74 in total) that had indicated such motivations²



2 Each company can possess more than one motivation for job redesign and reskilling.

About one-third of employers also showed a keen interest in building up data analytics capabilities to support decision-making.

One-third of employers (30%) embarked on JRR CCP to develop data analytics capabilities and foster a data-driven culture. Employers see this as a way to enhance decision-making and operational efficiency.

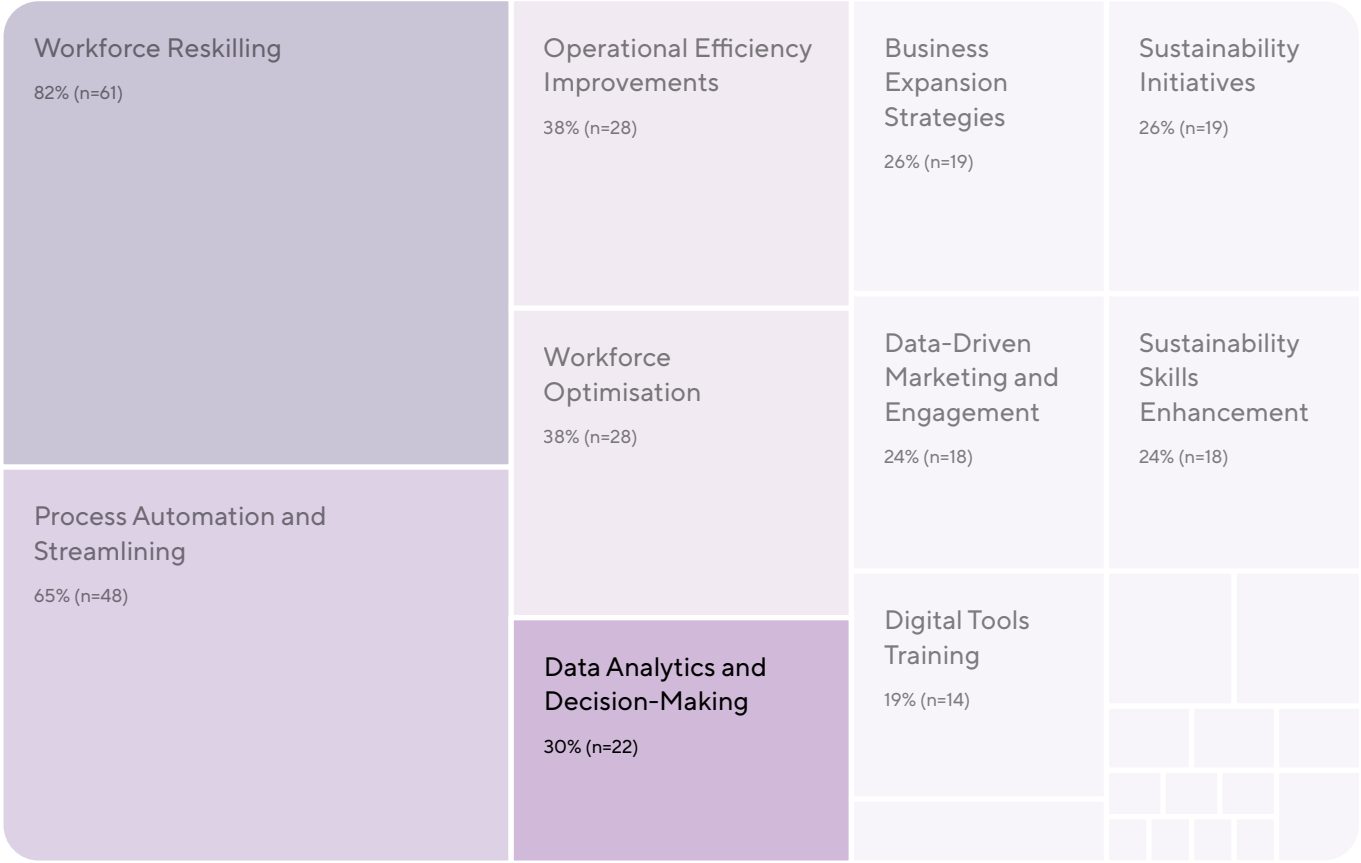
Different sectors cited the building up of data analytics for decision-making as a motivation for embarking on the JRR CCP, demonstrating the cross-cutting importance of data-related capabilities.

- Improving data analytics and decision-making was a strong motivator for service sector employers, particularly in retail, where it was cited by 67% of companies

- Employers in the manufacturing and technology sectors, including professional services (75%), precision engineering (50%) and electronics (50%), also sought to reskill employees in data analytics capabilities

In Singapore, rising costs, tight labour constraints, and the growing prominence of AI are pushing companies to invest in job redesign, especially to build data analytics capabilities that provide useful insights. This drives productivity, innovation, and competitiveness, while strengthening decision-making and operational resilience. In turn, companies can stay agile in shifting market conditions.

Overview of employers' motivations for JRR CCP; percentages are based on the number of unique companies (out of the 74 in total) that had indicated such motivations²



More than half of employers in service sectors prioritise workforce optimisation as a foundational step, through the JRR CCP.

75% of all employers in the service sectors engaged in JRR CCP to optimise resource allocation for enhanced operational flexibility and improved employee satisfaction ('workforce optimisation').

- They aimed to optimise manpower usage, address high turnover rates, and resolve under-utilised resources amid the tight labour market

These foundational efforts are crucial for enabling service sectors to build a more agile and engaged workforce.

- Employers from food services (76%) and retail (67%) ranked it as the second-highest³ motivation for participating in the JRR CCP, particularly for roles such as waiters and bartenders and cashiers and ticket clerks

Percentage of unique companies within the sector that embarked on JRR CCP for workforce optimisation, by nature of sector



3 Across all sectors, the biggest motivating factor to participate in the JRR CCP was to adapt to new technologies and processes, ensuring workforce readiness for evolving job demands ('workforce reskilling')

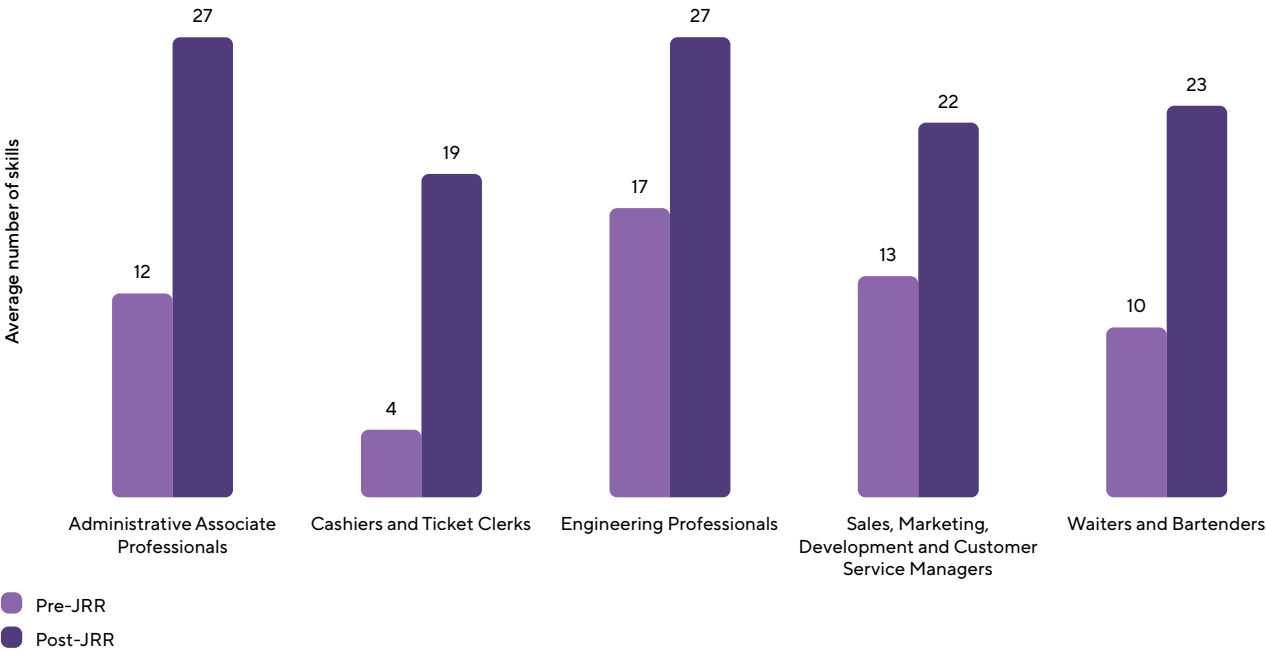
Redesigned job roles had greater skill requirements. Companies must stay aware of how skill requirements are evolving within current roles, especially as job scopes continue to change.

All five redesigned job roles saw an increase in the average number of skills required after job redesign (ranging from +9 to +15).

Examples of top new skills that emerged for the job roles include:

- *Business Insights and Data Design* for PMET roles
- *Customer Service Excellence and Developing Framework for Service Challenges* for non-PMET roles

Average number of skills required in the five job roles, pre and post JRR CCP⁴



4 Based on 138 unique job descriptions across the five job roles, as identified from 947 JRR CCP applications.

Most (65%) of the new skills required in redesigned job roles were high-ubiquity or high-growth skills⁵.

High-ubiquity skills made up the largest proportion (45%) of the new skills that emerged post-JRR CCP. These skills are broadly transferable across many occupations.

