PP17630/12/2012(031478)

MiGHT
Malaysian Industry-Government Group for High Technology

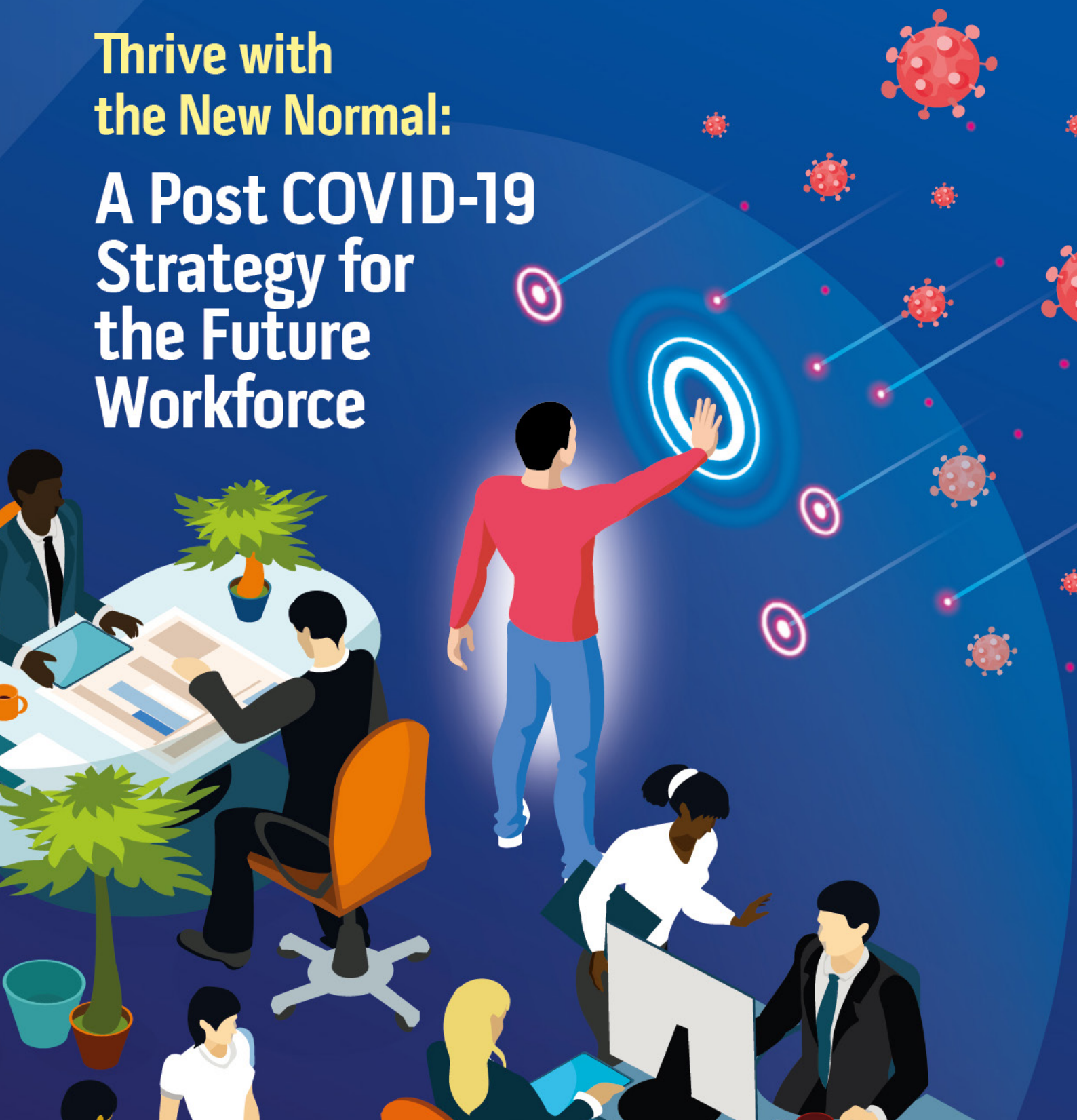
myForesight® 35

edition 1/2022

MALAYSIA'S NATIONAL FORESIGHT MAGAZINE

Thrive with the New Normal:

A Post COVID-19 Strategy for the Future Workforce



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35th Edition | **1/2022**

PUBLISHED BY
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myForesight

PP176630/12/2012(031478)

myForesight® is pioneering a national level foresight initiative to facilitate technology prospecting for local businesses. myForesight® advises and provides a common platform for the government, industry and academia to share experience, insights and expertise on 'futures' strategy, both locally and at a larger global level.

Key components of myForesight's mission are intelligence, research, competency framework and community engagement. myForesight® raison d'etre is set out to accomplish the following:

1. Anticipate Malaysia's future possibilities;
2. Promote foresighting at national, sectoral and corporate levels;
3. Identify key technologies to support sectoral development;
4. Outline key future R&D areas.

Editor's Note

by: **Rushdi Abdul Rahim**
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Initial Thoughts

The Future of Work. Are We Prepared?

Greetings and Salutations,

For this edition we are revisiting a topic that we did back in 2016. Other than a continuous review on our part, the pandemic brought about a rethinking of the future of work–expediting work transformation with work practices formed during the crisis becoming our new normal.

Prior to the pandemic, the conversation on the future of work revolved around disruptive technologies and the Fourth Industrial Revolution (4IR). There were mixed headlines –proclaiming millions of jobs will be lost or technology could wipe out humanity. However the World Economic Forum published reports on how the 4IR is creating more jobs than destroying it, and up to 85% of the jobs that will exist in 2030 haven't even been invented yet.

And then the pandemic hit. According to the International Labour Organization (ILO), the resulting lockdown caused 114 million people globally to lose their jobs in 2020. Although millions have returned to work, the ILO does not expect things to return to pre-COVID levels. This is also true in Malaysia, as jobs lost during the pandemic are not refilled because of the much-changed employment landscape. Datuk Dr Syed Hussain Syed Husman, President of the Malaysian Employers Federation said that the shift to remote working, digitalization, and automation of some occupations in industries such as hospitality, leisure and food & beverage have curtailed labour demand in these areas.

Has our outlook for the future of work changed?

Not really. What the pandemic did was expedite automation, digital transformation, and technology adoption, and brought about changes that could possibly be here to stay. Are we ready? Well, not according to a study by Gartner that cites only 9% of Chief Human Resources Officers agree that their organization is prepared for the future of work. This raises the question; what are the factors that affect organization preparedness for future of work? Our conversations with several leaders, management teams of various organizations have given us some insights. There are a number of factors cited, however for the next 10 years, these are the top five main drivers shaping organization preparedness future of work.

Employees need to start preparing themselves by having the right workplace skills, essential for the future of work–tech skills, flexibility & adaptability, data literacy, critical thinking and innovative are amongst the most cited skills required.

Technology

Technology will be the main driver to the future of work as its adoption and application creates new opportunities and risks for both employers and employees. Technology advancement allows for ease of doing work, increase productivity whilst replacing routine work. Regardless of the time horizon, technology is advancing at an increasing rate and will be a dominant influence in the way people work. Therefore, the ability to use and apply technology has a major impact in preparation for the future of work.

Infrastructure

Post-pandemic, the design of future workplace will be people-centric with health and wellbeing of the employees given priorities, incorporating the use of technology to allow employees the ability to work from anywhere that allows for flexible working practices. This also makes collaboration and multiple teams working together more accessible. The availability or the absence of the right infrastructure will determine preparedness for the future of work.

Culture & mindsets

Culture is growing in importance as organizations move into the phase of getting employees to fully return to the workplace or create a new hybrid work model. We ask the question–is the current organization culture still relevant today as it was 10 years ago? However, cultures don't shift overnight. Leadership acceptance, intergenerational gap, trust issues and archaic working practice pose a stumbling block for organizations' transition to work of the future. How employers and employees navigate and overcome this will ensure their preparedness.

Policies

Laws and policies have shifted during the pandemic. National level policies are being developed to address gaps in what would be needed to drive a "human-centered" agenda for the future of work as well as deliver economic security, equal opportunity, and social justice in the years to come. However, this also must be translated into organizational policies, allowing for the right culture, work practice to take hold. Yet most organizations that we talked to still have not fully developed the necessary policy actions to prepare for the future of work.

Skills & competencies

Gartner found that the skills required for a single job was increasing by 10% annually, and now the pandemic is already reshaping the way the workplace operates. Therefore, employees need to start preparing themselves by having the right workplace skills essential for the future of work where tech skills, flexibility & adaptability, data literacy, critical thinking and innovative are amongst the most cited skills required. Having employees with these critical skills are vital to organizations' preparedness for the future of work.

As said, even before the pandemic, there were already shifts in work, workforce and workplace. However now, new tasks and responsibilities emerged suddenly, outdating role titles and definitions. Work trends driven by COVID-19 — such as remote work and rapid digital transformation — are all accelerating these shifts.

Are you prepared? Try fulfilling the preparedness of the previous five factors cited.

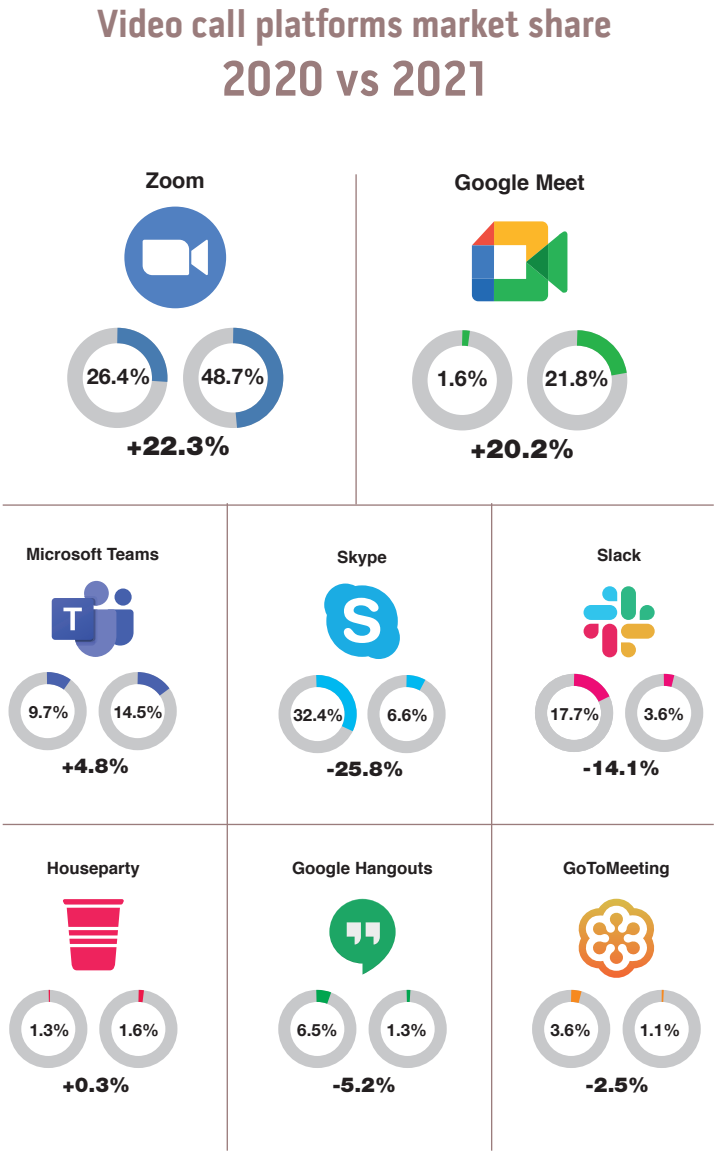
I look forward to hearing your thoughts on these matters.

#StaySafe.

From the Desk of

Datuk Dr. Mohd Yusoff Sulaiman

Designing Workplace and Workspace of the Future



Source: EmailToolTester

The pandemic has indeed brought about a rethinking of the future of work, expediting transformation with practices formed during the crisis that is becoming our new normal. Much has been reported about the significant improvements in our working life over the past two years, changes that were undoubtedly prompted by necessity and safety concerns. The pandemic is still a very real part of life for many of us in 2022. However, it is fair to claim that while we perform our tasks, we have adapted to new behavioural patterns and expectations. As one of the millions of "knowledge workers" who now have greater flexibility in how and where work is done, perhaps it is a timely shift towards a better balance of our personal and professional lives.

Future work processes must be reshaped to support a workplace that is secure, inventive, inclusive, and intelligent. We will be able to better unleash human potential and create a workplace where people and teams are equipped with tools, technology, and culture to realize their full potential by changing the way we think about work, concentrating on re-architecting workflow, and using technology to elevate human capabilities. In planning a future workplace, there are five key aspects:

Employees Well-being and Safety as a top Priority

COVID-19 has brought attention to employees' health and safety across all sectors of the economy. Returning workers use masks, sanitize their space and maintain social distances, and some even allowing their temperatures to be taken. These would probably further expand into workplace testing procedures, cutting-edge ventilation systems, and sophisticated detection and disinfection equipment.

The general population now experience higher levels of anxiety, depression, and stress due to the pandemic, the recession, and social instability. Employers have heavily promoted their employee support programmes, boosted the number of paid counselling sessions available to staff members while waiving or reducing co-payments, and expanded the number of digital tools available to aid self-focus and relaxation. Some organisations train managers to recognise warning signs of distress.

Evolving responsibilities of managers and managements

Leaders must empower and motivate, while maintaining flexibility resulting in better work-life balance which leads to workers to perform at their highest level and avoid burn out.

Engagement is an excellent place to begin when making that change. In light of the growing trend toward hybrid workplaces, this calls for greater interaction between on-site and remote workers to achieve the feeling of connectedness. This is accomplished through the creation of a community and support structure for staff members.

Prioritising communication is a prerequisite for hybrid managers to guarantee that the intended corporate culture transcends the whole organisation. This can entail holding town hall meetings, doing frequent video conferences to get feedback, and creating more possibilities for in-person participation. For example, managers should put in place communication programmes that involve staff members in frequent social interactions.

Hierarchies are evolving into cross-unit organisational groupings with fewer layers and more decentralised decision-making. Boundaries dissolve as organisations become more laterally structured because diverse departments must collaborate more successfully. There is a larger demand for task and knowledge sharing as division and job function boundaries (managerial, professional and technical) become more fluid.

The shift toward a team-based organisational structure is the outcome of demands for quick decision-making, reducing inefficiencies and continuous process improvement. Responsibilities inside organisations are also impacted by the blurring of boundaries as managers adopt a more supportive and coaching role in the workplace, as employees gain more autonomy and decision-making abilities.

Hybrid jobs: connecting geography and technology

Flexibility and empathy are key components of the human-centric work design, which boosts employee engagement and productivity. Additionally, businesses become more efficient, more tolerant of interruptions, and responsive to client demand. It also potentially lowers a variety of costs, including those related to real estate, travel, and employee turnover.

Radical flexibility encourages productivity. In this context it refers to letting go of micromanagement and putting more emphasis on work outcomes than activity measures. Changes in culture, trust, empowerment, and empathy are necessary for radical flexibility to take place.

Hybrid work is an evolution of geographically focused traditional workplaces into a more human-centered digital workspace model. This requires leadership to rethink the culture, implement relevant modes of working, and choose appropriate tools to drive innovation, provide better work/life balance, increase productivity, and most importantly, drive business outcomes.

The necessity of digital skills and upskilling

To make the world more resilient, capable, and inclusive, it is necessary for all stakeholders to collaborate in order to bridge the digital barrier of a global skills gap, specifically digital skill. Workplace transformations largely involving digitization, remote working, distributed workforces, asynchronous and virtual collaboration, and reskilling and upskilling were greatly accelerated by COVID-19. Companies were able to maintain momentum and seize the opportunity to construct a future of work based on work and talent requirements.

The importance of soft skills is becoming increasingly recognised. The second most in-demand ability worldwide now, behind cloud computing, is creativity. Employees with the most essential skill sets - both hard and soft skills - can steer organisational success in the right direction as business models evolve and technology assumes a greater role in society. Soft skills are anticipated to receive fresh attention with the advent of digitalisation as workers are encouraged to create, address and innovative business challenges, and gradually shorten their learning curve for embracing new technologies.

It is obvious that technology will have a significant impact as firms shift their learning and development initiatives towards continuous and cross-functional learning. When it comes to providing educational experiences and information in a portable and scalable manner, technology is inevitably heavily involved. In creating a more 'involved' workplace, digital badges and awards will make employees feel appreciated, interactivity in corporate learning may increase engagement, and microlearning increases flexibility.

