

FUTURE JOBS & SKILLS REPORT

SS TABLE OF CONTENTS

INTRODUCTION	02
KEYTRENDS	
Employees' Perspective	03
Business Leaders' Perspective	06
EMPLOYEES' GENERAL OUTLOOK	09–20
BUSINESS LEADERS' GENERAL OUTLOOK	21–31
SKILLS AND JOB TRENDS BY INDUSTRY CLUSTERS	
Advanced Manufacturing and Trades Cluster	32
Information, Communication and Technology (ICT) Cluster	35
Lifestyle Cluster	38
Modern Services Cluster	41
Sustainability, Urban Systems and Connectivity Cluster	44
CONCLUSION	48
ABOUT THE RESEARCH	
Research Methodology	50
Profile of Respondents	51
TERMS OF USE, DISCLAIMER & COPYRIGHT INFO	53
ABOUT NTUC LEARNINGHUB	53

INTRODUCTION

With rapid technological advancements, evolving economic structures, and shifting societal expectations¹, the job market is undergoing a significant transformation. This shift is redefining the skills that are in high demand and reshaping industries. To succeed in this new landscape brought about by Industry 4.0^2 , it is essential to understand the skill sets required for future jobs.

The emergence of artificial intelligence (AI) has already exerted a significant impact on various sectors, automating routine tasks and augmenting human decision-making processes³. Simultaneously, the advent of generative AI technologies, with its capability to create content, images, and even intricate pieces of text, has brought forth a new paradigm of creativity and productivity⁴. Therefore, technology can achieve more, and has the potential to revolutionise industries and job markets.

The Future Jobs and Skills Report 2023 builds upon insights gained from two previous reports: The New Normal of Sector Skills Report from 2020 and the Emerging Jobs and Skills Report published in 2021. In this latest edition, NTUC LearningHub continues to survey both employees and business leaders to uncover their sentiments towards jobs and skills trends. Specifically, the report looks at the future of work from a dual perspective in light of the advancements in generative AI technologies.

Additionally, the report explores job and skills trends across five industry clusters, namely Advanced Manufacturing and Trades, Information Communication and Technology (ICT), Lifestyle, Modern Services, and Sustainability, Urban Systems and Connectivity. This will allow workers to identify the essential skills needed to stay relevant in the job market.

Last but not least, this report encourages employers to actively support their workforce in upskilling and reskilling through learning and development (L&D) and in doing so, create a lifelong learning culture in their organisation that fosters the growth and sustainability of their talent and business capabilities.

I Deloitte. 2022. The skills-based organization: A new operating model for work and the workforce

² McKinsey. 2022. What are Industry 4.0, the Fourth Industrial Revolution, and 4IR?

³ Brookings. 2018. How artificial intelligence is transforming the world

⁴ LinkedIn. 2023. How Will Generative AI Change The World?



Employees' Perspective Generative AI Technologies Raise Job Security Concerns

Half of employees believe that generative AI technologies will **affect** job roles in their industry to a large or moderate extent.



Large extent

Moderate extent



are concerned that generative AI technologies will **replace their** job roles.



31% of employees are concerned about their digital fluency and proficiency when it comes to working with generative AI technologies.



3



Skills Outlook - Continuous Learning Remains a Priority Despite Lack of Time





Nearly 9 in 10 employees agree that the focus on upskilling and reskilling has increased in

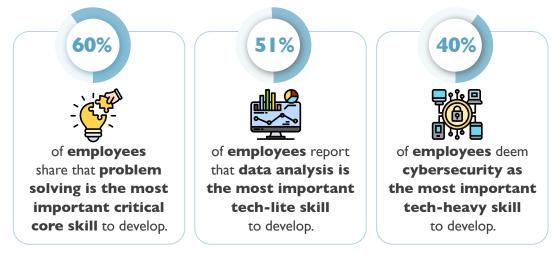
Singapore as compared to pre-COVID times (before 2020).







TOP SKILLS EMPLOYEES DEEM IMPORTANT TO DEVELOP



Business Leaders' Perspective

Embracing the Business Potential of Generative AI Technologies

About 9 in 10 business leaders agree that generative Al technologies can enhance employees' work quality and support daily tasks.



encourage employees to use generative AI technologies to support their work to a large or moderate extent.



TOP THREE OPPORTUNITIES PRESENTED BY GENERATIVE AI TECHNOLOGIES ACCORDING TO BUSINESS LEADERS

Al-powered chatbots (i.e., interact and provide customer support beyond working hours)	59%
Personalised customer experience (i.e., provide recommendations based on needs)	<u> </u>
Price optimisation (i.e., analyse competitors' prices and optimise pricing strategy)	<u> </u>

Job Outlook - Attracting and Retaining Talent

77% of business leaders have been hiring or intending to hire new talent to meet their company's current business goals.





are looking to hire candidates with a **broader set of skills to take up hybrid roles.**







Importance of Employee Skills Development Gaining Momentum

Over 4 in 5 business leaders



agree that their **organisation has placed** greater emphasis/investment in the skills development of their workforce as compared to pre-COVID times (before 2020).



20% Strongly agree

64% Somewhat agree

Almost 3 in 4 business leaders

say their organisation is **likely to increase** the budget allocated for L&D.



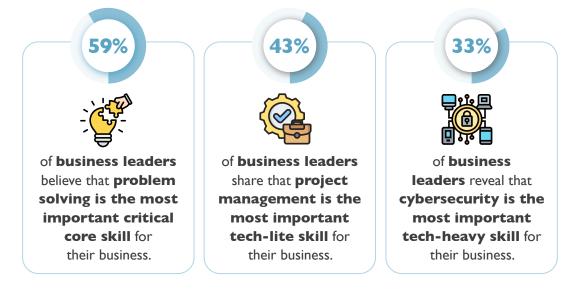
have been training or intending to train existing employees to meet current business goals.

78%

of **business** leaders



TOP SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT



GENERAL OUTLOOK



The Augmented Workforce -Marrying Man and Machine

Al used to be a technology typically reserved for skilled professionals such as coders, but with enhancements including improved user interface and higher quality output⁵, the power of generative Al technologies is now democratised to the masses⁶.

As more employees embrace these technologies at the workplace, 83% agree that generative AI technologies enhance their work quality and support daily tasks. In particular, employees reveal that generative AI technologies help to analyse complex data (48%) and generate ideas, designs, and content (47%).



agree that generative AI technologies can enhance employees' work quality and support daily tasks.



TOP FIVE BENEFITS OF GENERATIVE AI TECHNOLOGIES ACCORDING TO EMPLOYEES

Analyse complex data	
Generate ideas/designs/content	4 7 %
Work customisation (i.e., the outputs are based on given requirements)	
Comprehensive use of enterprise data	37%
Enhance creativity and innovation	36%

⁵ KPMG. 2023. Generative AI in the modern workplace

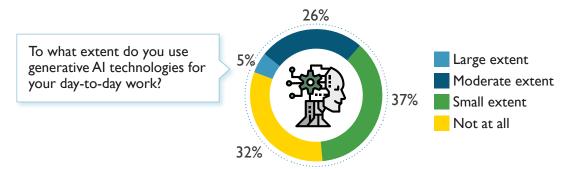
9

⁶ Forbes. 2023. Generative Al: Why An Al-Enabled Workforce Is A Productivity Game Changer

It is said that compared to other technologies such as blockchain and the metaverse, generative AI technologies are arguably easier to navigate and use⁷. This is consistent with our findings where 74% of employees are comfortable working alongside generative AI technologies.