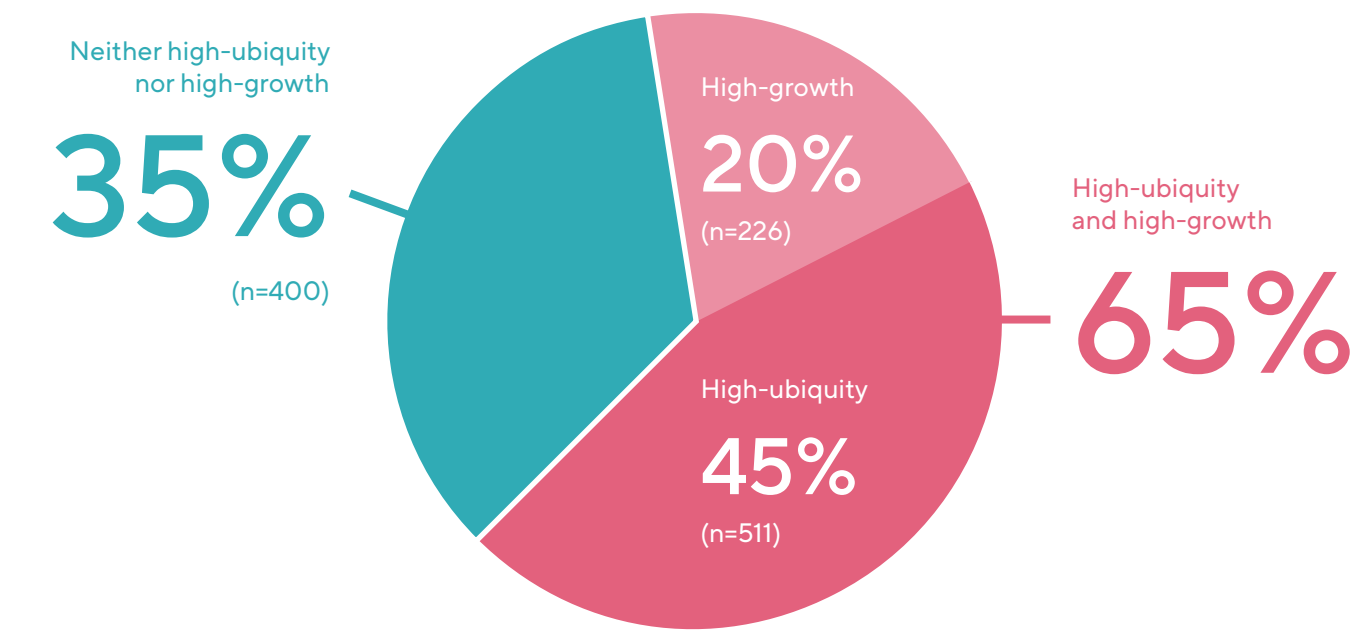
- Top and new high-ubiquity skills are *Data Collection and Analysis, Stakeholder Engagement and Management, and Business Needs Analysis*

A smaller proportion (20%) of the new skills are high-growth skills, which are increasingly demanded by employers.

- Top and new high-growth skills are *Data Strategy, Carbon Footprint Management, and Sustainability Management*

Through embarking on the JRR CCP, employers gained a future-ready workforce aligned to evolving business needs, while individuals acquired valuable skills that were transferable and in high demand. These skills will be elaborated upon in the next chapter to guide individuals' upskilling and reskilling efforts.

Overall skill-type breakdown of the new skills required post-JRR CCP



⁵ New skills are mapped to the list of high-ubiquity and high-growth skills identified by SkillsFuture Singapore (SSG), which are also referred to within the next chapter, "For individuals: upskilling and reskilling to build career health". See next page for the lists of top new skills post-JRR CCP, based on skill type.

Top new skills from the redesigned job roles in this study

S/N	Top New High-Ubiquity Skills (>10 counts)
1	Data Collection
2	Stakeholder Engagement Business Needs Analysis
3	Power Plant Incident Investigation Management Applications Development
4	IT Standards Decision Making
5	Project Feasibility Assessment Performance Management

S/N	Top New High-Growth Skills (>10 counts)
1	Data Strategy
2	Carbon Footprint Management
3	Sustainability Management Business Insights
4	Collaborative Practices with Stakeholders across Disciplines
5	Environmental Protection Management

S/N	Top New Skills (Neither High-Ubiquity nor High-Growth) (>10 counts)
1	Data Design
2	Non-Financial Reporting
3	Data Visualisation Analytics and Computational Modelling
4	Data-Mining and Modelling Business Data Analysis
5	Marketing Strategy Development

CASE STUDY 1:

PMET job role: logistics solution analyst

The logistics solution analyst⁶ analyses customer needs and supports the development of integrated logistics solutions for customers across warehousing, transportation, freight forwarding solutions and customer service operations. With the push towards smart, data-driven operations for trade and logistics, the redesigned logistics solution analyst role now integrates technology and data capabilities.

Two new skills highlighted under the Jobs Transformation Maps (JTM) emerged from the redesigned job role of a logistics solutions analyst, an administrative associate professional within the logistics and wholesale trade sectors:

- *Applications Development*, a high-ubiquity skill, i.e., developing applications (including coding, testing, and reviewing) based on design specifications, to improve fleet efficiency, reduce costs, and stay ahead

- *Data Strategy*, a high-growth skill, i.e., building a robust and coherent data strategy and support architectures (including trend identification, leveraging predictive analytics to optimise e-commerce potential and last-mile delivery) that enables the organisation to utilise data effectively

The above examples showcase the utilisation of WSG's JTM insights with sector implementation in response to key trends outlined, such as Industry 4.0 and digital technologies. This transformation reflects Singapore's push to elevate logistics and wholesale trade operations beyond traditional planning and into smart, data-driven operations. As a global trading and logistics hub, the new emphasis on *Applications Development* and *Data Strategy* positions planners to drive higher-value activities in their respective domains, supporting Singapore's vision for a next-generation intelligent trade and logistics ecosystem.

Rank	Top new high-ubiquity skills for Logistics Solution Analyst
1	(a) <i>Applications Development</i>
	(b) <i>Financial Analysis</i>
	(c) <i>Data Analysis and Interpretation</i>
2	(a) <i>Power Plant Incident Investigation Management</i>
	(b) <i>Drive Productivity and Innovation</i>

Rank	Top new high-growth skills for Logistics Solution Analyst
1	<i>Data Strategy</i>
2	<i>Collaborative Practices with Stakeholders across Disciplines</i>
3	(a) <i>Sustainability Management</i>
	(b) <i>Sustainability Assurance</i>
	(c) <i>Carbon Footprint Management</i>

6 As defined in the Logistics JTM (2020).

CASE STUDY 2:

Non-PMET job role: service crew/waiter

The service crew/waiter⁷ delivers service and operations excellence, including taking orders and delivering the food, operating Point of Sales (POS) systems, and carrying out food and beverage operational tasks. In a service-oriented economy with rising expectations for quality and responsiveness, the redesigned Service Crew/Waiter role has evolved to emphasise new skills high in both ubiquity and growth.

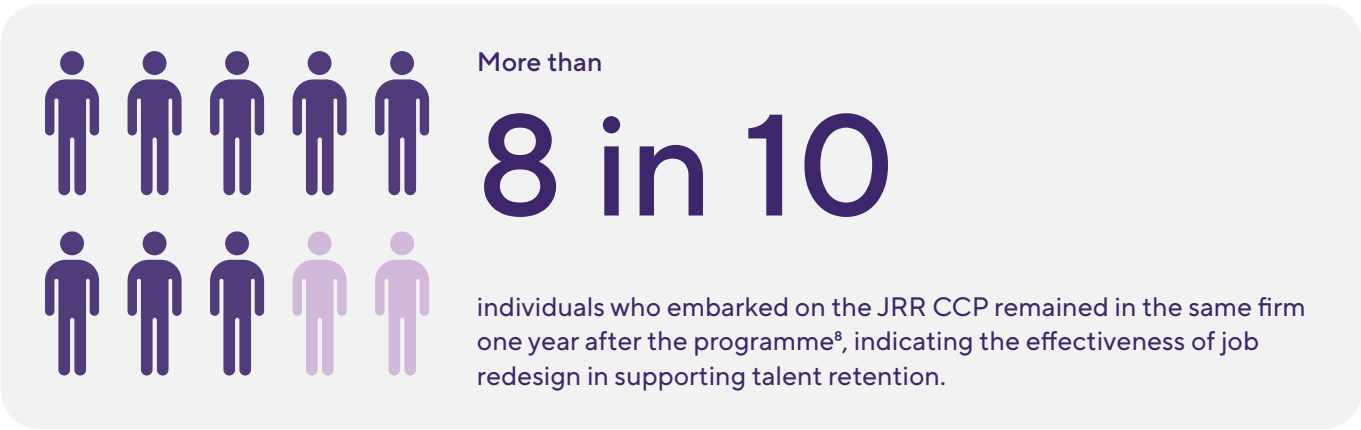
New skills emerged in the redesigned service crew/waiter role:

- High-ubiquity skills in *Customer Service Excellence*, *Perform Stock Control and Housekeeping Operations*, and *Problem Solving*
- High-growth skills in *Specialty Cuisine Preparation and Cooking*

As outlined in WSG's JTM insights for the Food Services sector, consumers are prioritising convenience, personalised experiences, and experiential services. Technology is also increasingly adopted to streamline manual tasks. This shift in skills for the high-impact service crew/waiter role reflects the growing need for frontline service roles to deliver higher-value customer experiences and adapt to address problems effectively, while supporting more efficient operations. This is particularly so in a service-oriented economy, where expectations for quality and responsiveness are rising.

Rank	Top new high-ubiquity skills for Service Crew/Waiter role
1	(a) <i>Customer Service Excellence</i>
	(b) <i>Perform Stock Control and Housekeeping Operations</i>
2	<i>Problem Solving</i>

Rank	Top new high-growth skills for Service Crew/Waiter role
1	<i>Specialty Cuisine Preparation and Cooking</i> (includes basic food/drinks preparation, and food plating)



7 As defined in the Food Services JTM (2023).

8 Based on the 12-month retention data of 542 JRR CCP participants (56% of the total pool of individuals). Retention data for the remaining participants is unavailable due to insufficient data runway.

Conclusion

In the face of megatrends such as automation and digitalisation, it is imperative for employers to proactively redesign job roles and reskill workers, to remain competitive and future-ready.

WSG's Job Redesign Reskilling Career Conversion Programme (JRR CCP) supports employers in redesigning job roles with good worker retention outcomes: over 80% of participants are retained in their firms post-programme. Employers need to embrace job redesign as a strategic lever to adapt to changing business needs and skills requirements, and to optimise their workforce.

