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Jobs of Tomorrow

Large Language Models and Jobs – A Business Toolkit

WHITE PAPER

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Foreword



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Generative artificial intelligence (AI) and, in particular, large language models (LLMs), underpinned by advancements in machine learning and natural language processing, represent a paradigm shift in how we interact with information and, by extension, how we work. These technologies can create original content, generate insights from large amounts of data, translate languages with near-human accuracy and potentially even make complex decisions. The versatility and efficiency of these technologies, including new LLM-powered human-machine interfaces such as intelligent agents, could have profound implications for jobs and the future of work.

While the application of LLMs could lead to significant productivity gains and the creation of new types of jobs, there is also a risk that they could displace existing roles, exacerbating socioeconomic disparities and creating a sense of job insecurity among the global workforce. As such, integrating AI into our workplaces is a balancing act between seizing opportunities and managing potential disruptions.

This paper is intended to serve as a toolkit for businesses to provide guidance on strategies to maximize the potential of employees as they adapt, learn and grow with these technologies in their professional careers. This paper also serves as a call to action for business leaders to take the

initiative in curating strategies and practices that facilitate LLMs to work for businesses, employees and society as a whole.

This paper is a direct follow-up on the previous edition of the Jobs of Tomorrow series, [Jobs of Tomorrow: Large Language Models and Jobs](#), which took a structured approach to understanding the direct impact of LLMs on specific jobs. That paper provided a structured analysis of the potential impact of LLMs on jobs, enabling stakeholders – business leaders, policy-makers, workers and the broader public – to make more informed decisions. In addition, the structured approach proposed in that paper also provided a case study for future waves of technological advancement across sectors.

We are deeply grateful to the Centre for the New Economy and Society partners and constituents for their leadership of the jobs agenda, as well as for the partnership of the Accenture team, whose members served as core collaborators on this paper. The insights of this paper will be instrumental for the Jobs Consortium, a global coalition of ministers and chief executive officers that promotes a better future of work, through boosting labour market foresight, driving job creation and improving job quality while enabling job transitions and will serve as a key tool for the Good Work Alliance, a global, cross-industry group of businesses committed to prioritizing good work in an evolving jobs landscape.

Executive summary

Businesses will need to strategically navigate concerns over job displacement risk, job quality and skilling.

The explosive popularity and accessibility of generative artificial intelligence (AI) technologies, such as GitHub's Copilot, Midjourney and ChatGPT, have produced AI's first true inflexion point in public adoption, demonstrating the technology's transformative potential. While there are myriad possible use cases for generative AI, including image, video, written language and music creation, large language models (LLMs) have an outsized potential to impact the greatest number of jobs in the near future.

The [Future of Jobs Report 2023](#) states that global business leaders believe that 23% of global jobs are expected to transform within the next five years due to rapid technological advances, particularly in generative AI technologies. Especially, LLM's have the potential for both automating and augmenting tasks across various occupations. The [Jobs of Tomorrow: Large Language Models and Jobs](#) white paper, published by the World Economic Forum and Accenture earlier in 2023, found that 40% of working hours could be transformed, affecting roles from specialized fields requiring advanced degrees to those focused on routine procedures.

Jobs emphasizing face-to-face interaction are likely to be less affected. Businesses are urged to adopt proactive and responsible approaches to manage this transformation, addressing concerns like job change and job displacement risk, job quality and skilling. Structured analysis, planning and proactive preparation are required of business leaders to ensure that LLMs and other technological advancements lead to an improved future of work with new opportunities for workers.

This paper serves as a toolkit for businesses, providing practical strategies to navigate the changing job landscape in three primary areas of consideration: 1) job change and job displacement risk, 2) job quality, and 3) learning and skilling. Each of these considerations is addressed through business practices guided by three fundamental approaches: 1) promoting worker awareness, 2) facilitating organizational change, and 3) shifting workplace norms and culture. The result is a business strategy matrix for effectively leading the workforce transition through the large-scale deployment of LLMs.

Introduction

Up to 40% of working hours could be transformed by LLMs – businesses must take the lead.

Technology is rapidly transforming the labour market. The *Future of Jobs Report 2023* found that global business leaders expect 23% of current jobs to transform within the next five years.¹ This transformation is driven by key trends like technology adoption, the green transition and the global macroeconomic outlook. In particular, technology adoption is driving change in labour markets: 82% of business leaders expect increased adoption of new technologies to drive business transformation, while 37% of business leaders anticipate that new technologies will be a net job creator, and 21% believe that they will be a net job displacer.

Throughout 2023, specifically, generative artificial intelligence (AI) has developed at a rapid pace in terms of capabilities and adoption, and that pace shows no signs of slowing down. In fact, three out of every four companies across the globe are expected to adopt technologies that include generative AI in the next 3 to 5 years, and 98% of global executives agree AI foundation models will play an important role in their organizations' strategies in that same time period.² GitHub's Copilot, Midjourney and ChatGPT are a case in

point, demonstrating the technology's transformative potential. One week into its November 2022 launch, ChatGPT, OpenAI's trained language model, reached one million users. By January, ChatGPT had reached one hundred million monthly active users, making it the fastest-growing consumer application in history at the time.³

Generative transformer models have the ability to impact all classes of creative work, possessing the capability to generate novel images, videos, music, sounds and written language. While there are myriad possible use cases for generative AI, large language models (LLMs) and their unique language-generating capabilities have an outsized potential to impact the greatest number of jobs in the near future. LLMs, such as those powering ChatGPT, have demonstrated this rapid development and have the potential to impact many jobs and workers across industries. In September 2023, to increase understanding of how LLMs could impact jobs, the World Economic Forum, in collaboration with Accenture, published the *Jobs of Tomorrow: Large Language Models and Jobs* white paper. It provides a structured analysis of the potential



“ Over 40% of working hours could be transformed by LLMs through automation or augmentation.

impact of LLMs on jobs and finds that it will both automate and augment job tasks, ultimately having a transformative effect on jobs.