The pursuit of work-life balance

Today's workforce is changing and places greater emphasis on fulfilment. Aspects of purpose, creativity, engagement, and presence make up the parameters of employee productivity and growth.

In this context, time allocation is no longer an adequate indicator of a healthy work-life balance. It's vital to understand that while everyone has worthwhile activities for which to devote our energy, it is also necessary to be able to exercise choice and discretion in the management of time.

Future definitions of work-life balance might have employees and their employers agreeing that purposeful life and work are essential. In this future, jobs may even begin to recharge our energy reserves that enable pursuit of personal interest.

Conclusion

However, there is no one-size-fits-all approach, and there are more proposals that would be necessary in order to have a holistic working environment in addition to the five key aspects that predict the future of workplaces. Gender equality and religious diversity are two crucial components which call for organisational improvement including fostering a work environment that values everyone's independence, respect and dignity.

Inclusion-focused businesses see higher productivity and frequently better financial outcomes. It is not only morally right, but also strategically important for business to support gender equality. In order for an organisation to be sustainable, the boardroom should be equal in terms of social identities. This encourages more responsible governance and leadership throughout the organisation and attracts investors in the future, which will encourage businesses to disclose their metrics for equality. Perhaps an acceleration in the evolution of equality as organisations reaffirm their commitment to empowering women in the workplace.

In person with...

Datuk Zainal Abidin Bin Abu Hassan

Secretary General
Ministry of Science, Technology and Innovation

This interview was held on 20th July 2022, prior to retirement of Datuk Zainal Abidin bin Hassan

LEVERAGING FORESIGHT TO DRIVE TECHNOLOGY AND INNOVATION

Expectations, forecasts, predictions and assumptions allow us to make decisions. But they can also contain biases and blind spots. Forecasts and predictions are not well suited to situations of volatility, uncertainty, and ambiguity because they project the future in a linear way that is not reflected in reality. The speed of technological change and the emergence of disruptive technologies continuously transform regional industrial structures.

Datuk Zainal Abidin bin Hassan is currently serving as the Secretary General of the Ministry of Science, Technology and Innovation Malaysia. As a skilled public figure, Datuk Zainal possesses decades of experience in a myriad of fields – from leadership to industrial strategies, business, technology, national policies and global issues. myForesight® is honoured to have Datuk Zainal for him to share his knowledge and insights as well as in discussing further how MOSTI uses technology foresight in shaping the future of Malaysia's science, technology and innovation.

Technology Foresight: Support and Create a Sustainable Future

Foresight is a provocateur of innovation. Foresight help us to identify future readiness and opportunities that will lead to necessary solutions for the future.

We live in an environment of constant and unpredictable change that is now the norm in Government, industries and societies across the world. It is commonly referred to as volatile, uncertain, complex and ambiguous, known as VUCA world.

As Malaysia positions itself for the next phase of its development and beyond the COVID-19 pandemic, many of the issues related to Malaysia's transformation are being addressed, including through the 12th Malaysia Plan, Shared Prosperity Vision 2030 and related policies/ roadmap under the respective Ministries/ Agencies. Thus, foresight is key in anticipating change and making our industrial strategies more future proof in a VUCA setting.

The COVID-19 pandemic for instance, caught Malaysia and other countries in the world by surprise. Though the Government, through various policies, initiatives and projects had been advocating on the use of technologies to enhance the competitiveness and resilience of our industries, but the transition was slow as many industries still relied on unskilled foreign labour and lacked emphasis on digitalisation strategies. So, when COVID-19 struck, we could see many supply chains were disrupted and operation of industries were affected, leading to economic and job losses, affecting various companies. The operation of Government too was impacted, with various Government bodies trying its best to address the catastrophic situation that affected our socio-economy.

The pandemic provides an opportunity to Malaysia in resetting our economy, strengthening security, emphasising inclusiveness, and advancing sustainability so that we can mitigate future shocks. In this regard, tech-centric foresight approach undertaken by Government and industries in resetting their approach or future direction using STI to address socio-economic challenges would enhance productivity, job creation, innovation capacity, high-skilled talent pool and ultimately economic prosperity and societal well-being. It would also change the current production-based economy to a knowledge-intensive economy, whilst challenging the conventional boundaries of operation.

Therefore, in formulating policies and strategies related to our industrial strategies, foresight which foresees new horizons, key drivers and trends, including in Science, Technology and Innovation (STI), has been acknowledged as important and can be used as a key high-level instrument in strategising and planning so that we remain competitive, resilient and agile in responding to changes and major shocks. Foresight is one of the tools that can be used to compliment efforts in formulating policies and strategies.

Foresight is a provocateur of innovation. Foresight help us to identify future

readiness and opportunities that will lead to necessary solutions for the future. Recognising the importance of foresight, MOSTI through the National Policy on Science, Technology and Innovation (NPSTI) 2021-2030, has included STI foresight as an important strategy, specifically in increasing capacity development and application of STI foresight. It is to ensure that STI foresighting capabilities and expertise are improved, whilst emphasising the application of STI foresight in developing policies to address key challenges such as industrial competitiveness, food security, climate change, environmental, social and governance (ESG) realisation and disaster risks. For this purpose, the Strategic Data and Technology Foresight Division was established in 2016 to institutionalise foresight initiative within MOSTI and to work with Malaysia Industry-Government Group for High Technology (MIGHT) at the national level to meet the country's aspirations by identifying future STI technologies, inputs and studies that can be used in formulating STI policies and mainstreaming STI for policy making to further enhance the country's economic growth and become a high-tech nation.

For instance, based on the foresight by MIGHT, some of the major initiatives that the Malaysian Government embarked as strategic investment for high impact value creation were development of the aerospace industry, development of rail industry and pioneered the concepts of Industrialised Building System and Modular Construction. These efforts eventually led to the aerospace industry generating revenue of 16.2 billion in 2019 and 11.6 billion in 2020, proliferation of rail-based projects such as Mass Rapid Transit (MRT) and Light Rail Transit (LRT) and IBS being mandated for use in Government projects

Using Foresight to Support and Create a Sustainable Future

> Foresight plays an important role in identifying as well as preventing or mitigating the issues or gaps in Government, industries and societies.

Malaysia's policies such as 12th Malaysia Plan, Shared Prosperity Vision 2030, NPSTI 2021-2030 and National Policy on Industry 4.0 (Industry4WRD) places importance on Sustainable Development Goals (SDG). We need to create a conducive ecosystem that supports the development and adoption of products and technologies that can drive SDGs. For instance, Goal #9 (Industry, Innovation and Infrastructure) and Goal #12 (Responsible Consumption and Production) provide opportunities to Government, Society and Industries in devising and prioritising initiatives and projects that emphasis on life-cycle approach so that they are sustainable.

This is where foresight plays an important role in identifying the issues or gaps in Government, industries and societies in adopting sustainable practices and developing possible scenarios and strategies to prevent or mitigate those issues and gaps. By generating plausible scenarios, where traditional planning

has sought to prevent failure, foresight instead engenders agility, innovation, strategic evaluation, and the proactive shaping of the future, including in supporting and creating a sustainable future for the nation.

Initiatives that wean the market off hydrocarbons, tap into renewable energy sources, prevent pollution, and reward commitment, would create a sustainable future for Malaysia and achieve our commitments made under the Paris Agreement to reduce our greenhouse gases by 45% by 2030, and at the recently concluded United Nations (UN) Climate Change Conference 2021 (COP26).

Foresight that consists of developing possible scenarios which showed technically and economically possible routes forward to reduce carbon emissions, for instance categorised as unambitious pathway, aggressive pathway, modest pathway and balanced pathway would provide critical information for policy and decision making taking into consideration the trade-offs. In this regard, key strategies related to potential of green technologies and new energy sources such as hydrogen could be developed and implemented to encourage economic resilience and accelerate our transition to low carbon economy. This has paved the way for MOSTI to embark on the initiative to develop Hydrogen Technology and Roadmap as an alternative energy source that would unlock potential growth of hydrogen related technology companies as solution providers. The Malaysia Startup Ecosystem Roadmap 2021-2030 has also prioritised developing and facilitating startups in clean energy as among the strategic sectors that would eventually create positive social and environmental impact.

Based on the foresight that led to informed policy and decision-making, it would provide confidence to the private sector and guide them towards right investment decisions based on environmental, social and governance aspects, adopt agile regulatory approach, as well as stimulate research, development, commercialisation and innovation (R,D,C&I) activities.

Moving forward, as approved by the National Science Council Meeting held on 8 April 2022, MOSTI through the Academy of Sciences Malaysia (ASM) is embarking to develop a National Action Plan for Planetary Health driven by science, technology, innovation and economy (STIE) to mainstream planetary health in all national policies and plans through a whole-of-nation approach in addressing ecosystem changes, biodiversity, human health and climate change for sustainable development. The adoption of a new "Planetary Health" approach that focuses on the interdependence between human, animal and environmental health will ensure that the nation's prosperity is built upon environmental sustainability coupled with social equity and inclusion so that no one is left behind. This development will bring together various ministries, agencies and all relevant stakeholders for inputs and support in ensuring that it is a doable action plan to be carried out nationally via the whole of nation and whole of societal approach. Here, foresight approaches are useful in identifying emerging issues, navigate uncertainties, articulate scenarios and develop a common vision for a desired future to safeguard planetary health. It is evident that the interdependence of human health with biodiversity conditions and climate change, also reflected in the COVID-19 pandemic which is one of the zoonotic diseases has resulted in 4.1 million deaths in the world and 90 million people fell into hardcore poverty by 2020. This reminds the world of the importance of nature conservation and preservation and the need to balance them with socio-economic development. The foresight process imparts an instrumental value in improving our understanding of futures for strategy formation to address issues related to "Planetary Health", find new solutions and also to prepare for future pandemics. It also offers intrinsic value such as democratic participation process to invite more stakeholders for long term agile planning and anticipatory policy making for robust policies and action-oriented strategies to shaping futures.

Technology Foresight as Instrument to Influence Future Policy and Planning

> Through foresight, MOSTI could bridge the gap of technology adoption and application in socio-economic sectors by working collaboratively with the respective industries, communities and Government entities in matching products, technologies and services.

The 10-10 Malaysian Science, Technology, Innovation and Economic (MySTIE) Framework is an integration of 10 key Malaysian socio-economic drivers with 10 leading science and technology drivers aligned to Malaysian strengths and needs. The framework was derived from Academy of Sciences Malaysia (ASM) Emerging Science, Engineering and Technology (ESET) Study to provide S&T Foresight as part of ASM's flagship initiative on Envisioning Malaysia 2050. A process of identifying, characterising, and anticipating the possible scenarios in Malaysia's future was adopted through a method in foresight termed scenario planning. By taking into account different alternatives of our future in 2050, policy and decision makers, industries, communities and STI influencers are able to put in place long term planning tools in anticipating and preparing for plausible futures. In particular, it enables the selection of a desired scenario that is conscious of our historical past and capitalises on our unique strengths while mitigating our weaknesses. By doing so, we are able to create the future that we desire and based on Malaysian landscape. ESET study culminated in 284 products, services, technologies, possible applications and outcomes relevant for Malaysia towards 2050, 95 emerging technologies and 21 impactful emerging technologies.

Subsequent analysis by ASM to identify the top Science and Technology (S&T) drivers that can develop Malaysia's socio-economic sectors. Research capabilities, outputs (publications, patents and commercialisation activities), outcomes and the research building blocks (e.g. public and private Centres of Excellence (CoEs) and research institutes) were evaluated before 10-10 MySTIE Framework was finalised and approved by Government. The framework provides guidance that can be used as an integrative tool for government, researchers, innovators, industries and communities to address challenges affecting our socio-economy using Science and technology. The 30 National STIE Niche Areas identified in the framework provide an opportunity to build collaborative networks and platforms towards establishing vibrant innovation ecosystems across Malaysia. These ecosystems in turn need to be strengthened through regular foresighting to be agile, relevant and impactful over time.

Based on the 10-10 MySTIE Framework, MOSTI, including our funding agencies have reprioritised our initiatives such as National Technology and Innovation Sandbox (NTIS), Upskilling for Deeptech

and Future Skills, Malaysia Social Innovation (MySI) and funding projects related to R,D,C&I. This would in return ensure there is focus, particularly on R,D,C&I activities by optimally utilising our resources and increasing the return on investment from public funded projects through strategic partnership with related stakeholder, particularly private sector.

Furthermore, through foresight, MOSTI could bridge the gap of technology adoption and application in socio-economic sectors by working collaboratively with the respective industries, communities and Government entities in matching products, technologies and services from our R,D,C&I initiatives to address industrial issues, climate change, pollution and food security. For instance, in addressing climate change impact based on various studies undertaken by respective Ministries/Agencies, Academia or other related parties that incorporated among others foresight methodologies, MOSTI through Malaysian Nuclear Agency had developed the IS21 paddy seed using nuclear-technology with gamma radiation-induced mutation method. The paddy seed has higher resistance to unpredictable weather, crop disease, as well as biotic and abiotic pressures, contributing to food security.

MOSTI through ASM had also provided relevant inputs to the United Kingdom Government on NPSTI (2021-2030) and 10-10 MySTIE Framework. As a result, Malaysia was one of eight countries, including Canada, Finland, Netherlands, New Zealand, Singapore, United Arab Emirates and the United States that showcased for best practices related to foresighting in the United Kingdom Government's 2021 publication on "Features of Effective Systemic Foresight in Governments around the World" study. The document featured the 10-10 MySTIE Framework as an enabling tool for 'Whole-of-Government and Society' approach to ensure STIE development to enhance economic growth, improve the livelihood as well as quality of life of the citizens and global competitiveness of Malaysia. To date, the 10-10 MySTIE Transformation Book has recorded more than 8300 downloads with more than 8000 readers from 69 countries. Stakeholders such as the state governments are now incorporating the framework in planning and implementing activities for regional prosperity.

Therefore, technology foresight is important as it can provide clear understanding on possible scenarios for informed decision making in various aspects. The foresight effort undertaken by MOSTI, including ASM and MIGHT is crucial in policy formulation or adopted in other areas such as project planning. Foresight has to be mainstreamed and institutionalised in various Government entities, industries, research organisations and at regional and global platforms such as through ASEAN Foresight Alliance to continuously create awareness and build capacity in using foresight for analysis, formulating policies and making informed decisions.

The Future of Work in Malaysia

The future of labour force in Malaysia in the context of 4IR, with a focus on older persons.

Dr Muhammed Abdul Khalid is currently a Senior Associate at MIGHT. He is a Research Fellow at IKMAS, UKM and Adjunct Professor at CenPriS, USM. He is formerly the economic advisor to the prime minister.

By 2050

The world is experiencing rapid demographic changes.

Many countries are ageing, with more than **three quarters are projected to be ageing or already aged.**

It is forecasted that the number of older persons **will exceed 2.1 billion** with nearly two thirds living in the Asia and Pacific region.

1 of 4

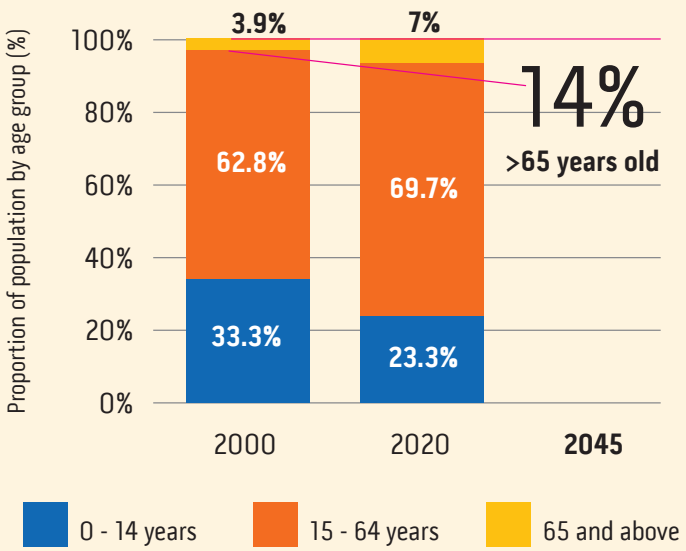
people across the region are expected to be **60 years old or older.**

Malaysia is speedily aging compared to other countries.