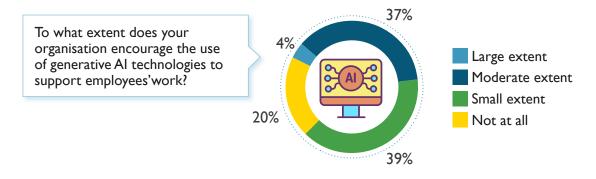
Although generative AI technologies are generally well received, the usage is low with 5% using the technology to a large degree and another 26% using it to a moderate degree in their daily work. Employees also reveal that ChatGPT (63%) is the most used generative AI technology at work.



TOP THREE COMMON GENERATIVE AI TECHNOLOGIES USED AT WORK ACCORDING TO EMPLOYEES

Cha	GPT 63%	
Not	on 10%	
Barc	7%	,

The low utilisation may be attributed to a corporate culture where 20% of employees report that their organisation does not encourage the use of generative AI technologies and another 39% encourage its use only to a small extent.



7 Forbes. 2023. Why Generative AI Could Grow Even After A Set Of Bad Nvidia Earnings

Challenges associated with generative AI technologies could also be a contributing factor to the low usage. Security concerns (52%) are the topmost challenge, followed by fears of job displacement (41%), legal and ethical concerns (40%), concerns over one's digital fluency and proficiency (31%), and that output generated may have inaccuracies or biases (29%).

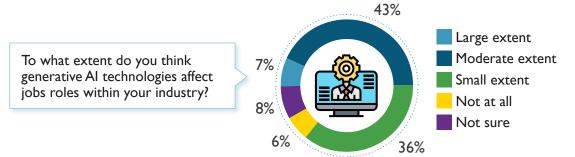
TOP FIVE CHALLENGES OF GENERATIVE AI TECHNOLOGIES ACCORDING TO EMPLOYEES

Security concerns (e.g., leaking of confidential data)	<u> </u>
Generative AI technologies will replace my job	<u> </u>
Legal and ethical concerns (i.e., violate copyright standards)	— 40%
Concerns over my digital fluency and proficiency	<u> </u>
Output generated may have inaccuracies or biases	<u> </u>



"Together with the explosion of AI is a rise in concern of data privacy as AI functions rely heavily on data. Therefore, organisations must implement data governance practices to ensure cybersecurity and closely monitor data flow. Transparency is also crucial when using generative AI systems. Organisations must be clear about which algorithms or AI systems are being used, what data is behind them, and how it is collected and utilised. As AI becomes more pervasive, organisations must prioritise these practices and frameworks for the safe and effective use of AI at the workplace," says SM Aditya, Co-Founder & Chief Technology Officer, Xaltius & Xaltius Academy.

Consistent with concerns over one's job security and skills, half of employees perceive that generative AI technologies will affect job roles in their industry to a large (7%) or moderate extent (43%).



The Search for Better Prospects and Progression

Sentiments towards the job market in Singapore have generally improved in recent years, from 43% in 2020 during the height of the pandemic to 63% in 2023. However, there is a slight dip in employee optimism towards the job market as compared to 2021, possibly due to the recent spate of retrenchment⁸ and the expectations of worsening business conditions⁹ as outlined by the Singapore Business Federation.

63% of employees are optimistic about the Singapore job market right now as compared to 71% in 2021 and 43% in 2020.



According to a study by Page Insights, job hopping is fast becoming the norm with many employees becoming increasingly open to exploring new job opportunities¹⁰. This notion is also evident in our findings where 65% of employees reveal that they are either actively job-hunting or open to a new job – which has remained relatively stable in the past three years.

65% of employees indicate that they are either actively job-hunting or open to a new job as compared to 70% in 2021 and 70% in 2020.



Employees reveal that better pay (74%), career progression opportunities (50%) and exploring new roles (46%) continue to be the main motivating factors in seeking new jobs in the last three years.

TOP FIVE REASONS FOR LOOKING FOR A JOB

Better pay	
Better career progression opportunities	50%
Looking to explore new roles	46%
Looking to explore new industry	33%
Lack of growth in current job	31%

⁸ Today Online. 2023. Job market remains strong but signs of cooling could intensify if global economic troubles persist: Economists

⁹ Singapore Business Federation. 2023. SBF Survey on Manpower and Wages 2023

¹⁰ Page Insights. 2023. Talent Trends 2023 Singapore: The Invisible Revolution

On the flip side, job (45%) and pay (30%) satisfaction are key reasons among those who choose to remain in their current role. Additionally, good work culture (30%) emerged as another contributing factor, indicating that employees do not stay at their jobs based on salary alone¹¹.

TOP FIVE REASONS FOR REMAINING IN THEIR CURRENT ROLE

Satisfied with current role	<u> </u>
Satisfied with current pay	30%
Current job has good work culture	30%
Fear of not being able to find new job	23%
Current company provides job security	22%



"Successful employee retention is essential to an organisation's stability, growth and revenue. Organisations should develop retention strategies that balance organisation needs with employee-centricity. These may be explored in the areas of communication, diversity, and development," according to Sean Lim, Chief Human Resource Officer, NTUC LearningHub.

Employees are generally confident about their ability to find a job that matches their needs (58%), with 77% confident of doing so within six months.

58% of employees are confident about their ability to find a job that matches their needs as compared to 63% in 2021 and 47% in 2020.



77% of employees are confident to land a new job within six months as compared to 74% in 2021 and 71% in 2020.



Among those who are actively looking for or open to a new job, 64% are likely to switch to a different job role, while another 73% are likely to pivot to a different industry. However, those working in the Lifestyle Cluster are least likely to pivot to a different industry.

64% of employees are likely to switch to a different job role.



II SHRM. 2021. The culture effect: why a positive workplace culture is the new currency

are likely to **pivot to a** 73% different industry. of employees Employees working in the Lifestyle Cluster are the least likely to pivot to a different industry as compared to those in other clusters. **58%** 8% 78% 72% Advanced Modern Sustainability, ICT Lifestyle Manufacturing & Services Urban Systems & Trades Connectivity

The hassle of job hunting and getting accustomed to a new job and organisation¹² can be daunting. In turn, 77% of employees are open to undertake a new job role within their current organisation due to the potential for growth and development opportunities without having to leave the organisation (63%).



are open to undertake a new job role within their organisation.



