

SUSTAINABILITY

CARBON
MANAGEMENT

SKILLS DEMAND FOR THE FUTURE ECONOMY

SPOTLIGHT ON SINGAPORE'S
KEY GROWTH AREAS

1ST EDITION (2021)

TECHNOLOGY
APPLICATION

CONDUCT
AND ETHICS

COLLABORATION

DATA
ANALYSIS

SKILLS *future* SG

About SkillsFuture Singapore

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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FOREWORD

The pace of change over the past few years has been accelerated by the diffusion of technology, speed of innovation and rapidly evolving business needs. Jobs have changed. New ones have emerged and replaced existing ones. In tandem with this, the required skills and competences have also rapidly evolved.

The SkillsFuture movement was launched in 2015 as Singapore's strategic response to these disruptions. Six years on, we have started on the Next Bound of SkillsFuture, to strengthen our support for individuals and companies in their skills development journeys.

In the Next Bound of SkillsFuture, we will build on SSG's prior work with employers, industry associations, education institutions, unions and government agencies to develop our Skills Frameworks. We are committed to continually update this body of work to provide timely and relevant jobs-skills insights to Singaporeans.

I am proud of the work that SkillsFuture Singapore has put in to issue this inaugural report. We intend for this to be an annual report that provides a macro perspective of our economic growth areas, with insights on emerging good jobs and skills paths. More importantly, we intend for the report to indicate the priority skills and training Singaporeans can take up to embark on and grow their careers.

I would like to thank all our partners for their valuable contributions to this report. This inaugural report would not have been possible without you.

I urge you to take advantage of this report, to embark on your skills development and lifelong learning journey.

Ong Tze-Ch'in
Chief Executive
SkillsFuture Singapore



OUR PURPOSE AND APPROACH

Since 2016, SkillsFuture Singapore (SSG) has been working with tripartite partners to identify sectoral skills needs to support industry transformation and new growth sectors. The thirty-four sectoral skills frameworks articulate the skills needs of the respective sectors for the next three years, and have been well-received by stakeholders.

To ensure that our workforce continues to receive timely and relevant jobs-skills insights to guide their skills development journey, SSG has deployed big data and machine learning models to continually monitor the global, regional and local jobs-skills trends. Our team of Jobs-Skills Analysts and Data Scientists work hand-in-hand with sectoral agencies to monitor changes in business models, operating models and deployment of technology that impact job content and skills needs.

Data from the skills stock of global and local lead-enterprises, job postings, training consumption and the global workforce's curriculum vitae data, are synthesised to derive jobs-skills insights. These insights are further validated with global and local industry leaders and stakeholders, before we produce fit-for-purpose insights for citizens, enterprises and training partners.

In this inaugural skills report, we decided to spotlight three priority economic growth pillars, namely the Digital Economy, the Green Economy and the Care Economy. They are selected because these emerging, high-growth areas mean new opportunities for our citizens, new talent and skills needs for enterprises, and new curriculum or training requirements for training providers. In addition, there are also cross-cutting areas, which means that some of these skills will be transferable, and can thus provide more career options to our citizens as they explore pivoting to adjacent areas. In the coming years, we expect more jobs and skills to have 'green' and 'smart' tagged to them.

This report is designed for Singaporeans, as a resource for each individual's skills development journey over the next one to three years. We have spotlighted priority skills and jobs in demand, for each of the three growth pillars. Corresponding courses have been curated to provide ease of access, with more courses available on the MySkillsFuture portal and some with free access via National Library Board's NLB Mobile eLearning app.

I encourage readers to follow SSG on our LinkedIn and Facebook pages for announcements on upcoming workshops and webinars in the following months, and to join the discussion on emerging jobs and priority skills needs of the three economies. I would also like to invite professionals and experts in this space to step forth and share your insights with us. I look forward to hearing from you.



Dr Gog Soon Joo
Chief Skills Officer
SkillsFuture Singapore

CONTENTS

I. Executive Summary	06
II. Understanding Your Skills	09
III. The Digital Economy	11
IV. The Green Economy	25
V. The Care Economy	38
VI. Critical Core Skills for the Future of Work	53
VII. Charting Your Skills Development Journey	55
VIII. Methodology	65
IX. Glossary	66
X. Acknowledgements	68

I. EXECUTIVE SUMMARY

Knowing which skills are in demand has never been more important. With the relentless pace of technological innovations, evolving consumer demands and disruptions brought about by the COVID-19 pandemic, many Singaporeans are asking how they can better prepare themselves for unprecedented changes to their jobs and livelihoods.

In 2020, the World Economic Forum reported that “the adoption of new technologies” is “giving rise to greater demand for Green Economy jobs” and those “at the forefront of the data and [artificial intelligence (AI)] economy”¹. Additionally, the “continuing importance of human interaction in the new economy” is increasing “demand for care economy jobs”, including “roles at the forefront of people and culture”². Many of these developments are already happening in Singapore, with macroeconomic trends, new business models and technology innovations accelerating the emergence of new jobs and skills.

KEY FINDINGS

1 Singapore’s key growth areas bring about exciting opportunities for jobs and skills

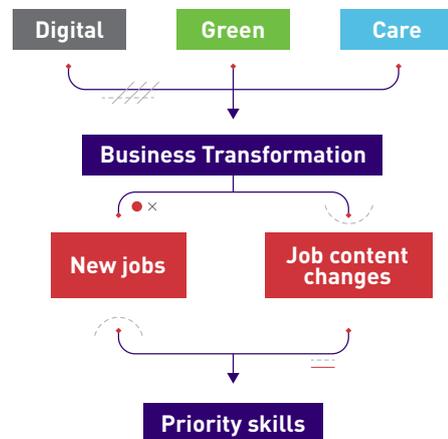
The **Digital Economy** has been gathering pace, powered by Smart Nation initiatives and the National Artificial Intelligence Strategy³. Today, digitalisation is a key driver of growth, and Digital Economy jobs can be found across all 23 sectors with **Industry Transformation Maps (ITMs)**⁴.

The **Green Economy** involves enterprises that are restructuring and creating new business functions by shifting from environmentally harmful business activities to greener ones. Today, more than 450 job roles across 17 sectors require green skills, from manufacturing and trade & connectivity, to financial services, hospitality and built environment.

The **Care Economy** is driven by an ageing population, evolving demands for care and the future of work and learning. This is part of national efforts to transform and protect health, advance human potential and inculcate lifelong learning. These efforts will leverage data to bring about innovations in new care models, teaching and learning, and health and wellness.

2 Growth in these economies have direct influence on priority skills

New opportunities presented in these economies can affect changes in work processes and job functions. This, in turn, changes the content and skills profile of existing jobs, while creating new jobs. To take advantage of the new opportunities, employers and citizens need to prioritise the acquisition of relevant skills in new and emerging areas.



¹ World Economic Forum, *Jobs of Tomorrow: Mapping Opportunity in the New Economy*, 2020.

² Ibid.

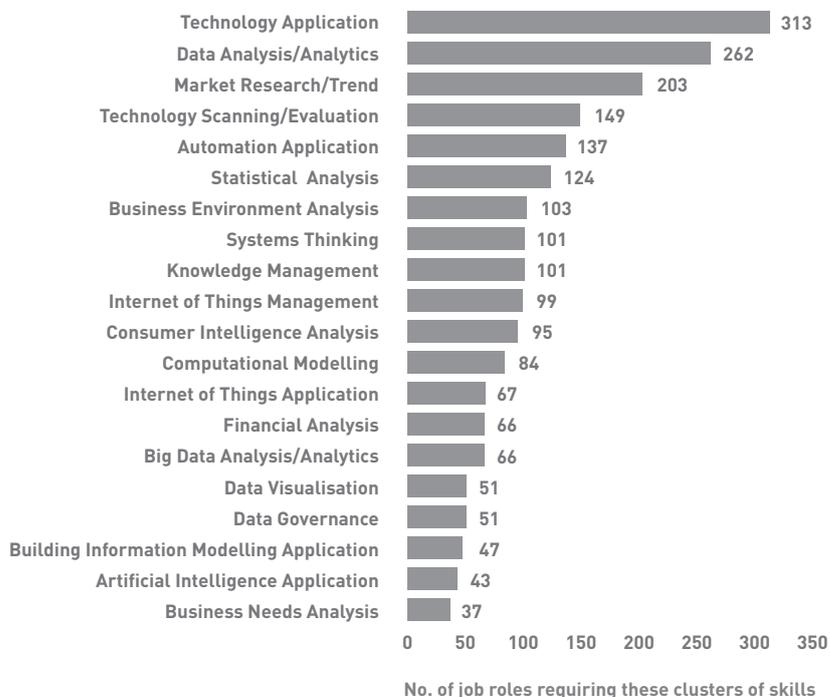
³ Smart Nation Digital Government Office, *National Artificial Intelligence Strategy: Advancing our Smart Nation Journey*, 2019.

⁴ For more information, please visit www.mti.gov.sg/ITMs/Overview.

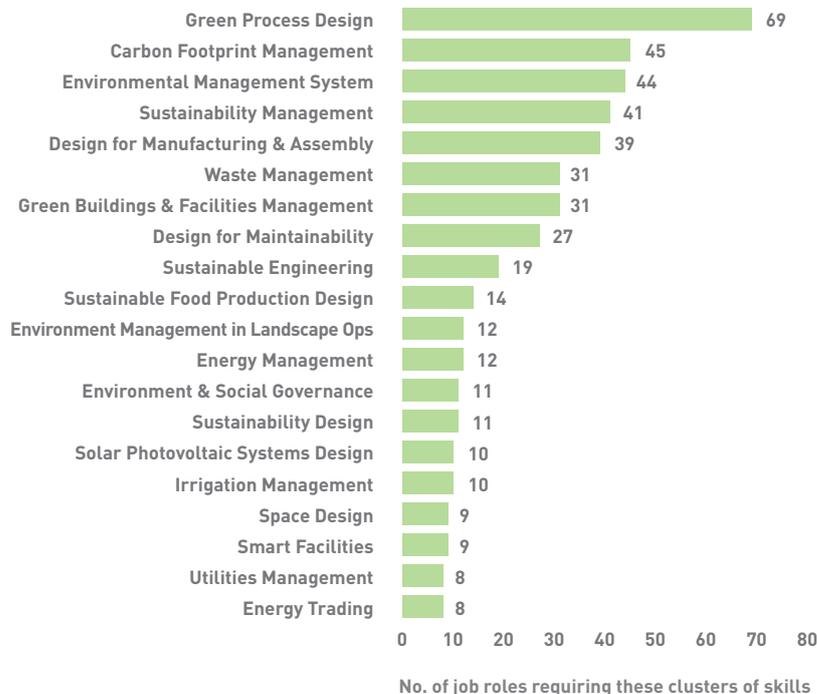
3 Priority skills arising from these economies are largely transferable

The wide-reaching influence of the three economies, as the root impetus for change across multiple sectors, means that enterprises are pursuing transformation for similar objectives. The priority set of skills needed to support new developments in each economy, therefore, become transferable across various industries, as enterprises create demand for similarly-skilled workers to achieve their goals.

Digital skills are increasingly transferable across different sectors, as more enterprises embark on digital transformation and technology adoption. The Digital Economy entails different types of skills, depending on their job role applications. **Tech-Lite roles** are job roles that involve the use of foundational digital solutions at work; while **Tech-Heavy roles** are specialised roles responsible for the development, implementation and maintenance of more complex technological solutions and applications. Today, the majority of tech roles across all 23 ITMs are tech-lite. Top clusters of priority skills include *Technology Application*, *Data Analysis/Analytics*, and *Market Research/Trend*.



In the Green Economy, there are many skills for implementing and managing sustainability practices that are applicable across organisations and sectors, as they adopt greener business models and practices. These priority skills are transferable, as large numbers of job roles and sectors require them. Top clusters of priority skills include *Green Process Design*, *Carbon Footprint Management*, and *Environmental Management System Framework and Policy*.



Source of data in graphs: SkillsFuture Singapore

Technology enablement, multi-disciplinary skills and community collaboration provide more holistic and inclusive care-wellness-learning outcomes. These in turn drive the emergence of new jobs and skills in the Care Economy. Today, clusters of priority skills such as *Conduct and Ethics*, *Stakeholder Management* and *Inclusive Practices* are required by at least two-thirds of job roles in the Care Economy, and are transferable across sectors from healthcare and community care, to early childhood, social service, and training and adult education.



Source of data in graph: SkillsFuture Singapore

Beyond technical skills, there is also a set of transferable soft skills, that guides how we think critically, interact with one another and stay relevant. These **Critical Core Skills (CCS)** enable the integration of knowledge across disciplines for more effective decision-making and problem-solving, influencing of stakeholders through empathy and consensus, and management of one’s own well-being, personal effectiveness and personal brand. These are the skills increasingly valued by employers to drive sustainable organisations. For individuals, these are also the skills supporting the building of other skills.

4 Many curated jobs-skills resources and programmes available for public access are already aligned to these growth economies

These resources and programmes have enabled Singaporeans to pivot careers, and move into new or emerging jobs. This report highlights individuals from different walks of life who have stepped into new roles or opportunities by taking advantage of SSG’s programmes and resources. It features a collection of resources carefully curated to help Singaporeans consider, plan, determine and materialise their career trajectory.

II. UNDERSTANDING YOUR SKILLS

Employers are increasingly paying close attention to their employees' skills. This trend has been observed during recruitment and planning for training. To support readers in their skills development journeys, this chapter attempts to offer a simple frame to understand skills, and how they impact our jobs, career options and everyday lives.

1 Understanding the skills demanded within a job role

To perform well at work, every job role requires a set of technical skills, and a set of Critical Core Skills.

Technical skills are the skills we use to carry out our daily work functions. For example, *Stakeholder Engagement and Management* is a technical skill for learning facilitators to analyse stakeholder needs and priorities, and to build long-term stakeholder relationships. Similarly, *Customer Experience Management* is a technical skill for retail store managers to manage customer order fulfilment and review customer satisfaction. These skills enable individuals to fulfil their roles and responsibilities competently, and to perform the key tasks of the job.

Many technical skills are transferable across job roles and across industry sectors. Acquiring these transferable technical skills allows us to move into new job roles, or transit more easily into an expanded job role. For example, the technical skills in *Digital Marketing* are transferable across job roles in financial services, hotel and accommodation services, tourism, wholesale trade, and training and adult education. Details on the technical skills of specific job roles in Singapore can be found in the 34 sectoral skills frameworks.

Critical Core Skills (CCS) are also known as soft skills. In Singapore, we have identified 16 Critical Core Skills for the Future Economy, after extensive research and validation with employers across 28 sectors. These skills are expected of all job roles in every workplace, and are essential to help us think critically, interact with others, adapt, learn and grow. CCS are transferable across job roles and industries, serve as a foundation to build new skills, and are considered to be most fundamental for one to succeed in working life.