These demographic shifts will require changes in the labour market since the share of prime-working age adults will be declining, hence increasing the need for older persons to participate.

In 2020, older persons make up 7% of the population

Proportion of population by age group, Malaysia, 2000 and 2020 (%)



The *speed of aging* in Malaysia is much faster

* *number of years required or expected for percent of population aged 65 or over to rise from 7 to 14 per cent*

115 years	73 years	69 years	45 years	26 years
France (1865-1980)	Australia (1938-2011)	United States (1944-2013)	United Kingdom (1930-1975)	Japan (1970-1996)

These demographic changes were driven by a decline in fertility rates as well as a sustained rise in life expectancy

The Total Fertility Rate (TFR) was 1.7 in 2020 as compared to 6.3 in 1957 and has been well below the replacement level of 2.1

Malaysia's life expectancy

in 1957

57.8 years

in 2021

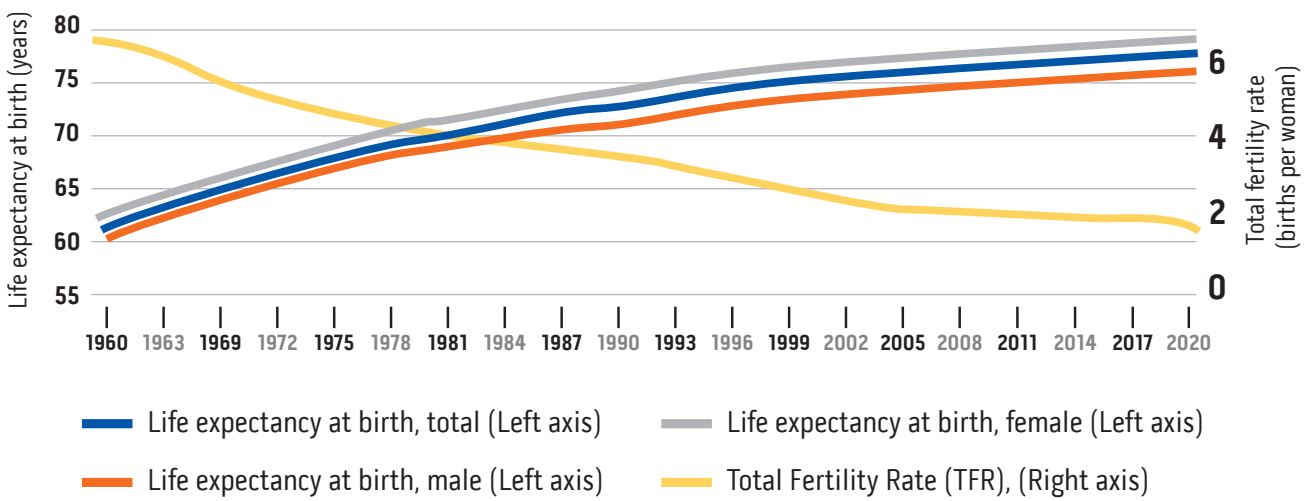
75.6 years

Women live longer!

Woman 78.3 years

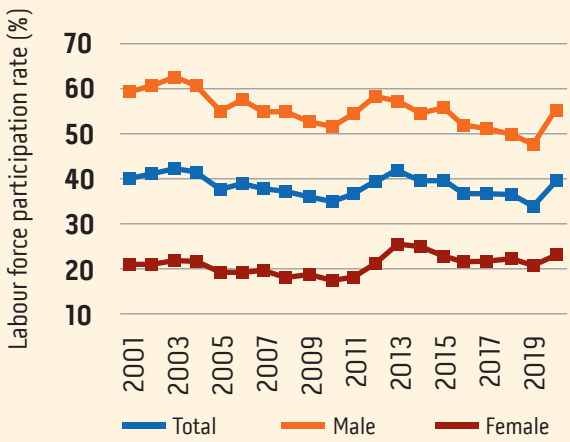
Man 73.2 years

Total fertility rate and life expectancy at birth, Malaysia, 1960-2020 (years, births per woman)



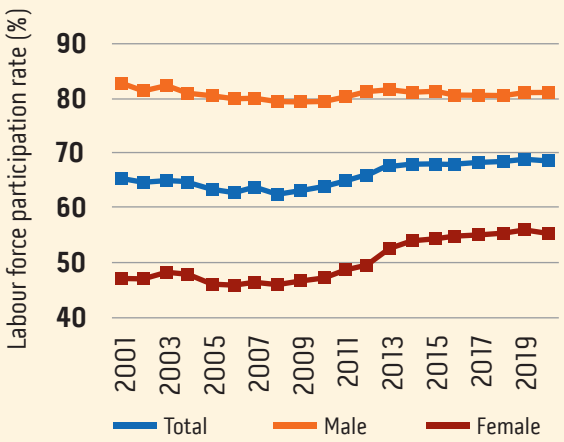
Despite the increase of older persons in Malaysia, the participation rate of older persons in the labour market remains low. The labour force participation rate (LFPR) in Malaysia for those aged 60 - 64 in 2020 at 39.2 per cent is lower compared to the overall (and increasing) LFPR at 68.4 per cent (Figure 1). The increase in overall LFPR from 2001 to 2020 is due to a higher participation of women in the labour force (Figure 2). Meanwhile, the share of those aged 55 and above in the labour force increased marginally in the last ten years, from 6.6 per cent in 2010 to 8.7 per cent in 2020.

Figure 1: **Labour force participation rate for age group 60 to 64 years old, Malaysia, 2001-2020 (%)**



Source: DOSM (2021-b).

Figure 2: **Labour force participation rate by gender, Malaysia, 2001-2020 (%)**



Source: DOSM (2021-b).

Population ageing will increase pressure on government fiscal resources, particularly on healthcare and pension systems. A lower working-age population and increased number of older persons tend to reduce revenue collection, and hence increased pressure on public finances to overcome the increasing demand on pensions and healthcare. In addition, the access and coverage of old-age social protection retirement schemes remains small, with sizeable future retirees possibly to retire in poverty. Increasing health issues will also increase pressure on Malaysia's healthcare system and pensions. Although older persons are bolstered by familial and community support, this care system is declining.

The current labour market outlook for older persons in Malaysia will be challenging due to key emerging trends, namely the **Fourth Industrial Revolution (4IR)** and **environmental and climate change**. The Fourth Industrial Revolution (4IR), one of the biggest trends impacting the future of employment, will result in a shift in the existing jobs and require more complex skills from the workforce. While 4IR has the potential to raise income levels and improve quality of life, with about 590 million to 890 million new jobs having been estimated to emerge from 4IR especially for those who have digital access, it can also bring greater inequality because of its potential to disrupt labour markets. Job markets are increasingly segregated into 'low-skill, low-pay' and 'high-skill, high-pay' segments. It is estimated that 400 million to 800 million jobs worldwide will be displaced by 2030 because of global automation and 14 per cent of existing jobs will become redundant in the next 15 - 20 years. About one in three jobs will change in response to automation, and a sizeable number will be replaced and become obsolete. By 2028, approximately 28 million fewer workers in six ASEAN member countries (Indonesia, Vietnam, Thailand, Philippines, Malaysia, and Singapore) will be needed to produce the same level of output as in 2018. The Organisation for Economic Co-operation and Development (OECD) has estimated that 14 per cent of existing jobs will become redundant in the next 15 to 20 years while 32 per cent will change in response to automation. Projections estimate that by 2028, 0.5 million less people would be needed to produce the 2018 level of output for Singapore, 1.2 million less for Malaysia and 4.9 million less for Thailand due to advances in technology. Therefore, workers will need to periodically upskill and reskill to cope with technological shifts or enhance skills which cannot be highly replicated by machines. In 4IR,

the most emphasised competences are adaptability and self-directed learning and thinking. For older workers, it is pertinent to engage in lifelong learning to cope with advances in technology.

Malaysia has several policies in place, such as the 4IR National Policy and Malaysia's Digital Economy Blueprint, to take advantage of 4IR which is expected to increase labour productivity in Malaysia by 30 per cent. 4IR is expected to increase labour productivity across all sectors, with improvement in agriculture by 55 per cent, manufacturing, 30 per cent and services, 45 per cent by 2030. Government estimates that 4IR is expected to create up to 500,000 jobs by 2025. Under the 4IR policy, Malaysia is planning to transform 20 per cent of semi- and low-skilled labour to highly skilled labour that will engage in 4IR-related industries. Three out of the five initiatives that focus on talent in the 4IR National Policy are related to schools and higher education institutions. These initiatives are geared mostly for young graduates and not older workers. For example, the MyDigitalWorkForce in Tech (MYWiT) programme provides companies with training incentives to hire fresh graduates and unemployed Malaysians in 4IR-related sectors. However, there is no specific provision for older workers.

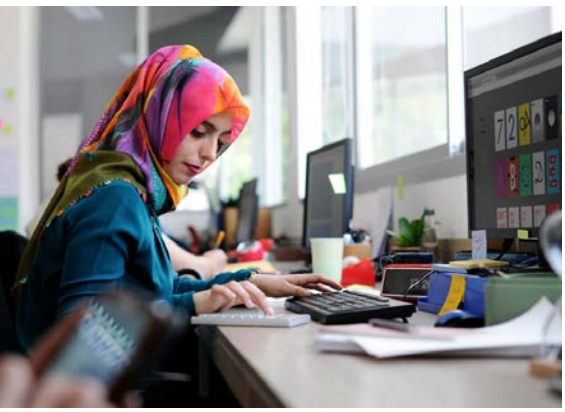
It is important to ensure that while pursuing 4IR, workers must also have access to social protection and social assistance. While labour participation in the gig economy and in digital platforms in Malaysia has been increasing, workers lack access to benefits and social security usually afforded to traditional employment. About 559,900 persons were involved in Malaysia's gig economy in 2018, with roughly 1 in 10 or 50,700 aged 55 – 64. The incidence of gig work increased during the pandemic because workers had to supplement their income due to pay cuts and job losses. However, gig workers, like other categories of informal workers, face challenges in enjoying social protection, skills development, or social support.

> The Fourth Industrial Revolution (4IR), one of the biggest trends impacting the future of employment, will result in a shift in the existing jobs and require more complex skills from the workforce.

The negative impact of **environmental and climate change** will also affect the labour market, and in particular towards sectors like agriculture and tourism. Evidence suggests that older persons are more vulnerable to the effects of temperature extremes and have a significantly higher mortality risk in extreme temperature events due to susceptibility of disease, reduced mobility and the effect of stress. Increased incidences of drought and flooding on rice growing could reduce yields by up to 60 per cent. Drought can also result in an inability to cultivate other valuable crops for Malaysia such as rubber and palm oil. Climate studies suggest that palm oil is very vulnerable to climate change, with large areas of the country likely to become unsuitable for cultivation. Although 10 per cent of the labour force is in agriculture, the incidence of older workers in agriculture is the highest among all age groups, at 25.5 per cent, which makes them more vulnerable to climate change. Tourism in Malaysia too will be affected by climate change due to ecological changes, flooding, coral bleaching, and extreme heats. It will impact tourism sites; besides extreme heats will lead to personal discomfort and potential health problems. Pre-pandemic, tourism and hospitality industry contributed about 16 per cent to GDP and making up just under a quarter of all employment, or about 3.5 mil workers. .

Several policies and strategies can be deployed to promote active participation of older persons in the labour market, including **reducing age discrimination and promoting gender and age-friendly practices in workplace**, with many older persons still experiencing or perceiving age discrimination in their workplace.

Anti-age discriminatory laws can be introduced or further refined to ensure older persons are not discriminated against in the labour market. Flexible working settings and gender and age-friendly workspaces can also enhance the hiring and retention of older workers that are more highly educated, especially in urban areas. Expanding upskilling and reskilling programmes for the older workers is vital. Current interventions are limited, both in size and scope. A dedicated skills-building initiatives for older workers, particularly those with relatively low level of education and skills are needed. **Widening incentives for employers**, in particular towards **recruitment** of aged workers is one of many efforts in rewarding employers who employ and retrain elderly workers. Malaysia has less specific and non-extensive incentives for the recruitment of older workers, with tax deductions are fairly limited in size. Singapore's experience is useful, as it has implemented various programmes to enhance employability of older persons, such as employment credit, and grants are provided to employers who employ older workers. Adjustments need to be done to ensure pensions and contributory systems are in line with the ageing population, in particular to ensure all workers are **covered by social protection and social insurance** as early as possible, without differencing their employment status (formal sector vs informal sector) or nationality (citizens vs migrants/ refugees/stateless). **Enhancing female labour force participation is equally important**, with flexible working time arrangements that would enable women to balance societal expectations or the perception that women would need to shoulder housework responsibilities. Strengthening the affordability, accessibility, and quality of care options could promote more women employment by alleviating them of the extra burden of childcare. More generous parental leave policies that includes paternity leave could also support female labour force participation. Finally, **promoting elderly health in the workplace** is crucial. Policies that promote healthy ageing and improve safety in workplace by integrating age and gender in workplace risk assessments would encourage better labour force participations of older workers.



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The Future of Work: Imagination Vs Reality

By:
Liz Alexander, PhD
Futurist. Author. Consultant. Speaker.

Dr. Liz Alexander has been named one of the world's top female futurists. She combines futures thinking with over 30 years' communications expertise to produce publications that showcase the advice of fellow futurists on issues including the future of education, and how businesses can practically benefit from working with the futures community.

Dr. Liz is the author/co-author of 22 nonfiction books published worldwide, that have reached a million global readers, and has contributed to leading US technology magazine Fast Company, Psychology Today, and journals such as Knowledge Futures, and World Futures Review. She earned her PhD in Educational Psychology at The University of Texas at Austin.

How does your working day look so far?

I imagine you are in your fully functioning home office where digitisation has replaced every scrap of paper. Everything you need, including your robotic personal assistant, is available at the swipe of a finger. Or perhaps you are carrying out your job from a beach in, say, Tahiti. At the very least, you have relocated to what Aldous Huxley, the author of Brave New World, once envisaged: One of those "small country communities, where life is cheaper, pleasanter, and more genuinely human than... the great metropolitan centres of today."

No? Not even close?

Yet this is what future thinkers of yesteryear imagined we would experience in 2022. And these aren't even some of the more outlandish suggestions that have been made about the future of work over the past 100 years (See Boxout).

Perhaps it is time we asked ourselves: Why is it that so many predictions about the future of work are just plain wrong? Why, for example, did a highly publicised University of Oxford study from 2013 confidently state that "47 percent of US jobs were at high risk of being automated within two decades," when just three years later the figure was estimated to be closer to 9 percent?

Why do we fail to question a future in which autonomous trucks will put tens of millions of drivers out of work worldwide, when the reality--at least according to someone who has studied the phenomenon--is that: "Trucking and delivery includes a lot of skills and tasks that are probably going to be very hard to automate? "More to the point, what can we learn from these past biases and mental blocks, in order to avoid repeating them?

Psychology First

Allow me to segue into that by pointing out how often decision-makers appear to ignore the importance of work for the psychological health and wellbeing of the vast majority of ordinary people.

Countless international studies have shown that the loss of jobs is associated with a range of mental health issues, from apathy and depression, to substance abuse and the decline of family relationships.

Where high unemployment occurs across communities, this is associated with a rise in violence and criminal behaviour.

Why, then, would those who help shape our future appear so enthusiastic about (or accepting of?) a world in which robots take all the jobs and we humans are largely left to navigate life without any sense of well-being, individual satisfaction, or accomplishment? Let alone where the money to live is going to come from.

Thankfully, that scenario is unlikely to come to pass.

Yet that brings me to my first point, about the hubris inherent in much of our future thinking concerning the world of work. I have written on several occasions about how prominent business leaders frequently try to sell us visions of futures that are tied largely to their own commercial advantages (see for example, my Fast Company article entitled: What Faux Futurists Cost the Rest of Us). Just because someone is seen as smart, passionate, and a "visionary" it doesn't mean that their pronouncements are right. Elon Musk is a prime example. According to Tesla employees' testimony to the California Department of Motor Vehicles in 2021, "Tesla CEO Elon Musk's messaging around driverless vehicle technology does not always 'match engineering reality'."
No matter how brilliant or well-educated a person might be: "Combining exponential change with multivariate phenomena -- two things humans are bad at estimating and understanding -- is a challenging analytical problem. That's why futurists are so often wrong: There are too many variables and unknown feedback and feedforward loops."