78%

TOP FIVE REASONS FOR INTEREST IN INTERNAL TRANSFERS

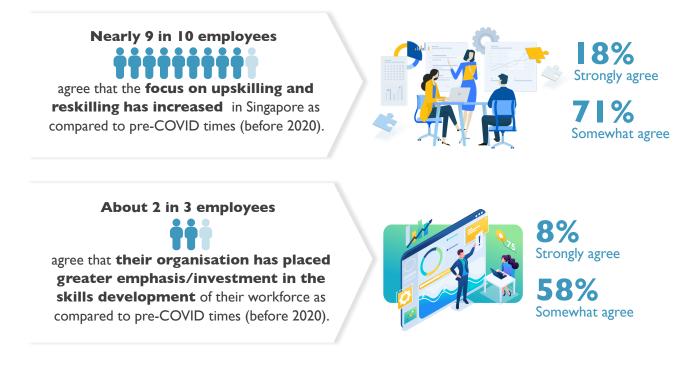
Opportunities for growth and development without leaving the organisation	63%
Build diverse skill sets	52%
Transfer of knowledge and expertise	43%
Interest in different job roles	42%
Adapt to the changing business needs	29%

¹² MyCareersFuture. 2023. Upskilling in the Same Company: How to Ask & Navigate an Internal Transfer

Increased Prioritisation for Skills Upgrading

Be it switching to a different job role or transitioning into a new role within the same organisation, continuous skills development is key in helping one navigate disruptions and ensure career success¹³. This notion was made more pertinent at the onset of the pandemic when the national call for upskilling and reskilling intensified¹⁴.

Three years on, 89% of employees agree that the focus on upskilling and reskilling has increased in Singapore as compared to pre-COVID times (before 2020), while another 66% agree that their organisation has placed greater emphasis/investment in the skills development of their workforce as compared to pre-COVID times (before 2020).



At the individual level, 92% agree that it is now more important for them to embrace continuous upskilling and reskilling as compared to pre-COVID times (before 2020) – with 77% having developed a habit of lifelong learning.



¹³ Capleo Global. 2022. Why Upgrading Your Skills is Important For Your Career Goals

¹⁴ Singapore Business Review. 2020. IN THE COVID-19 ERA, ARE SINGAPORE EMPLOYERS DOING ENOUGH TO TRULY DEVELOP TALENT?



The need for skills upgrading has also remained relatively constant in the last three years where currently 91% of employees agree that there is a need to upgrade their skills to keep themselves relevant in their current role. To a similar extent, 93% are open to attending training programmes for skills development to keep pace with new technology advancement (57%) and to improve their job performance (56%).

agree that there is a need to upgrade their skills to keep themselves









TOP FIVE REASONS FOR UPSKILLING

Keep pace with the new technology advancement	57%
Improve my job performance	56%
Ensure job security	53%
Enhance qualifications for promotions	—— 47%
Acquire necessary skills for a career switch into a new job role or industry	46%

In view of this urgency for upskilling, 91% of employees desire more support from their organisation when it comes to their skills development. Specifically, the lack of time has remained a persistent challenge in upskilling over the past three years (48% in 2023 vs. 54% in 2021 vs. 55% in 2020). Other key challenges include the limited funding support (35%) and guidance (30%) from their organisation.



wish their company could provide more support to help with their skills upgrading as compared to 90% in 2021 and 71% in 2020.



TOP FIVE OBSTACLES EMPLOYEES FACE WHEN UPSKILLING

Lack of time (i.e., busy with work to attend training)	—— 48%
Training programmes are not fully funded by my company	35%
Limited support or guidance from my company	30%
There is no one to cover me while I am away on course	<u> </u>
I do not know what my skills gaps are	29%

When asked about the types of training opportunities that employees hope to receive, on-the-job training (50%) emerged at the top of the list, followed by training offered by external training providers (47%) and free training resources to aid in self-study (45%).

TOP FIVE TRAINING OPPORTUNITIES DESIRED BY EMPLOYEES

On-the-job training	50%
Training (e.g., face-to-face/virtual classes) offered by external training providers (e.g., NTUC LearningHub)	47%
Free training resources for self-study (e.g., using printed books and materials)	
Provide employees with a budget and they pick skills to train	42%
Obtain certifications via Massive Open Online Courses (MOOC; e.g., Coursera, Udemy, Google)	40%

"In today's fast-paced technological world, on-the-job training may not be sufficient to keep up with the ever-changing fields of cybersecurity, big data, Al, data analytics, and data science for example. To ensure continuous personal and professional growth, gaining experience outside of work through training by industry experts, mentorship, and hands-on exposure outside the organisation would complement the technology growth for employees," says Aditya.

Boosting Employability and Career Resilience in a Skills-based Economy

Consistent with 2021's findings, problem solving (60%), communication (54%) and decision making (52%) remain as the top three critical core skills which employees deem important to acquire. Although the majority perceive problem solving to be the most important critical core skill to develop, it is also seen as the skill which they lack the most (33%). This highlights a skills gap which employees should strive to address.

TOP TEN CRITICAL CORE SKILLS EMPLOYEES BELIEVE ARE IMPORTANT TO DEVELOP

Problem solving	60%
Communication	54%
Decision making	52%
Creative thinking	46%
Adaptability	43%
Learning agility	41%
Self-management	39%
Developing people	35%
Digital fluency	33%
Collaboration	32%

TOP TEN CRITICAL CORE SKILLS THAT EMPLOYEES LACK

Problem solving	33%
Creative thinking	32%
Decision making	29%
Developing people	29%
Global perspective	28%
Communication	26%
Transdisciplinary thinking	25%
Influence	25%
Digital fluency	24%
Learning agility	24%

The same can be said for data analysis (51%) which is the most important tech-lite skill according to employees, and also the skill which they lack the most (41%).

TOP TEN TECH-LITE SKILLS EMPLOYEES BELIEVE ARE IMPORTANT TO DEVELOP

Data analysis	51%
Project management	42%
Business intelligence	
Digital marketing	37%
Basic IT support	34%
Data-driven decision making	34%
Digital strategy	33%
Data visualisation	30%
Customer insights analysis	30%
Risk analysis	29%

TOP TEN TECH-LITE SKILLS THAT EMPLOYEES LACK

Data analysis	4I%
Business intelligence	35%
Risk analysis	33%
Digital strategy	33%
Digital marketing	32%
Data visualisation	32%
Project management	31%
Data-driven decision making	30%
Data governance	29%
Customer insights analysis	27%

According to employees, cybersecurity (40%), big data analysis (38%), data science (34%) and AI engineering (30%) are the top tech-heavy skills which employees believe are important to develop. Yet, these are also the top tech-heavy skills which employees currently lack – with cybersecurity voted at 42%, AI engineering at 41%, data science at 39%, followed by big data analysis at 38%.

Cybersecurity	40%
Big data analysis	38%
Data science	34%
Al engineering	30%
Data engineering	27%
Cloud development	25%
Data mining	24%
Software engineering	24%
Network engineering	21%
Compliance analysis	21%

TOP TEN TECH-HEAVY SKILLS THAT EMPLOYEES LACK

Cybersecurity	——— 42%
Al engineering	41%
Data science	39%
Big data analysis	38%
Cloud development	35%
Data engineering	35%
Data mining	34%
Software engineering	33%
Blockchain development	32%
Network engineering	30%

"As a business, it is crucial to adopt a data-driven culture. However, many organisations lack this culture, which results in a lack of tech-lite skills among their employees. To address this, companies should promote data literacy across all departments and encourage collaboration among employees to share knowledge and information. Additionally, employees should be given sufficient time to explore new tools and technologies to support these skills. These actions can help employees acquire and develop tech-lite skills, benefiting both the organisation and its employees," says Aditya.