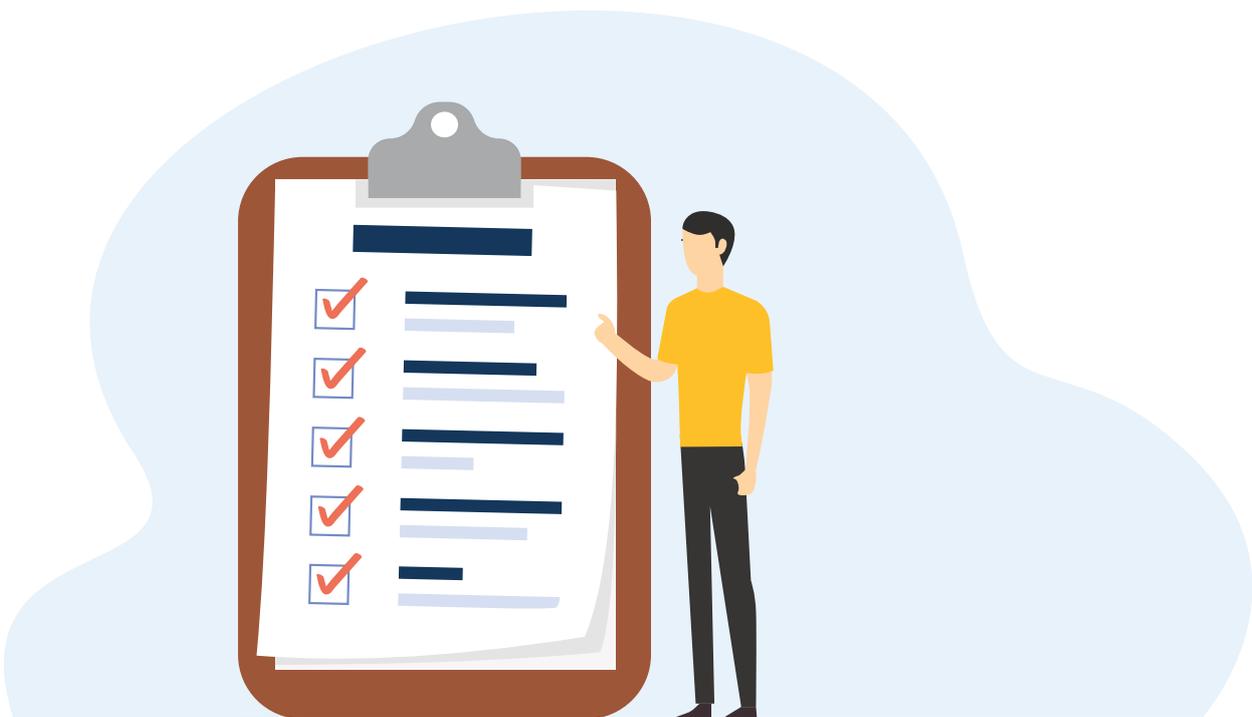


2 Understanding the skills to prioritise in the next one to three years

Changing industry trends, technology adoption and new business models can affect work processes and job functions. This in turn changes the content and skills profile of existing jobs, as well as creates new jobs. In order to respond to these changes, employers and citizens need to prioritise the acquisition of relevant skills in new and emerging areas. These **priority skills** can include a mix of technical skills and Critical Core Skills.

Similarly, within the Digital, Green and Care Economies, there are priority skills that individuals should acquire, as many employers are demanding them at work now, and likely over the next three years. These priority skills are important to the competitiveness of our workforce both nationally, across industries and within specific industries.

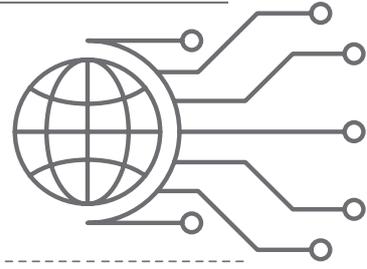
It is worthwhile noting that the Emerging Stronger Taskforce has identified growth areas for Singapore to accelerate towards a leading position, through innovation and public-private partnerships⁵. The growth areas can be summarised as (i) accelerating the digitalisation and automation of our key sectors; (ii) developing sustainability as a capability of our enterprises; (iii) test-bedding new ideas in healthcare and education technology; and (iv) going global with our suite of innovation and solutions. These growth areas reflect the Digital, Green and Care Economies, and are aligned in terms of the priority skills needed.



THE DIGITAL ECONOMY



WHAT IS THE DIGITAL ECONOMY?



The **Digital Economy** can be defined as a “broad range of economic activities” that use (i) “[digitised] information and knowledge as [key factors] of production”; (ii) “modern information networks as an important activity space”; as well as (iii) information & communication technology (ICT), to drive productivity growth¹.

In simple terms, the Digital Economy is a marketplace defined, organised, enabled and facilitated by digital technologies.

According to a recent World Economic Forum report, by 2022, close to 30% of new job opportunities globally will be in data, **artificial intelligence (AI)**, engineering and cloud computing². These trends reflect the growing potential of the Digital Economy.

With the rapid advancements in digitalisation and digital services driven by AI, **Internet of Things (IoT)**, cybersecurity and 5G, old paradigms and business

models are being challenged. More organisations across sectors are now required to have online-offline presences and operations. A study by McKinsey & Company has indicated that “[digital] adoption has taken a quantum leap at both the [organisational] and industry levels”³. Besides customer-facing processes, organisations are also rapidly digitising their core internal operations, and their supply chains.

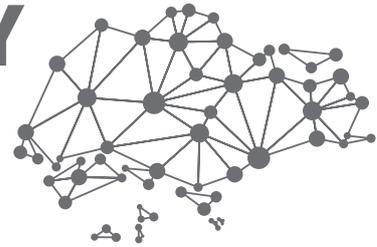
With more plug-and-play digital solutions available across almost all industries, the Digital Economy’s rate of growth is likely to accelerate further, post-COVID. It is foreseeable that in the future, most job roles will have some aspect of technology in it. Our workforce will have to pick up digital skills to deploy technology, or develop new digital products and services that can support the digital needs of the global economy.

¹ G20, *G20 Digital Economy Development and Cooperation Initiative*, 2016.

² World Economic Forum, *Jobs of Tomorrow: Mapping Opportunity in the New Economy*, 2020.

³ McKinsey & Company, “How COVID-19 has pushed companies over the technology tipping point—and transformed business forever”, 5 October 2020, <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>.

THE DIGITAL ECONOMY IN SINGAPORE

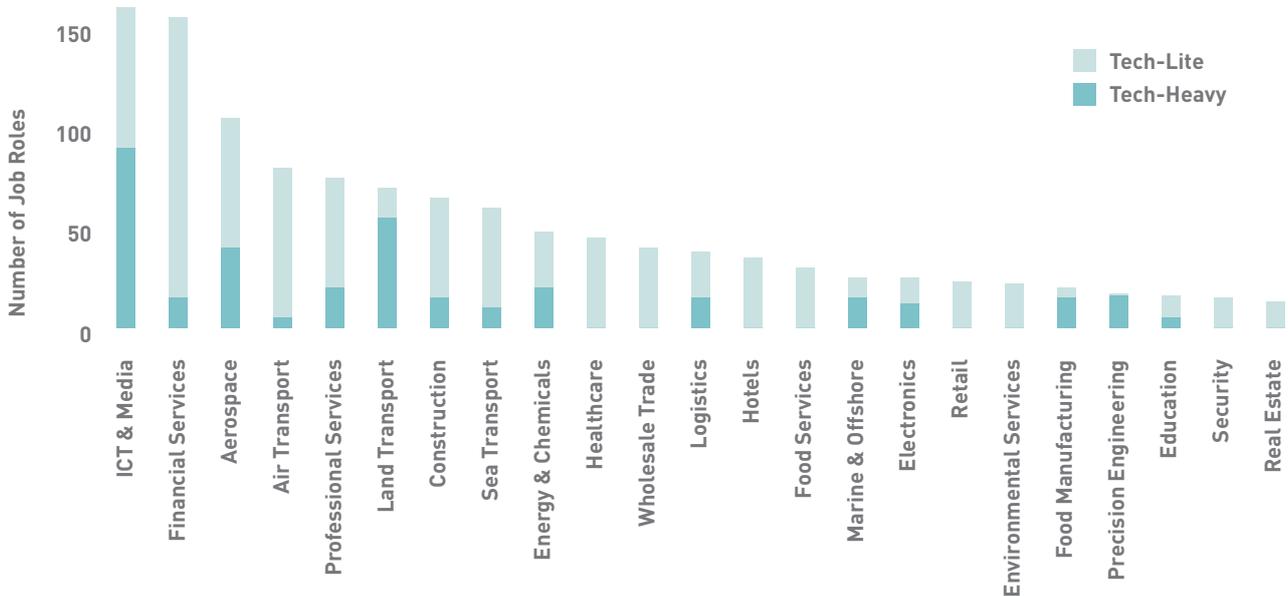


The Research, Innovation and Enterprise 2025 Plan (RIE2025) embodies four strategic domains, one of which is Smart Nation and Digital Economy (SNDE)⁴. Till date, Smart Nation initiatives have fueled widespread digital adoption in both the public and private sectors.

Supporting this, the Digital Economy includes not only firms and industries that are deploying digital applications as part of their business processes, but also those that are developing, deploying and maintaining digital products and services to support the needs of the global economy.

In Singapore today, Digital Economy jobs are required across all 23 sectors with **Industry Transformation Maps (ITMs)**. The majority of these jobs are **Tech-Lite roles** that do not require specialised and advanced IT skills. Examples include data analysts, digital marketing analysts and customer insights specialists. These roles are most required by sectors such as financial services, air transport and sea transport. On the other hand, **Tech-Heavy roles** include software engineers, data scientists and AI engineers. These roles are mostly demanded by sectors such as ICT, media, aerospace and land transport (Diagram 1).

Diagram 1: Breakdown of Tech Roles by Industry



Source: Infocomm Media Development Authority (IMDA) and SkillsFuture Singapore

⁴ For more information, please visit www.nrf.gov.sg/rie2025-plan.

DIGITALISATION AS A MODERN NECESSITY

Mr Yuen Kuan Moon
Group Chief Executive Officer, Singtel



As Asia's leading communications technology group with over 750 million customers in over 21 countries, Singtel is a leader in the telecommunications and digital services industries and our economy. Having successfully navigated Singtel's Consumer business through many technological disruptions in his previous role, Group CEO, Mr Yuen Kuan Moon is keenly aware of the need for businesses to transform digitally, especially with the COVID-19 pandemic forcing more daily interactions and services online. In his view, investing in digital is no longer just a consideration, it is a necessity. With many companies playing catch-up in this great digital migration, it is the ones who embrace digital acceleration, develop a digital core and learn to ride the tailwinds of digital change that will differentiate themselves and pull ahead.

Developing a digital core, Mr Yuen would argue, is the key to building resilience. Consumer-facing technology applications and omni-channel strategies are important but will only allow companies to scale to a certain degree. The pandemic also showed that the entire business landscape could dramatically change at the drop of a pin. Companies need to digitalise their systems to remain agile adapt to changing business environments or risk losing relevancy. Mr Yuen can personally attest to this. He saw Singtel lose 70% of overseas call centre capacity during the COVID-19 pandemic, due to lockdowns. Having started its digital transformation journey much earlier, Singtel had robust infrastructure and digital processes in place to adapt and quickly set up additional call centre sites in Singapore to maintain stability and continuity for its customers.

With extended work from home arrangements, an unintended consequence has been the blurring of the line between work and our personal lives resulting in mental fatigue or health issues. As an employer, Mr Yuen recognises that work models are changing, looking for a better balance between productivity and employee wellbeing, and digitalisation is needed to reimagine the

future of work. Singtel is adopting a new work model that provide employees with the flexibility to work at locations best suited to their needs, accommodates those with disabilities or caregiving responsibilities, and reduces health exposure risks and office expenses. **"We are looking at a new blended way of working for the future,"** he says. **"It leverages digitalisation to empower staff with options that help them maximise productivity and prioritise their wellbeing while still fostering the collaboration that face-to-face working provides. It's about paying attention to staff welfare while enhancing the overall work experience."**

Aside from investing in technology, Mr Yuen believes that talent acquisition and development are just as critical. Good manpower strategies should not only be about acquiring tech talent from outside the company, but also building internally, providing opportunities for employees to grow and work in different portfolios to develop broad-based skills. Diversity and job mobility within the company are part of Singtel's culture. As he puts it, **"Fresh perspectives and ideas are important, but you cannot only hire externally because new hires are unfamiliar with your company's unique differentiation. You need people from within the organisation as well, who know your current business and processes. It's then about how to use all that knowledge, within the boundaries of technological possibility, to digitally transform your business. Recruiting, nurturing and retaining talent are absolutely essential for business process re-engineering."**

BUILDING FROM WITHIN AND WITHOUT FOR THE DIGITAL AGE

Ms Susan Cheong
Managing Director, Talent Acquisition Group Head, DBS Bank



With the digital economy's rapid advent, organisations and workforces around the world are racing against time to stay relevant and thrive in a new technology-driven landscape. We speak with Ms Susan Cheong, Managing Director and Talent Acquisition Group Head at DBS, to learn how Singapore and Southeast Asia's largest bank is managing the change.

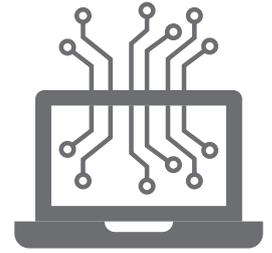
"Part of DBS's plan in closing the talent and skills gap created by the new digital economy is 'building our own talent' to expand the pipeline," Ms Cheong tells us. This involves reskilling or upskilling DBS's workforce through exposure to different functions, and work on technical projects. **"For example, some colleagues who worked on creating DBS's personal mobile wallet application, PayLah!, are now highly marketable with skills gained through developing it,"** Ms Cheong shares.

According to her, DBS has also adapted its reskilling efforts and learning processes to help transitions from non-tech to tech-heavy roles. **"It's not an easy change, and cannot happen overnight. One way we've adapted is by creating teams with members possessing complementary skillsets, because it is impossible to find all the relevant capabilities in one individual today,"** Ms Cheong explains. Transitioning non-tech-trained individuals also involves partnering them with technology experts in tech-light roles requiring simpler tech knowledge, to capitalise on non-tech skills like business, customer, or design experience.

"The beauty of moving people within our organisation is being able to build on talent with cross-functional gains. It complements DBS's succession planning where talents need broad education, experience and exposure to assume larger future roles," Ms Cheong offers, adding that DBS is exploring how AI can skill-up or automate skills-matching within its workforce with a marketplace concept where employees can explore job opportunities matching their capabilities.