When their feet are being held to the fire by impatient stakeholders, decision-makers tend to want future-focused outcomes that are quickly arrived at, neatly packaged, and cut-and-dried.

After all, who wants to grapple with uncertainty when you are responsible for determining how the future will affect your constituency?

But if we are not willing to take the time and considerable mental effort to work through a range of scenarios--not least the "worst case" examples--then it is hardly surprising that so many variables and loops are overlooked.

Giving Attention to the Wrong People?

Another reason why predictions about the future of work tend to be so inaccurate, at least in my opinion, is that we focus too much time and attention on those who are over-confident about what the future of work will look like, and how soon it will appear.

As Bill Gates was quoted as saying, "We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten."

But when, in all that time, does anyone ever ask the people who will be affected by these changes about how, where, and when they want to work?

As one report backed by the London School of Economics entitled 'Unlocking Opportunities for People Hard Hit by Automation and Globalization' recommends: "We should spend less time trying to predict the future of work and more time focusing on what workers really want from work."

As a futurist this makes total sense to me, given that we know the future is fluid and shaped by the decisions and actions we take in the present.

Configure work according to human needs, not just technological drivers, and we will create the future people want, rather than presenting them with forecasts they will likely fight against.

After all, we have plenty of examples where human behaviour trumps technological pronouncements:

Human Choice Trumps Technology

- E-books were expected to threaten the physical book with extinction. Even in 2016 a BBC.com article proclaimed that this vision, "is well on its way to being realised". In 2022, e-books didn't even come close since a considerably higher percentage of people *still* buy printed books rather than ebooks .

- In 2005, *The Singularity Is Near: When Humans Transcend Biology* posited that by now we would be ingesting "nanobots," making traditional food consumption "obsolete." Yet TV shows and YouTube about cooking and eating are increasing in popularity worldwide. A meal-in-a-pill, or even a nanobot, might fit "abstract notions of technological efficiency and scientific notions of health ," but those aren't why people are enjoying cooking, and eating, real food.

- In *Shift 2020*, one "global trends expert" predicted that robots would become our therapists and home care assistants. Yet such pronouncements glibly overlook concerns raised by one study entitled, 'Caregivers' use of robots and their effect on work environment: "We know little about robots' long-term effects on working life. Also missing is research about legal and ethical aspects of using robots, not just in regard to patients' and clients' integrity and safety but also to employees."

  In short, predictions about the future--not least the world of work which provides many human beings with a sense of esteem, satisfaction, and accomplishment--invariably ignore human psychology. They also highlight the fact that we have a tendency to become over-excited by the latest technological advancements without thinking deeply about their social, even ethical, ramifications.

Data ≠ Futures Thinking

Which brings me to one more forecast that I don't see bearing fruit any time soon; another example of how technologists get things wildly wrong.

In 2012 the chief futurist for Cisco Visual Networking believed that in less than a decade. there would be no need for futurists because, "everyone would be able to predict the future themselves."

He ascribed the universal adoption of this skill to the "rich source of data, creating unprecedented insight." As if access to "cloud-based tools" alone would enable widespread "what-if" analysis and transform people into futures thinkers.

As with so many highly-educated, smart individuals, this man made the mistake of thinking that if you provide people with a certain environment, they will suddenly think, act, and achieve in the ways you expect.

That isn't reality, it's wishful thinking.

As the Director of the Institute for the Study of Political Economy at Ball State University in the United States, Professor Steven Horwitz points out, "Rather than focusing on the big, dramatic technologies and what seem to be their efficiency-enhancing elements, predictors of the future should be thinking more about the everyday things that matter to human beings and trying to imagine how technological change might interact with commerce and culture to produce the weird but still recognizable future."

Could it be that we get the future of work so wrong because we're trying to fit complex, unpredictable human beings into scenarios that hold no appeal for them?

Should we not try to better understand what people want from their working lives--and then help them create futures that are more, in Aldous Huxley's words, "genuinely human."

Otherwise the future of work that we posit today will never become a reality, but remain an over-enthusiastic elitist dream.

Imagination versus Reality

Artists asked to envision the future saw certain professions, like firemen, customs agents, and taxi drivers all taking to the skies, the first two outfitted like a cross between a bat and a drone.	1900	2020
		"The idea of small aircraft buzzing through city skies is obviously raising a number of questions around safety, regulations, costs, urban design, transportation policy and other issues."
According to a TIME Magazine article entitled "The Futurists": "By 2000 machines will be producing so much that everyone...will be independently wealthy," and hence not need to work.	1966	2022
		"Between 1990 and 2007, the increase in robots (about one per thousand workers) reduced the average employment-to-population ratio in a zone by 0.39 percentage points, and average wages by 0.77%, compared to commuting zones with no exposure to robots ."
The average American will work only 26 hours a week by 2020.	1968	2022
		The average global working week i 35 hours; Americans work 38.6 hours.
According to futurist, Ray Kurzweil, "Paper books and documents are rarely used" in the 20th century as "paper documents of interest have been scanned and are available through the wireless network."	1999	2022
		"The global consumption of paper and board amounted to an estimated 399 million metric tons in 2020." Demand is expected to increase yearly, reaching around 461 million metric tons in 2030.
In his book, Shift 2020, Michael J. O'Farrell wrote that, "In the pending nanomobility era, I predict that telepathy and teleportation will become possible by the year 2020--with both commonplace by 2040.	2014	2022
		Sorry, if you're trying to tell me something, you're going to need to speak up - I'm not a mind-reader!
"Self-driving cars: From 2020 you will become a permanent backseat driver." That describes Level 5 automation.	2015	2022
		"Current self-driving technology stands at level 2, or partial automation."

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Viewpoints

TRENDS FOR FUTURE OF WORK

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What will be the future of work look like? In the past, the work environment demanded the need for long-term employment, a process-centric approach, institutional driven decisions, and one workplace or workspace. However, moving towards the future, with the development of factors likes AI and robotics, change of social behaviour and demand for greener lifestyle have changed the way of work, workplace, and workforce.

The future will demand significant changes in the ways of work, workplace, and workforce.

Trends in Work, Workplace & Workforce.

WORK

Work can be defined as any activity involving mental or physical effort done to achieve a purpose or result. The change of cultural idea of work is not a new thing. Historically, work was synonymous with craftsmanship which is from the creation of products to the delivery of complete outcomes. Then, the cultural idea of work has changed to industrialisation where products could be manufactured faster and cheaper if end-to-end processes were automized into repeatable tasks in which workers (and, later, machines) could specialise. The work becomes specific or specialised of tasks which not related to each other in delivering a complete product or outcome.

Now, the cultural idea of work will be redefined with the development of catalysts such as the advancement of technology and improvement in human or social communication. Technology has already begun to change the way how to organise tasks for instance robotics and robotic process automation have transformed manufacturing and warehouses, and digital reality technologies are helping workers transcend limitations of distance and who is assigned to which task. The trends for 'work' have changed to resolve the uncertainty of the future.

#1: Focusing on Resilience Approach

Most organizations and institutions have redesigned the way of doing things by streamlining the roles, supply chains, and the work process to increase efficiencies. Through this streamlined approach, the company is acted as a factory to improve production efficiency and effectiveness by employing faster or simpler working methods. However, this approach is open for fragility as the systems have no flexibility to respond to disruption.

Instead, act as a factory, the company needs the flexibility to act like a laboratory that allows fast analysis and to correct problems quickly with change. This approach brings resilience to the company which builds a more responsive organisation, design roles, and structures around outcomes to increase agility and flexibility, and formalize how processes can flex. Also, provide employees with varied, adaptive, and flexible roles so they acquire cross-functional knowledge and training. Leadership also is the important criteria, which diverse leaders need to be involved in role design and creation of flexible work systems to ensure that employees of all backgrounds and needs are considered when the organization designs new workflows.

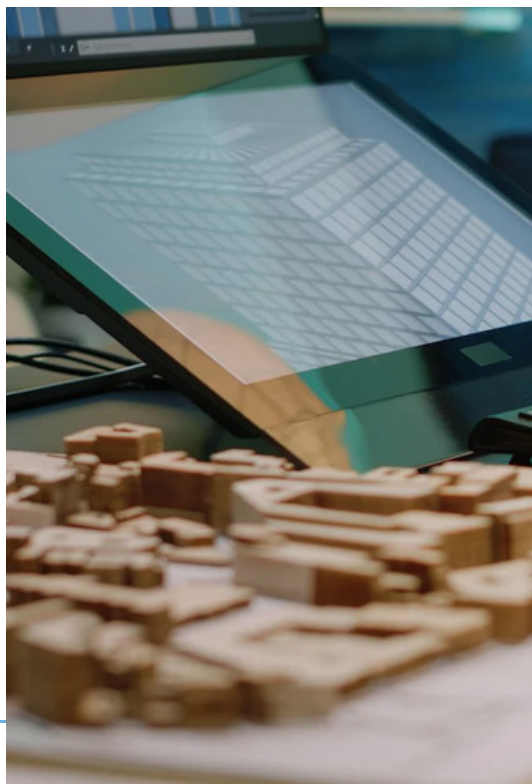
#2: Expanded Data Collection

Technology usage has increased in the institutions or companies, which accelerated especially during movement control order (MCO) on COVID-19. Technology has been used mainly in the completion of tasks and medium for communication between employers and employees, generating a lot of valuable data and information to be analysed. In the future, the usage of technology will continue and may become more advanced with the expansion of data collection. This will change the work from focusing on process-centric tasks to strategic and creative; from managing the task towards coaching and mentoring; and from setting the hour and location for meeting and deliberation of task towards flexibility and quality of time and task deliverables. For the human resource department, data generated will introduce a new way to monitor remote workers and able to collect employee health and safety data to better understand employee experience.

#3: The Green Transition Takes Shape

The way of delivering tasks will focus on sustainable approaches and green practices. The awareness on sustainability has increased, the shift is not just about changing of using pen and paper to paperless, digital and connectedness of everything, but is towards changing of mindset of delivering works by the adoption of sustainable goals, circular economy approach and may adopt Environmental, Social, and Governance (ESG) approach that takes consideration more than financial values only.

Leadership also is the important criteria, which diverse leaders need to be involved in role design and creation of flexible work systems to ensure that employees of all backgrounds and needs are considered when the organisation designs new workflows.

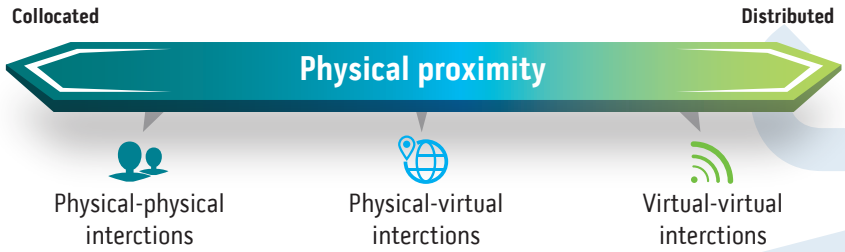


WORKPLACE

The workplace is defined as a place of employment or a location where people perform tasks, jobs, and projects for their employer. Organisations are now able to orchestrate a range of options as they reimagine workplaces, from the more traditional collocated workplaces to those that are completely distributed and dependent on virtual interactions.

Redesigned the workplace or workspace required an innovative way of design with the aim for efficient outcomes and reduce costs. But most importantly the design should not reduce the connectivity and reduce the work culture that has been fostered in the company or organisation. Digital technology as one of the catalyses of change has allowed for flexibility in designing the workplace or workspace. It creates from one workspace towards a spectrum of workspaces that improved the connectedness. The following are the trends in shaping the future in workplaces or workspaces.

Workplaces are also shifting



Source: Deloitte analysis.

#4: Hybrid and Remote Work

The traditional way of doing things is changed with digitalisation. Central workplace's physical location has been the design of choice for most companies to allow the workers to focus on their professional responsibilities while creating opportunities for communication and collaboration. Due to pandemic and MCO, physical and central workplaces are not suitable anymore in this situation and companies are forced to ensure work activities are ongoing. Then comes the adoption of technology and digitisation of work to allow workers to be always connected.

Remote working becomes the new norm during the pandemic, and the challenge for now and towards the future will see the development of remote working as a choice for the organisation during this recovery state. Hybrid and remote work will be the way of the workplace in the future, where employees are expected to come into the office at least once a week. Advancing towards the future the use of virtual reality (VR) may close the gap of challenges in hybrid and remote working. For example, immersed, a VR start-up looking to reorient the way work happens gives remote workers easy access to a "solo mode" VR experience that allows people to work without distractions while incorporating multiple monitors and other productivity resources into the platform.

#5: Physical Spaces Bring People Together

As the hybrid workplace is adopted for the companies, workspace at the office will be changed it looks towards functional space for workers to connect and bounce ideas. Moving forward, the physical space needs to be a place that brings people together which redesigns spaces to significantly reduce or eliminate individual workstations, instead of providing places where people can connect.

The idea of having 'Starbucks' like the design or safe spaces where people can bump into each other with whiteboards and other collaborative resources near are available at these places. Thus, the idea flow will always be in the conversation and businesses will propel collaboration in new and meaningful ways. The way of the workplace will be changed since most companies are unlikely to abandon their offices altogether, these places will be optimized for a hybrid reality, functioning as spaces to bring people together, not just locations where employees clock in to accomplish their to-do list.

WORKFORCE

The following are the trends shaping the future workforce:

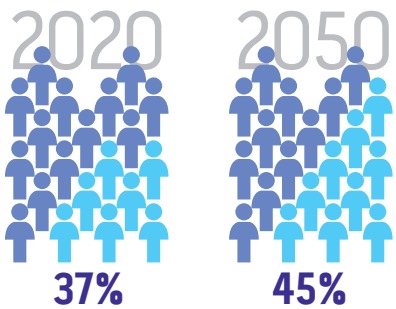
#6: A More Age-diverse, Healthier, and Better-educated Workforce

By 2050, more than four in ten individuals in the world's most advanced economies are likely to be older than 50. The workforce is ageing even more rapidly as smaller cohorts of younger people enter work at a later age and older people are staying on longer at work. Optimising the benefits of a multigenerational workforce increases productivity such as raising the value-added per worker of the firm. OECD cited that based on a unique dataset that links employer and employee characteristics, the new analysis highlights that a firm that has a 10% higher share of workers aged 50 and over than the average is 1.1% more productive. These benefits accrue from older workers being more productive than other workers on average as well as productivity-enhancing complementarities between employees of different ages e.g. through teams where younger and older employees work together and spillover of knowledge and experience. Building a multigenerational workforce also yields a stronger pipeline of talent, increases resilience and improves workforce continuity, stability and the retention of know-how. Many employers already have a mixed-age workforce, presenting opportunities in terms of a diversity of ideas and knowledge, and skillsets. Nonetheless, the use of generational or age labels continues to be common when designing policies within employing organisations and governments.

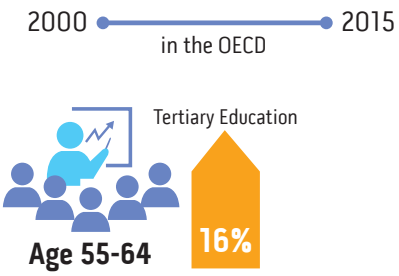
Key facts: The future workforce will be more age-diverse, healthier and better educated

Benefiting from greater experience

Share of the OECD Population aged 50 and over.



Healthier and better educated older adults



Health shocks such as COVID-19 aside, this trend is expected to continue.

Maximising the potential of a multigenerational workforce

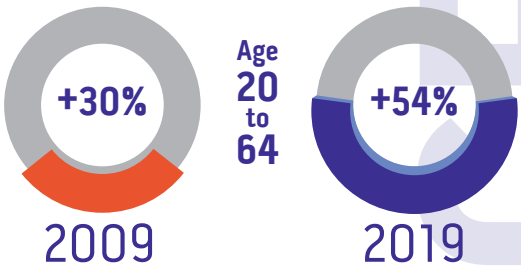
Ageing effects on GDP per capita

Next 30 years → **-10%** GDP in the OECD

If business and governments do nothing, population ageing will lower living standards.

Talents shortages need to be tackled

With the share of the OECD population aged 20-64 declining, the share of firms reporting talent shortages rose dramatically prior to the COVID-19 pandemic.