In tandem with job redesign, individuals also need to proactively plan their careers and pursue meaningful upskilling and reskilling to ensure that they maintain good career health. The next two chapters provide insights on how individuals can do this.



For individuals: upskilling and reskilling to build career health



Individuals can also act to take ownership of their career planning and growth.

This report has thus far outlined the key forces reshaping businesses, jobs and skills. In response, Chapter 3 highlighted how employers are adapting through job redesign, process automation, workforce optimisation, and reskilling.

Chapters 4 and 5 will look at how individuals can take action to enhance resilience by taking charge of their career planning and growth.

As businesses and job roles continuously evolve, individuals are expected to adopt a proactive stance and ensure skills are up-to-date and future-ready.

One way to do so is to build a diverse portfolio of high-growth skills and high-ubiquity skills that can strengthen career health.

The [Job-Skills Profile Dashboard](#) also provides a clear lens for individuals to understand job-defining skills asked for by employers, and to stay informed through evolving market signals on skills.



Managing a portfolio of skills for career health

Fostering career health in a dynamic labour market means curating a diversified portfolio of high-growth and high-ubiquity skills¹.

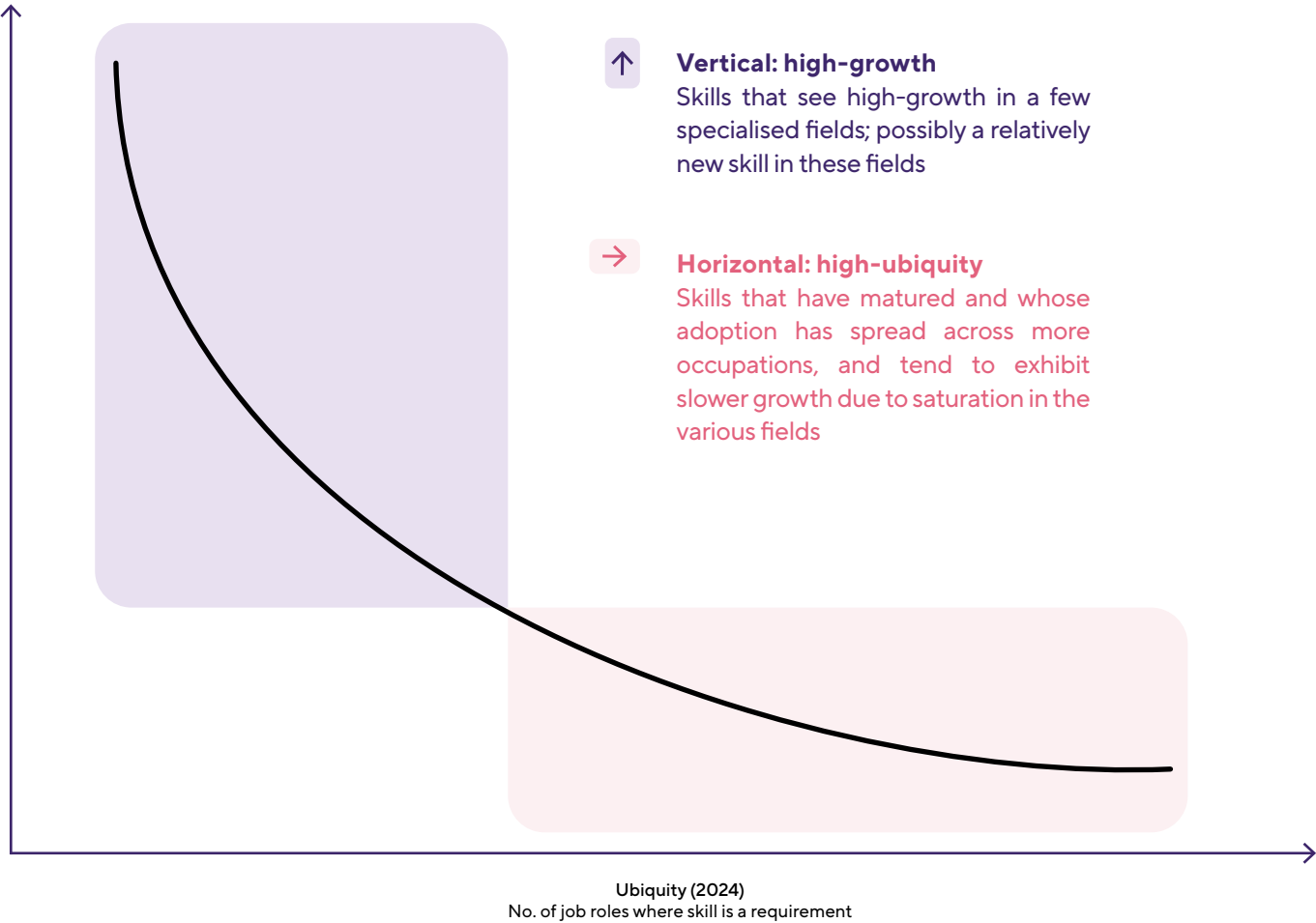
These measures capture two distinct aspects of skills for career health:

- High-growth skills (e.g. *Artificial Intelligence Application*) are increasingly demanded by employers. They offer deep specialisation and keep individuals at the cutting edge of change
- High-ubiquity skills (e.g. *Project Management*) are broadly transferable across many occupations. They offer professional versatility and resilience

A curated list of 941 skills (467 high-growth skills and 474 high-ubiquity skills), identified from 2019 to 2024 job posting data, is available on the Job-Skills Profile Dashboard to support the development of a diverse skills portfolio.

$$\left(\frac{\text{skillFreq}_{2024}}{\text{skillFreq}_{2019}} - 1\right) \%$$

Demand Growth (2019 - 2024)



1 See 'Methodology' to learn how high-growth skills and high-ubiquity skills are identified



Taking the first step: knowing what skills are valuable

Why career health matters

Job roles are constantly evolving. To stay relevant in today's labour market, it is essential to build career health. Individuals should not limit themselves to the skills required in their current role. It is beneficial to regularly optimise one's personal skills portfolio and actively acquire skills that are demanded in the economy, even when one is employed and not looking for a change in roles.

Such skills are likely to be needed in one's work, either now or in the near future, and can open up new opportunities. Individuals can use the Careers & Skills Passport as a repository to manage their personal skills portfolio.

How to build career health

One practical way to build career health is to acquire and apply high-growth and/or high-ubiquity skills. While the importance of skills varies by role, it is the diversity of specialisations and transferability that benefits career health.

Regular review of the skills needed in current and adjacent job roles is part of skills development planning. Staying competitive requires continuous exploration and refinement of one's skill set as the labour market demands change.

The next section offers practical guidance on how to adapt and strengthen one's skill sets at any stage in one's career, using three archetypes.



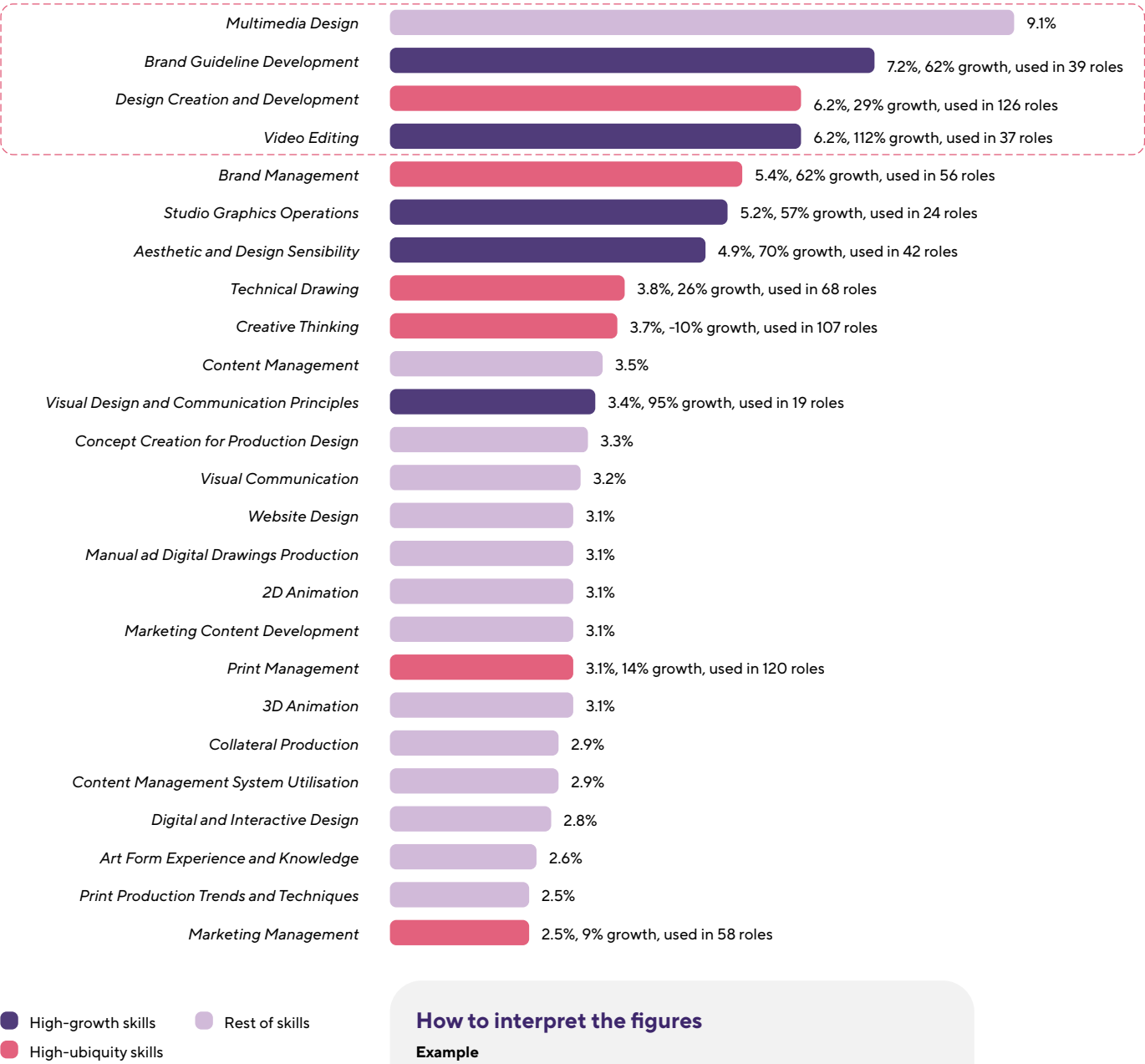
New entrants: build the right foundations

Starting a new role is exciting, but it can also feel overwhelming. Whether one is new to the workforce or changing to a new role, the first step is to assess one’s skills set.