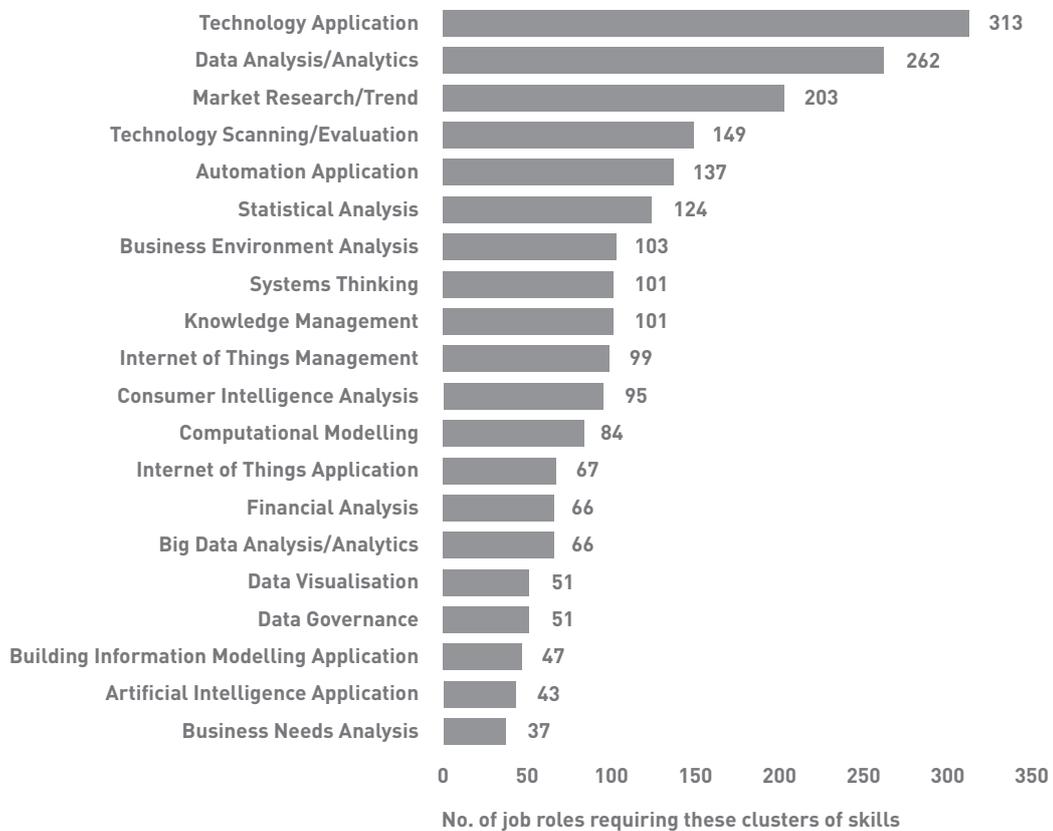
Ms Cheong admits that being able to build fast enough to meet the demand for tech talent remains a challenge, so DBS 'buys' talent by hiring from within and beyond the industry. **"Awareness of who you can leverage and work with is important as the diversity brought to the table can be very valuable,"** she says. Besides drawing from fresh graduates of STEM backgrounds to train across different technology pillars, DBS also works with partners to hire mid-careerists. **"We are taking on another 80 mid-careerists in technology this year, through the Institute of Banking & Finance, Singapore (IBF)'s Technology in Finance Immersion Programme, where IBF trains them before placement,"** Ms Cheong shares. Ultimately, she feels that infrastructure that allows talents to hone the level of tech ability being demanded is necessary to build a tech eco-system where companies can buy, build, or borrow talent.

PRIORITY SKILLS FOR TECH-LITE ROLES IN SINGAPORE'S DIGITAL ECONOMY



The majority of Digital Economy jobs in Singapore are tech-lite roles that can be found in many industries. These are not necessarily new job roles; they can include existing ones that evolve through digitalisation, requiring digital skills to perform new job functions and/or processes.

Diagram 2: Top 20 Clusters of Priority Skills for Tech-Lite Roles in Digital Economy



Source of data in graph: SkillsFuture Singapore

Diagram 2 shows the clusters of **priority skills** most required in tech-lite roles. Some priority skills are more transferable, based on the large number of job roles and/or multiple sectors that require them.

The top three clusters are:

 **Technology Application**
Skills to operate, adopt and apply new technology

 **Data Analysis/Analytics**
Skills covering data collection, data management, data interpretation and data visualisation, applied in research or business

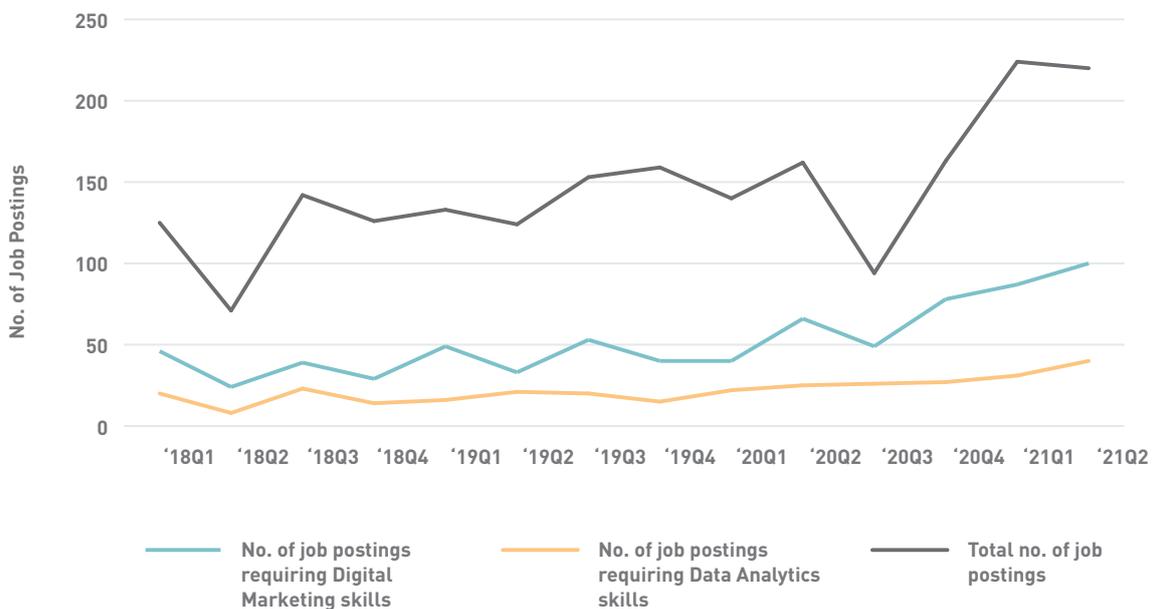
 **Market Research/Trend**
Skills to enable businesses to make informed decisions on their business directions

These top three clusters of skills are required in two-thirds of all tech-lite roles across 23 ITM sectors. These sectors include, most commonly, financial services, retail and sea transport.

As digitalisation transforms business processes, models and job content, similar shifts have been observed in employers' demand for specific skills.

Job vacancy postings over the last three years indicate that while the demand for traditional marketing job roles is still prevalent, candidates for marketing job roles are increasingly required to possess digital marketing and data-related skills (Diagram 3).

Diagram 3: Skill Demand Trend for Marketing Job Roles



Source of data in graph: SkillsFuture Singapore

FEATURE: A DAY IN THE LIFE OF A MARKETING EXECUTIVE

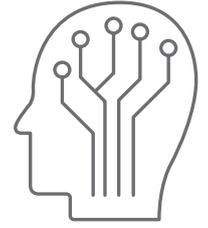
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1 Monitor new market trends, business opportunities and market segments in global and local landscapes, using market research analytical tools
- 

2 Provide personalised marketing and outreach to consumers, where social media and digital campaigns are key channels to drive marketing
- 

3 Monitor expenses and adhere to budget allocations with team members, through the use of budget applications and cloud sharing

PRIORITY SKILLS FOR TECH-HEAVY ROLES IN SINGAPORE'S DIGITAL ECONOMY



Tech-heavy job roles entail specialised and highly complex functions. The clusters of skills required for these job roles are critical to lead digital transformation in tech-reliant industries and organisations.

Diagram 4: Top 20 Clusters of Priority Skills for Tech-Heavy Roles in Digital Economy



Source of data in graph: SkillsFuture Singapore

Diagram 4 shows the clusters of priority skills most required in tech-heavy roles. Some priority skills are more transferable, based on the large number of job roles and/or multiple sectors that require them.

The top three clusters of skills are:

 **Technology Development**
Skills to analyse, review, formulate and lead new digital transformation efforts with organisations' IT systems and technologies

 **Internet of Things Management**
Skills to enable working with interconnecting computing devices, equipment and machine data, in a networked environment

 **Data Engineering**
Skills to develop and implement data management systems and tools

Due to the diverse job roles classified under tech-heavy roles, the top three clusters of skills are required in half of the tech-heavy roles across 15 ITM sectors. These sectors include, most commonly, ICT and media, aerospace and land transport.



FEATURE: A DAY IN THE LIFE OF A SOFTWARE ENGINEER



1

Conduct business needs analysis and recommend approaches that balance security, stability and performance needs of the organisation



2

Design software components and modules



3

Solve complex technical issues by analysing defect arrival rate and failure intensity data

DIGITAL JOBS AND SKILLS IN FINANCIAL SERVICES



Diagram 5: Priority Skills supporting Digital Economy in Financial Services Sector



Source of data in graph: SkillsFuture Singapore

Today, the majority of tech roles in financial services are tech-lite in nature. There is high hiring demand for tech-lite roles such as digital marketing executives, data officers and business analysts.

The rapid digital transformation within the financial services sector means that talent will not just require *Investment and Financial Management* skills, but also priority skills in *Business Environment Analysis, Data Collection and Analysis, Customer Experience Management, Market Research and Analysis, and Market Specialisation*, to name a few (Diagram 5).

At the same time, the sector is also seeing an increasing demand for tech-heavy jobs and skills, to develop the technology in support of business transformation. These roles include software engineers, product designers and user experience designers, with priority skills in *Business Requirements Mapping, Product Management, Research and Information Synthesis* and *Customer Behaviour Analysis*.

DIGITAL JOBS AND SKILLS IN RETAIL



Diagram 6: Priority Skills supporting Digital Economy in Retail Sector



Source of data in graph: SkillsFuture Singapore

Over the past decade, retailers have been setting up online-offline presences and using omni-channel marketing and e-commerce platforms to reach out to consumers. In recent months, this trend has been further fuelled by the pandemic-induced digital shift, and by hybrid work arrangements set to become the new norm. A 2021 report by Facebook and Bain & Company estimates that e-commerce sales in Singapore is projected to hit more than \$13 billion, by 2026⁵.

Skills such as *Data Analytics*, *Knowledge Management*, *Consumer Intelligence Analysis*, *E-Commerce Campaign Management*, and *Social Media Management* are key to support the growing use of e-commerce in the retail sector (Diagram 6). Specifically, knowledge management includes the ability to treat and systematically manage consumer data/information. These priority skills are required for in demand job roles such as e-commerce specialists, digital marketing executives and brand specialists.

Skills such as *Data-Mining and Modelling*, *Business Environment Analysis* and *Digital Asset and File Management* are also increasingly important to tech-heavy roles that drive e-commerce in the retail sector. These skills are needed for in demand tech-heavy roles such as system administrators, user interface (UI) designers and data scientists.

⁵Facebook, Inc., and Bain & Company, Inc., *Southeast Asia, The Home For Digital Transformation*, 2021.

MECHANICAL ENGINEER TURNED SOFTWARE ENGINEER

Mr Qin*,
Full Stack Software Engineer

After a nine-year career in mechanical parts design, Mr Qin decided that mechanical engineering did not offer much potential for him. As such, he decided to take on a new challenge, and enter the IT industry. "I think, the trend nowadays is to reduce manpower in doing repetitive jobs, and programming can fill that gap. I think, for the IT industry, this would have a very good prospect."

He enrolled in the four-month SGUP-CT[^] GoSchool programme, to learn Go programming, and is now working as a full stack software engineer. Mr Qin admits that the programme was the only coding course he could find, and while it was not necessarily his first choice, he eventually found that Go was a good programming language to invest his time and effort in. "I did research to compare Go with other programming languages, and Go has sound advantages. The built-in development cycle is very short, running speed is quite fast, and the syntax is not very difficult. So the learning curve is not so steep."

Nonetheless, the transition from training to working as a software engineer was not easy. The tools used in his company were different from what he had learnt, and Mr Qin had to put in extra work every night to catch up on the technical coding knowledge, while learning on the job as much as he could. He feels that it is important to devote time and effort to reading beyond work. This allows him to catch up on all the developments and trends, so as to become successful in his new industry. "Updates and new information appear on the internet first. If you don't like to read, or are

satisfied with [what] the school taught, it will not be enough."

While it may seem daunting for some to abandon a nine-year career for something completely new and different, Mr Qin believes that it is worthwhile to forget what was learnt before, relearn, and start again. He recognises that writing code is just one part of his job, and that softer skills like *Communication* and *Project Management* are also important. For now, his priority is to further develop his technical competencies, through self-directed learning and using online resources like GitHub. "My recommendation is, if you want to immerse into a new area, you need to forget about what you have done previously, because maybe they are totally different."

**"IF YOU WANT TO IMMERSE
INTO A NEW AREA, YOU NEED TO
FORGET ABOUT WHAT YOU HAVE
DONE PREVIOUSLY."**

Learning points:



Do your research



Growth mindset



Pick up new skills

*Note: Mr Qin's real name has been withheld upon request for privacy.

[^]SGUnited Mid-Career Pathways Programme – Company Training

UPSKILLING FROM A TRADITIONAL MARKETING ROLE INTO A DIGITAL MARKETING ROLE

Ms Sharon*,
Digital Marketing Executive

Ms Sharon holds a communications degree and has been working in media management and marketing-related roles since graduation. Unfortunately, she was forced to make a career change when her job was impacted by the COVID-19 pandemic. Seeing how digitalisation has impacted different aspects of our lives, from how we work and learn to how we stay connected with friends and family, Ms Sharon decided to take up a tech-related role. She wanted to move into a digital marketing role due to her interest, but realised that she did not have the necessary skills. "While I have the skills to do some level of marketing and communications, I didn't have the skills to go fully digital and optimise the digital space." She approached a few schools and finally took up a digital marketing course with the Singapore Institute of Retail Studies (SIRS), due to their learner-centric commitment, and structured and clear programme.

The transition into the digital marketing executive role was not difficult for Ms Sharon due to her prior work experience. She feels that employers play a key role in supporting such transitions. Her current portfolio requires her to develop a social media strategy for her company, which includes setting up a social media page and creating content to build brand awareness. With the availability of consumer preference data, she now rolls out personalised and targeted marketing campaigns, as opposed to mass marketing campaigns which often only appeal to some. For now, Ms Sharon plans to further develop her specialisation in digital marketing, by attending short courses and tapping on online resources.



The COVID-19 pandemic had impacted Ms Sharon's work, but she was able to turn things around by developing her interest in digital marketing. It also made her realise the importance of learning and adapting, as things are constantly changing. "If you have a fixed mindset, it will be very difficult. It is important to have a growth and open mindset. One of the best ways to adapt is always to have an open mind to learn." She also recognised the importance of taking the first step and moving out of one's comfort zone. "Give it a try. There are a lot of resources out there. Be brave, go forward and try new things as you never know what you can learn and the people that you will come across. These experiences will make a difference and have a positive impact on your life."

"BE BRAVE, GO FORWARD AND TRY NEW THINGS AS YOU NEVER KNOW WHAT YOU CAN LEARN AND THE PEOPLE THAT YOU WILL COME ACROSS."

Learning points:



Take the first step



Growth mindset



Be resourceful

*Note: Ms Sharon's real name has been withheld upon request for privacy.

JOB OPPORTUNITIES IN THE DIGITAL ECONOMY



The influence of digital technology across various industries, businesses and jobs is, indeed, strong. This is reflected in the wide range of in demand, tech-lite and tech-heavy skills identified. Jobs that have adopted digitalisation have similarly shown strong demand over the last four years.

Using data from various job portals and hiring sites collected from 2018 to 2021, the list of Digital Economy-related job opportunities and their respective examples of hiring companies are listed below.

S/N	Job Roles with Hiring Opportunities	Examples of Hiring Companies
1	Digital Marketing Associate/Assistant/Manager	DBS / Dell / PolicyPal
2	E-commerce Manager	Shopee / D-Team Engineering Pte Ltd / Apple
3	Brand Associate/Assistant/Manager	Proctor & Gamble / Unilever / Shopee
4	Software Engineer	JPMorgan / Visa / Grab
5	Network Engineer	Avaloq Asia Pacific Pte Ltd / Singtel / NCS Group
6	DevOps Engineer	DBS / OCBC / BP Global
7	Associate Data Engineer/Data Engineer	Credit Suisse / ByteDance / Apple
8	Compliance Analyst	Credit Suisse / Duff & Phelps / RedHat
9	Data Analyst	DBS / Titansoft Pte Ltd / Pan-United Corporation Ltd
10	Data Scientist	Grab / ByteDance / Illumina Singapore Pte Ltd

Source: Various job portals and hiring sites. This information is valid as of Oct 2021.