The September 2023 white paper found that an estimated 62% of total work time across occupations involves language-based tasks – tasks that could be exposed to the potential impacts of LLMs. Over 19,000 individual tasks across 867 occupations were assessed to understand the potential exposure of each task to LLM adoption, classifying them as tasks with high potential for automation (the task could be performed by LLMs, without humans), high potential for augmentation (the task will continue to be performed by humans, with LLMs increasing human productivity), low potential for either (humans will continue to perform the task with no significant impact from LLMs) or unaffected (non-language tasks).

The analysis found that over 40% of working hours could be transformed by LLMs through automation or augmentation. Jobs with the highest potential for automation of tasks include those that emphasize routine and repetitive procedures and do not require a high degree of interpersonal communication, including many clerical occupations. Jobs with the highest potential for augmentation by LLMs are those that emphasize critical thinking and complex problem-solving skills, especially those in science, technology, engineering and mathematics (STEM) fields. They include a mix of highly specialized roles often requiring advanced degrees, such as computer programmers, plus roles that require human validation, such as assessors, monitors and screeners. Jobs emphasizing face-to-face communication and interpersonal interactions are expected to be less exposed to the impacts of LLMs, and those emphasizing non-language tasks will be even less exposed or not exposed at all.⁴ Lastly, the paper also found that new jobs could emerge, for example, AI model and prompt engineers, interface and interaction designers, AI content creators, data curators and trainers, and ethics and governance specialists.

Given the likely ubiquitous implementation of LLMs in business environments, paired with its

potential for job transformation as found by the *Jobs of Tomorrow: Large Language Models and Jobs* white paper, it is critical that businesses adopt a proactive, human-centred and responsible approach to LLMs.

This white paper is a follow-up to the *Jobs of Tomorrow: Large Language Models and Jobs* paper and serves as a toolkit for businesses to address three considerations for the technological transformation of labour markets to come. The first is job change and job displacement risk: as LLMs are capable of performing many of the language tasks used on the job, and up to 60% of work time uses language tasks, there is potential for some jobs to be displaced as others emerge. The second is job quality: the deployment of these technological tools could affect not only the number of jobs but also the nature of the work itself, potentially affecting the meaningfulness of work, the well-being of workers and the diversity associated with new and legacy roles. The third concern is learning and skilling: to adjust to and embrace technological change requires continuous learning; an agile workforce is the best approach to meet the evolving demands of the labour market.

In the following sections, each consideration is first defined and then addressed with several practical business strategies that ensure a cohesive and inclusive approach to the rapidly changing job landscape. This white paper proposes that the business strategies fall into three primary approaches: 1) promoting worker awareness, which involves informing and educating employees about the potential impacts of LLMs on their current roles and future job prospects, empowering them to proactively engage with the evolving technological landscape, 2) facilitating organizational change, in which companies adapt their structures, processes and strategies to harness the benefits of new technologies while mitigating the risks associated with such transformations, and 3) shifting workplace norms and culture, to reshape the underlying attitudes, behaviours and values within the workplace to promote agility in responsiveness to change. Table 1 summarizes the key considerations and proposed business strategies.

TABLE 1

Summary of business strategies in each of the primary three concerns

	Job change and job displacement risk	Job quality	Skilling and learning
Worker awareness	1 Deploy proactive forecasting and communicate expectations	4 Ensure inclusive design of AI and LLM applications	7 Roll out broad LLM literacy programmes alongside AI-specific jobs
Organizational change	2 Set up and make use of internal job markets	5 Implement transparent governance structures for LLM deployment	8 Apply a skill-first approach organization wide
Shifting norms and culture	3 Create increased workforce agility	6 Increase awareness of LLM benefits in the workplace	9 Offer workplace learning opportunities

1

Consideration 1

Job change and job displacement risk

Proactively addressing job change and job displacement risk through internal job markets and worker agility ensures smooth transitions for employees.

Concerns have arisen that the latest wave of generative AI technologies, specifically LLMs, could lead to the automation of job tasks and, ultimately, job loss. While labour market predictions are never 100% certain, recent World Economic Forum research took a structured approach and found that the adoption of LLMs could automate some tasks and augment others.⁵