The Job-Skills Profile serves as a valuable self-check reference, identifying the 25 most job-defining skills asked for by employers of a particular job role. This charts individuals’ path forward in bridging important skills gaps in the desired role.

For example, a new graphic designer who masters the top four skills in this Job-Skills Profile would cover nearly 30% of the overall importance of job-defining skills that employers search for. After executing steps to gain these core skills, they can then build career health by learning other high-growth skills and/or high-ubiquity skills within (or even outside) their role.

Example 1: Graphic Designer Job-Skills Profile, ordered by skill importance



How to interpret the figures

Example

- Brand Guideline Development (7.2%, 62% growth, used in 39 roles)
- 7.2% – Overall Importance of job-defining skills employers search for
 - 62% growth – Increase in demand growth from 2019 to 2024
 - Used in 39 roles – No. of job roles where skill is a requirement

Experienced professionals: future-proof one’s career

Individuals who assess their skills sets and invest proactively in high-growth and high-ubiquity skills beyond their job role will future-proof their careers.

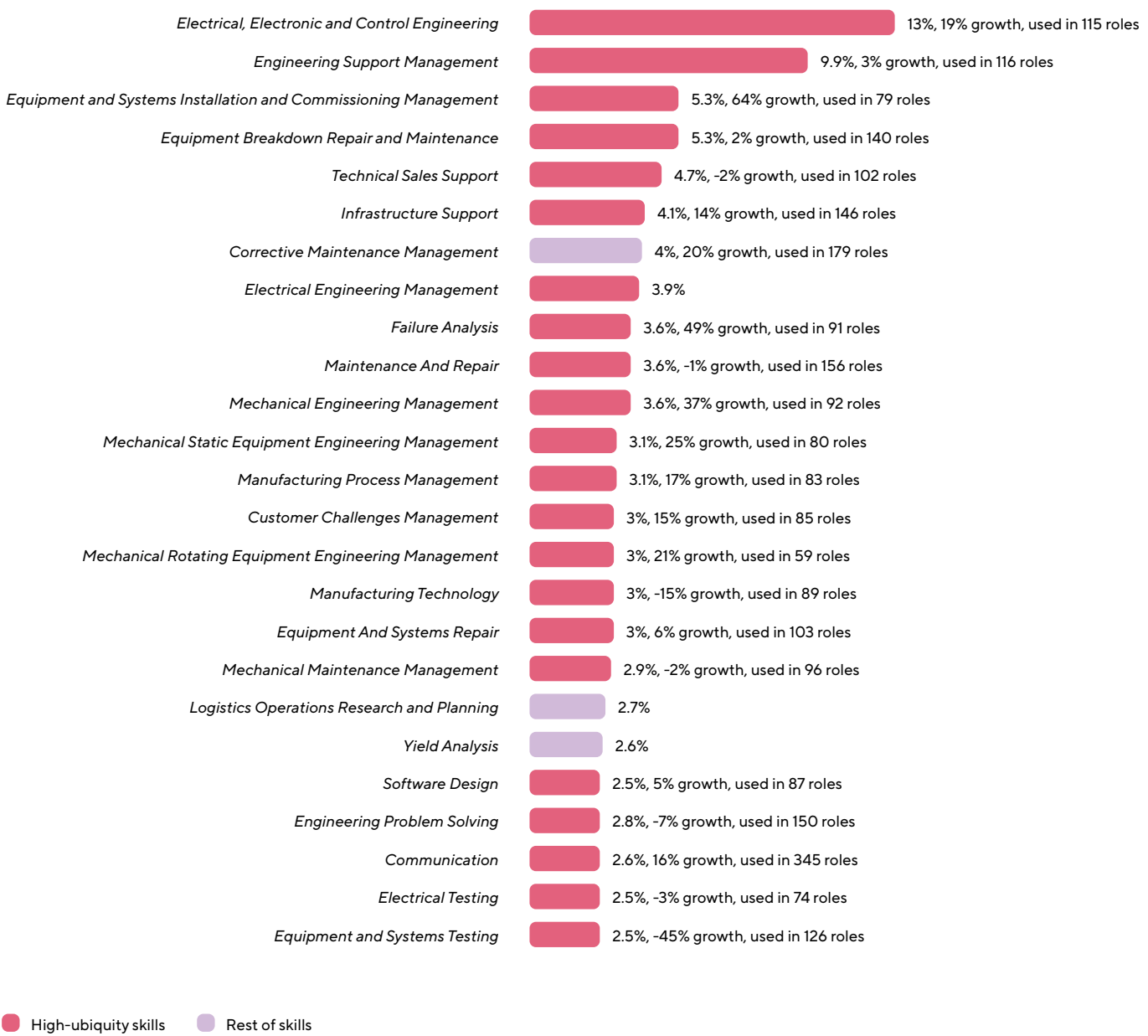
The Job-Skills Profile charts the path forward by guiding the investment in skills.

- Those who possess high-growth skills can add high-ubiquity skills to broaden professional versatility

- Those who possess high-ubiquity skills can add high-growth skills to stay ahead of job market evolution

For example, semi-conductor engineers can execute targeted upskilling by focusing on high-growth skills like *Sales Closure* (70% growth) and *Energy Product Performance Management*² (81% growth). Having commercial awareness helps them shine as businesses evolve toward customer-centricity and cross-functional teams.

Example 2: Semi-Conductor Engineer Job-Skills Profile, ordered by skill importance



2 Skills asked for by employers for the semi-conductor engineer role but do not fall within the 25 most defining skills.

Individuals in transition: harnessing skills for career mobility

As the employment landscape evolves, some job roles may experience a tapered demand. However, the skills developed in these roles, particularly high-growth and high-ubiquity skills, remain valuable and relevant.

For example, a cashier’s experience builds a strong foundation of high-growth and high-ubiquity skills that can chart pathways for career transitions.

- High-ubiquity skills such as *Retail Administration* and *Customer Service Excellence* are versatile across the retail sector and support transitions into Retail Manager, an adjacent role

- *Sales Closure*, a high-growth skill, is critical in enabling transitions into sales-orientated roles like Sales Supervisor

Individuals interested in learning how to harness their skills and execute their career transition plans are encouraged to utilise the Skills and Job Mobility Dashboard.

Skills and Job Mobility Dashboard

Example 3: Cashier Job-Skills Profile, ordered by skill importance



Explore the Job-Skills Profile Dashboard and take action to build career health

The Job-Skills Profile Dashboard highlights high-growth skills and high-ubiquity skills, along with the 369 job roles in which these skills appear (based on each role’s Job-Skills Profile, which comprises its top 25 defining skills).

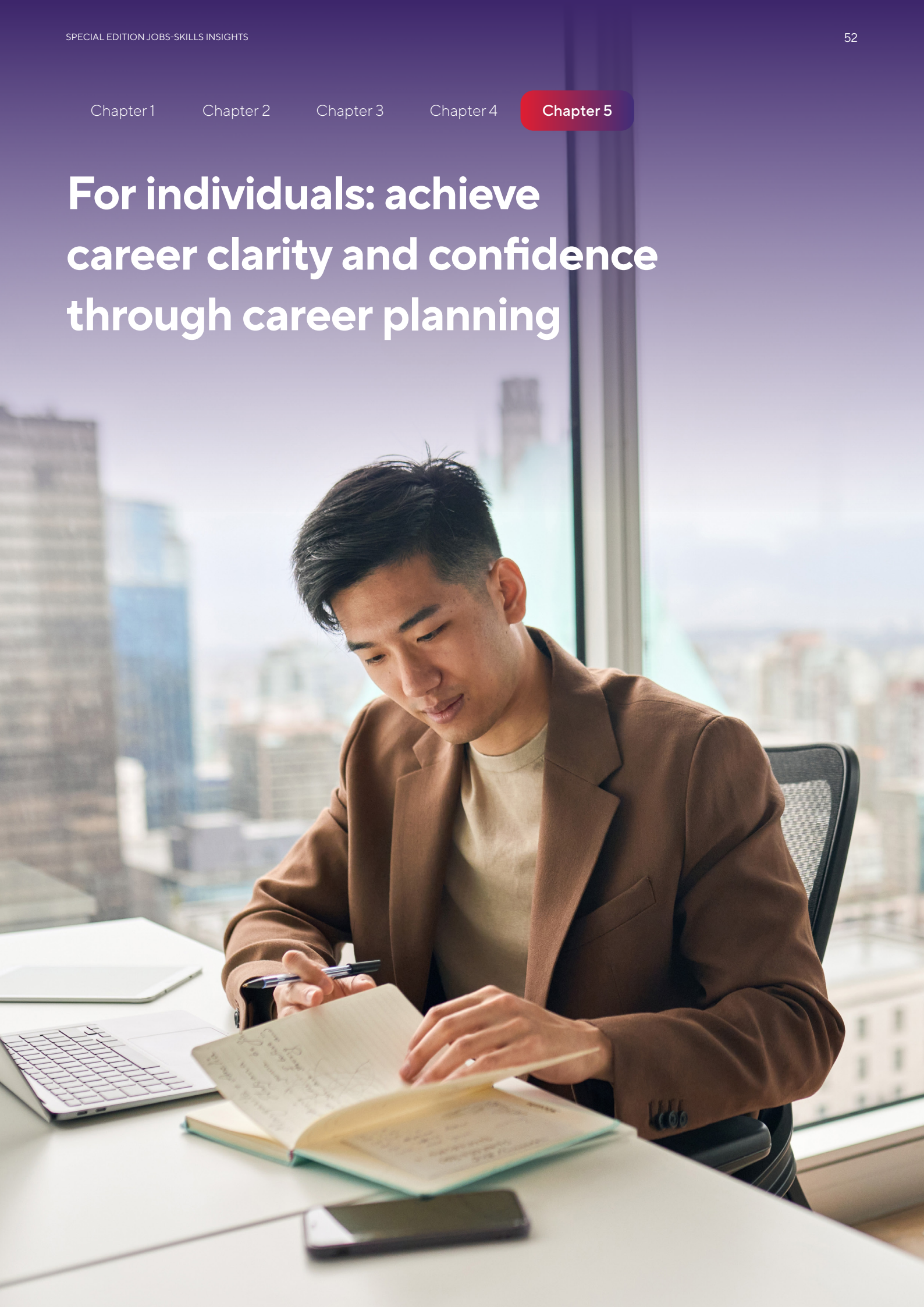
While every job has a unique skills profile, many of these skills are transferable. Understanding the demand and transferability of skills in one’s skills portfolio will enable better decision-making in skills development and strengthen career mobility.