Please see Charting Your Skills Development Journey, p. 58 for information on related courses.

THE GREEN ECONOMY



WHAT IS THE GREEN ECONOMY?



The United Nations defines a “green economy” as “low carbon, resource efficient and socially inclusive”¹. Coupled with the rise of **Environmental, Social and Governance (ESG)** discussions to the fore of policy and business agendas, this inevitably spells innovation and change across almost all sectors. Enterprises in existing sectors are expected to ramp up their greening efforts, even as new green sectors emerge. The green wave is in sight. Individuals can prepare to ride on it, rather than be inundated, or potentially left behind in its wake.

Put simply, the **Green Economy** is about living, working and pursuing growth, while taking care of the environment and using the limited resources available as efficiently and sustainably as possible. It is an economy that achieves balance among three types of outcomes:

- 1 **Environmental outcomes**
Sustainable use of environmental resources, thriving for net-zero carbon emissions
- 2 **Economic outcomes**
Sustainable use of economic/organisational resources
- 3 **Social outcomes**
Equitable distribution of resources



DIAGRAM 7: DIFFERENT CONCEPTS OF THE GREEN ECONOMY



Source: Adapted from United Nations, “Related concepts: Green economy, green growth and low-carbon development”, retrieved 2021, www.sustainabledevelopment.un.org/topics/greeneconomy/relatedconcepts.

The different concepts of the Green Economy (Diagram 7) means companies can participate in different ways to yield the environmental, economic and social outcomes. With this, jobs and skills are impacted in the following three ways:

- Enterprises are restructuring and creating new business functions as they shift from **‘brown’ activities** (i.e. environmentally-harmful business activities), to green or cleaner ones;
- Existing jobs are **“greening”**, where new green skills are being encompassed to take on greener practices and work processes, and to better optimise natural assets and improve the sustainable use of resources
- New green jobs and skills are required in existing business functions, as a result of new regulatory requirements or green technologies and practices serving to minimise negative environmental externalities; and

THE GREEN ECONOMY IN SINGAPORE



Singapore Green Plan 2030 is a nation-wide, concerted effort to build sustainability as a way of work, play and life. It lays out clear directions for how Singapore will embark on a sustainability agenda, towards the zero-emission vision. It also contributes to international efforts, under the United Nations' 2030 Agenda for Sustainable Development.

This chapter covers opportunities for the Green Economy as a whole, for existing sectors including built environment and energy & power, and for emerging sectors such as agri-tech.



SG GREEN PLAN

The Singapore Green Plan 2030 is a national sustainability movement which seeks to rally bold and collective action to tackle climate change.

It is a living plan which will evolve as we work with Singaporeans and partners from all sectors to co-create solutions for sustainability. Let's work together to make Singapore a green and liveable home.

City in Nature

Green, Liveable and Sustainable Home for Singaporeans

- ✔ Plant 1 million more trees, and have every household within a 10-minute walk from a park by 2030
- ✔ Develop over 130 ha of new parks, and enhance around 170 ha of existing parks with more lush vegetation and natural landscapes by end-2026
- ✔ Add 1000ha of green spaces by 2035

Sustainable Living

Strengthen Green Efforts in Schools

- ✔ Introduce an Eco Stewardship Programme to enhance environmental education in all schools
- ✔ Work towards two-thirds reduction of net carbon emissions from schools sector by 2030
- ✔ At least 20% of schools to be carbon neutral by 2030

Green Commutes

- ✔ 75% of trips during peak periods to be on mass public transport by 2030
- ✔ Triple cycling path network to 1,320km by 2030, from 460km in 2020
- ✔ Expand rail network to 360km by early 2030s, from around 230km today

Green Citizenry:

Reduce waste and consumption

- ✔ Reduce amount of waste to landfill per capita per day by 20% by 2026, and 30% by 2030
- ✔ Reduce household water consumption to 130 litres per capita per day

Energy Reset

Cleaner-energy Vehicles

- ✔ New diesel car and taxi registrations to cease from 2025, with all new car and taxi registrations to be of cleaner-energy models from 2030
- ✔ Further revise road tax structure to bring down road tax for mass-market electric cars
- ✔ Target 60,000 electric vehicle (EV) charging points by 2030, with 8 EV-Ready Towns by 2025

Greener Infrastructure & Buildings

- ✔ Green 80% of Singapore's buildings (by Gross Floor Area) by 2030
- ✔ 80% of new buildings (by Gross Floor Area) to be Super Low Energy buildings from 2030
- ✔ Best-in-class green buildings to see 80% improvement in energy efficiency (over 2005 levels) by 2030

Sustainable Towns & Districts

- ✔ Reduce energy consumption in HDB towns by 15% by 2030

Green Energy

- ✔ Quadruple solar energy deployment to 1.5 gigawatt-peak by 2025
- ✔ Tap on cleaner electricity imports, and increase R&D on renewable energy and emerging low-carbon technologies

Green Economy

Sustainability as New Engine of Jobs and Growth

- ✔ New Enterprise Sustainability Programme to help local enterprises adopt sustainability practices
- ✔ Develop Singapore to be a carbon services hub, and a leading centre for green finance in Asia and globally
- ✔ Develop Jurong Island to be a sustainable energy and chemicals park
- ✔ Leverage opportunities in sustainable industries to create good jobs for Singaporeans

New Investments to be Carbon and Energy Efficient

- ✔ Seek new investments to be among the best-in-class in energy/carbon efficiency

Resilient Future

Safeguarding our Coastlines against Rising Sea Levels

- ✔ S\$5b dedicated to coastal and drainage flood protection measures
- ✔ Formulation of coastal protection plans for City-East Coast, North-West Coast (Lim Chu Kang and Sungei Kadut) and Jurong Island by 2030

Safeguarding Food Security

- ✔ Produce 30% of our nutritional needs locally and sustainably by 2030, through developing land and sea space and skilled workers, funding support, and promoting R&D

Keeping Singapore Cool

- ✔ Moderate the rise in urban heat, such as with cool paint and by increasing greenery

Jointly led by:



Ministry of Education
SINGAPORE



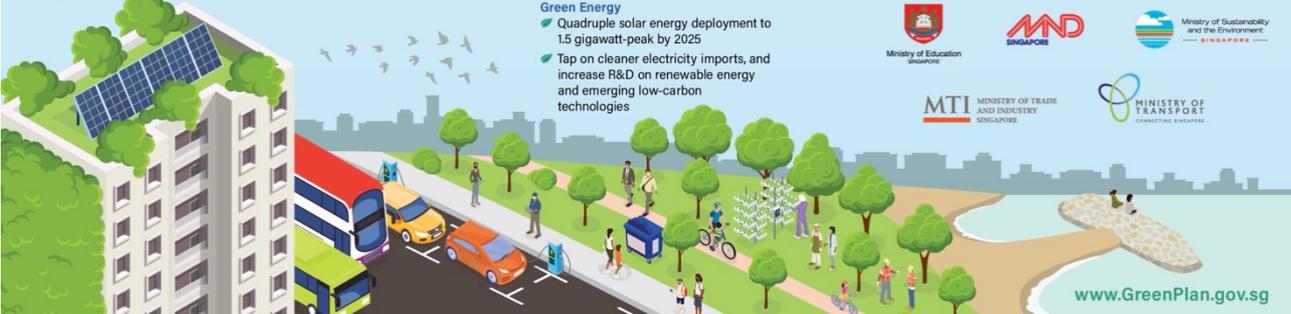
MTI
MINISTRY OF TRADE AND INDUSTRY
SINGAPORE



Ministry of Sustainability and the Environment
SINGAPORE



MTA
MINISTRY OF TRANSPORT
SINGAPORE



www.GreenPlan.gov.sg

Image source: SG Green Plan, 2021²

² For more information, please visit www.greenplan.gov.sg.

BUILDING A SUSTAINABLE FUTURE

Mr Wong Kim Yin
Group President/CEO, Sembcorp Industries



Mr Wong Kim Yin, Group President and CEO of Sembcorp Industries, believes that Singapore's sustainability drive is all encompassing and there are tremendous opportunities on many fronts.

Mr Wong went on to explain that in order to have faster clean energy adoption, it is necessary to manage both supply and demand of clean energy. On the demand side, shaping customers' demand and behaviour comes through consumer education and supporting their goals for higher energy efficiency and sustainability. On the supply side, while parts of the world are rich in renewable resources, others with high demand often lack such resources.

He felt that matching demand and supply through greater regional cooperation can make a big difference, and today, there is the technology to link these demand and supply centres together to provide more affordable access to clean energy.

In addition, Mr Wong said systems to support energy transition financing, unlock capital, and help brown assets become greener are needed. **"To support the Green Economy, we need good talent and partnerships in areas such as renewable energy, integrated sustainable solutions, and digital innovations,"** he elaborates.

He explained that the Sembcorp Centres of Excellence (CoEs) house experts and implement processes to optimise the capabilities in key business streams, such as the Water CoE in China, Solar CoE in Singapore, Wind CoE in India, Urban CoE in Vietnam, and Energy Storage CoE in UK. Sembcorp is also working closely with the Institutes of Higher Learning, such as Singapore Polytechnic and the Institute of Technical Education, to develop certified curriculum in solar energy.

The company also focuses on retraining and redeploying people to retain talent. Mr Wong shared about Chua Kia, who joined Sembcorp 14 years ago as a senior project engineer in Jurong Island, and managed key utilities and power plant projects across their core markets. Chua Kia made a switch in 2017 to help set up the solar team, which grew from five persons to more than 100 today. He is now their Project & Engineering Director for solar business and leading the solar CoE in the region.

"Digitalisation has enabled employers to invest in the skills of their workforce while allowing them to take charge of their own learning journey" he added. Sembcorp Academy, their online learning platform, allows all Sembcorp employees to upskill remotely through digital content, to learn anytime and anywhere.

Mr Wong noted, **"There is a common trait I see in all the successful people that I have encountered, from all walks of life, and that is their continuous pursuit to learn. I hope individuals will find the same joy and enrichment as I do, and make learning a lifelong pursuit."**

SHRINKING THE CARBON FOOTPRINT

Mr Russell Tham
Joint Head, Enterprise Development Group; Joint Head,
Strategic Development, Temasek International



The Joint Head of Temasek International Enterprise Development Group, as well as Strategic Development, Mr Russell Tham, expressed that as Singapore transitions into the Green Economy, all businesses should start developing skills in understanding and mitigating its carbon footprint.

To achieve this, companies need to firstly measure their business' carbon footprint including the interdependencies along the value chain, then develop a strategy to reducing the carbon footprint based on fundamental understanding of the causes of emission.

He went on to say that a company also needs to develop strategies to offset the business carbon footprint, which they cannot reduce by buying carbon offsets. This is because he believes that as the society transitions to a green economy, there will be disruptions; and like all disruptions, it will present both challenges and opportunities. Already, many companies are pivoting to green business models. New businesses are also formed to take advantage of this energy transition.

“The ‘greener’ your company or your skills are, the more competitive and employable one would be. Today, there is rapidly increasing demand of such “green” skills, much like data science and advance digital skills,” he explains.

Mr Tham added that numerous sectors are inherently carbon intensive including transportation, heavy industries, energy generation, and built environment. Many of such sectors will require novel STEM based innovations to retool or reconfigure. He mentioned that in a recent report, venture capital climate tech investment is expected to rise 4-fold to \$250B by 2025.

“These climate tech companies require a combination of skillsets in sciences and engineering such as chemistry, physics, materials science, mechanical and electrical engineering,” says Mr Tham. This multi-disciplinary STEM work

combined with innovative business models would present lots of opportunities for current and future cohorts with STEM background. He continues, **“If you developed the products and services which are differentiated and valued (by your customers), then I think the world is your market.”**

The Ecosperity Week 2021 by Temasek was part of their national efforts to galvanise actions and deep dive into green economy opportunities. Mr Tham said that building Singapore's future skillsets for our local workforce requires agility and staying abreast of changes.

He continued that SkillsFuture Singapore and various higher learning infrastructures can scaffold different modular bite-size CET courses. This should help many with a foundational understanding of multi-faceted dimension of the green economy, equip companies with tools and methodologies to measure their carbon footprint and the skills to operate in various carbon markets scenarios. Individuals too can have access to a curated green CET journey depending on one's inclinations and career pathways.

He voiced that Singapore's pre-employment education and training system requires the same accelerated approach as they prepare young Singaporeans for employment in the 2nd half of this decade and beyond. **“Business leaders have an important role and responsibility to educate and re-educate themselves and de-skill and re-skill their employees for this existential transition,”** he notes.

CHAMPIONING SUSTAINABILITY WITH MULTI-PRONGED DIVERSITY



Ms Esther An
Chief Sustainability Officer, CDL

We are in a climate change emergency. Change is no longer a choice by business leaders, and more companies are under greater pressure from regulators and investors to reset their business model to integrate sustainability as a core part of it. We speak with Ms Esther An, CDL's Chief Sustainability Officer, to learn more about the relationship between the green economy and businesses, as well as the skills needed for a climate-resilient future.

Post COP-26, we have seen a surge of global climate action, with approximately 90% of the world GDP covered by net zero commitments. Part of this is the United Nations' (UN) Global Race to Zero, comprising hundreds of countries and investors, and thousands of businesses and organisations pledging towards a zero carbon economy. As Ms An states, **"Sustainability is no longer a trend but a mainstream requirement of businesses today."**

She notes that the UN Sustainable Development Goals are a "common language" that connects every part of the world. Singapore, in particular, is focusing on 'energy reset' as a key pillar driving Singapore's Green Plan 2030 and Green Building Masterplan. **"This accelerated push towards Super Low-Energy (SLE) buildings calls not just for expertise from architects, engineers and other technical professionals in the design,"** she shares, but also project managers and developers who need to understand the corresponding technologies and methods.