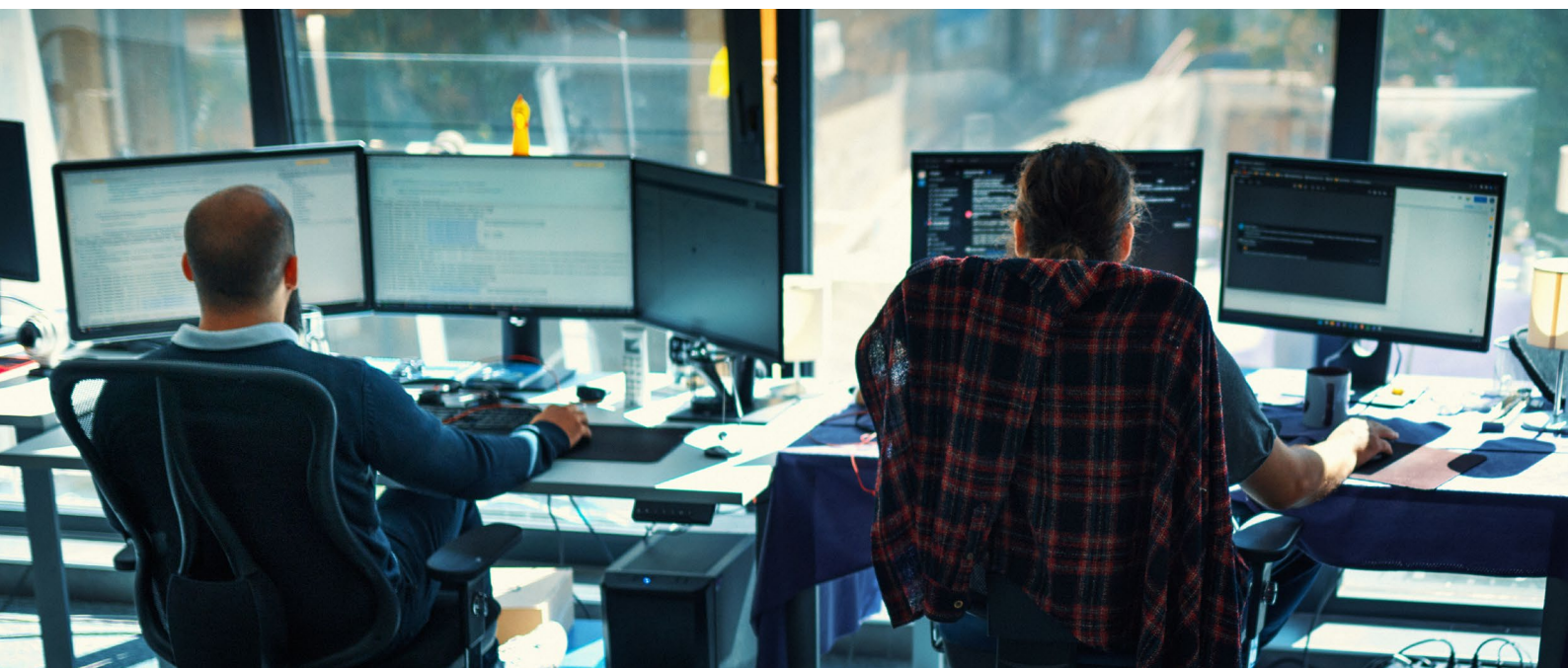
The World Economic Forum's *Jobs of Tomorrow: Large Language Models and Jobs* white paper found that job tasks with the highest potential for automation by LLMs tend to be those that use language in a routine and repetitive manner. While LLMs will impact tasks – rather than jobs as a whole – jobs emphasizing these types of language tasks could see a decline, with some workers aware of this potential. For example, over the course of Q3 of 2023, global searches for “Is my job safe?” doubled, indicating the public's increasing concern about whether LLMs would automate their jobs.⁶ However, LLMs and other generative AI technologies offer potential for job growth as well. The same paper found that job tasks emphasizing abstract reasoning and problem-solving skills have the highest potential

for augmentation by LLMs, meaning these technologies will assist in task execution and boost individual productivity. Additionally, the paper found there is potential to generate new employment opportunities by creating roles that oversee, complement and enhance AI's capabilities.

The *Future of Jobs Report 2023* echoes many of these findings, indicating that many of the jobs with high potential for automation by LLMs were also expected by business leaders to undergo employment decline within the next five years, such as bank tellers and related clerks, data entry clerks, and administrative and executive secretaries. Jobs with higher potential for augmentation are expected to grow, such as AI and machine learning specialists, data analysts and scientists, and database and network professionals.

Nevertheless, labour market predictions are never completely certain and will likely evolve with the development of LLMs. Businesses must be proactively engaged in addressing the concerns of their workers while preparing them to adapt to the transition to come.

“ Job tasks emphasizing abstract reasoning and problem-solving skills have the highest potential for augmentation by LLMs, meaning these technologies will assist in task execution and boost individual productivity.”



1.1 Responsible business strategies

Worker awareness – deploy proactive forecasting and communicate expectations

Using predictive analytics to forecast which jobs will most likely be affected by LLMs and other disruptions, and communicating actively with management and employees to proactively provide pathways to mitigate negative employment impacts.

- Organizations have the ability and responsibility to support workers through job changes and disruptions. Equipping employees with the right knowledge empowers them to make better decisions⁷ in searching for reskilling opportunities or transitioning to a different job or career. Clearly sharing data and methods will also increase trust and improve employee well-being, performance and business accountability.⁸ Analyses like *Jobs of Tomorrow: Large Language Models and Jobs* provide realistic assessments of the labour market and can help shape expectations in the short term. Organizations can use the results of these studies or apply similar analysis methods to understand how LLMs could transform their business and the work of their employees.
- In 2019, Singapore launched its *National AI Strategy*, which includes additional skilling and education programmes to support workers – particularly relevant as a 2018 report by Cisco and Oxford Economics found that Singapore had the most relative exposure of six ASEAN countries to potential job displacement effects of AI, with 7 in 10 workers in Singapore saying AI will impact their jobs.⁹ Furthering this commitment to skilling and workforce resilience, the Infocom Media Development Authority (IMDA), for example, recently committed to reskilling 18,000 Singaporeans in AI and adjacent skills through these skilling programmes.¹⁰ These efforts have borne fruit – since the introduction of the programme in 2015, 1 in 4 eligible Singaporeans has participated in SkillsFuture Singapore across many industries, participating companies and education programmes.¹¹

Organizational change – set up and make use of internal job markets

Create a dynamic internal job marketplace that helps employees transition into roles as technology and business conditions change.