BUSINESS LEADERS' GENERAL OUTLOOK



The Business Case for Generative AI Technologies

Slightly more business leaders (91%) as compared to employees (83%), agree that generative AI technologies enhance work quality and support daily tasks. Both business leaders and employees share the same view that generating ideas, designs and content, work customisation and analysing complex data are the top three benefits of generative AI technologies.





TOP FIVE BENEFITS OF GENERATIVE AI TECHNOLOGIES ACCORDING TO BUSINESS LEADERS

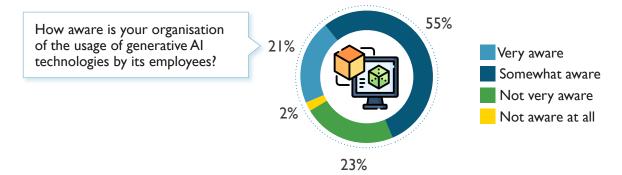
Generate ideas/designs/content	
Work customisation (i.e., the outputs are based on given requirements)	42%
Analyse complex data	42%
Enhance creativity and innovation	42%
Streamline research and development process	38%

Beyond that, business leaders also see business opportunities presented by generative AI technologies This includes the AI-powered chatbots (59%), personalised customer experience (58%), and price optimisation (45%).

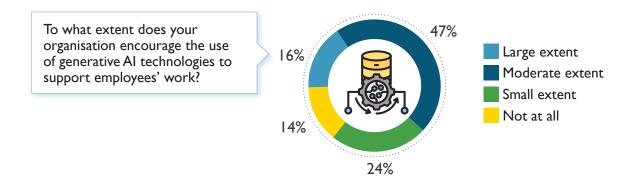
TOP FIVE OPPORTUNITIES PRESENTED BY GENERATIVE AI TECHNOLOGIES ACCORDING TO BUSINESS LEADERS

Al-powered chatbots (i.e., interact and provide customer support beyond work	ing hours) —— 59 %
Personalised customer experience (i.e., provide recommendations based on nee	eds)
Price optimisation (i.e., analyse competitors' prices and optimise pricing strategy	<mark>/)</mark> 45%
Streamlined operations	38%
Improved inventory management	33%

Business leaders are generally aware of the usage of generative AI technologies by their employees with 21% being very aware and another 55% being somewhat aware.



Business leaders are generally receptive to the idea of employees embracing generative AI technologies at the workplace. In fact, more business leaders (63%) as compared to employees (41%), reveal that their organisation encourages the use of generative AI technologies at work to a large or moderate extent.

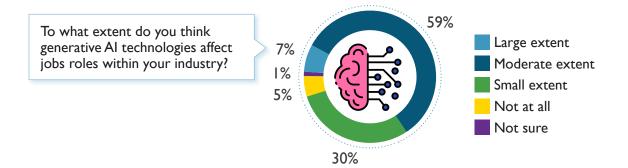


"Well-implemented AI technologies can help business leaders who are focused on optimisation and efficiency to save time, reduce costs, and redirect resources towards other strategic aspects of the business. It is essential for employees to be involved in this process by providing the necessary training and assurance that AI adoption augments, and not replaces them. Leaders need to ensure open communication channels and collaboration for the successful integration of AI in the workplace," says **Sean**.

While business leaders generally hold positive views toward generative AI technologies, they are cautious of the output produced. In particular, security concerns (57%), legal and ethical concerns (52%) as well as fears over inaccuracies or biases in generated output (45%) are the top challenges raised by business leaders. Other challenges include the workforce's digital fluency/proficiency (44%) and transitioning workers to higher value job roles (40%) as business leaders believe that generative AI technologies will affect job roles within the industry to a certain extent (66%).

TOP FIVE CHALLENGES OF GENERATIVE AI TECHNOLOGIES ACCORDING TO BUSINESS LEADERS

Security concerns (e.g., confidential data-leaked)	57%
Legal and ethical concerns (i.e., violate copyright standards)	52%
Output generated may have inaccuracies or biases	
Concerns over my workforce's digital fluency and proficiency	
Transitioning workers to higher value job roles	



Hiring Sentiments, Growth Sectors and In-Demand Roles

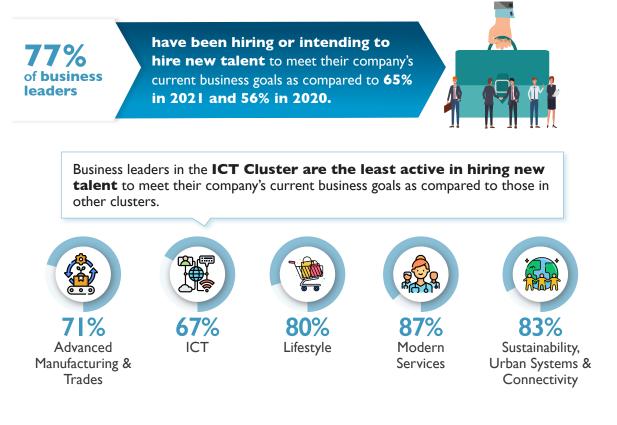
The job outlook among business leaders was at its lowest in 2020 (39%) where there were massive layoffs and hiring freeze in Singapore¹⁵. Since then, the job sentiments have improved and remained stable in the last two years at 76% in 2021 and 74% in 2023.

74% of business leaders are optimistic about the Singapore job market right now as compared to 76% in 2021 and 39% in 2020.



¹⁵ Human Resources Director. 2021. How did COVID impact Singapore's recruitment market?

Business leaders are also increasingly hiring new talent to meet their company's current business goals – from 56% in 2020, 65% in 2021 to 77% in 2023. However, business leaders in the ICT Cluster are the least active in their hiring efforts as compared to other industry clusters. According to the Ministry of Manpower (MOM)'s annual Job Vacancies 2022 report, tech talent continue to be in high demand despite the recent wave of layoffs by tech companies¹⁶. Although hiring might be slower in the tech industries, the demand for tech professionals remain high as there are also tech job roles in other industries which require workers with the same technical skills¹⁷.



The demand for skilled talent to take on hybrid roles remains high as well with 95% of business leaders agreeing that there is a greater need for employees in hybrid roles and another 78% looking to hire candidates with broader skills to fill hybrid roles.



¹⁶ Today Online. 2023. Job vacancies decline as borders reopen, tech talent still in high demand across many sectors: MOM

¹⁷ TechCrunch. 2023. The tech jobs market is as strong as it ever was

According to SkillsFuture Singapore's Skills Demand for The Future Economy 2022 Report, digital job roles are on the rise due to the rapid development in the Digital Economy¹⁸. This is consistent with our findings where 75% of business leaders are hiring or intending to hire digital job roles, including data analysts (28%), data scientists (25%) and software engineers (25%).