Elaborating on green economy skillsets, Ms An said, **"Management skills like communications, accountancy, business administration, and stakeholder engagement are highly relevant in a sustainability career. While technical skills in Environment, Health and Safety remain essential, it is a combination of arts and science that will offer a good and balanced mix of skill sets for sustainability professionals."**

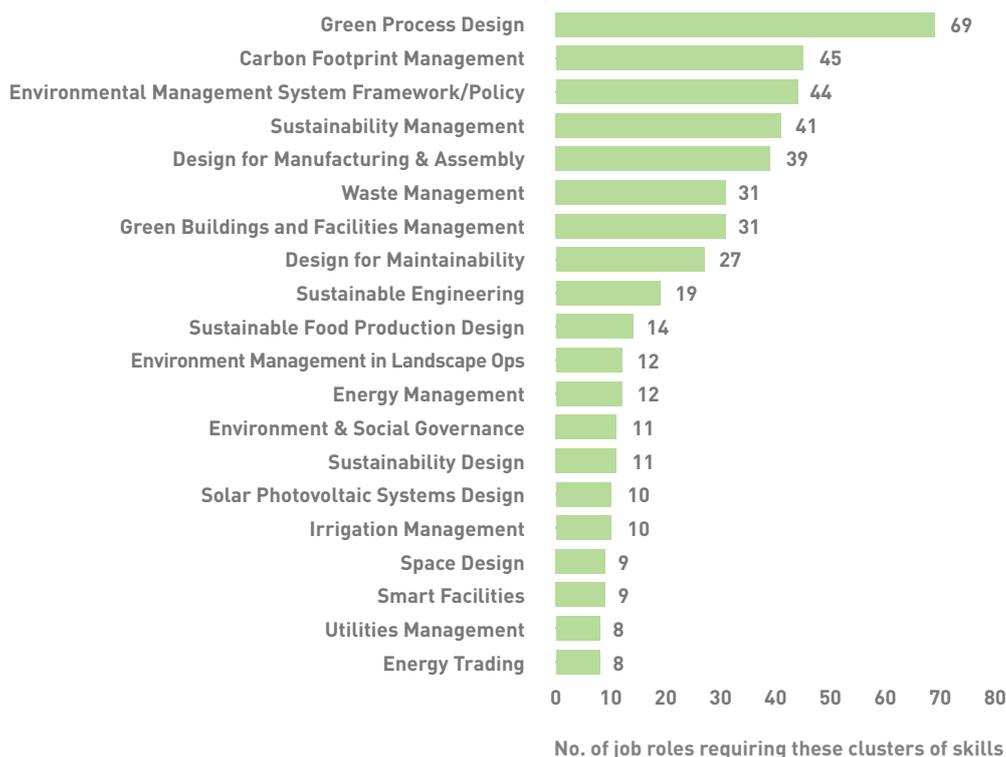
Employers like CDL will need to maintain an open mind to allow non-technical professionals opportunities to transfer relevant skills in strategic planning, finance, research and accountancy to the sustainability field, Ms An asserts. **"Institutional and industry knowledge and technical expertise is important, but communication is the critical skillset needed to meet rising expectations of ESG disclosure through sustainability ratings, rankings, and most importantly, reporting,"** she says. Engineers must also be open to expanding job scopes by picking up on sustainability communication skills, she adds, as it will help them meet changing demands and accelerate career growth.

Digitalisation and investing in innovative R&D and green technology will be key to CDL's design and decarbonisation of the built environment, Ms An states. **"This includes using AI to simulate building sites' ventilation and natural illumination, digital planning to improve energy efficiency and reduce heat gain, and implementation of smart technologies like predictive facility management tools to pre-empt problems and reduce operational expenses."**

PRIORITY SKILLS IN SINGAPORE'S GREEN ECONOMY



Diagram 8: Top 20 Clusters of Priority Skills for Green Economy



Source of data in graph: SkillsFuture Singapore

There are many clusters of **priority skills** required across multiple sectors supporting the Green Economy. Today, more than 450 job roles across 17 sectors require these priority skills. These sectors range from manufacturing and trade & connectivity, to information & communication technology (ICT), financial services, hospitality and built environment.

Some priority skills are more transferable, based on the large number of job roles and/or multiple sectors that require them. Clusters of these skills include *Green Process Design*, *Carbon Footprint Management*, *Environmental Management System Framework/Policy* and *Sustainability Management*. Possession of these skills opens up multiple job opportunities across sectors (Diagram 8).

On the other hand, there are priority skills more relevant to specific sectors. Clusters of these skills include *Green Buildings and Facilities Management*, *Sustainable Food Production Design*, *Sustainable Engineering* and *Solar Photovoltaic Systems Design*. The skills in these clusters are mainly required by the workforce in the respective sectors: built environment, energy & power, engineering services and agri-tech. These sector-specific skills are critical for one to do well in a job, within a sector.

Clusters of skills like *Waste Management* and *Utilities Management* are also 'greening', as jobs and work processes begin to incorporate more environmentally friendly and energy-efficient processes.

GREEN JOBS AND SKILLS IN BUILT ENVIRONMENT

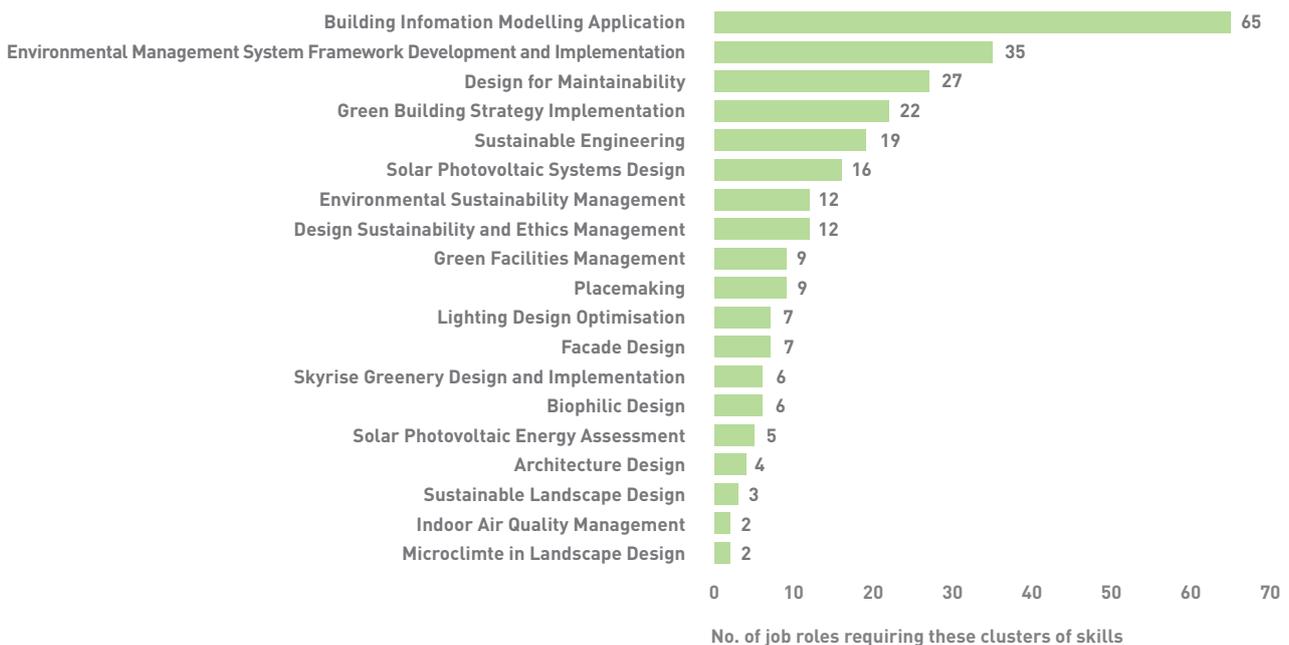


Buildings and construction account for almost 40% of global carbon emissions today³. With greater awareness of global climate issues in recent years, there have been increasing calls to render the built environment sector more energy efficient, to reduce carbon emissions and ultimately move towards a **net-zero carbon emission** sector in Singapore.

The **Green Mark Certification** is a green building rating system designed to evaluate a building's environmental impact and performance. It has been

progressively stepped up to meet the goals set out in the Singapore Green Plan 2030. SSG's industry consultations further identified priority skills needed by today's built environment professionals, to accelerate the momentum towards Super Low Energy (SLE) building goals. These priority skills include *Building Information Modelling (BIM) Application*, *Environmental Management System Framework Development and Implementation*, *Green Building Strategy Implementation*, *Sustainable Engineering*, and *Green Facilities Management* (Diagram 9).

Diagram 9: Priority Skills supporting Green Economy in Built Environment



Source of data in graph: SkillsFuture Singapore

FEATURE: A DAY IN THE LIFE OF A FACILITIES ENGINEER/MANAGER



1 Formulate and implement sustainability and environmental management systems and procedures



2 Implement green building solutions such as smart FM technologies to monitor and enhance building facilities



3 Collaborate with stakeholders to develop sustainability initiatives, inculcate sustainability and green mind-set

³ UNEP, "Building sector emissions hit record high, but low carbon pandemic recovery can help transform sector – UN report", 2020, www.unep.org/news-and-stories/press-release/building-sector-emissions-hit-record-high-low-carbon-pandemic

GREEN JOBS AND SKILLS IN ENERGY & POWER



The energy & power sector is at the forefront of changes following the acceleration of megatrends in decarbonisation, electrification and urbanisation. The development of new business models in areas such as solar, energy storage imports and smart grids, will create new, higher value-adding green jobs, and drive growth in energy-related jobs.

roles such as solar technologists/specialists, clean energy specialists and sustainability engineers are *Business Intelligence and Data Analytics*, *Environmental Management System Framework Development and Implementation*, *Sustainable Engineering*, *Solar Photovoltaic Systems Design*, and *Energy Management and Audit* (Diagram 10).

These developments compel the workforce to take on new skills and expand skillsets to take on new opportunities. Key skills required to access new job

Diagram 10: Priority Skills supporting Green Economy in Energy & Power Sector



Source of data in graph: SkillsFuture Singapore

FEATURE: A DAY IN THE LIFE OF A SOLAR SPECIALIST

1 Develop commercial applications of solar construction and installation projects, technical promotion and business development

2 Integrate solar solutions, system requirements and designs, per prevailing technical and environmental management standards

3 Implement solar panel installations, services and maintenance, as well as energy management and audit

GREEN JOBS AND SKILLS IN AGRI-TECH



Agri-tech is still a **nascent** sector in Singapore, requiring expertise existing in other sectors. Besides *Agriculture and Aquaculture* skills, skills in *Manufacturing and Engineering, IT and Data, Sustainability and Environment*, and *Business Development and Management* are essential to support the agri-tech sector.



Agriculture and Aquaculture Skills

- Aeroponics
- Animal Husbandry
- Ecology
- Horticulture
- Hydroponics
- Plant Nutrition
- Precision Agriculture
- Urban Agriculture



Business Development and Management Skills

- Social Media Marketing
- Portfolio Management
- Strategic Partnership
- Intellectual Property Management
- Logistics Management



Sustainability and Environment Skills

- Environmental Impact Analysis
- Environmental Management
- Sustainable Engineering



Manufacturing & Engineering, IT & Data Skills

- Process Automation
- Internet of Things (IoT), Artificial Intelligence (AI), Sensors and Monitors
- Programming
- Data Analytics and Visualisation

FEATURE: A DAY IN THE LIFE OF A FARM TECHNOLOGIST



- 1 Implement process automation, and manage artificial intelligence (AI), Internet of Things (IoT) and smart sensor technologies



- 2 Conduct research and development (R&D), manage environmental impact and ensure circularity of resources



- 3 Develop strategic business partnerships to grow business, and tap on social media marketing and intellectual property management

ENGINEERING FOR SUSTAINABILITY FROM BROWN TO GREEN

Mr Kevin Chew,
Assistant Manager
Planning & Procurement: Integrated Solutions

In the recent years, there have been multiple headline news and articles on clean sustainable energy and environmental impact, that have enhanced our collective awareness and shared consciousness. At the same time, many sectors have also started to embark towards the Green Economy, including the solar power sector in Singapore, which has grown aggressively. This presented an opportunity to Kevin, who always relished the chance to play his part in making Singapore more sustainable.

Armed with a Bachelor of Engineering (Mechanical Engineering) degree, with a specialisation in Energy and Sustainability, Kevin started out his energy career in the gas power industry, working in technical engineering under operations and maintenance. After being in the energy sector for a number of years, he came across like-minded counterparts who shared about exciting developments in Singapore's solar power sector with him, piquing his interest and opening new doors for him.

Having worked in Sembcorp Solar for more than three years now, Kevin had the opportunity to explore different aspects of the job, including commercial and planning. In his current role, he handles procurement for their Engineering Procurement and Construction (EPC) contractors, and other key suppliers for their solar installation projects. His former work experience also enabled this transition to his current role. "I could understand some of the key considerations that our customers have in choosing green energy over brown energy. Many of the operating principles and technical aspects on the electrical front are similar", he shared.



Kevin was also heartened to share that his company is also providing knowledge and technology transfer to its EPC contractors and staff, through the experiences they had gleaned for themselves. This is to help the industry as a whole keep pace with the transformation to clean energy. "Solar technology is changing constantly and rapidly. It's imperative that we keep up with the latest trends, technology and innovation", he said.

As one who had witnessed the rapidly changing demands in the energy sector within such a short period, Kevin knows the importance of learning and picking up new skills to adapt to changes. "Work processes are more digitalised now and there is greater emphasis on data collection and analysis. I am thankful that I was offered several on-the-job training opportunities, as well as external training to keep upgrading and improving my skills." Though the energy sector is going through structural changes very quickly, Kevin knows he had his work cut out in more good ways than one. "It's challenging yet rewarding. Knowing that we play a part in making Singapore more sustainable with renewable energy makes it all worth it", he concluded.

"KNOWING THAT WE PLAY A PART IN MAKING SINGAPORE MORE SUSTAINABLE WITH RENEWABLE ENERGY MAKES IT ALL WORTH IT."

Learning points:



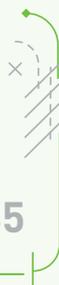
Adaptability



Transferability of skills



Continuous Learning



FROM BIG 4 AUDITOR TO SUSTAINABILITY MANAGER

**Ms Tracy Yeow,
Sustainability Manager**

One would say 'the stars are aligned' when one's career marries passion, values and the job itself. That was what it looked like for Tracy, a bubbly sustainability manager at City Developments Limited (CDL). However, her positive attitude towards upskilling, and taking the time to put her career choice into reality, takes hard work.

Tracy took the well-tested route as an auditor at one of the 'Big 4' companies after graduating with an accountancy degree. This was followed by a stint in banking, before taking a long-needed sabbatical to figure out her next career move. However, opportunities were scarce. There were hardly any sustainability-related continuing education and training (CET) courses then, that a mid-career switcher like her could take at that time, and Tracy was not prepared to dive into a full-time postgraduate course without finding out more about the field. Eventually, she enrolled in a part-time Sustainability Professionals Programme co-organised by Global Compact Network Singapore (GCNS) and NTUC U Associate. It helped that the Employment and Employability Institute (e2i) provided subsidies for the course. The programme is now led by GCNS and Singapore Management University (SMU). The six-month fortnightly classes opened up new opportunities for Tracy. Alongside getting to network with her course mates and trainers, she was fortunate to land a sustainability role with CDL at the end of the course.



Tracy's accountancy background comes in handy for skills in sustainability reporting. Yet, besides these skills and in the course of her work, sustainability is also very much about social advocacy, and collaboration with partners and businesses to go green. Learning on-the-job is almost an everyday affair, and this has motivated her to be an avid reader and learner, finding solutions to sustainability issues through technical reports, research and sustainability data.

As the sustainability field is still quite nascent in her view, she strongly encourages more corporate leaders and experienced practitioners to offer opportunities to candidates who are passionate but have no hands-on experience. Tracy encourages anyone interested in entering this field, to consider other ways besides upskilling courses. For instance, one can also volunteer for non-governmental organisation (NGO) events, organise youth/social outreach sessions in the circular economy, or simply participate in a beach clean-up. Her words of advice: "Don't be afraid to reach out for help, there are many opportunities to find resources on how to enter this field."

"DON'T BE AFRAID TO REACH OUT FOR HELP, THERE ARE MANY OPPORTUNITIES TO FIND RESOURCES."

Learning points:



Positive attitude



Learning on-the-job



Don't be afraid to ask for help

JOB OPPORTUNITIES IN THE GREEN ECONOMY



As the Green Economy grows in importance, new jobs are emerging and current jobs changing to adopt green practices. The skills we identified earlier are significant within jobs that have shown strong demand over the last four years.