- Developing internal job markets enables employees to understand the opportunities available to them within the firm and provides a

chance to grow. Enabling internal mobility not only rewards loyal employees, it enables firms to address their talent shortages while mitigating costs. About 60% of companies globally note that skills gaps are a major limitation to business transformation.¹² Replacing workers is costly: Gallup estimates that the replacement cost can exceed two times an employee's annual salary.¹³ Retaining experienced workers through job transitions on the internal job market reduces total hiring costs and increases the speed at which people contribute value to an organization.

- HSBC, a global financial services organization based in the UK, deployed an internal job market for about 200,000 of its employees with plans to expand access to all 220,000 employees around the world. They estimate that their internal talent marketplace is central to their skill-building strategy and has unlocked over 170,000 hours of work. Furthermore, about 45% of projects are cross-functional.¹⁴

Shifting norms and culture – create increased workforce agility

Create a company culture that values and rewards flexibility in job roles, encouraging employees to embrace diverse work experiences and interdisciplinary skill development, which could reduce the anxiety around job displacement and promote a resilient workforce.

- By cultivating a culture that values workforce agility, employees become more adaptable and resilient, better equipped to transition into new roles as LLMs impact job markets. Creating such a company culture involves a deliberate approach that starts with leadership commitment and the clear articulation of a new vision and values. It involves engaging employees, aligning hiring and reward systems to these values, and reinforcing them through consistent policies and communication.
- A good example is “side project time”, or “the 20% concept”, popularized by Google but which is also currently used by firms like Atlassian¹⁵ and Rakuten.¹⁶ These programmes have enabled employees to focus on personal projects not directly tied to a job task during their time at work. Side projects enable employees to explore personal interests and build transferable skills outside their job specialization, helping retention, improving morale and encouraging creativity.¹⁷ It also enables companies to boost their innovative potential – something large companies struggle with.¹⁸ The output from these programmes can be significant: Gmail and AdSense both arose from past side projects at Google.¹⁹

2

Consideration 2

Job quality

Maintaining high job quality involves worker inclusion in LLM governance, involving diverse teams in LLM development and promoting awareness of LLM benefits.



“LLMs could automate the more routine and repetitive tasks on the job, which could otherwise disengage workers, while making room for more creative, problem solving and independent decision-making tasks on the job, boosting worker fulfilment.”

Concerns have also arisen that LLMs and other generative AI technologies could erode job quality, potentially making jobs and workplaces less fulfilling and less inclusive and fair. Additionally, increasing concerns about bias in LLMs highlight the risk of inherent systemic discrimination in these models, which could exacerbate existing inequalities. Despite these concerns, emerging data show that LLMs and AI technologies also have the potential to improve job quality. As discussed in *Jobs of Tomorrow: Large Language Models and Jobs*, the use of LLMs could automate the more routine and repetitive tasks on the job, which could otherwise disengage workers, while making room for more creative, problem-solving and independent decision-making tasks on the job, boosting worker fulfilment. The World Economic Forum’s Good Work Framework offers a robust definition of job quality and a strategic template to maintain and improve the quality of work in rapidly evolving labour markets. It outlines key objectives to create a better future of work, including promoting fair wages and responsible technology use, providing flexibility and protection for all workers, ensuring health and well-being, driving diversity, equity and inclusion, and creating a culture of continuous learning and employability.

Of particular relevance when incorporating LLMs and other AI technologies on the job is the framework’s objective of maintaining the health and total well-being of workers. There is not yet strong

evidence that LLMs have impacted worker’s well-being.²⁰ Yet, worker anxiety has increased. A 2023 survey by the American Psychological Association found that 38% of workers are worried about the impact of AI on their jobs; roughly half of those with these concerns say that work negatively affects their mental health, compared to only 29% of those without concerns.²¹

Another critical concern is that LLMs could induce bias in responses that lead to decision-making, highlighting the importance of adhering to the Good Work Framework’s objective of driving diversity, equity and inclusion. For instance, persistent patterns of racial and ethnic discrimination could be reflected in hiring datasets, which could skew algorithms used to sort and filter job candidates in the application screening process.²² In the same vein, most LLMs are trained on English texts, which could lead LLMs to produce overwhelmingly Anglo-centric responses.²³ Furthermore, the burdens of adapting LLM-induced changes in jobs could disproportionately fall on particular population groups who may be over or underrepresented in affected occupations, such as women and ethnic minorities.²⁴

Businesses must move proactively and with urgency to address these concerns, particularly around job quality, agency and inclusivity, if they are to establish the trust needed to unlock the positive potential of LLMs.

2.1 Responsible business strategies

Worker awareness – ensure inclusive design of AI and LLMs applications

Emphasize the collaborative and inclusive development of AI applications and LLMs. This involves establishing cross-functional teams with diverse backgrounds and actively involving employees in the design and implementation of company-specific AI systems and LLMs.

- LLMs have the greatest positive impact when developed, tested and piloted by teams with a diverse mix of skills and perspectives. Driving diversity among the people who build LLM applications can help reduce the built-in bias those applications and algorithms demonstrate. Diverse, representative teams can think through the operational changes new LLM applications require, and development teams that include end users result in applications with higher chances of adoption. In total, 92% of companies that scale AI effectively use multidisciplinary teams.²⁵
- Microsoft, for example, has created a framework for assembling “inclusive” technology design teams to support inclusion, fairness, reliability and safety.²⁶ Paired with inclusive skilling initiatives, efforts such as this can drive improved workforce representation and reduce bias. Similarly, Siemens actively involves its engineering and shop floor employees in developing AI applications for industrial use. This involvement ensures that the AI solutions are practical and enhance operational efficiency in real-world industrial settings.²⁷

Organizational change – implement inclusive governance structures for LLM deployment

Ensure the adoption of transparent and inclusive LLM governance and frameworks. This approach necessitates inclusive and participatory decision-making processes in all aspects of LLMs governance and deployment, addressing not only efficacy but also bias, ethical implications and overall impact on job quality.