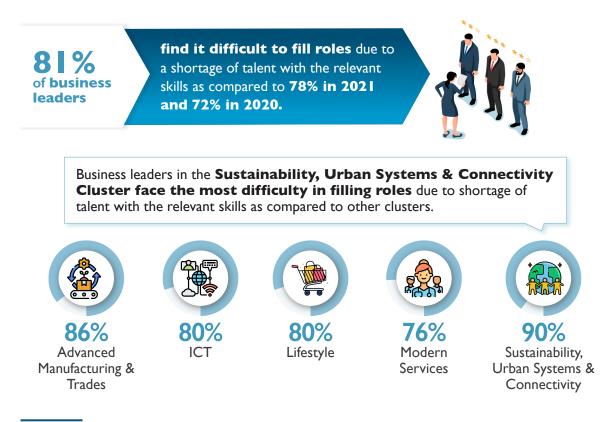
On the other hand, the Care Economy is transforming beyond traditional healthcare roles. SkillsFuture Singapore characterised the Care Economy into four emerging domains namely person-centred care, collaboration with stakeholders, teaching and learning, as well as health and wellness. Examples of job roles include nurse clinicians under the person-centred care domain, learning solutionists and HR business partners under the collaboration with stakeholders domain, youth workers and psychologists under the teaching and learning domain, and occupational therapists and social workers under the health and wellness domain¹⁹. Consistent with SkillsFuture Singapore's Demand for the Future Economy Report 2022, our findings show that almost half of business leaders (45%) are hiring or intending to hire care job roles with HR business partner (17%) being at the top of the list.



18 SkillsFuture Singapore. 2022. SKILLS DEMAND FOR THE FUTURE ECONOMY 19 SkillsFuture Singapore. 2022. SKILLS DEMAND FOR THE FUTURE ECONOMY As more organisations continue to embrace sustainability in their business models, the demand of green job roles is likely to increase in tandem²⁰. About three in five business leaders (58%) are hiring or intending to hire green job roles such as green facilities managers (20%), quality assurance and quality control specialists (19%) and technicians (16%).



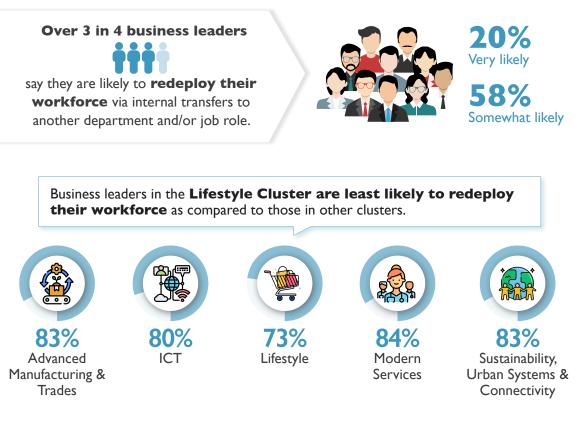
Despite the promising hiring sentiments, many business leaders (81%) still face difficulty in filling roles due to a shortage of talent. Specifically, business leaders in the Sustainability, Urban Systems & Connectivity Cluster face the most difficulty in this respect, likely due to the existing small talent pool in a niche industry.



20 SkillsFuture Singapore. 2022. SKILLS DEMAND FOR THE FUTURE ECONOMY

"In Singapore, certain job clusters are more specialised, which leads to intense competition for top talent. To overcome this, companies can invest in employee training and development. The Career Conversion Programme for Sustainability Professionals (CCP-S) for example, prepares workers for green roles and is a good starting point. Under one of the modalities, the programme allows existing staff to be reskilled, for new or redesigned job roles to develop their internal capabilities to support sustainability efforts. Additionally, collaborating with training providers and industry associations can help develop and nurture new talent on top of attracting and increasing the talent pool for the future," says **Sean**.

To address this talent crunch, 78% of business leaders are likely to redeploy their workforce via internal transfers to another department and/or job role in order to improve the talent and skill retention at their workplace (53%). However, those in the Lifestyle Cluster are least likely to redeploy their workforce as compared to those in other clusters.



TOP FIVE REASONS FOR REDEPLOYING THE WORKFORCE

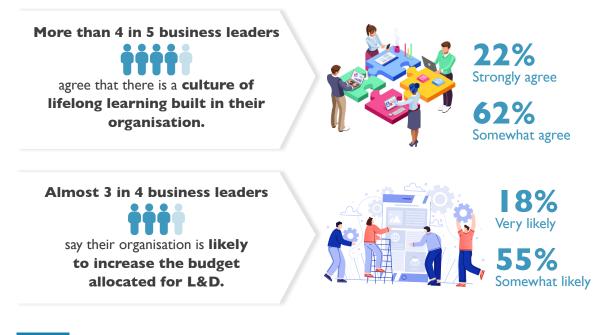
Improve talent/skill retention	53%
Improve relationship between organisation and employee	44%
Restructuring in the organisation	41%
Cost optimisation	
Managing workforce surplus/shortage	4 0 %

Stronger Emphasis Placed on Workforce Learning

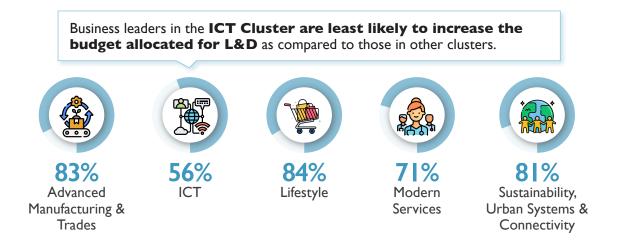
Although both business leaders and employees agree to a similar extent that the focus on upskilling and reskilling has increased in Singapore as compared to pre-COVID times (before 2020), business leaders (84%) are more likely to think that their organisation has placed greater emphasis/investment in workforce skill development as compared to employees (66%).



With the intensified call for upskilling and reskilling in recent years, business leaders reveal promising outcomes with more than four in five business leaders agreeing that there is a culture of lifelong learning built in their organisation. Notably, this focus on L&D is likely to be sustained in the long run with almost three in four business leaders likely to increase the budget for workforce development. However, those in the ICT Cluster are the least likely to increase the budget for L&D as compared to those in other clusters.



28 FUTURE JOBS AND SKILLS REPORT 2023 © NTUC LearningHub. All rights reserved.



It is evident that there are more employees showing interest to attend training (93%) as opposed to business leaders who send employees for training (78%). This disparity highlights a need for business leaders to further expand the opportunity for L&D to the wider workforce.

78% of business leaders have been training or intending to train existing employees to meet current business goals as compared to 83% in 2021 and 65% in 2020.



Business leaders and employees share the same view that enrolling in training offered by external training providers and on-the-job training are the top ways to upskill the workforce. Apart from these, business leaders prize guided learning methods whereas employees prefer self-directed learning. For example, business leaders also place greater value on other learning methods including mentoring programmes (39%), bite-sized courses (37%) and job shadowing opportunities (37%); while employees prefer to receive free training resources (45%), a budget to self-select skills to train (42%) and courses conducted by MOOCs (40%).