By proactively assessing their skills portfolio, charting the way forward and executing steps, such as through training and taking on new job roles, individuals can stay relevant, adaptable, and confident in navigating future disruptions.

The next chapter will support individuals in navigating their career and skills development journey, offering guidance to help them turn their career plans into concrete actions.

Job-Skills Profile Dashboard

For individuals: achieve career clarity and confidence through career planning



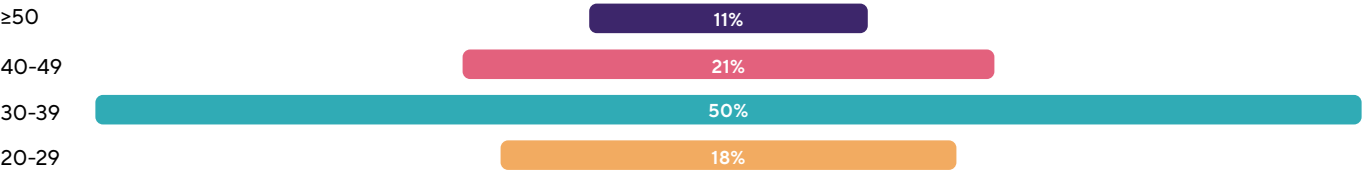
Proactive career planning aligns your skills and aspirations with emerging opportunities, leading to greater career resilience and mobility in the long run.

As highlighted in the previous chapters, the jobs and skills landscape is changing rapidly. For individuals, upskilling and reskilling goes hand-in-hand with career planning, which is key to strengthening career health in a dynamic jobs and skills landscape.

In November 2023, WSG launched Polaris, a suite of career guidance programmes designed for individuals looking to elevate their career through structured and personalised career planning. Under this initiative, certified career coaches guide individuals to assess their values, interests, personality, and skills, and to develop a Career Development Plan, outlining clear career goals and a roadmap.

This chapter presents an empirical evaluation of the motivations and outcomes of the 262 participants who received career guidance services through Polaris between November 2023 and July 2024. It explores the reasons why individuals sought career guidance and examines the relationship between their participation in the programme and the actions they took afterwards.

Age group of Polaris participants (n=262)



Profile of Polaris participants

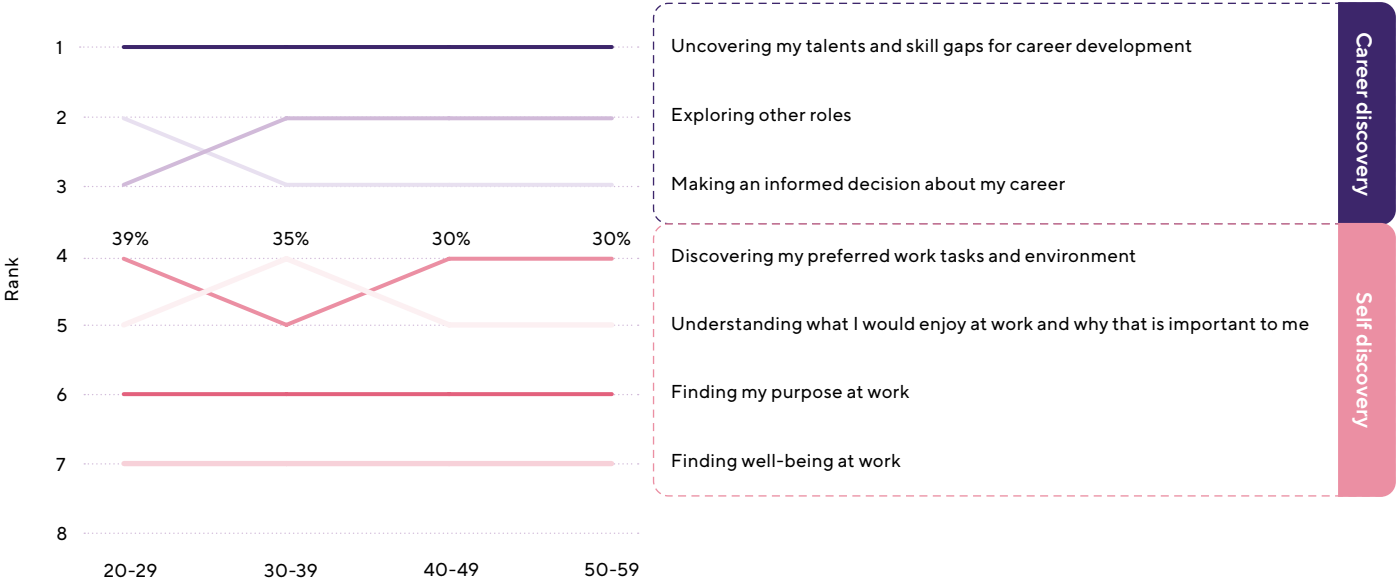


Registrants¹ for personalised career guidance and career planning services were largely motivated by career-related reasons. Older registrants indicated stronger interest in career discovery over self-discovery.

The top three motivations for seeking personalised career guidance services were (i) uncovering talents and skills gaps (72%), (ii) exploring other roles (61%), and (iii) making informed career decisions (52%).

In contrast, motivations linked to self-discovery became less prominent among older age groups (up to 30% for those aged 40-59 selected the motivations linked to self-discovery, compared to up to 39% for those aged 20-29 and up to 35% for those aged 30-39).

Motivations of registrants for personalised career guidance



¹ Refers to the 262 participants who took up career guidance services via WSG’s Polaris pilot between Nov 2023 – Jul 2024 and 1,115 who were waitlisted due to limited capacity

More than 90% of participants reported greater clarity and confidence in career planning after receiving structured and personalised career guidance.

Polaris offered participants professional guidance to navigate career-related challenges, identify career development opportunities and align their skills, strengths, and career aspirations with evolving market needs.

The career coaches guided participants to develop a Career Development Plan. After completing Polaris and undergoing structured and personalised career guidance, more than 90% of participants reported greater clarity and confidence in planning their careers.

Out of 221 participants

100%

Completed the programme and developed a Career Development Plan (CDP)

>90%

Indicated satisfaction with the career guidance received
Overall satisfaction: 4.62/5

>90%

Reported greater clarity and confidence in career planning

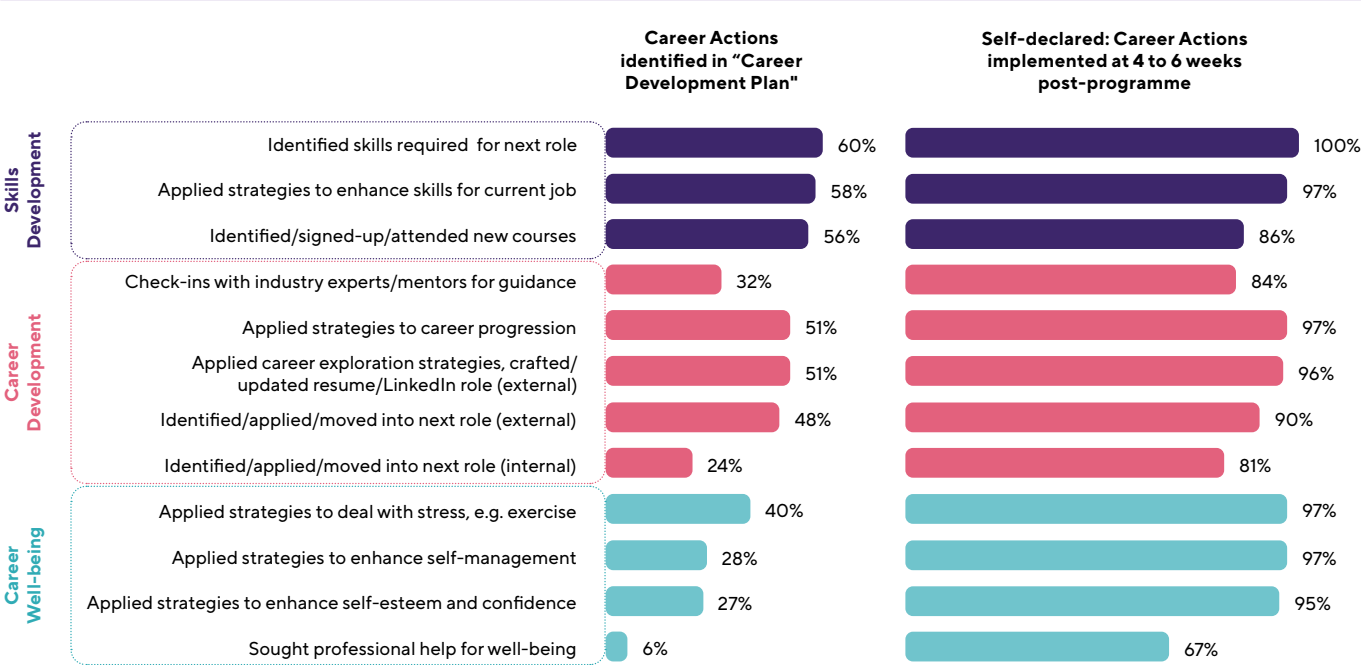
Career planning boosted skills development: all participants acted on the career actions post-programme

Taking action post-programme

Participants' Career Development Plans identified specific career actions that were categorised into three key areas: (i) Skills Development, (ii) Career Development, and (iii) Career Well-Being.