- Transparency around the deployment of LLMs, detailing their use, is key to building employee trust. When employees fully understand how AI, and specifically LLMs, apply to their role, the adoption of the technology is two times more likely to be successful.²⁸ This transparency is best achieved through establishing responsible LLM frameworks that involve employees throughout. The framework should, for example, detail how a participative decision culture should guide the design, development and deployment of LLMs.²⁹ A vital element of these frameworks is the inclusion of employee feedback mechanisms akin to those proposed in the World Economic Forum’s

Good Work Framework.³⁰ Such mechanisms ensure ongoing assessment and refinement of LLM applications, focusing on their ethical, impartial and effective use within the company.

- Several leading companies have been recognized for their efforts in adopting transparent and inclusive AI governance, which can be tailored to LLMs specifically. Google has implemented a three-tiered governance structure to oversee the responsible use of AI. This structure includes multidisciplinary reviewers and product team members whose primary focus is on developing AI applications that yield social benefits.³¹ IBM is known for its commitment to trustworthy AI; they have an AI Ethics Board and have published clear principles on trust and transparency in AI. IBM emphasizes AI that is explainable, fair and secure, and they provide tools for businesses to detect and mitigate bias in AI systems.³² Accenture established a responsible AI (RAI) compliance programme to institutionalize its RAI principles into practice by embedding RAI across its entire enterprise – from development and use, to deployment and post-deployment monitoring.

Shifting norms and culture – increase awareness of LLM benefits in the workplace

Drive the adoption of LLMs by encouraging innovation and increasing awareness of how LLMs can benefit workers, including by automating routine tasks and augmenting human potential, resulting in more meaningful and fulfilling jobs.

- As discussed in *Jobs of Tomorrow: Large Language Models and Jobs*, LLMs could significantly improve the overall work experience by automating routine tasks and augmenting others, resulting in more meaningful and fulfilling jobs and freeing time and resources to spur innovation. Roughly 60% of organizations are optimistic about the impact that generative AI will have on their people, including their overall work experience. Approaches include improving job satisfaction by reducing time spent on routine tasks and enabling individuals to engage in more meaningful and innovative tasks.³³ Effectively communicating these positive impacts and examples is key to addressing concerns around job quality.
- An example case study comes from Moderna, whose employees are frequent users of AI technologies, including LLM tools. Moderna used AI tools to develop mRNA COVID-19 vaccines and continues to find new uses for them. One executive noted that removing repetitive, non-value-add tasks from employees’ responsibilities boosts morale at Moderna. Employees are also eager for this change, as they recognize the benefits of engaging in insightful and creative work rather than monotonous tasks.³⁴

3

Consideration 3

Skilling and learning

Enhancing workforce skills with LLM training and a skills-first approach ensures employees are empowered to leverage LLMs optimally.

With the ascent of LLMs and other AI systems, it has become imperative for organizations to embrace a culture of continuous learning and skill development. Additionally, many workers have doubts surrounding their current skill levels. The *Accenture Future of Work Study 2022* showed that only 31% of workers are confident that their skills will be relevant in five years.³⁵ Over 50% of employees believe LLM skills specifically will be essential to their role, according to a global study done by the staffing agency Randstad.³⁶

Employers have also expressed similar concerns: according to the *Future of Jobs Report 2023*, business leaders estimate that 44% of workers' skills will be disrupted in the next five years. Businesses estimate that six in 10 workers will require training before 2027, yet only half of workers are seen to have access to adequate training opportunities today.³⁷ Training will naturally need to focus on the skills predicted to grow the most, namely analytical skills, creative thinking,

technology literacy, curiosity and lifelong learning, resiliency, flexibility and agility, which three out of four firms predict will rise in importance. AI and big data skills rank as the number three priority in company training strategies between 2023 and 2027 – and are the number one priority for companies with over 50,000 employees. The need for AI skills is also evident directly in employment data. Employer demand for LLM and other generative AI skills is growing. AI skills are rare and in high demand, creating a new marketplace for highly paid talent while widening reskilling opportunities across adjacent skillsets.³⁸ Across 15 advanced economies, AI hiring is up by about 60% since 2016. In an analysis of job postings in 2022, jobs requiring AI skills reached 2.05% of postings in the United States.³⁹

By focusing on the development of skills, from core digital literacy to deep AI expertise, organizations have an opportunity to fill critical talent gaps while improving the overall working experience of their people.

“ Business leaders estimate that 44% of workers' skills will be disrupted in the next five years.



3.1 Responsible business strategies

Worker awareness – roll out broad LLM literacy programmes along AI-specific jobs

Introduce courses that explain LLMs, including their limitations and how they can be used, to demystify the technology for workers.

- By establishing a baseline level of LLM fluency among their entire workforce, companies can help their employees understand what LLMs are, how their jobs will evolve to work alongside the technology, and its benefit to the enterprise when responsibly deployed. This approach not only builds confidence in LLMs but also encourages adoption and use. Employees should be trained to use LLMs to augment tasks where applicable, especially for in-demand occupations and critical processes. This will also support the development of the workforces needed to fill current and emerging AI-related jobs.
- Examples include Microsoft's new AI Skills initiatives, which include free certifiable coursework to improve data fluency,⁴⁰ and courses like DeepLearning.AI's [Generative AI for Everyone](#) on Coursera, which provides accessible, comprehensive and practical coverage of the technology. Employees engaged in AI deployment, such as Data Scientists and Machine Learning Engineers, can benefit from more advanced training programmes, such as Amazon's library of AI and machine learning modules, which include over 80 online courses.⁴¹

Organizational change – apply a skills-first approach organization-wide

Facilitate employee transitioning and hiring, as well as upskilling, by assessing skills directly, according to jobs' skills requirements.