#7: Tomorrow's Workforce has no Geographical Boundaries

In many ways, the pandemic has normalised remote work. Companies are starting to realise that recruiting and retaining employees who prefer those work arrangements is easier. Location flexibility also opens up the possibility for recruiters to manage oversea talents without bringing them into the market where the company is based. Companies are seeking to leverage emerging opportunities and capitalise on market conditions by expanding locally, regionally or beyond. But sourcing and retaining talents in the company's local market can be difficult given the intensity of competition for the best talents. If organisations find that hiring local talent is too challenging, one option is to hire people who live across borders and manage them remotely. A study by PERSOKELLY Regional Talent Solutions cited that 55% of Asia-Pacific businesses reported that they are open to hiring and managing remote talents across borders as the best workforce solution.

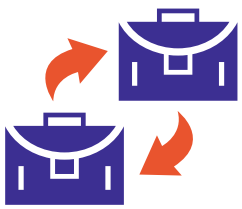
More fluid working life require agility and flexibility from employers and supports from goverments.

Rising longevity in changing work-life patterns

30%
in the OECD

The single-breadwinner model is antiquated: even among couples with children, few have only one earner.

Digitalisation and globalisation are accelerating career changes



People change jobs more frequently

Job tenure has decreased between 2006 and 2017, by **4%** among medium to high-educated and even **12%** among low educated

#8: Automation Reshaping Today's Workforce

AI and robotics are generating significant benefits for users, businesses, and economies, lifting productivity and economic growth. The extent to which these technologies displace workers will depend on the pace of their development and adoption, economic growth, and growth in demand for work. Even as it causes declines in some occupations, automation will change many more—60 % of occupations have at least 30 % of constituent work activities that could be automated. It will also create new occupations that do not exist today, much as technologies of the past have done. A report by Gartner predicts that some 2 million new job roles will be created concerning workplace AI by 2025. Hence, how do we prepare for a future where an estimated 60-85% of jobs don't yet exist? The answer is to keep prioritising new skills. Continuous learning options and instilling a culture of lifelong learning are the cultural changes needed by companies across all sectors for developing the workforce of tomorrow.

#9: Recruitment via Crowdsourcing

An increase in work flexibility not only affects the skills required in companies but also the search for suitable employees. The fastest-growing companies in 2025 will be able to quickly identify and develop skills from a global talent pool than hiring permanent employees for a particular role, the trend is toward global crowdsourcing of freelance talent. Teams of all sizes must be put together quickly and according to their needs. A reliable and flexible technology platform that enables employees to quickly authenticate with biometric data to gain access to the tools and systems they need is essential.

CONCLUSION

Looking at the trends shaping the work, workplace, and workforce in coming years, we need to start preparing our future workforce with the needed skills and knowledge, as well as employers to be agile and adaptive demanded by the advancement of technology and demographic shift.

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Emerging Skills of the Future

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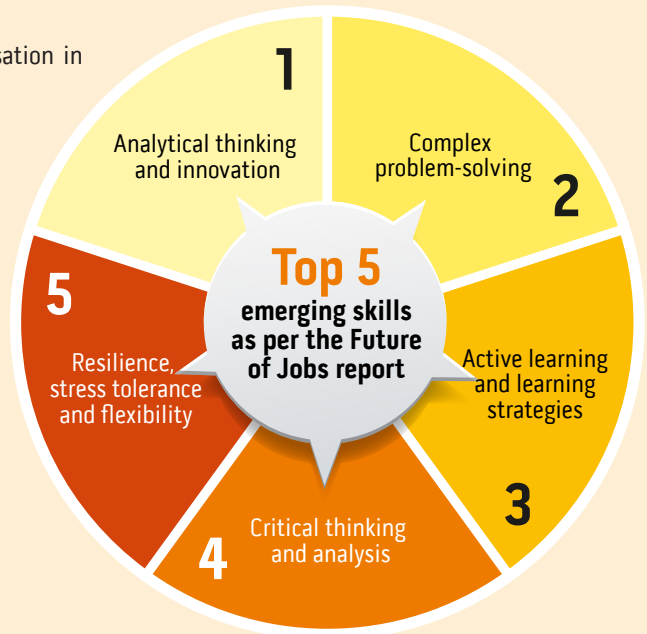
21st Century skills in a globally more connected world- emerging trends! The growing policy focus on key competences and 21st century skills is situated in a context where education institutions and industry alike have begun to focus more on the outcomes of education – that is, the accrued benefits of education with more of a dual focus in the EU on employability and as a means to improve equity.

The World Economic Forum estimates that the pace and scale of disruption brought forth by the Fourth Industrial Revolution would require more than one billion people in the world to be reskilled by 2030. By 2022, some 42% of the core skills required to perform existing jobs are expected to change.

Human skills or sometimes known as "soft skills," constitute as our ability to relate to one another and refer to aspects such as empathy, compassion, and authenticity. People with strong human skills can form deeper connections with colleagues and customers. This ultimately serves as a strong foundation for positive workplace performance in terms of innovation, adaptive thinking, collaboration, and more.

Emerging skills are driven by a growing awareness of the impact of globalisation in terms of the overall job turn-over and reconfiguration over labour markets.



A report published by the Centre for Economic Performance in 2021 cited that the benefits of innovation include increased business resilience to economic shocks like COVID-19, whilst a barrier to adopting new technology is the lack of a skilled workforce.

By identifying the future skills needed in the manufacturing and engineering workforce and building training systems for them to be met, the Emerging Skills Project is enabling UK businesses to better exploit emerging technologies and remain competitive. The Project is based on international research and analysis that demonstrated the importance of establishing a Skills Value Chain integrating government, industry, and education providers in producing a workforce fit for the future.

Lesson Learned for Emerging Skills for Personal Take

Learning

As the skills needed for the future required us to have capability of learning, we should have taken initiative to upgrade/upskill/reskill ourselves to learn faster and acquire new knowledge before it becomes obsolete. The Future of Jobs 2022 report suggests that before 2022, employees will need roughly 101 days of retraining and upskilling. And because the half-life of a professional skill is just five years, employees will need to become lifelong learners to remain competitive in the workplace, according to previous research by the WEF.

Delay gratification

Published in 1972, the popular study became known as The Marshmallow Experiment proved that the ability to delay gratification was critical for success in life. For example, if you delay the gratification of watching television and get new skills, then you'll learn more and get a better chance in the future.

Time needed to start building new skills online in jobs of tomorrow

Source: Cousera data produced for the Future of Jobs Report, World Economic Forum
Presents the days of learning needed for the average worker to gain the level of mastery through Coursera learning

Humanity

Skills of the future required more human skills compared to other skills. The COVID-19 pandemic, digitalisation and automation have accelerated skills changes in an unprecedented way, with businesses across the globe hastening their digitalisation of work processes. In this scenario, skills like thinking, creativity, empathy, innovation and socialisation become in demand. In the analysis based on information from the O*NET 24.2 Database by the U.S. Department of Labor, Employment and Training Administration (USDOL/ETA), released February 2020 featured in Pew Research Center, regardless of which group of occupations is examined, active listening, speaking, critical thinking and reading comprehension feature at the top of the list of skills ratings. This concludes that more human skills are needed in the future.

Older, newer or green:
All jobs value fundamental skills the most

Importance ratings of the five highest rated skills within a group of jobs, averaged across all jobs in a group. Ratings are on a scale of 1 (not important) to 5 (extremely important).

Older jobs		Newer jobs		Green economy jobs	
Active listening	3.56	Reading comprehension	3.83	Critical thinking	3.62
Speaking	3.51	Critical thinking	3.82	Active listening	3.57
Critical thinking	3.47	Active listening	3.80	Reading comprehension	3.55
Reading comprehension	3.39	Speaking	3.70	Speaking	3.49
Monitoring	3.27	Writing	3.55	Monitoring	3.35

Note: "Newer jobs" include the 147 occupations classifieds as "new and emerging" in the O*NET and for which skills ratings are available. "Older jobs" are all other jobs, 820 in number. "Green economy jobs" are the 199 jobs identified as such in O*NET.
Source: Pew Research Center analysis of O*NET (Version 24.2).

Resilience

Some technology advances and disruption could revolutionise the way we work. Mobile internet and cloud technology are already impacting the way we work. Artificial intelligence, 3D printing and advanced materials signal the pace of change will be fast. Thus, understanding the impact of technology toward our work or task helps us to push us to be more proactive in reinventing ourselves with new skills.

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The Emerging Future Workforce is here.

Are we all set to be redesigned?

By
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The future of work. What does this term really mean? While much debate has focused on artificial intelligence and whether robots will take over our work, cognitive technology is just one aspect of the major changes progressing. To understand what is happening and, more importantly, what can be done about it, there are some converging tendencies and all aspects of the work that affect individuals, organizations, and societies. It is important to consider how we are already radically transforming.

As we are rapidly entering the cognitive revolution, we are redefining our work to create valuable human-machine collaborations and understanding our work from task completion to problem solving and relationship management seems to be shifting to different dimensions.

There are changes in the way tasks are organized into jobs, for example, robotics and robotic process automation are transforming manufacturing and warehousing, digital reality technology allows workers to overcome distance limits and who is assigned to which task helps you to know better.

According to the Organization for Economic Cooperation and Development (OCED), "The division of labour between humans and machines are expected to continue to shift to machines, especially for repetitive and routine tasks.

Studies show that more than 14% of today's work is eliminated and 32% could be eliminated."

However, there is evidence that these technologies can be used to enhance the workforce's efforts rather than replace them.

In fact, in a 2018 report, the World Economic Forum predicted that "nearly one million jobs could be lost, while more than 1.75 million would increase".

Future workplaces are expected to use more machines and data than ever before, but may also require human skills in areas such as problem-solving, communication, listening, interpretation, and design.

As machines take on repetitive tasks and human work becomes less routine, roles can be redefined by combining technology and human skills, as well as advanced expertise in interpretation and service.

Techniques such as design thinking help organizations define roles that include new types of skills.

The abilities, activities, and practices needed to get the job done well.

To be successful in all of this, you need to change your mind set about your work and develop the training for employees needs to take on these new roles and responsibilities.

Otherwise, trying to apply outdated concepts and skills to the rapidly evolving world of new human-machine collaboration can be overwhelming and frustrating.

Rethinking the talent models

Over the last three decades, the workforce demographics have changed, not only has the workforce as a whole become older and more diversified, but also the very social contracts between employers and employees have changed dramatically.

Today, companies have a wide range of options for finding workers, from hiring traditional full-time employees to using managed services and outsourcing, independent contractors, gig workers, and crowdsourcing.

These new employee types help solve problems, complete tasks, and help leaders build a more agile and flexible organization.

As workforce options increase, this opens the door to increased efficiency and creativity in the composition of an organization's workforce.

But with more options it often becomes more complicated.

"Employers should consider not only how roles are defined when pairing humans with machines, but also the disposition of their human workforce and the type(s) of work best suited to them to acquire the creativity, passion and skills needed for the current job."

Coordinating this complex use of different segments of the workforce may require new models.

This could fundamentally change our view of the employee lifecycle from the traditional "attract, grow, and retain" model to a model where the key questions are how organisations should grasp, group and engage workforces of all types.

Grasp:
How do you leverage the capabilities and skills of the business and the broader ecosystem?

This includes sourcing internal and external talent markets, and leveraging and mobilising on- and off-balance sheet talent.

Group:
How do you provide employees (ecosystem talent) and teams with the widest and most meaningful scope of development? This includes work experience integrated into the flow of their work, career and personal lives.

Engage:
How do you support your workforce, sales teams, and partners?

Rethinking where works get done.

As the "who" and the "what" of a job change, so does the workplace. Where people can work in close physical proximity, the advent of digital communication, collaboration platforms, and digital reality technology, along with social changes, associations and businesses have enabled and created opportunities for more distributed groups. This helps the streamlining of a wide range of options as they reinvent the workplace, from more traditional shared workplaces to ones that are entirely distributed and dependent on virtual interactions.

Again, the actual workplace change should not be viewed simply as an opportunity to increase efficiency or reduce real estate costs. Workplace culture is closely tied to both innovation and business results, and as teams become more fragmented, organizations may need to rethink how they foster both culture and team relationships.The importance of these links should not be underestimated.

As Amy Wrzesniewski, a professor at the Yale School of Management, observed: "In previous generations, people would spend decades and even their entire careers embedded in the same organization.

In those cases, the sense of membership buoyed both individuals' identities and their psychological health."

For employers, this implies a clearer interest in building connections and communities as workplaces become more virtual and include more casual workers.

Making the future of work more valuable and eloquent

Changes in work, the workforce, and the workplace are closely linked.

Changes in one direction can have important consequences for workers and employers that were not previously taken into account.

"The future of work ultimately is not an assured result.

We seem to be at a crossroads in redefining the meaning of working, becoming an employer, and contributing to value and talent in new ways.

The purpose is to focus on the future. You can also take advantage of technological advances to increase efficiency and reduce costs.

Alternatively, advantages of these trends can be taken to think more deeply about how to increase the overall value and meaning of organisations, clients and employees.

If the view is too narrow, it can be a big risk."

Create: Analyse and redesign work, workforce, and workspace options to take advantage of automation, alternative talent sources, and collaborative workspaces.

To be successful, organizations must scale down and imagine opportunities to organize their jobs, workforce and workplaces in ways that add both value and meaning, while leveraging on the efficient opportunities we have. We see three measures that employers should consider when managing the forces of change, which are:

Envision: Visualise the possibilities of the future by using industry data analytics and insights to define goals and strategies to transform workforce into the future. Go beyond cost and efficiency to set goals for the future of work that includes value and meaning.

Create: Analyse and redesign work, workforce, and workspace options to take advantage of automation, alternative talent sources, and collaborative workspaces.

Activate: Coordinate organisational, leadership, and workforce development programs to access technology, curate the next generation of experiences, engage tomorrow's workforce in long-term relationships and engage business leaders in new ways of working.

In order to do well, the workforce has to be energised and technology needs to be used in a way that delivers far-reaching and valuable benefits to organisations and society.

There are many opportunities to create a preferred future of meaningful work for all.

All that needs to be done is to reshape the individual to fit well into the future workforce.

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Emerging Technologies in the Post COVID-19 Era: A South Korea Case Study

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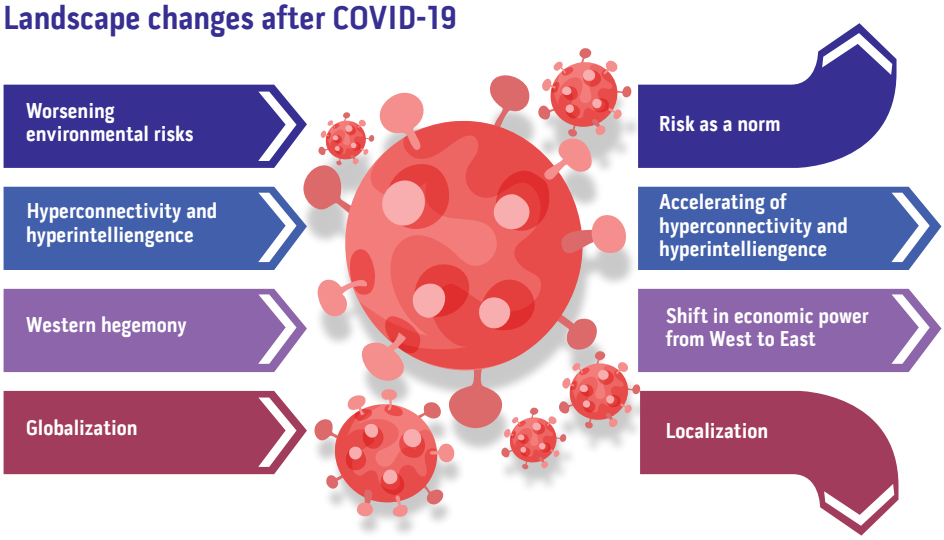
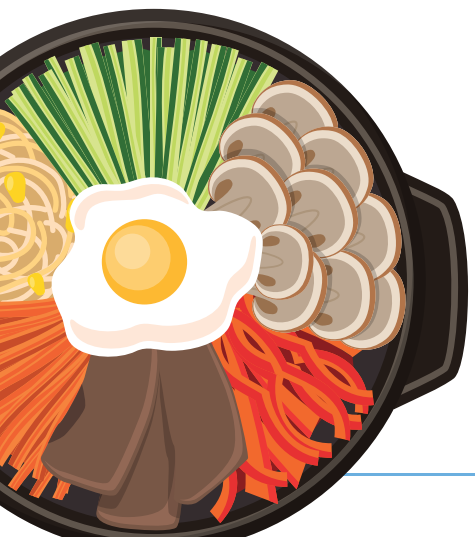
The original article with the same title is available in Korea Institute of S&T Evaluation and Planning publication; KISTEP R&D and Beyond.