Using data from various job portals and hiring sites collected from 2018 to 2021, the list of Green Economy-related job opportunities and their respective examples of hiring companies are listed below.

S/N	Job Roles with Hiring Opportunities	Examples of Hiring Companies
1	Agri-technologist/Urban Farmer	Commonwealth Greens / Grain International / Blueacres
2	Architectural Specialist/Technologist	Formwerkz Pte Ltd / Fdat Architects LLP / 3PA Pte Ltd
3	Energy Trader	Credit Suisse / The Scoular Company / Surbana Jurong Pte Ltd
4	Environment, Health & Safety Manager	Seagate / Optimum Solutions / Sembcorp Specialised Construction Pte Ltd
5	Facilities Engineer/Manager	Seagate / Capita Pte Ltd - Engineering / Kimberly-Clark
6	Facility/Building Officer/Technician	Capita Pte Ltd - Engineering / Housing Development Board / Jacob
7	Mechanical/Electrical Engineer	Capita Pte Ltd - Engineering / Surbana Jurong Pte Ltd
8	Portfolio Management Analyst	UOB / Great Eastern / Credit Suisse
9	Solar Photovoltaic (PV) Project Engineer/Technologist	Sunpro Energies Pte Ltd / Airswift / Capita Pte Ltd - Engineering
10	Sustainability Manager	Woh Hup Pte Ltd / FirstService PGP Valuation / CBRE

Source: Various job portals and hiring sites. This information is valid as of Oct 2021.

Please see Charting Your Skills Development Journey, p. 58 for information on related courses.

THE CARE ECONOMY

WHAT IS THE CARE ECONOMY?



The **Care Economy** refers to the professional cluster of jobs and skills that provides care and support services involved in the nurturing and teaching of current and future populations. The sectors delivering these services typically involve healthcare, wellness, community care, early childhood (EC), general education, and training and adult education (TAE). This network of care-wellness-learning services supporting human health and potential can be termed broadly as the Care Economy.

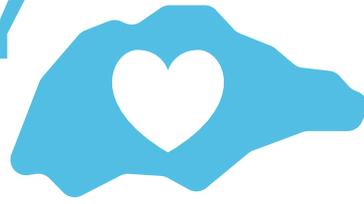


Globally, the Care Economy is one of the fastest-expanding economic sectors, contributing significantly to employment, and economic growth and development. In part, the COVID-19 pandemic has further contributed to this trend, and accelerated the need for a stronger care ecosystem. According to a recent report, almost 40% of job openings in emerging professions by 2022, will be in the Care Economy¹.



¹ World Economic Forum, *Jobs of Tomorrow: Mapping Opportunity in the New Economy*, 2020.

THE CARE ECONOMY IN SINGAPORE



By studying the drivers of growth in the Care Economy, developments in new care models, technological innovations and community resources to meet the increasing needs in Singapore, there are three ways in which impact to jobs and skills are anticipated to occur:

1 Tech enablement to support quality care management, outcomes and empowerment

Technological advancements have afforded new capabilities that enable more accurate diagnosis, intervention and targeted care plans.

On the consumer front, innovative health and learning solutions have empowered consumers to be more proactive in their own wellness and learning management, prompting client-centric design and delivery to become the core of care and learning services.

2 Multi-disciplinary skills and community collaboration to provide more holistic and inclusive care provision

Community partnerships and strong collaborations across different disciplines create and foster stronger networks to provide innovative, integrated and comprehensive services and solutions.

3 Alternate sources of workers as valuable community resources for care organisations

Non-traditional workers and the informal workforce, such as volunteers and part-timers, are important resources to lighten manpower crunches, enhance care services and strengthen engagement within the community; using technology to augment and roll out services is an emerging practice as well.



HEALTHCARE'S FUTURE LIES IN AN INTEGRATED COMMUNITY OF CARE



Ms Chin Wei Jia
Group Chief Executive Officer, HMI Group

A regional healthcare provider with growing presence across Southeast Asia, HMI Group is committed to improving the lives of patients and communities through constant innovation, technological expertise, and advancing human capital. Group CEO, Ms Chin Wei Jia, shares about how the healthcare industry is evolving, and the factors driving its change.

“The increasing convergence of online and offline patient care will be a key driver of future healthcare delivery,” Ms Chin tells us. **“Patients today are more informed and involved with the treatment planning and decision-making process with their doctors. They are already demanding for high quality, seamless navigation, faster access, as well as better unified in-person and virtual care across different healthcare settings,”** she explains.

The COVID-19 pandemic accelerated the shift care delivery towards innovative settings, and exponentially increasing adoption rates for digital health solutions and use of technology in treating patients. More patients are accessing care in a broader range of settings. This includes clinical examinations, therapies, and treatments migrating outside of the hospital setting to primary care, ambulatory care, community and home settings.

Ageing populations have led to more patients with complex health needs needing a continuum of care, meaning that healthcare institutions will have to go beyond focusing on quality of care to also focus on quality of life. **“Healthcare organisations will need to coordinate across care continuums with multidisciplinary capabilities and assistive healthcare solutions, to create personalised approaches that enhances each patient’s journey and maintain independence for as long as possible,”** Ms Chin shares.

The pandemic also exacerbated the global shortage of doctors, nurses, and allied health professionals, and the shortage is expected to increase with the growing number of healthcare and community care facilities built as populations age. Ms Chin adds, **“These factors mean that healthcare organisations will need to be very focused in their approaches to attract, recruit, and prepare talent with the skills needed to thrive in a new, blended work environment.”**

“Healthcare professionals will require digital skills as organisations strive to deliver more personalised care by leveraging technology. We will need a workforce familiar with using data for decision-making, and patient/customer satisfaction—multi-disciplinary professionals capable of engaging patients, their families and caregivers, across treatment and care,” Ms Chin shares. Community engagement and education on healthcare will also come to the fore of healthcare work, as healthcare organisations need to work closely with community partners—engaging diverse peoples, governments, and not-for-profit groups—to best serve the health of communities they operate in. **“This presents an opportunity to build and improve care skills across the different parts of the care economy, fostering a collaborative learning powered by technology,”** Ms Chin affirms.

CHANGING MINDSETS, CREATING PERFORMANCE CONNECTORS

Mr David Yeo
Chairman & CEO, Kydon Group



A digital learning agency, Kydon Group has expanded beyond offering advanced technology solutions and custom digital content to also host a digital learning platform and portal for technology and innovation knowledge. With it operating at the leading edge of education and training, we speak with Kydon's Chairman and CEO, Mr David Yeo, to gain insights to the future of learning in a digital, global workplace.

“Learning digitally is central to education and training today, and it is not simply about putting courses up online,” Mr Yeo shares with us. To be successful, learning professionals need to not just understand the pedagogy, but also be able to exploit technology to provide an optimal learning experience supporting organisations' workforce readiness and development strategies, he asserts.

What this means is that Training and Adult Education Professionals (TAEs) need to be competent learning technologists. Rather than knowing how to code or deploy server infrastructures, they need to possess operating knowledge of how various learning technologies work, and how these can be deployed to serve the learning needs of institutions, organisations, teams, and individuals.

This requires a shift in mindsets among curriculum developers and adult educators, Mr Yeo tells us, as workforce readiness and development is about connecting skills to jobs and therefore learning with performance. Training providers will need to transcend institutional learning for workplace learning, where skills acquisition becomes core.

“Rethink how you want to leverage the capabilities of technology through the design of programmes and learner engagement, as well as how these interactions can lead to real world skills,” he says.

It is also important to understand the modern learner who requires easily accessible yet engaging digital content, as well as interactions going beyond simply content, according to Mr Yeo. He believes that in addition to facilitating learning and delivering content, TAEs will need to develop in their roles to become Learning and Performance Specialists as coaching and mentoring grow in importance to support workplace requirements.

Mr Yeo believes that Singapore can potentially be a beacon of industry in the region as long as its TAEs keep up with innovations available in both the learning and non-learning space, and adopt an outward-looking mindset for innovation to be sustainable.

PRIORITY SKILLS IN SINGAPORE'S CARE ECONOMY

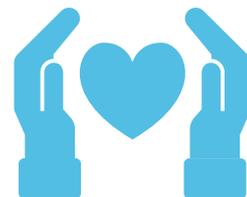


Diagram 11: Top 20 Clusters of Priority Skills for Care Economy



Source of data in graph: SkillsFuture Singapore

There are many clusters of priority skills across Care Economy sectors today. Certain skills are more transferable, as evidenced by the number of job roles and/or sectors that require them. This includes clusters such as *Conduct and Ethics*, *Stakeholder Management*, and *Inclusive Practices*. Conversely, skills such as *Curriculum Design*, *Safety Management Framework*, *Infection Control*, and *Healthcare/Social Policy Formulation/Development* tend to be more sector-specific.

Based on the ranking of priority skills, the top three clusters of skills (i.e. *Conduct and Ethics*, *Stakeholder Management* and *Inclusive Practices*) are required in two-thirds of job roles in the Care Economy (Diagram 11).

Sector-specific skills form the bulk of the other top skills clusters, with at least 25% of the job roles requiring skills in these clusters.

Besides these priority skills, **digital skills** are also fast-emerging in the Care Economy. Digital skills in care focus mainly on tech-lite roles, to develop predictive insights, track efficacy and enhance outreach (refer to insights in The **Digital Economy**).

The top five skills clusters that feature most prominently in Care Economy sectors contain skills that are highly transferable, although each sector may entail unique nuances and requirements from the specific skills.

A closer look at specific skills in each of these five clusters is explored here.

Conduct and Ethics

Care professionals should uphold high standards of ethical conduct, so that the individuals entrusted to them can feel at ease

Skills example:
Ethics, Values and Legislation

Stakeholder Management

Professional advisement and unprejudiced consultations are necessary in helping care recipients make well-informed decisions

Skills example:
Stakeholder Engagement and Management

Change Management Framework

Change is constant and frameworks are needed to manage such developments

Skills example:
Change Management

Reflective Practice

Care professionals should engage in regular reflection to assess their own skills and abilities, as they develop and improve their professional practice

Skills example
Reflective Practice for Educators

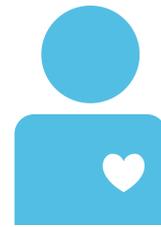
Inclusive Practices

Care professionals collaborate for the good of care recipients, regardless of diversity in their backgrounds and needs

Skills example:
Diversity Awareness and Management



CARE JOBS AND SKILLS IN HEALTHCARE



As Singapore's population ages, personalised care is gaining importance in striving to meet every patient's unique medical needs and history. Healthcare professionals need to have relevant skills in *Management of Stakeholders*, *Continuous Improvement Management* and *Service Quality Management*, in addition to skills that uplift professionalism, such as *Clinical Teaching and Supervision*, to bring about essential changes in patient-care delivery, education and experiences (Diagram 12).

Diagram 12: Priority Skills supporting Care Economy in Healthcare Sector



Source of data in graph: SkillsFuture Singapore

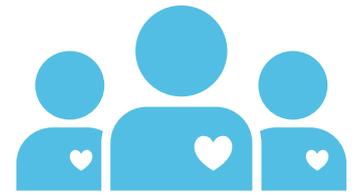
FEATURE: A DAY IN THE LIFE OF AN ASSISTANT NURSE CLINICIAN

1 Manage patient-centred care for patients with complex clinical conditions, using evidence-based care and in collaboration with inter-professional teams

2 Participate in quality and patient safety activities by leading clinical risk and quality improvement initiatives

3 Provide clinical supervision by maintaining a conducive environment for new nurses to learn, through delegation of appropriate work tasks, supervision support and coaching

CARE JOBS AND SKILLS IN COMMUNITY CARE



Community care plays an important role in complementing primary healthcare providers. They enable seniors to age in places with care flexibility at day-care centres, and in their homes. This requires strong collaboration from various stakeholders to ensure a well-networked system that provides assistance to seniors in a timely and coordinated manner, as well as regular engagements between family members and care-givers to ensure continuity of care.

Clinical and Therapy-related Skills

- Client Health Status
- Pain Management
- Tube Feeding
- Instrumental Activities of Daily Living
- Mobility Training
- Training for Independent Living

Care and Services Skills

- Client Empowerment
- Community Integration
- Facilitation of Client and Care-giver Training
- Relationship and Emotional Support
- Service Coordination

Business Development and Management Skills

- Customer Service
- Coaching and Training
- Resilience and Self-care
- Volunteer Management
- Workplace Information Technology

Source: Agency for Integrated Care and SkillsFuture Singapore

FEATURE: A DAY IN THE LIFE OF A CARE MANAGER



1 Take responsibility for the order, safety and cleanliness of the care environment for, and the provision of personal care assistance to, clients in their daily living



2 Support healthcare and social service teams in the development and review of client-centric plans, and partner care-givers in the delivery of the care plans



3 Design and conduct programmes and activities for clients, promoting independence, health, wellness and quality of life

CARE JOBS AND SKILLS IN SOCIAL SERVICE



With an ageing population and other demographic changes, the social service sector in Singapore has grown to support individuals in need across five service areas: (i) children and youth; (ii) people with disabilities and special needs; (iii) families and care-givers; (iv) people with mental health issues; and (v) seniors.

To serve such diverse social groups, social service professionals need to keep abreast with trends (*Trends Evaluation and Application*) and collaborate with the community and other professionals across disciplines to design and deliver holistic services. Diagram 13 shows a list of the other priority skills for the sector.

Diagram 13: Priority Skills supporting Care Economy in Social Service Sector



Source of data in graph: SkillsFuture Singapore

FEATURE: A DAY IN THE LIFE OF A SENIOR YOUTH WORKER



1 Evaluate trends and apply relevant insights to enhance community development work



2 Collaborate with community and partner organisations across disciplines to build strategic relationships for more effective delivery of youth programmes



3 Develop, implement and evaluate social service programmes to ensure effective youth outreach

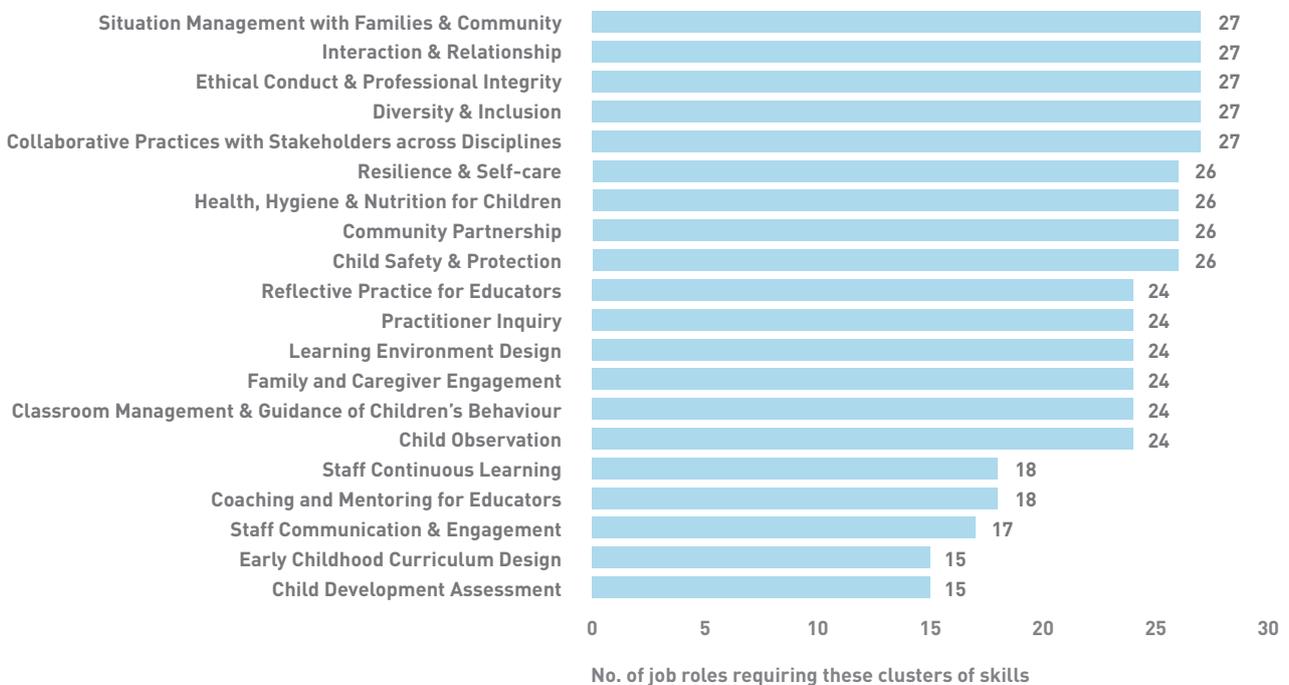
CARE JOBS AND SKILLS IN EARLY CHILDHOOD



Good early childhood education creates a positive impact on a child’s development, and contributes to his/her overall growth. Early childhood educators play an important role to create a secured, nurturing and inclusive environment, where children with diverse backgrounds can be encouraged to learn. To provide holistic care, strong collaborations among families, community and multi-disciplinary professionals are required.