TOP FIVE WAYS TO UPSKILL THE WORKFORCE ACCORDING TO BUSINESS LEADERS

Training (e.g., face-to-face/virtual classes) offered by external training providers (e.g., NTUC LearningHub)	- 48%
On-the-job training	- 47%
Mentoring programmes (i.e., paired with someone more senior)	- 39%
Offer short, bite-sized courses for self-paced learning (e.g., mobile or micro-learning)	- 37%
Job shadowing opportunities (i.e., learning from another employee with a different job scope)-	- 37%

"Self-paced learning through mobile learning, for example, offers bite-sized content, which is convenient and flexible for employees. However, even within micro-learning, there seems to be a gap in providing a comprehensive understanding of implementation. While there is an abundance of theoretical knowledge, practical exposure to initiating a technology or adapting to new technological advancements remains a crucial area for skill development. Therefore, a comprehensive mix of training formats including on-the-job training and micro-learning, should be provided to help individuals acquire and apply new skills effectively," says Aditya.

In-Demand Skills to Boost Business Competencies

In view of the rapidly evolving business landscape, it is imperative for the workforce to build transferable skills which they can apply across different job functions and industries. This notion is shared by business leaders where nearly all agree that a workforce equipped with transferable skills will be better able to adapt to the changing landscape of the industry.

Nearly all business leaders agree that a workforce equipped with transferable skills will be better able to adapt to the changing landscape of the industry.



"Transferable skills are valued because they can be applied across various roles, industries and situations. For example, good communication skills are vital for leadership, collaboration, and customer interaction. These transferable skills are versatile and can enhance one's employability, both laterally and vertically, regardless of the job role or industry. Learning agility is also an important skill as it involves being open to new knowledge and enables one to learn, adapt, unlearn and relearn to keep up with constantly changing conditions in the workplace. When switching industries, transferable skills are often the key to opening doors to new opportunities," according to **Sean**.

When asked about the most important transferable critical core skills for their business, business leaders reveal problem solving (59%), decision making (48%) and communication (46%) at the top of the list. Employees also share the same opinion and have ranked these as the top skills that are important for them to develop.

Problem solving	
Decision making	
Communication	
Adaptability	
Customer orientation	40%
Creative thinking	38%
Developing people	36%
Learning agility	36%
Collaboration	36%
Digital fluency	34%

TOP TEN CRITICAL CORE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

The same can be said about project management and data analysis which are the top two tech-lite skills voted by business leaders and employees alike. Notably, business leaders place greater importance on customer insights analysis skills (36%), coming in as the third top tech-lite skill, as compared to employees who ranked it lower among the top ten skills.

Project management	43%
Data analysis	
Customer insights analysis	36%
Business intelligence	34%
Risk analysis	31%
Basic IT support	30%
Digital strategy	29%
Data-driven decision making	28%
Digital marketing	28%
Data visualisation	27%

Cybersecurity emerged as the top tech-heavy skill across the board (33% business leaders and 40% employees). With more frequent cyberattacks and data-leaks reported in the media, it is evident that cybersecurity is no longer just confined to the tech industry, but rather a critical pillar required for all organisations, across all industries²¹.

Cybersecurity	33%
Al engineering	32%
Cloud development	30%
Big data analysis	26%
DevOps engineering	26%
Data science	26%
Software engineering	25%
Data mining	23%
Network engineering	22%
Compliance analysis	21%

"Technology is evolving rapidly and it is not focused on one industry or sector alone. Investing in technology and AI is essential for organisations to stay ahead in their industry. I believe technology needs to be at the forefront - it is the future, and technological skills development is crucial for employees. Organisations that don't invest enough now will eventually need to catch up. Start small and gradually increase investment to accelerate the process," says Aditya.

²¹ Security Brief. 2023. Four reasons to train your employees in cybersecurity in 2023

SKILLS & JOB TRENDS <u>BY INDUSTRY</u> CLUSTERS

Advanced Manufacturing and Trades Cluster Advanced Manufacturing, Supply Chain and Wholesale Trade

Sentiments Towards Generative AI technologies



and support daily tasks.



8 Strongly agree

% Somewhat agree

63% of **business** leaders

reveal that their organisation encourages employees to use generative AI technologies to support their work to a large or moderate extent.



Job Outlook and Coveted Job Roles

66% of **business** leaders

are optimistic about the Singapore job market right now.







say they are likely to **redeploy their** workforce via internal transfers to of **business** another department and/or job role.



% of **business** leaders

83%

leaders

have been hiring or intending to **hire** new talent to meet their company's current business goals.



77% of **business** leaders





TOP THREE IN-DEMAND DIGITAL JOB ROLES



Data analyst



Application support engineer







are hiring or intending to hire care job roles.



TOP THREE IN-DEMAND CARE JOB ROLES





23% HR business partner



Nurse clinician



4% Psychologist



are hiring or intending to hire green job roles.



TOP THREE IN-DEMAND GREEN JOB ROLES



34% Quality assurance and quality control specialist



23% Green facilities manager (e.g., building supervisor)



Technician (e.g., facilities technicians and automotive technicians for electric vehicles)

Workforce Training and In-demand Skills



71% of **business** leaders have been training or intending to train existing employees to meet current business goals.



TOP FIVE CRITICAL CORE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Problem solving	49%
Communication	
Decision making	43%
Developing people	40%
Adaptability	

TOP FIVE TECH-LITE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Project management	 40%
Business intelligence	 40%
Digital marketing	— 37%
Data analysis	- 37%
Customer insights analysis	31%

TOP FIVE TECH-HEAVY SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Cybersecurity	—— 40%
Cloud development	29%
Big data analysis	29%
Network engineering	26%
Blockchain development	26%

Information, Communications and Technology (ICT) Cluster

Sentiments Towards Generative AI technologies

All business leaders agree that generative Al technologies can enhance employees' work quality and support daily tasks.



73% of business leaders reveal that their organisation encourages employees to use generative AI technologies to support their work to a large or moderate extent.

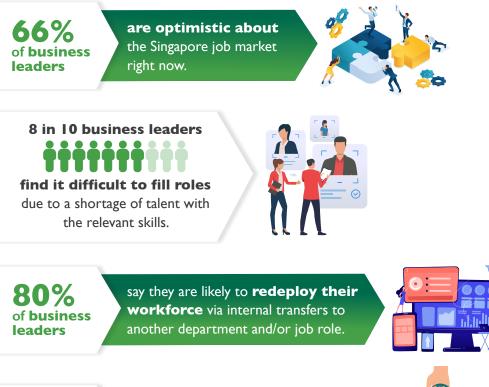


0%

Strongly agree

Somewhat agree

Job Outlook and Coveted Job Roles



67% of business leaders have been hiring or intending to hire new talent to meet their company's current business goals.





are hiring or intending to hire digital job roles.