- A skills-first approach focuses on whether a person has the right skills and competencies for a particular role, rather than having the right degree, job history or previous job titles, helping to ensure that businesses get the skills they need for a particular job while democratizing access to jobs for those who have the competencies but not the right formal qualifications for a role.⁴² The World Economic Forum's [Putting Skills First: A Framework for Action](#) paper provides a comprehensive framework for action that businesses and governments can use to shape their skills-first approach. Some studies demonstrate that companies hiring based on skills are 36% less likely to face talent and skills shortages.⁴³

- An example is Henkel, a German-headquartered consumer and industrial company, which developed a digital talent-skilling programme for about 10,500 of its managers. The programme involved assessing digital skills capabilities, identifying skills gaps, upskilling, and developing a Recruiter Toolbox to ensure that digital skills were included in the sourcing of new hires. Recruiting was also streamlined, as internal employees seeking new roles could easily see the skills requirements for a role, and then take the relevant courses to gain the required skills, becoming viable candidates.⁴⁴

Shifting norms and culture – offer workplace learning opportunities

Offer work-based learning opportunities such as apprenticeships, rotational programmes and temporary assignments to keep employees' skills current and to encourage a culture of lifelong learning.

- One of the most effective ways to upskill and reskill workers is by offering them on-the-job learning experiences. Apprenticeships provide long-term, paid, work-based learning opportunities alongside structured curricula that enable learners to gain both education and hands-on skills related to an occupation.⁴⁵ Rotational programmes are structured programmes offered by employers that allow employees, typically recent graduates or new hires, to gain experience in different areas or departments of a company over a set period of time. Employee retention rates are higher for companies that offer rotational programmes.⁴⁶ Temporary work assignments are short-term positions or projects that employees take on for a defined period. These are beneficial as they provide flexibility and diversity of experience to the workforce.
- Microsoft, for example, launched its [Leap](#) programme to facilitate recruitment in tech. Microsoft Leap is a 16-week immersive traineeship for individuals with baseline technical expertise, which combines classroom learning with hands-on engineering projects on existing products such as Azure, Xbox, Bing and Office365. As a result, 98% of Leap participants ultimately find work in the tech industry.⁴⁷ Additionally, Accenture launched its own apprenticeship programme in 2016, alongside the launch of their Apprentice Network, which has since expanded to 10 locations with 195 unique employers across North America. Accenture has set a goal for apprentices to make up 20% of North America entry-level hiring.⁴⁸

Conclusion

The revolutionary impact of generative AI and, more specifically, LLMs is undeniable, and organizations globally are seeking ways to capitalize on its transformative capabilities. This transformation must be managed responsibly. To fully benefit from AI and LLMs, businesses must first address concerns around ethics, trust, governance and legality. Yet, today, only 6% of organizations have adopted responsible AI frameworks and put principles into practice⁴⁹ – making the considerations outlined in this paper all the more relevant. As organizations address the risks presented by LLMs – including fairness, bias, untrustworthy outputs and legal considerations – they must also understand and address the impact the technology will have on their workers. In this nascent stage of the next wave of technological evolution, businesses have an opportunity to pioneer effective strategies for integrating LLMs in a manner that benefits workers and broader society.

This paper serves as a toolkit for businesses to address three key areas for consideration in implementing generative AI and LLMs in the workplace. The first is job change and job displacement risk: businesses must proactively manage the risk of job displacement by implementing transparent forecasting, establishing dynamic internal job markets and encouraging workforce agility. The second is job quality:

businesses must uphold high standards for job quality by embracing inclusive design principles, establishing collaborative governance structures and nurturing a work culture built around innovation and awareness. The third and final consideration is skilling: businesses will need to keep pace with the evolving needs for workforce capabilities by focusing on implementing AI literacy programmes, adopting a skills-first approach to talent management and championing learning on the job.

The insights of this paper will be instrumental in guiding the progress of the World Economic Forum's Jobs Consortium, a global coalition of ministers and chief executive officers that promotes a better future of work through boosting labour market foresight, driving job creation and improving job quality while enabling job transitions. It will also serve as a key tool for the Good Work Alliance, a global, cross-industry group of businesses committed to prioritizing good work in an evolving jobs landscape.

Business leaders must take a structured and proactive approach to integrating LLMs, ensuring that these technologies benefit businesses, employees and society at large. By adopting the strategies outlined in this paper, businesses can ensure a positive workforce transformation, harnessing the potential of LLMs to drive innovation, productivity and job satisfaction.