Background

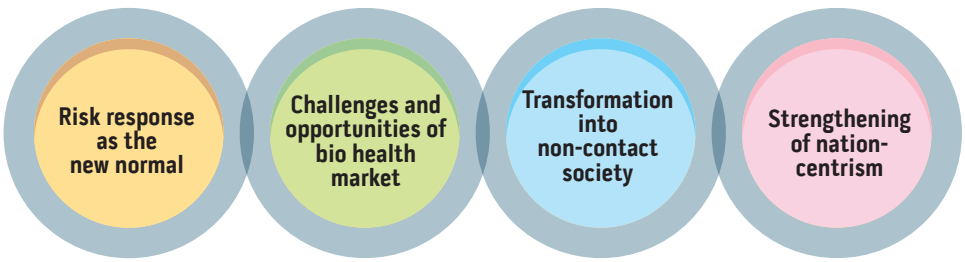
When we closely look at the rapid and uncertain changes in the landscape surrounding us, it is important to develop countermeasures based on predictions of the future. The digitalisation and other scientific and technological advances are important elements leading such changes in the post COVID-19 era, Therefore, it is necessary to identify emerging technologies that will soon be considered important in our society and come up with measures responding to them in advance. The government, research institutes, and companies can then apply the emerging technologies identified through this research to develop their investment strategies in the post COVID-19 era.

Landscape changes after COVID-19





Major changes that affect South Korea's landscape post COVID-19



Future outlook by area

After reviewing detailed changes and predicting scenarios through interviews with experts, majors issues were found in all sectors.

Healthcare

- Paradigm shift of health system from medical treatment to prevention and management of diseases
- Acceleration of digital transformation

Education

- Online learning content and infrastructure
- Preparation of short-term breaks due to emerging infectious diseases
- Changes in work method leading to new skillset needed

Transport

- Raising awareness on climate change, destruction of eco system
- Increasing demand for personal and micro mobility

Logistics

- Decline in transnational cargo demand due to closure of borders
- Explosive growth of e-commerce due to physical distancing practice

Manufacturing

- Adoption of smart technology and tools in factories
- Constant increase of manufacturing cost
- Response on pandemic and expectation on economic recovery

Environment

- Increasing volume of waste generated due to COVID-19
- Increasing used of disposable products due to COVID-19
- Climate change no longer a priority

Culture

- Increasing awareness of local based brands
- Financial damage on the cultural industry due to non-contact
- Changes in production, distribution and consumption of products in the culture industry

Data Security

- Expansion of non-contact services such as video conferencing online learning, work from home
- Strengthening protection of personal data
- Smartization of public security system

Emerging technologies

After predicting the future of major sectors in the post COVID-19 era, 25 emerging technologies were identified based on the performance of technological innovation and the impact on the society and economy. With regard to 'healthcare', 5 emerging technologies were identified including AI-based diagnosis of disease in real-time, real-time measurement and analysis of biometric information, prediction on the spread of infectious disease and early warning, and RNA-based vaccines resistant to viruses. These emerging technologies were mapped onto major changes and sectors and the result found that the emerging technologies were related the most to the 'transformation into the non-contact society' among major changes in the landscape.

EDUCATION

Technology	Areas of Application
VR/MR technologies for immersive learning	Special education to help student overcome physical disabilities and improve cognitive ability
Tailored learning technologies based on AI and big data	System development for the collection and analysis of learning and interactive data (between students – contents, students – students, and students – lecturer)
High-capacity communication technology for online classes	Secure the infrastructure for online classes

TRANSPORT

Technology	Areas of Application
Personalised last mile mobility	An eco-friendly way to solve traffic congestion by providing means of transport to move a short distance quickly and conveniently
Integration of multiple modes of transport	Strengthening the complex linkage with conventional modes of transport and provision of tailored service considering the patterns of movement
Autonomous vehicles to transport person suspected with virus disease	Provide unmanned services upon the occurrence of risk situations such as natural disaster, radiation pollution, etc.

ENVIRONMENT

Technology	Areas of Application
Robots to transport and collect medical waste	Safe collection and transport of medical wastes occurred in medical institutions, testing/inspection institutions, etc.
Technologies for integrated management of zoonotic diseases	Disease control and management, preventive measures for public health upon the outbreak of epidemic or pandemic

CULTURE

Technology	Areas of Application
Immersive broadcasting service	Immersive sports broadcasting, immersive worship, immersive live concert broadcasting
Deepfake detection techniques	To determine the authenticity of videos and voices used for scams and fake videos
GIS mapping with drones and 3D imaging technologies	Provision of VR and other services by converting the scenes of tourist attractions into 3D videos

DATA SECURITY

Technology	Areas of Application
Quantum-encrypted video conferencing for security	Hacking free video conference, data communication for quantum computing
Movement tracing system using homomorphic encryption	Tracing of travel routes while protecting personal data, remote medicine
Technologies to assure video conferencing security	Video conference, online class, work from home, non-contact tasks

LOGISTICS

Technology	Areas of Application
ICT based integrated platform of logistics data	Applicable to the entire areas of logistics services including freight cargo, marine logistics inventory management, logistics contract
Autonomous driving robots for delivery	On-demand parcel delivery service, unmanned delivery service by linking with self-driving trucks
Smartization of logistics and distribution centre	Transfer of goods within the center, dealing with the movement of heavy items and risky activities in the center, optimal use of space

MANUFACTURING

Technology	Areas of Application
Digital twin (Advanced CPS)	Production design, monitoring of plant operation, prediction on workload and production loss, failure diagnosis and prediction, performance analysis
Human Augmentation technology	Cochlear implant, artificial vision, brain implants, prosthetic arms and legs, sleep inducement, concentration improvement, neurofeedback device, BMI technologies to implement advanced driver assistance systems (ADAS) functions
Cooperative robot	Vehicle assembly, cooperative robots for quality inspection, streetlight assembly, cooperative robots for plant, packaging of cosmetic products, picking & placing, cooperative robots for the manufacturing of multiple items in small quantity

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Thrive with the New Normal:

A post covid strategy for the future workforce

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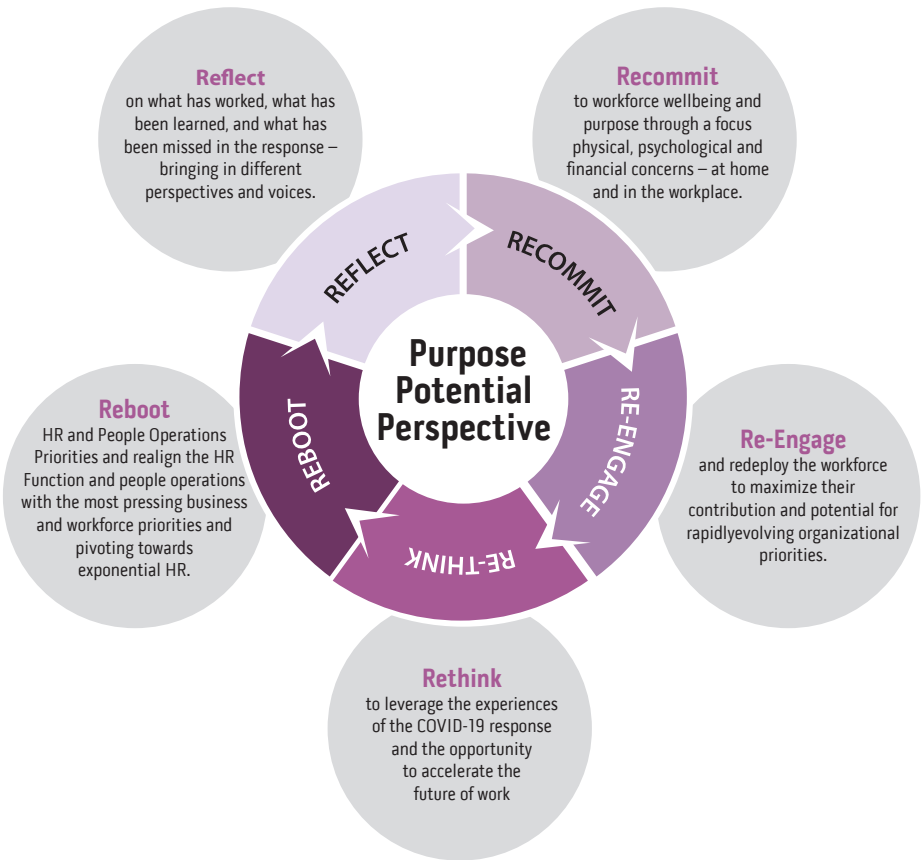
The top priority for most organisations is to focus on crisis response and health, safety, essential services, and work and education virtualisation. Now that the organisation is starting to move out of this response phase, leaders are focusing on the next challenges for their employees as they plan their recovery. It is important to know that recovery is not static. Given the lack of available treatments and the uncertain prospects and timing of vaccines, it does not happen suddenly. As a result, many organisations plan multiple scenarios and time horizons as they move from crisis response to recovery. Many also anticipate the potential for multiple waves of pandemics and their ongoing global-uneven-footprint. Therefore, it is expected to be a gradual transition from the reaction stage to the new reality. Organisations recognise that they need to be prepared for the various effects of a pandemic (mild, harsh, severe) and that recovery needs to adapt to different situations in different countries and industries around the world.

It is believed that the workforce-related strategies in recovery are best coordinated through five key actions: Reflect, Recommit, Re-engage, Rethink, and Reboot. These actions help organisations bridge crisis response to new conditions by laying the foundation for thriving in post-crisis times.



REFLECT

Create time to reflect. The main difference between response and crisis response is to take the time to think about: In fact, reflection is the most important first step in the recovery process and can be a continuous action. It starts by thinking about what worked, what was learned, and what was lost in the response. Reflection also includes taking the time to capture different perspectives, voices, and different levels of leaders as input for planning the next step. Given the seriousness, intensity and impact on workers and organisations, a workforce recovery strategy requires continuous reflection-based action. Like most parts of the recovery process, it's not easy and requires careful action on the part of the leader to make time to do it.

RECOMMIT

When an organisation initiates the recovery process, it needs to strengthen its commitment to well-being and purpose by focusing on physical, psychological, and financial concerns. Physical health includes a focus on health and safety, workplace cleanliness, and availability of testing and treatment. Mental health includes workplace practices such as flexitime that take into account the mental and emotional health of workers. Leaders need to be aware of the diversity of individual workers' expectations and support them through the transition to crisis and recovery. Efforts to happiness should extend to happiness at home, as workers continue to care for their children and elderly family members. Employees want meaning in their work. That is, what it means to the organisation and its customers, to itself and to its career as an individual, and to the community. New commitments to the workforce include focus on purpose, integration of employee needs for personality and attribution, and the value of connecting happiness, contribution and work.

Organisations need to communicate directly with individuals and teams in a timely manner, outlining their mission and priorities, and linking business goals and outcomes. The workforce must feel connected to its mission. As part of this effort, organisations need to evaluate, update, and implement basic policies and practices that promote employee's well-being, both on-site and off-site. Companies need to be aware that performance can take on new implications in the post-Covid workplace. Health and productivity work together to help employees achieve their goals as well as prosper. Leaders need to ask themselves how they support their employees so that they feel connected and involved in the organisation's newly defined priorities and strategies.

RE-ENGAGE

The recovery process creates opportunities for organisations to relocate their employees and maximise their contributions and potential. Some employees will return onsite, while others will be able to continue working remotely. Some people engage in hybrid activities. Workers tend to work remotely most of the time, but join with team members for specific features. Organisations need to prepare workers with the skills and abilities to return home. This includes providing infrastructure and technologies such as bandwidth and tools for virtual work, and the key knowledge resources and digital access they need to meet both immediate and future work needs. Reintegration and relocation of the workforce can be done both by allocating meaningful and influential opportunities to workers and by encouraging workers and teams to use their potential and skills. As we have generally seen in crisis response, we all have far more capabilities as individuals, teams and organisations than previously expected.

Teams play an increasingly important role and need to be designed and configured to meet changing business priorities and outcomes. Given the ongoing challenges many workers face in recovering from family and personal problems, team assignment needs to balance worker preferences for schedule and flexibility with key business needs. Team leaders are essential to short-term success, re-engage the workforce and drive business outcomes. Team empowerment and new roles help foster a sense of agility and ultimately lasting resilience.

Leaders need to provide teams, managers, and employees with clear directions for work priorities and routine changes, such as new technologies and digital work practices. This is an important issue for the reintegration and relocation of the workforce. Recovery requires a focus on new work priorities and new work routines. These include new schedules, combinations of onsite and virtual work, and new team assignments. How a company prepares and supports its employees for these new routines, priorities, roles, and tasks can be a determinant of employee performance.

RETHINK

Rethinking work also means rethinking workforce composition, compensation, and performance management. Changes in the composition of the workforce create opportunities for large-scale reinvention. In recent years, companies of all sizes are increasingly embracing alternative workforces for off-balance-sheet workers such as contractors, freelancers, gigs, and crowd workers.

The new workforce is often widely distributed throughout the employment model and can pose many questions for leaders in the next 12-24 months.

- What will be the composition and size of the workforce requirements?
- What skills are needed? Are they needed onsite or can they be accessed on-line or in a hybrid work environment?
- Which employees come back to work and when?
- How do leaders instil trust in the new employer-employee relationship-in onsite, online and hybrid workplaces?
- How will they ensure employees can be confident about their own safety?
- If more work will be done remotely, what support will the organisation provide?
- How can alternative workers add flexible capacity to the organisation?
- Is the organisation prepared for the increased cyber risk that comes with a dispersed and remote workforce?
- What messages and commitments can the organisation make about compensation, job security, performance management, and promotions in the next few years?

The perspectives of recovery range from global (how to serve clients and communities and fulfil their mission) to mediocre (re-wearing suits). This reassessment includes the flexibility needed to secure supply in the next crisis and a reassessment of business processes such as whether the supply chain runs across the global network or is relocated closer to home.

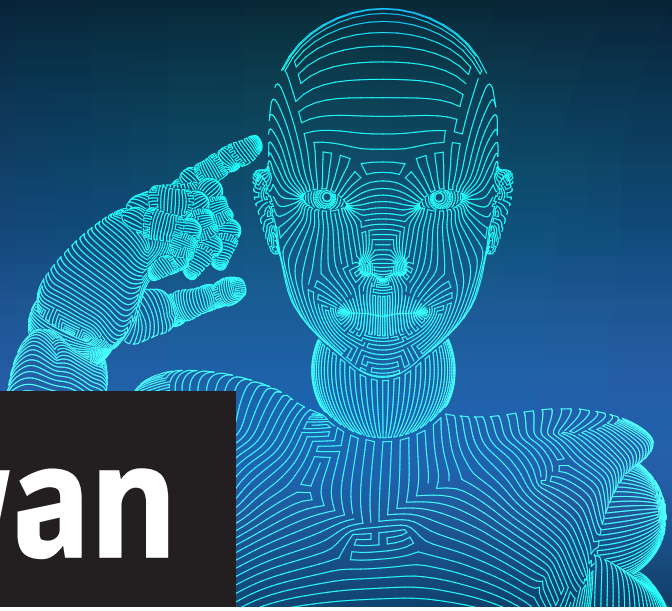
An important goal is to work with a more resilient workforce. This includes fostering a new dynamic environment that moves with a clear focus on the mission and linking employee contributions and well-being to organisational objectives (speed, adaptability, team focus, new priorities). These are important elements of a resilient workforce. Organisations need to find ways to capture the energy and rhythm of recovery, set a new pace, maintain it, and convey it at all levels.

REBOOT

In the future workplace, HR can be the voice of bold decision-making in the face of uncertainty. This helps to integrate the need for employee personality and attribution with the need for organisational security and reinvention. The choices and policies made during the recovery are an opportunity to make this shift towards purpose, potential, and perspective. The decisions HR makes today may determine its impact on recovery and its future role. When employees and broader workforce look back on this crisis and its aftermath, HR takes a positive perspective in responding, balancing important short-term workforce with business needs and the ability to focus on the future.