TOP THREE IN-DEMAND DIGITAL JOB ROLES





Application support engineer



Data analyst



TOP THREE IN-DEMAND CARE JOB ROLES



Learning solutionist



7% **Psychologist**

43% of **business** leaders





TOP THREE IN-DEMAND GREEN JOB ROLES



Technician (e.g., facilities technicians and automotive technicians for electric vehicles)



and quality control specialist



Engineer (e.g., Solar photovoltaic project development, automation)



agree that their organisation has placed greater emphasis/investment in the skills development of their workforce as compared to pre-COVID times (before 2020).



56% of business leaders say their organisation is **likely to** increase the budget allocated for L&D.



80% of business leaders

have been training or intending to train existing employees to meet current business goals.



TOP FIVE CRITICAL CORE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Problem solving	50%
Customer orientation -	43%
Decision making	
Communication	
Developing people	37%

TOP FIVE TECH-LITE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Project management	- 50%
Data analysis	- 47%
Data-driven decision making	- 40%
Digital strategy	- 40%
Basic IT support	- 37%

Cloud development	——43%
Software engineering	43%
Al engineering	43%
DevOps engineering	—— 40%
Cybersecurity	——40%

Lifestyle Cluster Food Services and Retail

Sentiments Towards Generative AI technologies

Over 9 in 10 business leaders agree that generative Al technologies can enhance employees' work quality and support daily tasks.



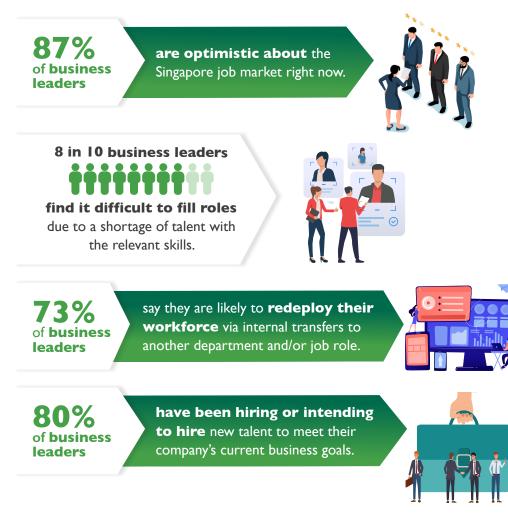
64% of business leaders reveal that their organisation encourages employees to use generative AI technologies to support their work to a large or moderate extent.



23% Strongly agree

Somewhat agree

Job Outlook and Coveted Job Roles





are hiring or intending to hire digital job roles.



TOP THREE IN-DEMAND DIGITAL JOB ROLES









TOP THREE IN-DEMAND CARE JOB ROLES



HR business partner



Social worker



10% Youth worker



are hiring or intending to hire green job roles.



TOP THREE IN-DEMAND GREEN JOB ROLES





agree that their **organisation has placed greater emphasis/investment in the skills development** of their workforce as compared to pre-COVID times (before 2020).



84% of business leaders say their organisation is **likely to** increase the budget allocated for L&D.



83% of business leaders

have been training or intending to train existing employees to meet current business goals.



TOP FIVE CRITICAL CORE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Decision making	57%
Communication	53%
Problem solving	50%
Adaptability	50%
Customer orientation	47%

TOP FIVE TECH-LITE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Customer insights analysis	53%
Project management	
Data analysis	37%
Risk analysis	37%
Digital marketing	33%

Network engineering	30%
Data science	30%
Al engineering	30%
Cloud development	27%
Big data analysis	27%

Modern Services Cluster

Healthcare, Finance and Tourism

Sentiments Towards Generative AI technologies

Almost 9 in 10 business leaders agree that generative Al technologies can enhance employees' work quality and support daily tasks.



26% Strongly agree

61% Somewhat agree



reveal that their organisation encourages employees to use generative AI technologies to support their work to a large or moderate extent.



Job Outlook and Coveted Job Roles



are optimistic about the Singapore job market right now.



About 3 in 4 business leaders



find it difficult to fill roles due to a shortage of talent with the relevant skills.



84% of business leaders

say they are likely to **redeploy their workforce** via internal transfers to another department and/or job role.



87% of business leaders

42

have been hiring or intending to hire new talent to meet their company's current business goals.





are hiring or intending to hire digital job roles.



TOP THREE IN-DEMAND DIGITAL JOB ROLES









are hiring or intending to hire care job roles.



TOP THREE IN-DEMAND CARE JOB ROLES







HR business partner

47% of business leaders

are hiring or intending to hire green job roles.



TOP THREE IN-DEMAND GREEN JOB ROLES



26% Green facilities manager (e.g., building supervisor)



Sales and distribution specialist



Technician (e.g., facilities technicians and automotive technicians for electric vehicles)



agree that **their organisation has placed greater emphasis/investment in the skills development** of their workforce as compared to pre-COVID times (before 2020).



71% of business leaders say their organisation is **likely to** increase the budget allocated for L&D.



82% of business leaders

have been training or intending to train existing employees to meet current business goals.



TOP FIVE CRITICAL CORE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Problem solving-	68%
Decision making	55%
Customer orientation	50%
Adaptability	50%
Communication	

TOP FIVE TECH-LITE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Project management	58%
Business intelligence	
Customer insights analysis	42%
Digital strategy	39%
Digital marketing	37%

Big data analysis	39%
Al engineering	39%
Cybersecurity	39%
DevOps engineering	37%
Cloud development	34%

Sustainability, Urban Systems and Connectivity Cluster

Sustainability, Workplace Safety and Health, Security, Environmental Services and Land Transport

Sentiments Towards Generative AI technologies

Almost 9 in 10 business leaders agree that generative Al technologies can enhance employees' work quality and support daily tasks.



20% Strongly agree

68% Somewhat agree



reveal that their organisation encourages employees to use generative AI technologies to support their work to a large or moderate extent.



Job Outlook and Coveted Job Roles



are optimistic about the Singapore job market right now.



9 in 10 business leaders

find it difficult to fill roles due to a shortage of talent with the relevant skills.



say they are likely to **redeploy their workforce** via internal transfers to another department and/or job role.



83% of business leaders

83%

leaders

of **business**

have been hiring or intending to hire new talent to meet their company's current business goals.





are hiring or intending to hire digital job roles.



TOP THREE IN-DEMAND DIGITAL JOB ROLES









are hiring or intending to hire care job roles.



TOP THREE IN-DEMAND CARE JOB ROLES



Psychologist





Learning solutionist

90% of **business** leaders

are hiring or intending to hire green job roles.



TOP THREE IN-DEMAND GREEN JOB ROLES





46



TOP FIVE CRITICAL CORE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Problem solving	56%
Decision making	41%
Adaptability	41%
Learning agility	41%
Creative thinking	37%

TOP FIVE TECH-LITE SKILLS WHICH BUSINESS LEADERS DEEM IMPORTANT

Data analysis	39%
Project management	37%
Risk analysis	34%
Customer insights analysis	34%
Basic IT support	29%

DevOps engineering	29%
Cybersecurity	29%
Data engineering	27%
Al engineering	27%
Cloud development	24%

୍ଙୁ CONCLUSION

The future of work is being shaped by the increasing use of AI, leading to workforce disruption²². As more jobs are affected by emerging technologies such as generative AI, the workforce will require reskilling and/or upskilling for increasingly higher-functioning jobs that demand critical thinking, creativity, complex information processing, and the human element in general²³.