Skills Development emerged as the predominant focus, with 60% of participants identifying the need to determine skills required for their next roles, as reflected in the bar chart below. In contrast, Career Well-Being actions were the least captured in the plans, with only 6% of participants planning to seek professional support for their well-being after the programme.

Within one month of programme completion, participants reported high career plan implementation rates. Among those who had planned to identify skills for their next role, all had successfully accomplished this objective. Other career actions, including skills enhancement, career progression, stress management, and self-management strategies, achieved 97% implementation rates.



Note: More than one option can be selected

CASE STUDIES

Navigating career transitions: case studies on how professional career guidance shapes career adaptability

With rapid technological changes and evolving job roles, individuals can no longer expect a linear career path. Instead, multiple episodes of transitions are expected throughout one's career, whether it's switching jobs within the same company or sector, moving across sectors, or upskilling to keep pace with changing demands.

This makes regular career review and planning essential to remain employable and achieve long-term growth. Professional career guidance offers structured support to help individuals make informed decisions, identify development opportunities, and align their skills with evolving market needs.

The case of Mr Adam* illustrates how career guidance empowers workers to take charge of their career mobility, adapt to changing roles, and stay resilient in the face of uncertainty. Similarly, Ms Beth's* experience shows how career guidance can help individuals navigate shifting job expectations. Career guidance equips individuals with the right tools and insights to expand their capabilities and remain relevant.

*Names have been altered to protect anonymity

Public and private sector employers both recognise how career guidance boosts employee productivity and engagement. They have since stepped up to facilitate career conversations at the workplace.

In the public sector, the Public Service Division's Public Service Career Coaching Network (PSCCN) guides officers in mapping out their professional journeys effectively. Through personalised coaching sessions, the network supports officers to discover their career aspirations, understand their core values, and identify their key strengths and interests. This enables officers to develop targeted career plans that align with both their personal goals and organisational needs, ultimately fostering meaningful career growth.

Case studies from private sector employers such as Eyesight.sg further highlight the important role employers play in career planning. By offering career planning support, employers enable individuals to take ownership of their development and thrive amid ongoing business transformation.

CLIENT PROFILE:

Mr Adam* gained clarity on his career direction and re-ignited his start-up passion after Polaris



40+ years old, married with kids

- B.Eng, Electrical and Computer Engineering
- Contract role as a Project Consultant, focusing on brand storytelling project
- Concurrently working on his second start-up on media platform

Employment History

- Non-profit organisation (1.5 years) – Project Consultant
- Educational institution (10 months) – Associate Lecturer
- Media start-up– (12.5 years) Co-Founder

Key skills:

- Content Creation/Video Editing
- Strategic Planning/Consulting

Motivations

- **Career planning:** Define what “career” meant to him at this stage of his life
- **Career conversations:** Seek outlet to reflect his career journey thus far
- **Self-improvement:** Identify areas for improvement upon clarifying his definition of “career”

Gains from career guidance

- **Ability to define** what “career” meant to him
- **Developed a clearer understanding** of himself and how to align his career path at this stage in his life
- **Guided career conversations** allowed him to share authentically how his past experiences were hindering his progress
- **Identified growth areas** and recognised his skills gaps in mentoring and management

Outcomes

- **Gained clarity** on why he had various diverse roles in his career life: Contract Role, Associate Lecturing and Own Start-Up
- **Embarked on his entrepreneurship journey**, with his start-up set to launch in Q3 2025
- **Actively sought mentors and training** programmes to help him grow in identified areas

*Names have been altered to protect anonymity

CLIENT PROFILE:

Professional career guidance helped Ms Beth* to assess her career goals and progress in her career



30+ years old, married with kids

- Diploma in Accounting and Business
- Happy with current employer (non-profit organisation)
- Keen to progress to a higher-level and leadership role

Employment History

- Non-profit organisation – (1.5 years) HR and Finance Manager
- Trading/Wholesale company – (4 years) Finance Executive

Key skills:

- Full spectrum of HR and finance functions

Motivations

- **Career conversations:** To be guided on facilitating fruitful discussions with her supervisor on her career progression
- **Communication skills:** Seek guidance on improving her business communication skills
- **Career planning:** Seek guidance on how to carry out her career plans

Gains from career guidance

- **Guided on facilitating career conversations** with her supervisor to accelerate her career progression to the next job level
- **Built her self-confidence** in improving her communication skills and carrying out her own career planning
- **Affirmed her need to attend leadership courses** to further build up her leadership capabilities

Outcomes

- **Initiated career conversations** with her supervisor, which revealed that the company intended to groom her for higher-level job roles
- **Improved communication skills:** Took initiative to speak up more and share her ideas during meetings
- **Completed a leadership course after Polaris**, ensuring her leadership capabilities are built up

*Names have been altered to protect anonymity

EMPLOYER PROFILE:

Employees of Eyesight.sg were more keen on taking on new career opportunities within the company after career conversations



Introduction

Eyesight.sg, a small and medium enterprise (SME) operating three optical retail outlets in Singapore, faced significant challenges in talent attraction and retention. The business owner, with limited knowledge of human resource (HR) practices, recognised

the importance of understanding employee retention and career development within the company, and took part in WSG’s structured career planning workshop to further the company’s human resource capabilities.

Objectives of structured career planning workshop

Through this initiative, Eyesight.sg strengthened their human resource capabilities, particularly in talent management:

- Enhanced knowledge of key HR concepts and practices
- Gained insights into employee turnover factors
- Enhanced talent retention strategies
- Established career development pathways for employees

Feedback from management-level workshop participants

The participants of the workshop gained valuable insights and practical tools for implementing career conversations with their employees:

- Career conversation templates proved particularly useful in facilitating structured career conversations
- Employer conducted meaningful career conversations with eight frontline employees as part of the post-workshop implementation
- The career conversations revealed varying career aspirations among staff, with three employees expressing interest in taking on new roles

Employees benefitted from career development by their employer

Employer’s implementation of structured career conversations led to:

- Creation of new career opportunities, including plans to create a new role of General Manager
- Development of alternative career pathways, particularly for staff interested in different functions like marketing
- Implementation of structured training plans to support employees in their career progression and career development

Conclusion

To support individuals in their career development, WSG piloted the Polaris suite of career guidance programmes, which offers structured and personalised career guidance for individuals seeking to advance their careers. Companies can also support their employees through structured career conversations that help employees to sharpen their career goals and identify skill gaps that they need to address. This will allow them to contribute more effectively, either in their current roles or in new ones.

Singapore’s open economy and exposure to global macro trends make individuals susceptible to job disruptions. To navigate today’s evolving job market, individuals should proactively:

- Assess their career and skill sets
- Chart their career and training goals correspondingly
- Execute their plans to achieve their goals

Through proactively planning their careers and participating in upskilling and reskilling efforts, individuals can build their career resilience and enjoy greater career mobility in the long run.

A three-step approach to ACE-ing one’s career:

1. Assess career and skill sets
2. Chart career and training goals
3. Execute plans to achieve goals



FOR INDIVIDUALS:

Resources to support skills and career development

Title of Resource	Short Description
Careers & Skills Passport	A personal digital repository that consolidates an individual’s skills, employment, academic qualifications and professional certifications from Government-verified sources and enables this verified information to be shared with potential hirers. It also functions as a career and skills planning tool to support individuals’ professional development and growth.
Career Conversion Programmes	Designed to support mid-career new hires or existing employees seeking to transition into new growth job roles with good longer-term prospects through structured on-the-job training.
Career Health for individuals	Enables Singaporeans to chart long-term career pathways through career coaching and deepening one’s knowledge with insights on growth jobs and industries. Singaporeans can take proactive steps to improve their career outcomes through training, on-the-job learning and intentional career moves.
Critical Core Skills (CCS)	A unique set of 16 core skills identified by Singapore employers as the most critical to thrive in the future economy.
Job Requirements (Skills) Index (JRI) Dashboard	Explore the JRI values and shifts in defining skill clusters across SFW job roles to see how business transformation is reshaping skill requirements.
Job-Skills Profile Dashboard	Presents a list of skills with high growth and high ubiquity, along with the 369 job roles in which these skills are found, based on the role’s Job-Skills Profile (top 25 defining skills of each job role)
Jobs Transformation Maps (JTM)s	Examines how key trends are reshaping various sectors and the impact on jobs and skills. JTMs can help individuals understand evolving job roles, identify emerging skills, and plan their career development to stay competitive in tomorrow’s job market.
MySkillsFuture Portal	Explore SSG-supported courses to pick up in-demand skills and realise your training goals. Users can also find out how various SkillsFuture initiatives can support their learning needs.
Polaris Polaris by WSG Polaris by Ingeus Polaris by AKG	A suite of personalised career guidance programmes designed for individuals who are looking to elevate their career through career planning.
Seminars & Workshops	Listing of seminars and workshops to learn effective career strategies to stay relevant
Skills and Job Mobility Dashboard	Explore the job roles with good growth and potential for career mobility while considering the skills needed for such transitions.