At the professional level, educators will also need to engage in *Staff Continuous Learning* and *Reflective Practice for Educators*, to continually enhance their skillsets (Diagram 14).

Diagram 14: Priority Skills supporting Care Economy in Early Childhood Sector



Source of data in graph: SkillsFuture Singapore

FEATURE: A DAY IN THE LIFE OF A PRESCHOOL EDUCATOR



1 Adopt a proactive and intentional approach in strengthening collaborative practices with families, community and stakeholders across disciplines



2 Create a diverse and inclusive environment for children, with developmentally and culturally-appropriate curricula



3 Engage in regular reflective practices to analyse areas for professional practice improvements

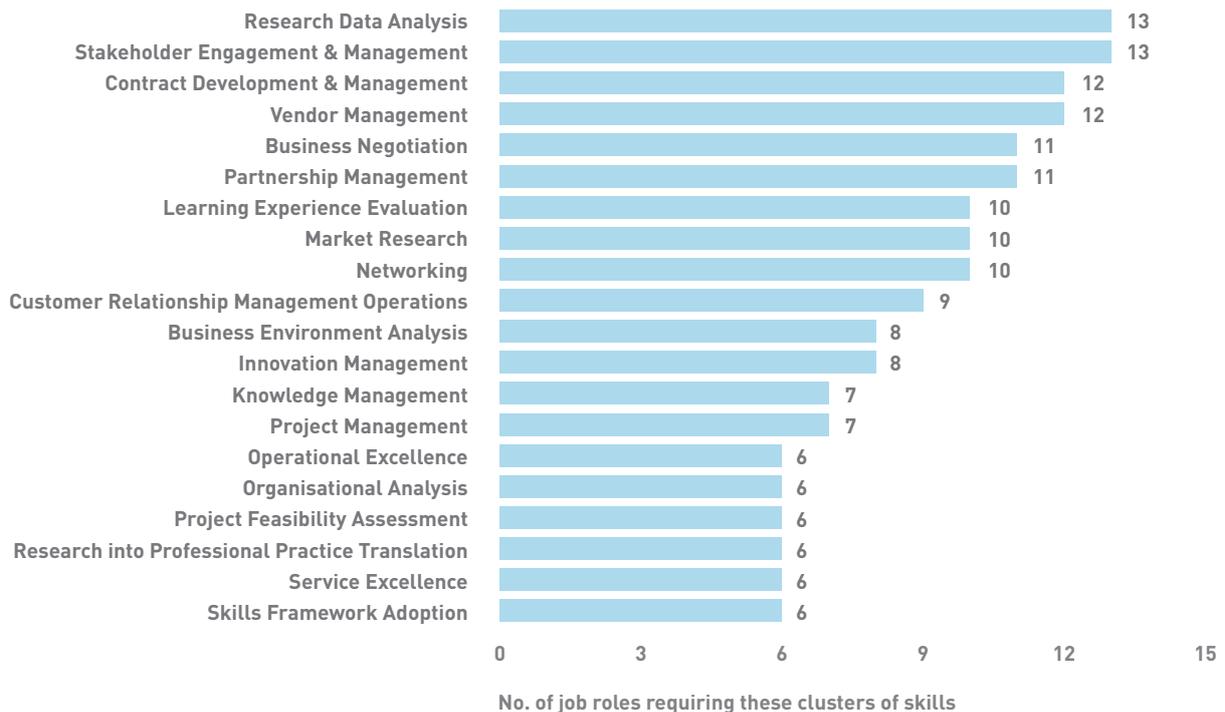
CARE JOBS AND SKILLS IN TRAINING & ADULT EDUCATION (TAE)



Organisations value skilled talents who grow and improve their workplace effectiveness with refreshed and/or newly-acquired skills. TAE professionals play a pivotal role in facilitating the transfer of learning, and the effective acquisition of skills.

This is achieved by applying skills such as *Business Environment Analysis* and *Organisational Analysis* to study the organisation's business strategies and talent profiles. Priority skills such as *Innovation Management* and *Learning Experience Evaluation* also enable TAE professionals to customise learning experiences and create positive learning experiences (Diagram 15).

Diagram 15: Priority Skills supporting Care Economy in Training & Adult Education Sector



Source of data in graph: SkillsFuture Singapore

FEATURE: A DAY IN THE LIFE OF A LEARNING CONSULTANT



1 Perform business environment analyses to identify business trends impacting clients' organisations



2 Analyse data on organisation performance and learners' profiles, to design and evaluate appropriate learning interventions



3 Identify potential learning technologies and systems that can enhance learning effectiveness

MAKING AN IMPACT

**Ms Elysa Chen,
Executive Director**

As a journalist, Elysa had the privilege to meet people and learn about their life stories. She was moved by the motivation and grit behind these stories, and often found herself wanting to go back to help them. However, she realised that such help may be limited and began looking for a role that would allow her to journey with them. She realised that, to help children, it would take a larger ecosystem with the infrastructure necessary to guide them and their families; providing for suitable home environments for the children to thrive. "In 2017, I made the natural move to social service, excited to be part of this big picture."

When Elysa first joined CampusImpact, she put herself through many different training programmes, which helped her better understand the social service sector, raise funds more effectively, and even understand clinical interventions such as cognitive behavioural therapy. She took the initiative to join community gatherings and social service programmes where she built a network of friends amongst the Social Purpose Entities (SPEs) who shared valuable experiences with her.

"My previous experience as a journalist prepared me with skills in engaging the children and their families to understand their needs. My formal education in communication was very useful, as it gave me the skills to think about available channels that I can leverage to strengthen our outreach



efforts through social media, collaterals and our website. I am also able to build on my experiences as a volunteer to facilitate discussions among my colleagues, and put to good use the active listening skills I have gained in the course my career."

Looking back on her own experiences, Elysa recognises that there may be a sense of inadequacy when anyone first transits to a new job, but she believes that experiences from work and life come in handy even in this transition to a new role. It is important to keep an openness to learn and grow, even more so for those in leadership roles.

"Know who you are and what your strengths are – your experiences and skills from other industries will give the social service sector a much needed perspective, and will help us grow. Remember your calling to serve."

"KNOW WHO YOU ARE AND WHAT YOUR STRENGTHS ARE – YOUR EXPERIENCES AND SKILLS FROM OTHER INDUSTRIES WILL GIVE THE SOCIAL SERVICE SECTOR A MUCH NEEDED PERSPECTIVE, AND WILL HELP US GROW."

Learning points:



Growth mindset



Build a wide set of skills



Leverage past experiences



SERVING IN A DIFFERENT LIGHT

Ms Jaya Latchime d/o Mutusammy, Clinic Assistant

Jaya was working as a customer service officer in the aviation industry for 10 years before moving to a finance administration role in a logistics company. Back at home, she was the main caregiver for her late father who was wheelchair-bound, accompanying him for medical visits and tending to his needs in the hospital. She found fulfilment in helping him and extending a helping hand to other patients who stayed in the same ward. She recognised that it was not possible for nurses to be at the bedside round-the-clock, and that the healthcare sector is in need of manpower. To her, “looking after someone is heart-warming, and that prompted me to move into healthcare”.

In 2019, she decided to take up a course under the WSQ for Healthcare Support Framework. While on the course, she took the initiative to take up a part-time job at a clinic so that she could gain actual experience. She eventually secured a role as clinic assistant upon graduation and one year on, she was assessed to be suitable for her next progression.

Currently, Jaya is taking a course in phlebotomy, again on her own initiative, because she feels that it would be a helpful skill to have in the clinic, and she can help out in other areas of work. She is also taking up a training programme in ‘Healthy Ageing and Community Care for Seniors’, to better prepare herself for new work requirements, as clinics start offering more holistic and one-stop

services. In turn, her employer supports her with work schedules that support her studies while balancing the operational needs.

At the workplace, Jaya feels that customer service skills are very important to establish good relationships with the patients, their families as well as her own colleagues. Her attitude towards work is that one should stay organised to see to the end of their tasks and ‘never say die’. She believes in paying forward, and she contributes as a mentor under the ‘Generation’ programme to provide support and guidance to trainees who are joining the sector.

“Love what you do and you will go far. Trust yourself that you can do it.”

“LOVE WHAT YOU DO AND YOU
WILL GO FAR. TRUST YOURSELF
THAT YOU CAN DO IT.”

Learning points:



Learning is a continuous journey



Widening our knowledge can add value to our work



Believe that you can do it

JOB OPPORTUNITIES IN THE CARE ECONOMY



With the growing significance of the Care Economy, alongside Singapore's ageing population, and a constant need for childcare and education, demand for workers in the Care Economy is growing rapidly. The skills identified earlier have been found in care jobs with strong demand over the last 4 years.

Using data from various job portals and hiring sites collected from 2018 to 2021, the list of Care Economy-related job opportunities and their respective examples of hiring companies are listed below.

S/N	Job Roles with Hiring Opportunities	Examples of Hiring Companies
1	Courseware Developer	Combuilder Pte Ltd / Quincus Pte Ltd / Credit Suisse AG
2	Teacher Aide	Odyssey the Global Preschool Pte Ltd / My First Skool / Sunflower Childcare Group Pte Ltd
3	Staff Nurse	Ng Teng Fong General Hospital / Institute of Mental Health / Parkway Shenton Pte Ltd
4	Senior/Research Associate	Nanyang Technological University / Singapore General Hospital / National Cancer Centre Singapore Pte Ltd
5	Occupational Therapist	Movement for the Intellectually Disabled of Singapore (MINDS) / Kwong Wai Shiu Hospital / Lakeside Family Services
6	Preschool Teacher	Pat's Schoolhouse / Star Learners Respect Pte Ltd / Genesis Child Care (TP) Pte Ltd
7	Learning Support Executive	Nanyang Technological University / Aural-Aid Pte Ltd / Spurwing Communications
8	Nurse Manager	Tan Tock Seng Hospital Pte Ltd / Fei Yue Community Services / The Oral Care Centre
9	Programme Manager	Fei Yue Community Services / Singapore Association for Mental Health / OnePeople.sg
10	Patient Service Associate	National Healthcare Group Polyclinics / National Health Centre of Singapore Pte Ltd / National Cancer Centre Singapore Pte Ltd

Source: Various job portals and hiring sites. This information is valid as of Oct 2021



CRITICAL CORE SKILLS FOR THE FUTURE OF WORK



CRITICAL CORE SKILLS FOR THE FUTURE OF WORK



Beyond the technical skills covered in the earlier sections, there is also an increasing emphasis on soft skills for the future of work. A 2019 study¹ involving approximately 80 organisations across 28 sectors, revealed that more enterprises are beginning to recognise that soft skills support their employees' performance and business competitiveness.

wide range of sectors, soft skills such as *Creativity*, *Persuasion*, *Collaboration* and *Adaptability* are most in demand by employers today.

SSG has identified 16 most in demand soft skills, which we term the **Critical Core Skills (CCS)**, or skills-to-build-skills. These 16 CCS are further organised into three clusters:

With automation and digitalisation driving business transformations and job content changes across a

Thinking Critically

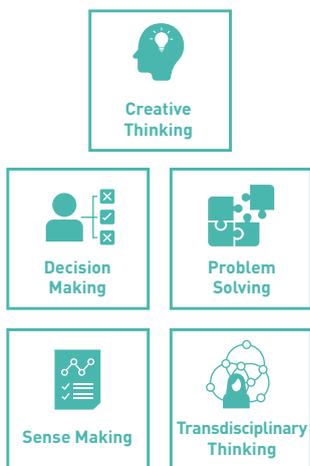
These are cognitive skills needed to think broadly and creatively, in order to see connections and opportunities in the midst of change. Cognitive skills are the root of technical skill development and progression.

Interacting with others

Being effective at interacting with others means thinking about the needs of others, as well as being able to exchange ideas and build a shared understanding of a problem or situation. Increasingly, individuals need to be able to combine their technical skills with others to succeed.

Staying Relevant

Managing oneself effectively, and paying close attention to trends impacting work lives, helps create strategies, direction and motivation for technical skill development.



Thinking Critically



Interacting with Others

Skills to Build Skills

The 16 CCS competencies can be found at the following website:
www.skillsfuture.gov.sg/skills-framework/criticalcoreskills



Staying Relevant



ROBOTICS

RENEWABLE

CHARTING YOUR SKILLS DEVELOPMENT JOURNEY

HEALTH

COMPUTING

ENERGY

CHARTING YOUR SKILLS DEVELOPMENT JOURNEY



Investing in your skills development

The three economies covered in the earlier sections illustrate new opportunities and the changing landscape of jobs and skills, as Singapore charges ahead in our economic transformation. With SkillsFuture initiatives rolled out across all the sectors, and for all segments of workforce, citizens and enterprises are empowered to take charge of the skills development journey.

This report provides timely information to help you make informed decisions on business directions, careers and professional development plans.

Here are a few useful tips for your skills development journey:



1 Take account of your personal skills stock

It is important to be aware of what skills you already possess, and are skilful in. There are a number of ways to do so: (i) review the priority skills in this report and compare them against your personal skills stock to identify skills to invest in; and (ii) create a LinkedIn account, articulate your skills within your account profile and compare with what is demanded in job vacancies.



2 Initiate conversations with your manager/Speak with a SkillsFuture Skills Ambassador

Have a personal development conversation with your manager to understand your employer's skills need, and secure support for your skills development. Alternatively, you may want to register an appointment with a SkillsFuture Skills Ambassador to discuss your career-learning plan.



3 Sign up for courses for reskilling or upskilling needs

Visit MySkillsFuture to search courses that match your skills needs. Evaluate the course schedule, course fees, and the course rating. Select one that matches your needs. You can find out about course fee subsidies that you are eligible for. You can also check out credible massive online open courses (MOOC) providers for online learning modalities.



4 Practise the skills learnt at work

Skills learnt must be put to use at work in order to upkeep the proficiency. It is advised to identify and create opportunities to use your newly learnt skills at work. Translating skills learnt to solve workplace problems is an effective way to practice the skills and enhance your performance.