The survey revealed that although there is excitement over the potential of machines to improve work processes and business outcomes, there is also the fear of what adoption will mean for jobs. While generative AI technologies offer tremendous potential, they also amplify the importance of certain critical core skills that remain uniquely human. Skills such as problem solving, adaptability, and customer orientation are indispensable in the future job market. Generally, employees value critical core skills such as problem-solving (60%), communication (54%) and decision-making (52%) and these skills are reinforced by business leaders who share similar values. Activities such as managing or coaching others, providing expertise judgement and discernment remain innately human actions. Future jobs will require more technological skills, but higher cognitive, social, and emotional abilities are also important to reflect the increasing significance of complex problem solving in the workplace.

Technology will open new lines of business and create roles that will demand skilled workers²⁴ rather than being replaced by them, as AI will augment the work of humans. The key challenge is to educate employees and assist them in upgrading and acquiring new skills, while also establishing guidelines for the responsible use of AI technology.

²² McKinsey & Company. 2017. Jobs Lost, Jobs Gained: Workforce Transitions In A Time Of Automation

²³ McKinsey & Company. 2018. Automation and the future of work

²⁴ CNBC. 2023. Artificial Intelligence is booming – but how will it impact your career?



On the training and development front, organisations continue to be responsible for supporting their employees in navigating the challenges of the digital age, as this can result in significant gains for both parties. It is essential that employees are aware of the current and future demand for their skills as identified by the skills and job trends in the industry cluster section of this report. One of the training solutions is for organisations to provide on-demand learning resources to be made readily available, and accessible at any time and from any device for employees²⁵. This allows the workforce to adopt flexible and personalised learning pathways that align with their individual learning needs and preferences by organising resources according to skill sets.

In conclusion, the development and advancement of AI are causing employers to place a higher value on skills, leading to a shift in the job market. Companies are becoming more open to using a skill-based approach in recruitment to address the shortage of skilled workers²⁶. This new approach emphasises assessing candidates based on their demonstrated abilities and past experience rather than traditional academic qualifications. This transition requires a culture of continuous learning and development as employees must be prepared to continually update their skills to keep pace with technological advancements and take advantage of the potential of AI. At the same time, companies should invest in reskilling and upskilling programs to ensure their employees are rightly-skilled to undertake the evolving job roles within the organisation.

²⁵ McKinsey & Company. 2022. Demand for online education is growing. Are providers ready?

²⁶ Deloitte. 2023. School's out: What the shift to skills means for degrees, jobs market

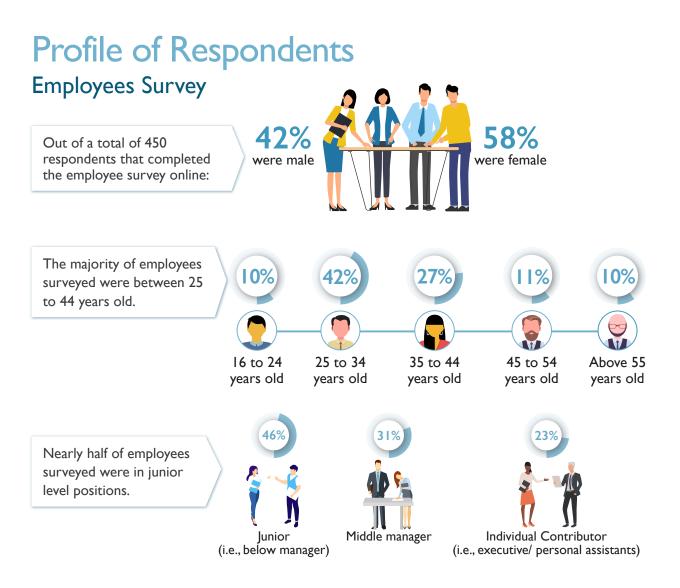
ABOUT THE RESEARCH

Research Methodology

39.05

Over 650 working professionals from Singapore were surveyed at the end of August 2023. The respondents included 450 employees and 200 business leaders to uncover a dual perspective about the current job market, in-demand jobs and skills as well as the training landscape in Singapore.

28.3



The respondents span across various industry clusters:







About NTUC LearningHub

NTUC LearningHub is the leading Continuing Education and Training provider in Singapore which aims to transform the lifelong employability of working people. Since our corporatisation in 2004, we have been working with employers and individual learners to provide learning solutions in areas such as Cloud, Infocomm Technology, Healthcare, Employability & Literacy, Business Excellence, Workplace Safety & Health, Security, Human Resources and Foreign Worker Training.

To date, NTUC LearningHub has helped over 29,000 organisations and achieved close to 2.6 million training places across more than 2,900 courses with a pool of about 900 certified trainers. As a Total Learning Solutions provider to organisations, we also forge partnerships to offer a wide range of relevant end-to-end training. Besides in-person training, we also offer instructor-led virtual live classes (VLCs) and asynchronous online learning. The NTUC LearningHub Learning eXperience Platform (LXP) — a one-stop online learning mobile application — offers timely, bite-sized and quality content for learners to upskill anytime and anywhere. Beyond learning, LXP also serves as a platform for jobs and skills development for both workers and companies.

For more information, visit www.ntuclearninghub.com.



Terms of Use, Disclaimer & Copyright Info

All information in this White Paper report is provided for information purposes only and does not constitute a legal contract between NTUC LearningHub and any person or entity unless otherwise specified. Information on the White Paper is subject to change without prior notice. Although every reasonable effort is made to present current and accurate information, NTUC LearningHub makes no guarantees of any kind. In no event shall NTUC LearningHub be responsible or liable, directly or indirectly, for any damage or loss caused or alleged to be caused by or in connection with the use of or reliance on any such content available on or through the White Paper. Contents of this report are the exclusive property of NTUC LearningHub and may not be reproduced in any form without the prior written consent of NTUC LearningHub.

NOTES

FUTURE JOBS & SKILLS REPORT

NTUC LearningHub Pte Ltd www.ntuclearninghub.com • 6336 5482

NTUC LHUB @ NTUC Trade Union House, 73 Bras Basah Road, #02-01, Singapore 189556

NTUC LHUB @ Aljunied Training Centre, 260 Sims Ave, ECM Building, #04-01, Singapore 387604

NTUC LHUB @ Devan Nair Institute, 80 Jurong East Street 21, #02-03, Singapore 609607 NTUC LHUB @ Lifelong Learning Institute, 11 Eunos Road 8, #05-01, Singapore 408601

NTUC LHUB @ Tampines Plaza 2, Tampines Plaza, 5 Tampines Central I, #04-02, Singapore 529541

NTUC LHUB Industry Skills Centre @ Benoi, 60 Benoi Road, #01-08, Singapore 629906

2023 © **Copyright NTUC LearningHub.** All rights reserved. The reproduction and transmission of logos, marks or any original design of all or any part of this work is restricted without a written permission of their respective owners. The commission of any unauthorized act may lead in civil and/ or criminal action.