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Endnotes

1. World Economic Forum, *Future of Jobs Report 2023*, 2023.
2. Accenture, *Technology Vision 2023*, 2023.
3. Mollman, Steve, "ChatGPT gained 1 million users in under a week. Here's why the AI chatbot is primed to disrupt search as we know it", *Yahoo Finance*, 9 December 2022, <https://finance.yahoo.com/news/chatgpt-gained-1-million-followers-224523258.html?guccounter=1>; Hu, Krystal, "ChatGPT sets record for fastest-growing user base – analyst note", *Reuters*, 2 February 2023, [https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/#:~:text=Feb%201%20\(Reuters\)%20%2D%20ChatGPT,a%20UBS%20study%20on%20Wednesday](https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/#:~:text=Feb%201%20(Reuters)%20%2D%20ChatGPT,a%20UBS%20study%20on%20Wednesday).
4. World Economic Forum, *Jobs of Tomorrow: Large Language Models and Jobs*, 2023; Eloundou, Tyna, Sam Manning, Pamela Mishkin and Daniel Rock, "GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models", *Cornell University*, 17 March 2023, <https://arxiv.org/abs/2303.10130>; World Economic Forum, *Future of Jobs Report 2023*, 2023.
5. World Economic Forum, *Jobs of Tomorrow: Large Language Models and Jobs*, 2023.
6. "AI is not yet killing jobs", *The Economist*, 15 June 2023, <https://www.economist.com/finance-and-economics/2023/06/15/ai-is-not-yet-killing-jobs>.
7. Stobierski, Tim, "The Advantages of Data-Driven Decision-Making", *Harvard Business School*, 26 August 2019, <https://online.hbs.edu/blog/post/data-driven-decision-making>.
8. Maloney, Devon, "Transparency in business: the next wave in company evolution", *Slack*, 30 November 2019, <https://slack.com/blog/collaboration/transparency-in-business-company-evolution>; Ratanjee, Vibhas, "How to Build Trust in the Workplace", *Gallup*, 14 June 2022, <https://www.gallup.com/workplace/393401/trust-decline-rebuild.aspx>; Harvard Business Review, *The Impact of Employee Engagement on Performance*, 2013, https://hbr.org/resources/pdfs/comm/achievers/hbr_achievers_report_sep13.pdf.
9. Cisco, *Technology and the future of ASEAN jobs*, 2018, https://www.cisco.com/c/dam/global/en_sg/assets/csr/pdf/technology-and-the-future-of-asean-jobs.pdf.
10. Infocom Media Development Authority (IMDA), *IMDA leads nationwide AI skilling to build AI talent pool* [Press release], 4 September 2023, <https://www.imda.gov.sg/resources/press-releases-factsheets-and-speeches/press-releases/2023/imda-leads-ai-skilling-to-build-ai-talent-pool>.
11. SkillsFuture Singapore, *Strong Participation in Skillsfuture Programmes; SSG Seeks to do More with Enterprises* [Press release], 23 March 2023, [https://www.skillsfuture.gov.sg/newsroom/strong-participation-in-skillsfuture-programmes-ssg-seeks-to-do-more-with-enterprises#:~:text=23%2F03%2F2023-,STRONG%20PARTICIPATION%20IN%20SKILLSFUTURE%20PROGRAMMES%3B%20SSG%20SEEKS%20TO%20DO%20MORE,Singapore%20\(SSG\)%2Dsupported%20programmes](https://www.skillsfuture.gov.sg/newsroom/strong-participation-in-skillsfuture-programmes-ssg-seeks-to-do-more-with-enterprises#:~:text=23%2F03%2F2023-,STRONG%20PARTICIPATION%20IN%20SKILLSFUTURE%20PROGRAMMES%3B%20SSG%20SEEKS%20TO%20DO%20MORE,Singapore%20(SSG)%2Dsupported%20programmes).
12. World Economic Forum, *Future of Jobs Report 2023*, 2023.
13. McFeely, Shane and Ben Wigert, "This Fixable Problem Costs U.S. Businesses \$1 Trillion", 13 March 2019, <https://www.gallup.com/workplace/247391/fixable-problem-costs-businesses-trillion.aspx>.
14. "HSBC: Providing Upskilling and Reskilling Opportunities for our Employees", *World Economic Forum*, <https://initiatives.weforum.org/good-work-alliance/case-studies/hsbc-providing-upskilling-and-reskilling-opportunities-for-our-employees/aJY6800000PAvbGAG#>.
15. Rotenstein, John, "Atlassian's 20% Time: A Year in Review", *Atlassian*, 19 February 2009, https://www.atlassian.com/blog/archives/atlassians_20_time_a_year_in_review.
16. "Corporate Culture", *Rakuten*, n.d., <https://global.rakuten.com/corp/careers/culture/>.
17. "The Positive Effect of Creative Hobbies on Performance at Work", *PsyBlog*, 28 April 2014, <https://www.spring.org.uk/2014/04/the-positive-effect-of-creative-hobbies-on-performance-at-work.php?ref=buffer.com>.
18. Wessel, Maxwell, "Why Big Companies Can't Innovate", *Harvard Business News*, 27 September 2012, <https://hbr.org/2012/09/why-big-companies-cant-innovate>; Viki, Tendayi, "Why Large Companies Continue To Struggle With Innovation", *Forbes*, 4 November 2018, <https://www.forbes.com/sites/tendayiviki/2018/11/04/why-large-companies-continue-to-struggle-with-innovation/?sh=2e0118fb67b4>.
19. Clark, Dorie, "Google's '20% rule' shows exactly how much time you should spend learning new skills—and why it works", *CBNC*, 16 December 2021, <https://www.cnbc.com/2021/12/16/google-20-percent-rule-shows-exactly-how-much-time-you-should-spend-learning-new-skills.html>.
20. Giuntella, Osea, Johannes König and Luca Stella, *Artificial Intelligence and Workers' Well-Being*, IZA Institute of Labor Economics, 2023, <https://docs.iza.org/dp16485.pdf>.
21. American Psychological Association, *2023 Work in America Survey*, 2023, <https://www.apa.org/pubs/reports/work-in-america/2023-work-america-ai-monitoring>.
22. Quillan, Lincoln and John J. Lee, "Trends in racial and ethnic discrimination in hiring in six Western countries", *PNAS*, 31 January 2023, <https://www.pnas.org/doi/10.1073/pnas.2212875120>.