Conclusion

These short-term actions and long-term visions give organisations the opportunity to quickly assess and reassess the strategies and response priorities of past people and relocate themselves to prosper in the upcoming new reality. Organisations can be tempted to dismiss the need for change or think of recovery as a return to the recent past. It is not. Organisations that have returned to their previous work styles may find that their competitors are using recovery to restructure their workforce and businesses and position themselves for the future. By anticipating and adjusting these five priorities, Reflect, Recommit, Reengage, Rethink, and Reboot, future-directed organisations guide and prepare people through the recovery phase while positioning themselves for the next stage: Thrive with new normal.



Black Swan of Advanced Materials Industry (Post COVID-19)

By
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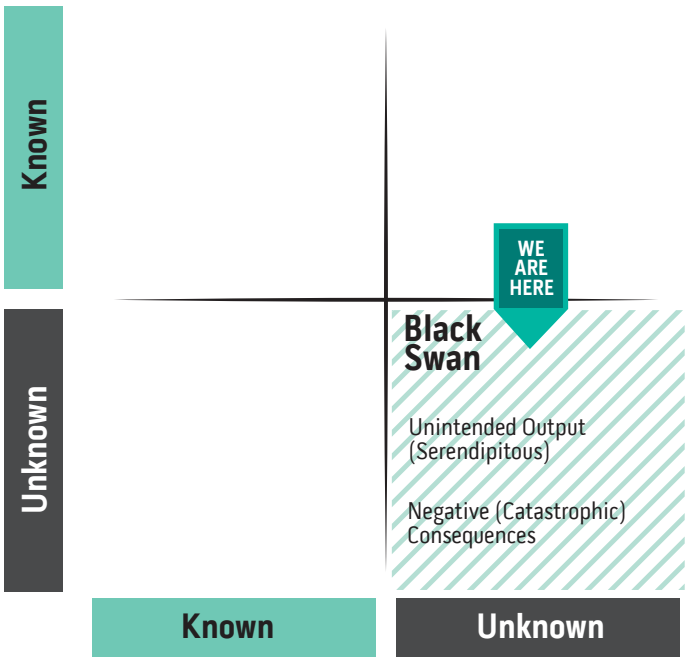
The unknown unknowns, Black Swans, or X-Events (Taleb 2010, 2012; Casti 2012). X-Events can also be the unintended output of a system with both positive (serendipitous) and negative (catastrophic) consequences. Sometimes, the terms wild card and black swan are used interchangeably. Taleb (2007) defines a Black Swan as an event meeting three criteria: 1. It is an outlier as it lies outside the realm of regular expectations, 2. It carries extreme impact and 3. Human nature makes us concoct explanations for its occurrence, after the fact, making it seem explainable and predictable. Black Swans are "unknown unknowns" which despite all the plans and precautions that might have been made still take the organisation by surprise and lead to catastrophic consequences.

Why does it matter? It can kill industries or businesses if it isn't managed well.



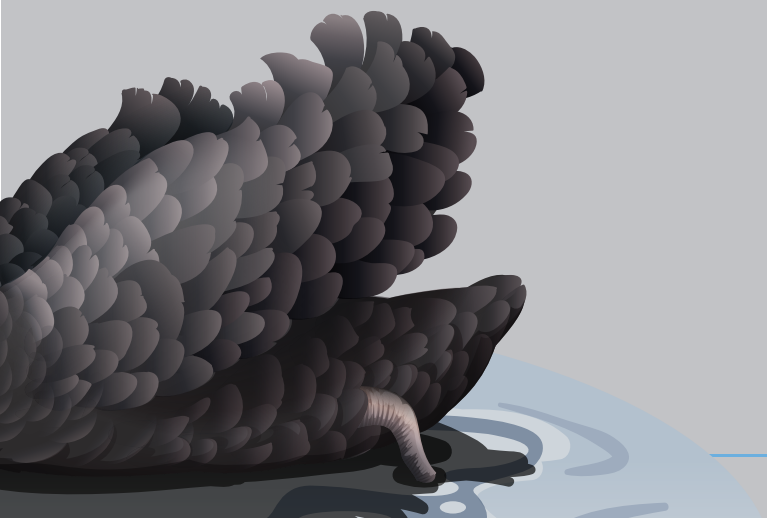
COVID-19 as the Black Swan for Advanced Materials Industry

The pandemics of COVID-19 was an unlikely event that imposed high impact globally in term of economy, the way we learn, work, and live. For global trade, COVID-19 showed the dependency on supply chain could disrupt business operations especially import and export of raw materials. *data shows disruption of raw material import-export.

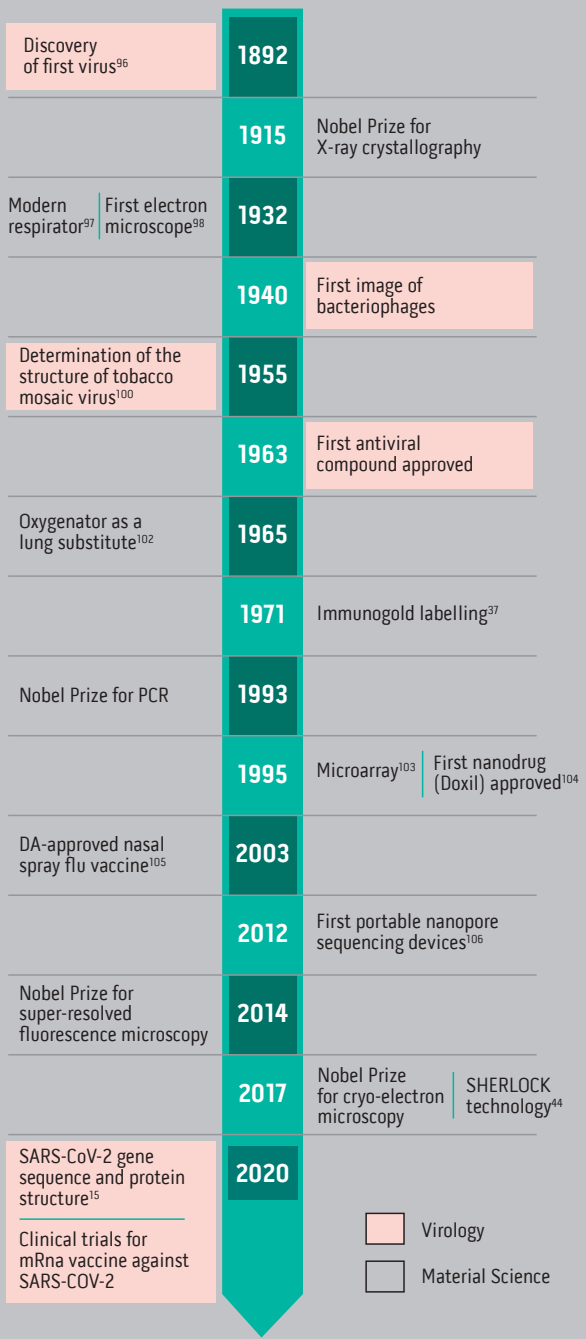
Although the full impact of COVID-19 is still unknown, the impact across the electronics value chain, from materials to final products, will likely be far reaching — and hard hitting on those parties involved with semiconductor manufacturing. COVID-19 is highlighting the potential risks and vulnerability of today's electronics and semiconductor value chain model and challenging the semiconductor industry to consider transforming its global supply chain model. COVID-19 might become the black swan event that forces the semiconductor industry to transform its global supply chain model in the context of advanced materials supply. (Deloitte,2022)

COVID-19 also became the unlikely event that changed the use of advanced materials as part of material used in Personal Protective Equipment (PPE). The ongoing COVID-19 pandemic highlights the importance of materials science in providing tools and technologies for antiviral research and treatment development.

In order to overcome the shortcomings, companies have changed the course of their strategy and are producing advanced materials essential in manufacturing Personal Protective Equipment (PPE) and ventilators such as Polyacetal (POM), Polyether ether ketone (PEEK), Polyetherimide (PEI), Polyphenylsulfone (PPSU), and Thermoplastic polyester (PBT) among others. Celanese Corporation has increased the production of materials like Polyacetal (POM), Thermoplastic polyester (PBT), Liquid Crystal Polymers (LCP), etc. in order to support PPE & medical equipment manufacturers. Also, Solvay S.A. has partnered with Boeing and is supplying high-performance medical grade PPSU and PSU films for manufacturing protective equipment for medical professionals.



Timeline of key contributions of materials science to virology



FDA, US Food and Drug Administration; SHERLOCK, specific high-sensitivity enzymatic reporter unlocking

COMPARATIVE ANALYSIS - 2

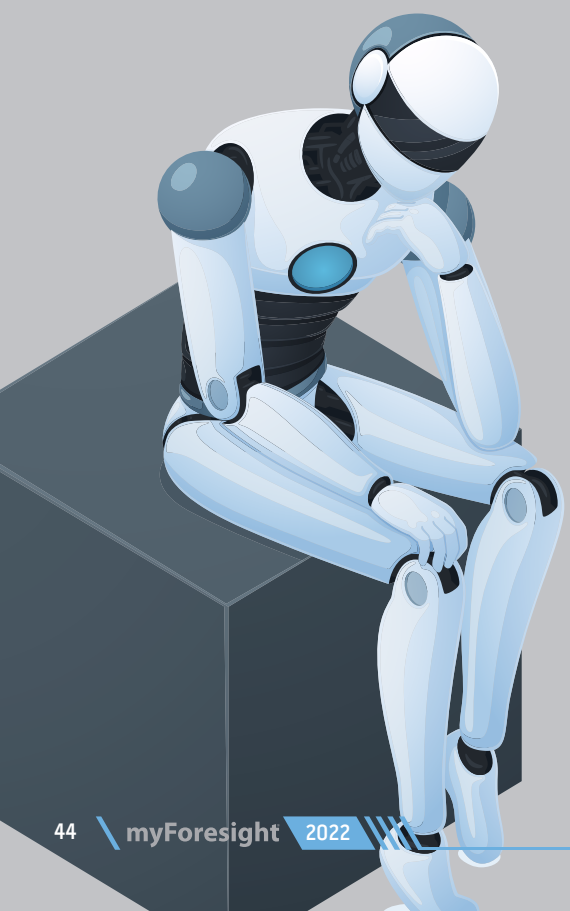
Top Gainers	vs	Top Losers
Polyhenysulfone (PPSU)		Industrial Greases
Polysulfone (PSU)		Quartz
Polyether ether ketone (PEEK)		Polyurethane Coatings
Polytherimide (PEI)		Synthetic Sapphire
Thermoplastic polyester (PBT)		Conductive Carbon Black
Polyacetal (POM)		Electronic Adhesives

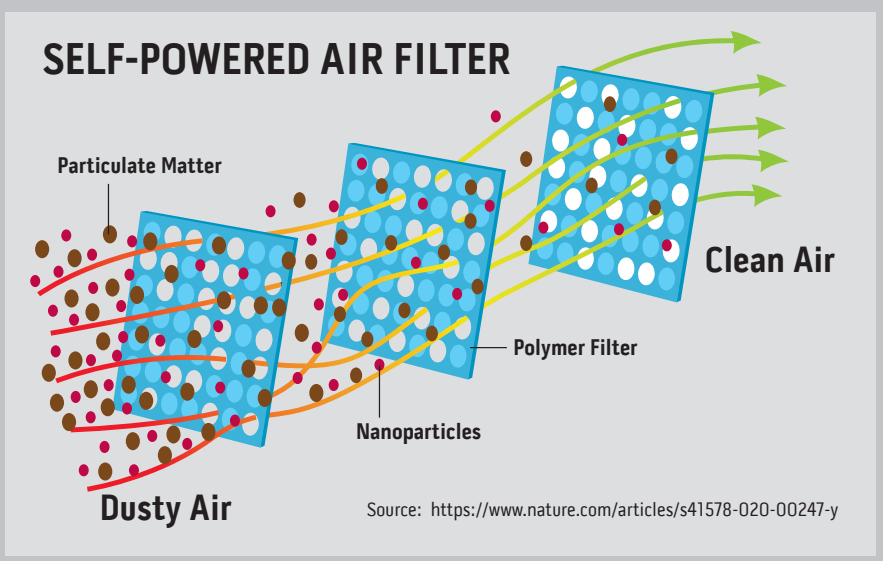
Source: Coherent Market Insights

The following comparative analysis by Coherent Market Insights shows Top Gainers for advanced material in the time of COVID-19 pandemics.

The emerging use of advanced coating for anti-bacterial surfaces become critical as tools in combating and prevention of wide spread viruses. A team from the Laboratory of Advanced Materials at Pittsburgh (LAMP) Lab at the university's Swanson School of Engineering has developed a textile coating that can not only repel bodily fluids like blood and saliva but can prevent viruses from adhering to a surface.

Nanotechnology, for example, nanopore sequencing, has contributed to the speed and accuracy of next-generation gene-sequencing platforms. While, A self-powered air filter can capture particulate matter and nanoparticles by surface adhesion.





Source: https://www.nature.com/articles/s41578-020-00247-y

Technology gone wrong

While most of the time we expect technological breakthroughs will benefit society, it also had unintended consequences. Nano technology for example used in drug delivery mechanism for health benefit, could potentially harm the recipient cased by residual stays in the body.

Geopolitisation of strategic resources

As the advanced materials key to some technological advancement for certain industries, the availability of resources could be use as strategic geopolitical tools. For example, material xxx used as key materials for F16?

For example, rare-earth elements (REE) are necessary components of more than 200 products across a wide range of applications, especially high-tech consumer products, such as cellular telephones, computer hard drives, electric and hybrid vehicles, and flat-screen monitors and televisions. Significant defense applications include electronic displays, guidance systems, lasers, and radar and sonar systems. Although the amount of REE used in a product may not be a significant part of that product by weight, value, or volume, the REE can be necessary for the device to function. For example, magnets made of REE often represent only a small fraction of the total weight, but without them, the spindle motors and voice coils of desktops and laptops would not be possible (US Geological Survey).

The annual demand for rare-earth metals doubled to 125,000 tonnes in 15 years, and the demand is projected to reach 315,000 tonnes in 2030, driven by increasing uptake in green technologies and advancing electronics. This is creating enormous pressure on global production.

The most mining for rare-earth metals occurs in China, which produces more than 70% of global supply. This raises concerns about long-term availability, particularly after China threatened to restrict its supply in 2019 during its trade war with the US.

To ban trade for certain countries would disrupt the specific industry development. Concentration, exploitation and/or mobility restriction by a state of goods, knowledge, services or technology critical to human development with the intent of gaining geopolitical advantage. According to Coherent Market Insights, inadequate supply of raw materials will lead to fluctuation in the prices per ton of advanced materials, reflecting an upward trend in the short run till September 2020. Disruption in the supply chain required businesses to revisit the topic of material requirements planning and to ensure business has the resources needed to succeed.

Malaysia is a case study in the conflict between people and profit. The government spent decades attracting foreign investment and diversifying its economy beyond rubber and tin. The country now accounts for 13% of the world's chip testing and packaging, a key step in producing the semiconductors that go into automobiles, smartphones and other devices. Some 575,000 people were employed in the electrical and electronics industry in 2020, working with global chipmakers such as STMicro, Infineon Technologies AG, Intel Corp. and Renesas Electronics Corp.

Taiwan, the world's major chip producer, is saying it cannot sort out the problem alone and needs Malaysia to do its part to help ease the stress on the chip shortage.

Currently, Malaysia is one of the top ten countries in the semiconductor industry, accounting for about seven percent of the global semiconductor trade and about 13% of the global capacity in terms of back-end assembly test and packaging.

Malaysia is home to suppliers and factories serving semiconductor makers such as Europe's STMicroelectronics and Infineon, as well as major carmakers including Toyota Motor Corp and Ford Motor Co.

Several automakers and semiconductor companies have said this month that pandemic-related disruptions in the Southeast Asian nation were hitting their supply chains.

In 2019, China was responsible for 80% of rare earths imports, according to the U.S. Geological Survey, although exports fell in 2020 in part due to COVID-19.

Rare earths supply chain responsible for some of the most important materials involved in electric vehicle production, battery making, renewable energy systems and technology manufacturing.