5 Keep track of emerging trends in the sector you are working with

Keep track of emerging trends of the sector you are working with regularly. Subscribe to notifications from education and training institution(s) that specialise in the domain you are interested in. Join regular networking sessions with professionals in your sector.

TAE PERSPECTIVES ON SKILLING IN THE FAST-CHANGING ECONOMIES

Mr Prateek Hegde, CEO, Generation Singapore, a Singapore charity that works to prepare, place and support job seekers into life-changing careers

Within the Green, Digital and Care Economies, there are growing trends impacting jobs and skills, not just in Singapore, but around the world. "We see rapid evolution in technology and digital tools in every industry. Hence, focusing on learning every single tool and skill required for the job may not be the best strategy for job seekers. Instead, focus on a strong set of core skills required for the function/sector, with lots of real-life experiences (internships, projects, freelancing) to highlight transferable skills and strengths."

For the job seekers, it can be difficult for them to navigate the fast-changing developments, identify and seize the right opportunities. "Job seekers are often confused while choosing jobs or training programs; usually they end up making choices based on availability and attractiveness only, without truly considering their own backgrounds, career histories and what they might like in a workplace. As a result, many job seekers decide to

drop out of the sector at the end of the training, or within months in the job as they realise they don't enjoy the role as much as they had anticipated."

Many job seekers seem to be unaware of certain, avoidable mistakes in their efforts, which are costing them more opportunities than necessary. "There is no shortcut to acquiring all the technical skills required for the job, other than engaging in actual work. Most training programs can only build a strong foundation in some areas, but the rest is typically picked up on the job after starting work... We often see job seekers failing to get selected as they show a lack of self-confidence (from limited technical knowledge), and fail to persuade that they can pick up new skills after joining the company."



Prof. Susanna Leong, Vice Provost (Masters' Programmes & Lifelong Education); Dean (School of Continuing and Lifelong Education), National University of Singapore (NUS)

The concept of what it means to be 'relevant and competitive' is rapidly changing, along with the definition of the 'global workforce'. To tackle these shifts, NUS employs an outside-in strategy, to take what is happening 'outside' and draw that back into the programme design. "We engage industry to understand their needs. They (industry) identify the job roles, where our graduates can go after they finish with the programmes."

Real-world problems are also incorporated into the learning. "We are very insistent that our students actually work on real-world problems; these are projects from companies. By working closely with the companies, and then getting our students to work on those solutions, we also hope those solutions will also result in enterprise

transformation for the companies, because they have real issues and real pain points to address."

Complementing their range of CET courses, the NUS career+ mobile app further helps learners plan for their careers in a skills-based economy. Using artificial intelligence (AI) and big data analytics, NUS career+ features skills-based matching and personalised skills profiles to help learners identify their skills gaps and build their learning plans and career readiness.



WHERE TO FIND THE RIGHT COURSES?



The following are suggested courses you can consider, to expand your skillsets and access the many exciting opportunities in the Green Economy, Digital Economy and Care Economy. Please visit [MySkillsFuture.gov.sg](https://myskillsfuture.gov.sg) for more course information.

Digital Economy	IHL / Training Provider
Introduction to Data Analytics	Nanyang Polytechnic
Product Managers and Designers Research Toolkit	Ngee Ann Polytechnic
Digital Economy Innovation Programme (Breakthrough Technology)	Nanyang Technological University
Digital Business Analysis	National University of Singapore
Cloud Architecture Fundamentals (for Financial Sector)	Singapore Management University
Software Engineering	Singapore University of Technology and Design
Become a Digital Marketing Specialist	LinkedIn Learning
NICF – Develop Applied AI Solutions	Lithan Academy
Developing Digital Marketing Programme	Singapore Institute of Retail Studies



Please visit www.linktr.ee/digitaleconomycourses for more course information.

Green Economy	IHL / Training Provider
Sustainable Energy Systems	Institute of Technical Education
Solar Photovoltaic (PV) System Know-How	Singapore Polytechnic
MLC – Foundation in Aquaculture Technology	Temasek Polytechnic
Waste Heat and Waste Cold Energy Recovery and Utilisation	Nanyang Technological University
Maintainability and Green Facility Management	National University of Singapore
Solar Energy Systems for Built Environment Professionals	National University of Singapore
Introduction to Energy Efficiency & Energy Audit	Singapore Institute of Technology
Sustainable Finance & Impact Investing: Risks and Opportunities Arising from Environmental, Social & Governance Issues	Singapore Management University
Carbon Management – Development of Carbon Footprint Reduction Roadmap	Singapore University of Social Sciences
Green Architecture and the Integrated Design Process	BCA Academy



Please visit www.linktr.ee/greeneconomycourses for more course information.

Care Economy	IHL / Training Provider
Certificate of Competence in Dementia Care & Smart Solutions	Institute of Technical Education
Digital Health and Health Informatics	Nanyang Polytechnic
Specialist Diploma in Integrated Care Management	Republic Polytechnic
Coaching & Case Management with Older Adults	Temasek Polytechnic
Analytics for Better Health	National University of Singapore
Drive a Highly Engaging Online Learning Experience	Institute for Adult Learning
Introduction to Mentoring for the Workplace	National Centre of Excellence in Workplace Learning (Nanyang Polytechnic)
Immediate Care Area Nursing Course	Singapore General Hospital
Practising Person-Centred Care Approach	Social Service Institute

Please visit www.linktr.ee/careeconomycourses for more course information.



WHERE TO FIND THE RIGHT COURSES?



Critical Core Skills	Resources / LinkedIn Learning Curated by NLB*	Links
Decision Making	Decision-Making in High-Stress Situations	www.go.gov.sg/2asdzh 
Decision Making / Problem Solving	Develop Critical-Thinking, Decision-Making, and Problem-Solving Skills	www.go.gov.sg/5t2ljd 
Problem Solving / Creative Thinking	Take a More Creative Approach to Problem-Solving	www.go.gov.sg/r7mwsv 
Building Inclusivity	Skills for Inclusive Conversations	www.go.gov.sg/5gvzkc 
Communication	Communicating with Empathy	www.go.gov.sg/poyag0 
Influence	Develop Your Communication Skills and Interpersonal Influence	www.go.gov.sg/k8pg9q 
Collaboration	Collaboration Principles and Process	www.go.gov.sg/6tvst0 
Global Perspective	Managing Globally	www.go.gov.sg/hti87s 

* All NLB members can enjoy free access to LinkedIn Learning for Library courses after logging in with myLibrary username and PIN (your year of birth in YYYY format). Here are the steps to log in:

1. Click on the link in this article for the course you are interested in.
2. Click on "Sign in with your library card".
3. You will be asked to enter your Library ID or custom invitation link. Enter "nlb" or "www.linkedin.com/learning-login/go/nlb" in the field requested.
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NATIONAL CENTRE OF EXCELLENCE FOR WORKPLACE LEARNING (NACE)



Supported by SSG, the National Centre of Excellence for Workplace Learning (NACE) was first established by Nanyang Polytechnic (NYP) in 2018 as a collaboration with the Swiss Federal University for Vocational Education and Training (SFUVET), Singaporean-German Chamber of Industry and Commerce (SGC) and the German Chamber of Industry & Commerce (IHK Akademie). NACE aims to help organisations put in the right internal structures and processes, so that learning is carried out in a structured and systematic way.

Best-in-class Practices: NACE worked with partners, including the Swiss Federal University for Vocational Education and Training, the German Chamber of Industry and Commerce (IHK) for Munich and Upper Bavaria, IHK-Exportakademie GmbH, and the Singaporean-German Chamber of Industry and Commerce to get the very best practices for these structures.

Organisational Contextualisation: As each company and workplace is different, contextualised and targeted implementation is needed for each organisation. NACE works closely with organisations to ensure that both the organisations' and employees' needs are met.

Specialised Training for Individuals: NACE also develops Workplace Learning (WpL) champions, who empower fellow colleagues on their lifelong learning journey. **Critical Core Skills** are imbued within the curriculum, like *Building Inclusivity*, *Collaboration*, *Communication*, and *Developing People*, while learning about WpL. These soft skills are highly sought after in today's market, and trained experts can further develop as workplace coaches, bringing along their WpL expertise when switching industries.

National Certification: To recognise organisations that have put in place the structures and capabilities for sustainable WpL practices, there is a National WpL Certification initiative. This certification helps local organisations identify and close gaps in their WpL systems, to enhance their business' competitiveness and improve employee retention rates.

Today, there are NACE centres – at the Singapore Institute of Technology, the Institute of Adult Learning under the Singapore University of Social Sciences, Ngee Ann Polytechnic, Republic Polytechnic, Singapore Polytechnic and Temasek Polytechnic – so that, nationally, at least 1,200 organisations can adopt WpL by 2025.

A company that puts in WpL to grow staff competencies see higher retention rates. Deep organisational knowledge is also systematically kept and documented this way. Organisations keen to embark on a workplace transformation journey, or individuals keen to develop expertise in WpL, can contact NACE to explore the suite of available services and solutions.

For more details, please visit: www.skillsfuture.gov.sg/nace or call 6550 0154.



RESOURCES TO SUPPORT YOUR SKILLS DEVELOPMENT



SSG offers a range of resources, tools, programmes and initiatives to help individuals identify and acquire the necessary skills to facilitate employment, improve job performance and adapt to job content changes in the midst of technological advancements and business operating model shifts. Here are some of our resources to build a viable, long-term professional development skills strategy.



Jobs-and-Skills Insights Resources

Make use of our JSI resources to keep abreast of trends impacting jobs and skills in Singapore

Jobs-Skills Insights Webinars

- for Individuals
- for Enterprises



www.go.gov.sg/yqynxs

Contact us at ssgsdg.bd@gmail.com to be added to our eDM contact list.

Jobs-Skills Insights Commentaries

- for Individuals

Follow SkillsFuture Singapore on LinkedIn, Facebook, and Instagram

Jobs-Skills Insights on SSG portals

- for Individuals
www.myskillsfuture.gov.sg/content/portal/en/career-resources/career-resources.html
- for Enterprises
www.sfec-microsite.enterprisejobskills.gov.sg/jsi
- for Training Providers
www.tpgateway.gov.sg/plan-courses/jobs-skills-insights



RESOURCES TO KICKSTART YOUR SKILLS DEVELOPMENT



Skills Information Resources

Singapore Skills Framework

- for Individuals
- for Enterprises
- for Training Providers



www.skillsfuture.gov.sg/skills-framework



Advisory Services

SkillsFuture Advice (SFA)

- for Individuals



www.skillsfuture.gov.sg/advice

Skills and Training Advisory (STA) Services

- for Individuals



www.go.gov.sg/registration-sta



Programmes and Initiatives

SkillsFuture Series

- for Individuals



www.skillsfuture.gov.sg/series

SkillsFuture Work-Study Programmes

- for Individuals
- for Enterprises



www.skillsfuture.gov.sg/workstudy

WSG Career Conversion Programmes

- for Individuals

www.wsg.gov.sg/programmes-and-initiatives/career-conversion-programmes-individuals.html



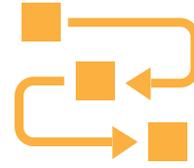
- for Enterprises

www.wsg.gov.sg/programmes-and-initiatives/career-conversion-programmes-employers.html





METHODOLOGY



How does SSG's Jobs-Skills Analysts identify priority skills and emerging job roles across economies?

Dynamic Data Sources

Jobs-Skills Analysts (JSAs) conduct research on dynamic Business, Labour, and Market intel relating to in demand and emerging jobs and skills...

1 Desktop Research

SSG's Jobs-Skills Analyst



SSG's Jobs-Skills Repository

...supported by SSG's Jobs-Skills Repository, a comprehensive database of jobs and skills-related data which is organised using the Singapore Skills Taxonomy and captures the 34 Singapore Skills Frameworks.

2 Information Synthesis

Research breadth: Cross-platform Analysis

JSAs work across a multitude of knowledge platforms to triangulate, connect the dots and distil insights on jobs and skills...

Research depth: Validating Data

...and validate the insights with multiple stakeholders to confirm their veracity and robustness, before sharing these insights with the public.



SSG's Jobs-Skills Analyst

GLOSSARY OF TERMS



Terminology	Definition
Artificial intelligence (AI)	A simulation of human intelligence processes by machines, especially computer systems. Examples of AI applications include natural language processing, visual and speech recognition.
Brown activities	Business activities that entail (potentially) harmful environmental effects.
Care Economy	An economy that is based on a professional cluster of jobs and skills that provides care and supports services involved in the nurturing and teaching of current and future populations.
Circular economy/ Circularity of resources	A concept and model of production and consumption, involving reusing, repairing, refurbishing and recycling existing materials and products for as long as possible.
Critical Core Skills	A unique set of 16 core skills identified by Singapore employers as the most critical to thrive in future economy.
Digital Economy	An economy that is based on digital computing technologies, based on interconnecting people, organisations and machines through the Internet, mobile technology and the internet of things (IoT).
Digital skills	Skills that support digitalisation in tech-lite and tech-heavy job roles.
Environmental, Social and Governance (ESG)	An evaluation of an organisation's collective conscientiousness for social and environmental factors. ESG is usually represented as a score, calculated from specific metrics.
Green Economy	An economy that strives to achieve environmental, economic and social outcomes to take care of the environment and use the limited resources as efficiently and sustainably as possible.
Green/Greening activities	Business activities which reduce or eliminate pressures on the environment and/or making more efficient use of natural resources.
Green Mark Certification	A scheme launched by the Building and Construction Authority of Singapore (BCA), in conjunction with a green building rating system, to evaluate new and existing building's environmental impact and performance.
Industry Transformation Maps (ITMs)	Roadmaps developed under the Singapore Ministry of Trade and Industry to drive industry transformation. Each ITM consists of a growth and competitiveness plan, supported by four pillars: productivity, jobs and skills, innovation and trade and internationalisation.
Jobs-Skills Insights (JSI)	Information resources produced by SSG to help stakeholders make informed decisions on employment, career and professional development. Examples of JSI include: (i) key sector trends; (ii) jobs and skills in demand.
Nascent	A word used to describe an organisation or process that is just coming into existence and beginning to display signs of future potential.

Terminology	Definition
Net-zero carbon emission	The state achieved by balancing carbon dioxide emissions with its removal or by eliminating emissions from processes associated with transportation, energy production, agriculture, and industry. Also commonly referred to simply as 'net-zero' or 'carbon neutrality'.
Priority skills	Skills that are important to the economy and sectors within.
Sustainable/Sustainability	Sustainable/sustainability refers to activities “that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Source: UN)
Tech-Heavy Job Roles	Job roles that use existing products to deliver tech products or services (e.g. IT infrastructure) and also use technology to create, build, and scale products. (Source: IMDA)
Tech-Lite Job Roles	Job roles that use tech products/solutions to achieve a business outcome e.g. digital marketers, business/data analysts, SEO specialist. (Source: IMDA)
Technical skills	Skills that enable individuals to fulfil their roles and responsibilities competently, and to perform the key tasks of their jobs.

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This publication was put together to help fellow Singaporeans prepare and position themselves in the areas of growth. We would like to know whether this report has been useful to you, and what types of jobs and skills insights you would like to see more of in future.

We greatly appreciate any input you care to share via our online feedback form.



[www.go.gov.sg/
ssgskillsdemandreport2021](http://www.go.gov.sg/ssgskillsdemandreport2021)