23. Nicholas, Gabriel and Aliya Bhatia, *Lost in Translation: Large Language Models in Non-English Content Analysis*, Center for Democracy & Technology (CDT), 2023, <https://arxiv.org/ftp/arxiv/papers/2306/2306.07377.pdf>.
24. Gmyrek, Paweł, Janine Berg, David Bescond, *Generative AI and Jobs: A Global Analysis of Potential Effects on Job Quality and Quantity*, ILO, 2023, p. 39, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_890761.pdf.
25. Lyman, Michael, "Scaling AI: Giving data its due", *Accenture*, 9 November 2021, <https://www.accenture.com/us-en/insights/artificial-intelligence/scaling-ai-giving-data-its-due>.
26. Daugherty, Paul R., H. James Wilson and Rumman Chowdhury, "Using Artificial Intelligence to Promote Diversity", *MIT Sloan Management Review*, 21 November 2018, <https://sloanreview.mit.edu/article/using-artificial-intelligence-to-promote-diversity/>.
27. Siemens, *Siemens and Microsoft drive industrial productivity with generative artificial intelligence* [Press release], 12 April 2023, <https://newsroom.sw.siemens.com/en-US/siemens-microsoft-generative-ai/>.
28. Accenture, *AI: Built to Scale*, 2019, https://www.accenture.com/content/dam/accenture/final/a-com-migration/custom/_acnmedia/thought-leadership-assets/pdf-2/Accenture-Built-to-Scale-PDF-Report.pdf.
29. Lucini, Fernando, "Getting AI results by "going pro"", *Accenture*, 24 September 2020, <https://www.accenture.com/us-en/insights/applied-intelligence/professionalization-ai?src=SOMS>.
30. World Economic Forum, *The Good Work Framework: A new business agenda for the future of work*, 2022.
31. Monetary Authority of Singapore, *FEAT Principles Assessment Case Studies*, n.d., <https://www.mas.gov.sg/-/media/mas/news/media-releases/veritas-document-6---feat-principles-assessment-case-studies.pdf>.
32. "AI Ethics", *IBM*, n.d., <https://www.ibm.com/impact/ai-ethics>.
33. "Accenture Pulse of Change", *Accenture*, September 2023, <https://www.accenture.com/us-en/about/company/pulse-of-change>.
34. Thibodeau, Patrick, "Mastercard, Moderna expect AI to improve jobs, productivity", *Tech Target*, 22 June 2023, <https://www.techtarget.com/searchhrsoftware/news/366542672/Mastercard-Moderna-expect-AI-to-improve-jobs-productivity>; Ransbotham, Sam, "The Cultural Benefits of Artificial Intelligence in the Enterprise", *MIT Sloan*, 2 November 2021, <https://sloanreview.mit.edu/projects/the-cultural-benefits-of-artificial-intelligence-in-the-enterprise/>.
35. Accenture, *Accenture Future of Work Study 2022*, 2022, <https://www.accenture.com/cn-en/insights/consulting/future-work>.
36. Ranstad, *More than half of workers believe AI skills will future-proof their careers, but only 13% have been offered such training opportunities - Randstad data reveals* [Press release], 5 September 2023, <https://www.randstad.com/press/2023/over-50-believe-ai-will-future-proof-their-careers-only-13-have-been-offered-ai-training/>.
37. World Economic Forum, *Future of Jobs Report 2023*, 2023.
38. "Artificial Intelligence skills can increase salaries by as much as 40%", *University of Oxford*, 24 October 2023, <https://www.ox.ac.uk/news/2023-10-24-artificial-intelligence-skills-can-increase-salaries-much-40#:~:text=Workers%20with%20artificial%20intelligence%20skills.Institute%2C%20and%20the%20Center%20for>.
39. Stanford University, *Artificial Intelligence Index Report 2023*, 2023.
40. "New skills for a new way of working", *Microsoft*, n.d., <https://www.microsoft.com/en-us/corporate-responsibility/ai-skills-resources?rtc=1>.
41. "AWS Skill Builder", *Amazon*, n.d., <https://skillbuilder.aws/>.
42. World Economic Forum, *Putting Skills First: A Framework for Action*, 2023, https://www3.weforum.org/docs/WEF_CNES_Putting_Skills_First_2023.pdf.
43. Accenture, *Uncover Missed Talent Pools, Improve Diversity*, 2021, <https://www.accenture.com/us-en/insights/consulting/finding-hidden-talent>.
44. "Upskilling a global workforce to be future-ready", *Accenture*, n.d., <https://www.accenture.com/us-en/case-studies/consulting/henkel-cultivates-in-house-talent>.
45. Goger, Annelies, "What three high schoolers have to say on the transformative impact of youth apprenticeships", 27 March 2023, <https://www.brookings.edu/articles/what-three-high-schoolers-have-to-say-on-the-transformative-impact-of-youth-apprenticeships/>.
46. Glaveli, Niki and Eleonora Karassavidou, "Exploring a Possible Route Through Which Training Affects Organizational Performance: The Case of a Greek Bank", *The International Journal of Human Resource Management* 22, no. 14, 2011, pp. 2892-2923, <https://www.tandfonline.com/doi/abs/10.1080/09585192.2011.606113>.
47. <https://leap.microsoft.com/case-study.pdf>.
48. Microsoft, *Microsoft Lead Apprenticeship Program*, n.d., <https://www.accenture.com/us-en/about/company/apprenticeships>.
49. Accenture, *The art of AI maturity*, 2022, <https://www.accenture.com/us-en/insights/artificial-intelligence/ai-maturity-and-transformation>.



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