The EU gets 98% of its supply from China. Rare earth minerals, with names like neodymium, praseodymium and dysprosium, are crucial to the manufacture of magnets used in industries of the future, such as wind turbines and electric cars. And they are already being used in consumer goods such as smartphones, computer screens and telescopic lenses.

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Skills for the Future

By
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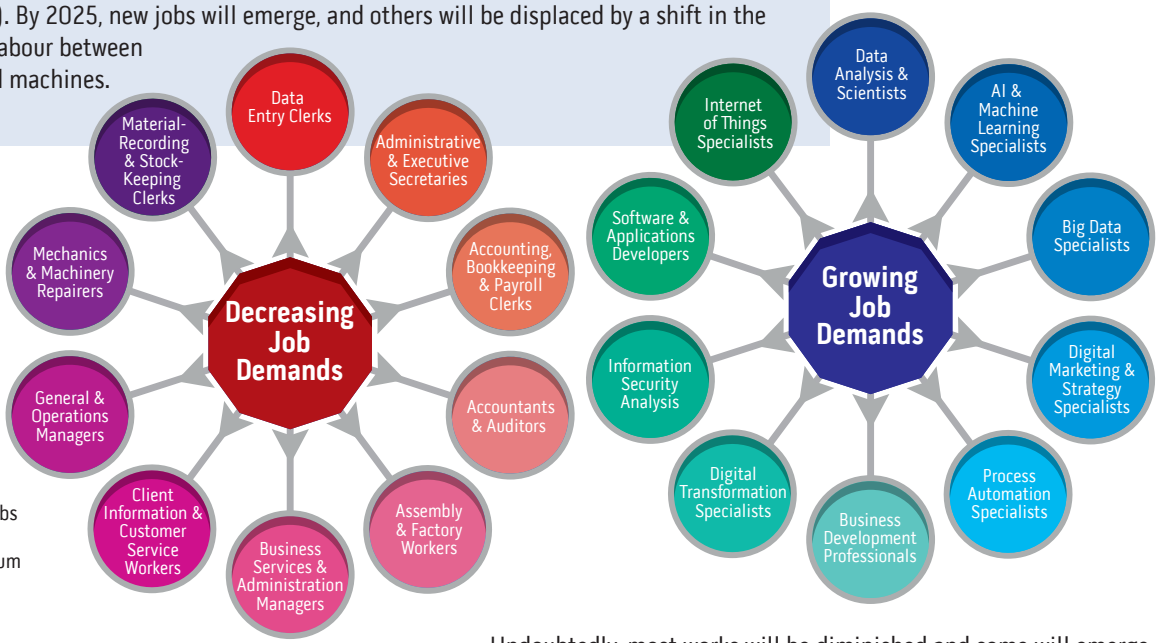
Though it is important to note that while automation will change 50% of jobs, it is not expected to eliminate more than 5% (WEF, 2020). The demand will shift away from machine operators, office support positions and low-skill professions towards technology professionals. According to World Economic Forum (WEF) 85 million jobs will be diminished and 97 million new roles will emerge to adapt to changing market (WEF, 2020). By 2025, new jobs will emerge, and others will be displaced by a shift in the division of labour between humans and machines.



Source: Future of Jobs Reports 2020, World Economic Forum

Facts to know about the future of jobs:

Undoubtedly, most works will be diminished and some will emerge. These are the comparison between the jobs in demand in the 90s and jobs in demand in 2030 and beyond. We can see that the jobs of the future revolves around an intensive usage of technology and the ones of yesterday consists mainly on manufacturing products.

Top 5 jobs in demand in the **1990s**


Wood building and mobile home manufacturing


Machinery manufacturing


Dyeing and finishing textiles manufacturing


Printing, publishing, and allied industries, except newspapers


Computers and related equipment manufacturing

Top 5 jobs of the future for **2030 and beyond**


Work from home facilitator


Fitness commitment counsellor – paired with digital wearables like Apple watches and FitBit dashboards


Smart home design manager


XR Immersion Counsellor – using augmented reality for training purposes. (Platform used is Stivr)


Workplace environment architect – health screenings were used in offices during the pandemic to detect & mitigate viruses infections

Source: World Economic Forum, 2021

These roles, which are still strange-sounding but are likely to start showing up in job listings more frequently shortly, might inspire us to consider new options that might make us in-demand workers in the future.

Comparison between South-East Asian Nations and how they have prepared for the coming of future of jobs

COUNTRY	INITIATIVES	WHY IT MATTERS
 MALAYSIA	**MakersLab** by Malaysia Research Accelerator for Technology and Innovation, MRANTI	■ Malaysia needs more scientists, engineers, technologists to fill critical occupations as the 4IR is approaching. Hence, there are a lot of events offered in the MakersLab to gauge innovators, hobbyists and engineers. ■ Making connections between problems and solutions is one of MRANTI's goals, and MakersLab would serve as a platform for developing community members' innovative, creative, and problem-solving abilities.
	Let's Learn Digital programme by MDEC	■ The Let's Learn Digital or LLD programme was created to ensure the pipeline for digitally-skilled and capable workforce goes unhindered.
 SINGAPORE	**Skillsfuture**	■ Help individuals make well-informed choices in education, training and careers ■ Develop an integrated high-quality system of education and training that responds to constantly evolving needs ■ Promote employer recognition and career development based on skills and master ■ Foster a culture that supports and celebrates lifelong learning

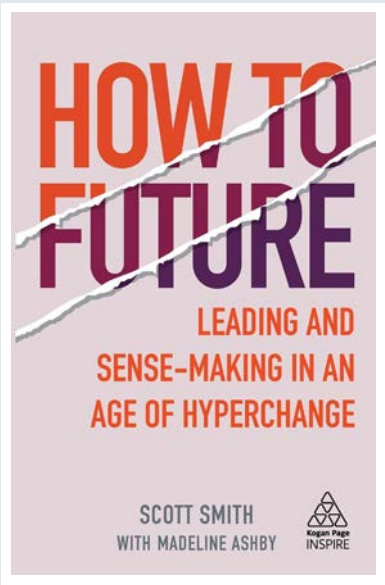
 THAILAND	**Cooperative and Work-Integrated Education (CWIE) Programme** by Ministry of Higher Education, Science, Research and Innovation (MHESI)	■ This is a curriculum cooperated by higher education institutions and external organizations to prepare graduates for the world of work completed with the competency to meet the needs of the job market and to develop careers in the present and prepare for future positions.
		■ The implementation of the policies have resulted an improvements of Thailand's labour force on international rankings.
		  ■ The growth of the labour force, in-training opportunities for employees in the private sector,
		  ■ Scientific infrastructure,
		  ■ Increase in scientific research publications,
		  ■ Business confidence on collaboration between academia and the private sector and
		  ■ The protection of intellectual property rights.

 VIETNAM	**The Digital Transformation Programme 2025**	■ The initiative will help accelerate digital transformation through changes in awareness, enterprise strategies, and incentives towards the digitalization of businesses, administration, and production activities.
 INDONESIA	**Digital Leadership Academy** **The Digital Talent Scholarship**	■ The programmes including courses in cloud computing, big data, artificial intelligence (AI), and cyber security; are aimed at creating digital talents in Indonesia to address the gap between the availability of digital talents and the need for such talents, both nationally and in the Asia-Pacific region.

 PHILIPPINES	**The Balik Scientist Programme**	■ Filipino scientists, technologists, and experts are encouraged to return home and share their knowledge through the Balik Scientist Program (BSP) of the Department of Science and Technology (DOST), which aims to advance scientific, agro-industrial, and economic development, including the growth of human capital in science, technology, and innovation.
		■ The Balik Scientist Programme aims to:
		  1. Reverse the effect of the brain drain
		  2. Strengthen S & T capabilities
		  3. Accelerate flow of technologies
		  4. Promote knowledge sharing

Conclusion We can see that South-East Asian countries have taken steps to get prepared for the future of jobs which will primarily revolve around the usage of technology on a daily basis. Hence, the reason new work roles developed. We must prepare for changes that will come with increased use of technology.

myForesight® Book Club



The Right Place
How National Competitiveness Makes or Breaks Companies
By Arturo Bris

ISBN-10: 0367674637
ISBN -13:978-0367674632

Publisher: Routledge; 1st edition (July 29, 2021)

The Right Place explains why firms succeed in one country and fail in another, irrespective of their inner drivers, and suggests potential initiatives that governments can take to help the private sector create jobs and, consequently make their countries more prosperous.

The competitiveness race is not unlike a cycling race. If you want to ride fast, you need three things: a good bike, to be in good shape, and a smooth and fast road. In a collaborative model, you might say the business is the bicycle, the business leader is the cyclist, and the road is the government and the external environment.

The responsibility of a government is to design and build the best possible road. It turns out that when the road is good, good cyclists suddenly appear and want to race on it. In this book, competition and macroeconomics expert, Arturo Bris, provides the analysis of country competitive performance based on 30 years advising countries on this topic. The typical mistakes that countries make are revealed and the pillars necessary in building a competitive economy: economic performance as a necessary condition for prosperity; government efficiency, so the public sector can create the conditions for a productive economy; business efficiency, so companies can create jobs; and infrastructure, both tangible and intangible, so businesses and individuals can operate efficiently.

With contemporary case studies throughout, the book provides an illuminating read for politicians, business leaders and students of macroeconomics.

MyForesight® in the News

Anticipating Change through Foresight and Future Studies

31 March, Berjaya Times Online session

En. Rushdi shared some insights on Anticipating Change through Foresight and Future Studies at the Open Virtual Leadership Programme organised by the Razak School of Government (RSOG).

The programme aimed to propel the advancement of Malaysia's senior public sector officials towards resilient, effective, and inspired leadership to strive in a new and challenging environment. From this session, it was emphasised that anticipating plausible change is a must-have skill for future leaders, as the decision-makers will be able to plan robust and future-proof strategies.

Future of Work in the Era of Uncertainty

31 March, Berjaya Times Square, Kuala Lumpur

Mr Azammi presented 'FUTURE OF WORK IN THE ERA OF UNCERTAINTY' at the Youth Career Symposium 2022, organised by Institute Pembangunan dan Kecemerlangan Kepimpinan (i-LEAD), Ministry of Youth.

The symposium gathered 300 youths from various backgrounds. The presentation included the trends and emerging technologies that could shape the future of work, challenges in preparing the future workforce.

Horizon Scanning Workshop: Exploring Future of Malaysia.

7 April 2022, MIGHT Cyberjaya

MIGHT welcomed the Ambassador of Finland to Malaysia HE Sami Leino, our collaborator of Business Finland and other participants to the Horizon Scanning Workshop: Exploring Future of Malaysia.

The delegation was hosted by Tan Sri Ahmad Tajuddin as this workshop was conducted to:

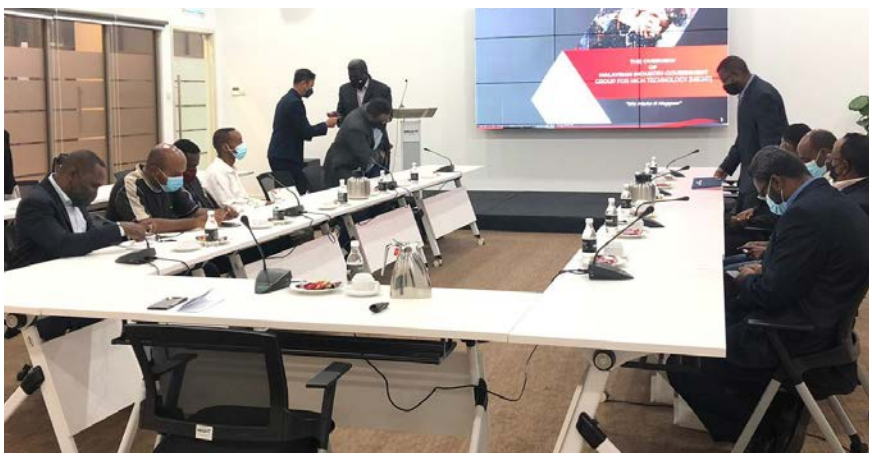
1. Envision the future of Malaysia through a foresight approach.
2. Identify key change signals/forces impacting the businesses/industries' operational environment in Malaysia
3. Explore opportunities and minimise potential risks ahead of us.

Visit of Students of MBEM, Sudan to MIGHT

25th May 2022, MIGHT Cyberjaya

A presentation on Foresight studies by myForesight® team and its purpose towards building a future path for the nation was conducted by Mr. Mohd Nurul Azammi Mohd Nudri for the Master of Building Engineering and Management (MBEM), Safat College students of Sudan.

A total number of 11 students attended the presentation and many engaging discussions pertaining to Foresight studies and its relevance to Engineering studies took place during the Question and Answer (Q&A) session.



Global Megatrends in the Professional Services Industry

3rd June 2022, Connexion Conference & Event (CCEC), Bangsar South

Ministry of International Trade and Industry (MITI), Malaysian Productivity Corporation (MPC), and PSPN (Professional Productivity Services Nexus) hosted a workshop on positioning Malaysia as a Professional Services Hub right now (Professional Services Productivity Nexus)

Dr. Tan was invited to present a discussion on Global Megatrends in the Professional Services Industry, as well as an outline of the New IMP 2030, as the workshop's scene setting and foundation.

There are two categories of global megatrends in professional services: business-and-employee-focused. Each of these centric contains tendencies that should be identified. The first business centric trend is the Digital Transformation from Automation and Artificial Intelligence. This is significant because it provides better, faster, and more effective service. It opens the door for new products and improved business models.

The second business centric trend is Globalisation and Transformation into Virtual Firms. The third business centric trend is Modularisation and Value-driven Revenue Model as New Business Models. The employee-centric trends are Talent's Changing Face and Tech-enabled Work-culture to Enhance Team Engagement. Therefore the discussion aims to identify future scenarios that are plausible and their impacts, developing megatrend changes, and create more effective, robust, and adaptable policies.

INTAN Sustainable Leadership Course

3rd June 2022, Online session

Over 35 participants from Malaysia's Service Grade 41-54 from various ministries and agencies attended a 2-hour seminar on Futures Thinking and Leadership to learn how Foresight would enable future leaders make good decisions.

The course also aims to create a resilient future with sustainable leaders, futures thinking and leadership are required. The focus of this session was on how futures thinking may develop sustainable leaders. Futures thinking should include foresight of the law of unintended consequences, agility and flexibility in anticipating change, and strategic planning towards a long-term and big-picture future from where we are now in order to have sustainable leaders.

Courtesy Visit to PETRONAS

24th June 2022, PETRONAS

Courtesy visit to our Lead Member, PETRONAS. From PETRONAS, the delegation was led by MIGHT Board Member, En Mazuin Ismail. The discussion centred on the value of strategic partnership between MIGHT and PETRONAS, the past and way forward.

Future of ASEAN STI 2035

25th May 2022, Online session
27-28 June 2022, Bangkok, Thailand

Over 35 participants from Malaysia's Service Grade 41-54 from various ministries and agencies attended a 2-hour seminar on Futures Thinking and Leadership to learn how Foresight would enable future leaders make good decisions.

The course also aims to create a resilient future with sustainable leaders, futures thinking and leadership are required. The focus of this session was on how futures thinking may develop sustainable leaders. Futures thinking should include foresight of the law of unintended consequences, agility and flexibility in anticipating change, and strategic planning towards a long-term and big-picture future from where we are now in order to have sustainable leaders.

MOSTI Strategic Retreat

6th to 8th July 2022, Janda Baik, Pahang

MIGHT moderated Ministry of Science, Technology and Innovation (MOSTI) Strategic Retreat at Janda Baik for 3 days, from the 6th to 8th July 2022. Participants were mainly MOSTI officials from various divisions who were being exposed to selected foresight and futures thinking tools.

This retreat aims to explore and identify new ideas that could drive MOSTI forward as a forward-looking, high-performance organisation as well as to anticipate and identify the threats and barriers to the Futures of MOSTI in driving the National Science, Technology and Innovation (STI) agenda.

Map the future

As a stakeholder and strategic policymaker, you can contribute by voicing out your opinion to help us map out the desired collective future for Malaysia.

This is an invitation by myForesight® to every member-of the public. If you think we could have done better orperhaps you would like us to cover a specific topic inthe study of Foresight or better yet, you would like tocontribute an article, we would love to hear from you.

Send your feedback and get in touch with us at foresight@might.org.my

Website: **www.myforesight.my**

We look forward to hearing from you.

myForesight® team.