FOR EMPLOYERS:

Resources to support skills and career development

Title of Resource	Short Description
Building a Skills-First Organisation through Work Transformation: Insights from Case Studies	Designed to guide SMEs through work redesign, enabling their transition into skills-first organisations and strengthening workforce resilience.
Career Conversion Programmes	Help employers broaden their talent pool or transform their workforce by reskilling mid-career new hires or existing employees into growth job roles with good longer-term prospects with up to 90% salary support.
Career Health for Employers	Enable employers to widen their access to talent. Employers can tap on tools and resources to take a skills-first approach to hiring and investing in human capital development. By offering meaningful career progression pathways, employers will be better positioned to attract and retain talent to drive growth.
Critical Core Skills (CCS)	A unique set of 16 core skills identified by Singapore employers as the most critical to thrive in the future economy.
Job Requirements (Skills) Index (JRI) Dashboard	Explore the JRI values and shifts in defining skill clusters across SFw job roles to see how business transformation is reshaping skill requirements.
Jobs Transformation Maps (JTM)s	Navigate industry transformation and examine how key trends impact sector-specific jobs and skills. JTM)s help employers understand emerging trends and technological shifts in their sector, enabling informed decisions about workforce development and job redesign.
National Centre of Excellence for Workplace Learning (NACE)	Build a sustainable workplace learning system through training programmes and mentorship support services.
Skills Development Partners (SDP)	Collaborate with Trade Associations and Chambers (TACs) as well as Professional Bodies (PBs) to help employers be informed, equipped with, and recognise skills that matter for their sectors and jobs.
SkillsFuture for Business	The go-to platform for employers on everything SkillsFuture. Discover support and programmes, and view our course directory for business to fulfil your company’s skills development needs.
SkillsFuture Enterprise Credit (SFEC)	SFEC is a credit of \$10,000 for employers to offset up to 90% of out-of-pocket costs for supported programmes and courses.
TalentTrack	Learn about your company’s skills-related insights and training recommendations, customised on this one-stop dashboard.
TalentTrack+	Discover your employees’ strengths and skills gaps to identify training courses personalised to their needs.
Workplace Skills Recognition programme (WPSR)	Enable employers to fast-track skills assessment and help more workers gain formal recognition of the skills developed at the workplace.



Methodology

Analysis methodologies applied in Chapter 1 Unleashing skills for an inclusive and productive economy

Chapter 1 draws on data from Organisation for Economic Co-operation and Development's (OECD) Programme for the International Assessment of Adult Competencies (PIAAC)—a large-scale, cross-national computer-based household survey of adults aged 16 to 65 conducted every 10 years. It involves two main components: a direct assessment of three information-processing skills namely literacy, numeracy and adaptive problem-solving, and a background questionnaire that captures how individuals use skills at work and in daily life.

PIAAC's first cycle was conducted in 39 countries, over multiple rounds (2011-2018). The second cycle involved 31 countries, with the first round of data collected in 2022-2023. Singapore participated in both cycles, with Cycle 1 conducted in 2014-2015 and Cycle 2 in 2022-2023. In each cycle, more than 5,000 Singapore citizens and permanent residents aged between 16 and 65 were surveyed.

This chapter draws on data from employed Singapore citizens and permanent residents aged 25 to 65 only. Those below 25 years of age are more likely to still be in education, or in transitional or unstable employment and were thus excluded. This ensures that the analysis reflects more established workforce patterns to give insights into the skills proficiency and skills use of working adults.

A. Significant changes in workplaces / Innovation activities

As part of the PIAAC background questionnaire, respondents were asked whether significant changes had occurred in their working environment over the past three years/in their current job in any of the six areas. Six items were listed, namely, 1) information and communication technologies (ICT), 2) working methods and practices, 3) products and services, 4) machinery, 5) outsourcing and relocation practices and, 6) amount of contact with clients or customers. Aimed at capturing megatrends like technological change, they were aligned with OECD Oslo Manual's definition of innovation activity as centred on "new or improved product or process that differs significantly from previous products or processes". Respondents were to select all options that apply.

Of the six items, items 4 and 5 were infrequently reported and contributed minimal variance. Item 6 posed conceptual ambiguity that could lead to varied interpretations. As such, these items were excluded to preserve statistical robustness and interpretability.

The final analysis therefore focused on the first three items: 1) information and communication technologies (ICT) (technology), 2) working methods and practices (workplace), and 3) products and services (product). These were systematically classified into eight mutually exclusive categories, capturing all possible combinations of reported change.

B. Skills proficiency

The direct assessment component of PIAAC measures proficiency in literacy and numeracy on a 500-point scale. This scale was divided into six proficiency levels (below Level 1, and Levels 1 to 5), each defined by specific score thresholds. The Survey of Adult Skills Reader's Companion¹ offers a summary of the types of tasks that adults can perform at each level (OECD, 2024).

C. Skills use at work

Measures for skills use at work were included in the PIAAC background questionnaire. A series of ten skills used at work are measured: 1) literacy, 2) numeracy, 3) ICT, 4) *Problem-solving*, 5) horizontal interaction, 6) planning of own time, 7) *Influence*, 8) task discretion, 9) *Collaboration*, and 10) physical skills.

The items were informed by occupational psychology and sociological theories distinguishing skills owned by individuals versus skills defined or demanded by jobs. Respondents self-reported the frequency of use of each skill in their current job by rating each skill on a 5-point Likert scale when asked, "In your current job, how often did you use (skill)?"

To ensure comparability and enable time-series analysis across survey cycles, individual skills use frequency scores were standardised. Each respondent's skills use frequency score is transformed by subtracting the mean score of the population, then dividing by the population standard deviation. This gives an individual's score relative to the overall distribution, showing how far above or below the population mean it is, in standard deviation units.

D. Factors predicting work environments with innovation activities

To assess the relative contribution of factors predicting work environments with innovation activities, a regression-based decomposition of inequality was used. This method

¹ OECD (2024), Survey of Adult Skills – Reader's Companion: 2023, OECD Skills Studies, OECD Publishing, Paris, <https://doi.org/10.1787/3639d1e2-en>.

quantifies the percentage contribution of each predictor to the variation in the outcome. The dependent variable was a binary indicator for the innovation activities (1) vs. no innovation activities reported (0) defined according to the innovation activities outlined in (A.). Residuals were excluded from the chart for clarity.

The model included predictors such as skills use at work (literacy, numeracy, ICT, *Problem-solving*, *Collaboration*, horizontal interaction, planning own time, *Influence*, task discretion, physical work), job characteristics (tenure, work experience, work arrangement, working hours, firm size, public/private sector), individual characteristics (gender, age, immigration status, parents’ education, native language, perceived health), industry, occupation, highest academic qualifications attained, and skills proficiency (literacy and numeracy, measured through the direct assessment). The results indicate the relative weight of each factor in explaining differences in the likelihood of reporting innovation activities.

E. Skills use at work associated with innovation activities

A logistic regression model was employed to examine the relationship between work environments with innovation activities and the 10 skills use at work (see C.) The model controlled for job characteristics, individual characteristics, industry, occupation, highest academic qualifications attained, and skills proficiency.

F. Relationship between types of innovation activities and training

Job-related structured training

In the PIAAC background questionnaire, respondents self-reported their participation in non-formal education (defined as organised learning in a formal setting (such as a course or workshop) that is short-term or does not lead to formal qualifications) for job-related reasons over the past 12 months. This item was used to operationalise “job-related structured training participation” as the dependent variable, with responses coded dichotomously for participation (1) vs. non-participation (0).

Workplace learning (i.e. informal learning)

In PIAAC, informal learning was assessed through three items asking how often the respondent’s job involved 1) learning new things, 2) learning-by-doing from the tasks they perform, and 3) keeping up to date with new products or services. Respondents self-reported the frequency of each item on a 5-point Likert scale.

An average composite score was derived from the three items, and a binary variable was constructed to operationalise “workplace learning” as a dependent variable, coded as participation (1) vs. non-participation (0).

Logistic regression was conducted to assess the robustness of the relationship between types of innovation activities and the two forms of training activities: 1) job-related structured training and 2) workplace learning. For each model specification, the dependent variable was binary, indicating participation (1) vs. non-participation (0).

Analysis

Independent variables included innovation activities in work environment (i.e. technology, workplace, product or their combination). The models controlled for skills use at work, job characteristics, individual characteristics, industry, occupation, highest academic qualifications attained, skills proficiency, social-emotional skills, and marital and parental status. Robustness checks using alternative model specifications confirmed the consistency of these relationships.

G. Access to high-skills-use jobs (skills-first hiring)

High-skills-use vs. low-skills-use jobs

In this analysis, high-skills-use (HSU) jobs are defined as those with overall mean skills use frequency score of 4 to 5. Low-skills-use jobs are defined as those with overall mean skills use frequency score of less than 4. The threshold of 4 captures the top 25% of jobs where workers use their skills most frequently. This approach identifies the quarter of jobs with the heaviest skills demands.

High vs. mid-low skills proficiency

PIAAC defines six proficiency levels for literacy and numeracy scores derived via direct assessment. Level 3 is described as the threshold where respondents begin demonstrating the ability to handle complex, multi-step tasks that require integration of information from multiple sources (OECD, 2024)². Therefore, in this analysis, respondents with high skills proficiency are defined as those scoring at Level 3 and above, while those at Levels 0 to 2 are classified as having mid-low skills proficiency.

Qualification-skills classification

Respondents were stratified by academic qualification attainment (degree vs. non-degree) and skills proficiency (high vs. mid-low), creating four distinct qualification-skills groups: degree holder with high skills proficiency, degree holder with mid-low skills proficiency, non-degree holder with high skills proficiency, and non-degree holder with mid-low skills proficiency.

Analysis

Logistic regression was used to estimate the probability of employment in HSU jobs. The qualification-skills groups served as independent variable. Control variables included gender, age, immigration status, parents’ education, and work experience.

H. Rewards in high-skills-use jobs (skills-based reward)

Two dimensions of job reward were examined: monetary (pay) and non-monetary (autonomy).

Pay (wage) as monetary reward

Linear regression was used to analyse wage patterns, with wages log-transformed to normalise the distribution. To minimise the influence of outliers, wages were trimmed at the 1st and 99th percentiles. The qualification-skills groups served as an independent variable. Control variables included gender, age, immigration status, parents’ education, and work experience.

Autonomy as non-monetary reward

Autonomy was assessed using self-reported responses to four PIAAC items on a 5-point Likert scale, capturing the extent of individual control over 1) the sequence of tasks, 2) how work is done, 3) the speed or rate of work, and 4) working hours put in. A composite autonomy score was derived and standardised as the dependent variable.

Linear regression was employed to analyse autonomy patterns, with the same independent and control variables applied to the analysis above.

2 OECD (2024), Survey of Adult Skills – Reader’s Companion.

Analysis methodologies applied in Chapter 2

Business transformation: driving change in jobs and skill requirements

A. Identifying the Job-Skills Profile of Job Roles³

A Job-Skills Profile refers to the list of job-defining skills that distinguish one job role from another. These profiles were derived from job posting data across 2019 and 2024 and developed through the following three-step data preparation process.

Step 1: Making job postings data reflect the labour market

Job postings may not be fully representative of the labour market. To address potential over- and underrepresentation of some occupation groups, weights were constructed using official employment data from the Ministry of Manpower (MOM) and applied to re-balance the job postings data.

Step 2: Strengthening skill signals from job postings

To produce a robust set of skills associated with each job role, the dataset was refined by removing:

- Extremely rare skills (less than five postings per job role per year)
- Skills with low relative prevalence in a job role compared to the overall labour market

Step 3: Identifying job-defining skills

Statistical method factoring (TF-IDF) is a statistical method that measures the importance of a word to a dataset. TF-IDF was used to rank the top 25 skills of each job role considering both how frequently each skill appears in the role and how prevalent it is across the labour market:

TF-IDF = $\frac{\text{Term Frequency (TF)}}{\text{Inverse Document Frequency (IDF)}}$

TF_(i,j) = $\frac{\text{Frequency of skill } i \text{ in job } j}{\text{Total frequency of skills in jobs } j}$

IDF_i = $\log\left(\frac{\text{Total number of roles}}{\text{Number of roles with skill } i}\right)$

i = a specific skill
j = a specific job role

B. Identifying Defining Skill Clusters of a Job

The defining skill clusters of a job refers to the clusters of job-defining skills in the Job-Skills Profile. The clusters are based on the Singapore Skills Taxonomy (SST), a hierarchical framework that categorises skills according to their underlying knowledge and abilities. For this analysis, SST Level 3, which has over 100 skill clusters, was used to group the job-defining skills into relevant clusters. It provides a structured way to define and communicate the most relevant skill clusters needed for the workplace.

C. Measurement of Skill Cluster Share of a Defining Skill Cluster

Skill Cluster Share refers to the proportion of total demand of a specific defining skill cluster, relative to the total demand across all defining skill clusters in a job role.

Skill Cluster Share = $\frac{\text{Total frequency of skills in the defining cluster}}{\text{Total frequency of all defining skill clusters}}$

D. Deriving Job Requirements (Skills) Index (JRI)

JRI is a measure of change that sums the absolute shifts in Skill Cluster Share across all defining skill clusters for a given job role. The analysis compared data from 2019 and 2024 to calculate the JRI, which captures the overall degree of change in a job's defining skill clusters over time.

JRI = $\sum_{c=1}^n |S_c^{(2024)} - S_c^{(2019)}|$

n = total number of defining skill clusters
*S*_{*c*}^(*t*) = Skill Cluster Share of defining cluster at time 2019/2024
|. | = absolute value

³ Section A of Chapter 2's methodology is also applied prior to Chapter 4's methodology and analysis

Analysis methodologies applied in Chapter 3

Job redesign: a proactive approach for an optimised workforce

This chapter draws on empirical data from WSG's Job Redesign Reskilling Career Conversion Programme (JRR CCP) covering 947 individuals from 74 participating companies, sourced from the application forms submitted from 2023 to 2024. It examines why employers embark on job redesign, how skills have changed in the redesigned jobs, and what the benefits of job redesign are to employers. The chapter references high- or medium-impact job roles and skills identified in WSG's Job Transformation Maps (JTM).

- a. To categorise the redesigned job roles into its specific Singapore Standard Occupational Classification (SSOC), MOM's SSOC auto-coder tool was used to classify the job roles using the job titles and job descriptions submitted by employers in the forms.
- b. To provide insights into why employers embark on job redesign, topic modelling using large language models was used to identify key motivations within the justifications submitted by employers in the application forms.
- c. To demonstrate how skills have changed in the redesigned jobs, SSG's Skills Extraction Algorithm tool was used to extract skills aligned to the Skills Frameworks from the job descriptions before and after job redesign. The extracted skills were then compared and mapped against SSG's identified list of high-ubiquity or high-growth skills (see Chapter 4) to provide insight into the nature of these skills.
- d. To exemplify the benefits of job redesign to employers i.e., positive retention outcomes, employee retention was measured at the 12-month mark after job redesign and reskilling implementation, using data from the JRR CCP programme and government administrative database.

Analysis methodologies⁴ applied in Chapter 4

For individuals: upskilling and reskilling to build career health

A. Measurement of demand of a skill

To derive the **demand of a skill**, the total count of job postings containing the skill was aggregated across the entire Singapore economy for a given year.

Demand of a skill = $\frac{\text{Total count of job postings containing the skill in a given year}}{\text{Total count of job postings in a given year}}$

B. Measurement of demand growth of a skill

Skill demand growth was derived by dividing the change in the demand of a skill from 2019 to 2024, by the demand of a skill in 2019. This resulted in a percentage that reflected the growth in employers’ demand for the skill from 2019 to 2024, over the five-year period.

Skill demand growth_(2019–2024) = $\frac{\Delta \text{Demand of a skill}_{(2019-2024)}}{\text{Demand of a skill in 2019}}$

C. Measurement of ubiquity of a skill

Ubiquity of a skill refers to the number of unique job roles that require the skill in a given year.

Ubiquity of a skill = $\sum_{i=1}^n \text{Unique job roles that required this skill in a year}$

D. Identifying high-growth and high-ubiquity skills

Within each skill economy⁵, the 75th percentile thresholds for both skill demand growth (2019–2024) and skill ubiquity (2024) were established. Skills surpassing these thresholds were categorised accordingly.

An independent approach for each skill economy ensures our insights account for varying growth rates and economy sizes. This provides a more robust understanding of skills for career health.

E. Measurement of Skill Importance

This measure indicates the relative importance of each job-defining skill in a given job role. We recall from Chapter 2 that TF-IDF was used to rank the top 25 skills of each job role. The TF-IDF score is further used to provide the weight or importance for each job-defining skill relative to the aggregate TF-IDF score of the all the job-defining skills for the job role.

The Skill Importance is given as a proportion, where the aggregated contributions of the job-defining skills in a job role will sum to 100%.

Skill Importance_(i,j) = $\frac{\text{TF-IDF score of skill } i \text{ in job } j}{\text{Total TF-IDF score of 25 skills in job } j}$

i = a specific skill
j = a specific job role

4 Section A of Chapter 2’s methodology is also applied prior to Chapter 4’s methodology and analysis
5 Care, Creative, Digital, Green, I4.0 and Others

Analysis methodologies applied in Chapter 5

For individuals: achieve career clarity and confidence through career planning

A. This chapter draws on empirical data to evaluate the motivation and outcomes of the 262 participants who took up career guidance services via WSG’s Polaris pilot between Nov 2023 – Jul 2024. It examines the motivations of the participants in taking up career guidance and the correlations between their participation in career guidance and their actions after career guidance.

1. During registration, participant demographics and motivations for enrolling in the Polaris were collected. The data enabled an analysis of participant profiles and potential correlations between age and motivation.
2. After completing the programme, participants were surveyed to measure their satisfaction with the career guidance received and their confidence in planning their careers post-programme.
3. Two months after the programme concluded, participants were surveyed to determine if they had acted on their career plan, to assess the effectiveness of the career guidance in driving tangible career-related actions.

B. To illustrate the impact of career guidance, the chapter included case studies of two participants from different age groups and with different motivations for joining Polaris. These examples highlighted how career guidance can help individuals clarify their career goals. Additionally, one company, which participated in WSG’s structured career planning workshops to build internal capability in developing their employees’ careers, was presented to demonstrate the vital role employers play in supporting employee career planning. This support helped employees to identify skill gaps, develop their abilities, and contribute more effectively to their organisations’ success.

Glossary

Term	Definition
Artificial Intelligence (AI)	A branch of computer science focused on creating systems that can perform tasks typically requiring human intelligence. These tasks include learning, problem-solving, pattern recognition, decision-making, and language processing. AI systems use algorithms and data to simulate cognitive functions, enabling machines to adapt to new inputs and perform human-like tasks.
Critical Core Skills (CCS)	A unique set of 16 core skills identified by Singapore employers as the most critical to thrive in the future economy.
Demand of a skill	The total count of the skill aggregated across the entire Singapore economy, based on job postings data in a year.
Demand growth of a skill	Defined as the percentage change of demand of a skill from 2019-2024.
Job-defining skill	The top 25 skills of a job role, identified using a TF-IDF based scoring method, which represent the most distinctive skills for that role.
Job redesign	Job redesign refers to the restructuring of work tasks and responsibilities to optimise processes and workforce allocation for improved productivity, and to better support business transformation priorities. Job redesign aims to create higher value jobs that are more fulfilling for employees and that contribute more effectively to the business’ goals.
Job-Skills Profile	The 25 most job-defining skills asked for by employers of a particular job role
Job Requirements (Skills) Index (JRI)	An index to measure the degree of change in the defining skill clusters of the the job.
Defining skill clusters	Clusters of job-defining skills that make up the core of the job.
Skills-first	A distinct orientation that consciously prioritises the identification (or articulation), acquisition, demonstration, and use of skills as the central aims of workforce development— including recruitment, job design, learning and career advancement.
Skill importance	A skill’s percentage contribution to the overall importance of job-defining skill requested by employees.
Skills use at work	The frequency of skills use at work which includes literacy, numeracy, ICT, <i>Problem Solving</i> , <i>Collaboration</i> , horizontal interaction, planning own time, <i>Influence</i> , task discretion, and physical work.
Term Frequency-Inverse Document Frequency (TF-IDF)	A numerical statistic used in natural language processing (NLP) to reflect the importance of a word to a document in a collection or corpus. It is calculated by multiplying Term Frequency (how often a word appears in a specific document) by Inverse Document Frequency (how rare the word is across all documents).
Ubiquity of a skill	The number of unique job roles that require the skill in a given year from job posting data.

References in Chapter 1
Unleashing skills for an inclusive and productive economy

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Job redesign: a proactive approach for an optimised workforce

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