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What Artificial Intelligence Can Do for Workers and What Skilled Workers Can Do for the World

Why AI and Machine Learning Are Crucial for Addressing Skills Shortages, Driving Employment and Ensuring a Socially-Driven Transition to the Data Economy

Sometimes history moves faster than our biology-bound brains' ability to keep up.[1] Change is suddenly everywhere around us – often before we have had time to understand it and sometimes before we have even had time to notice.

Consider this:

- The number of full-college-degree holders in the workplace is exploding. According to recently released statistics, 48% of 25-34 year-olds across the 38 Organisation for Economic Co-operation and Development (OECD) countries held a full tertiary qualification in 2021, up from 27% in 2000.[2] This is an astonishing figure. It means that the number of 25-34 year-olds with college degrees has doubled in two decades, and nearly half of this rising cohort has college-level qualifications. As Tia Loukkola, head of the innovation and measuring progress division at the OECD education directorate, puts it, "This means the knowledge economy isn't something that is coming. It shows we are already well into it."[3]

'Employers are reporting an unprecedented level of skills shortages and hiring difficulties.'

1 This paper is the result of a six-month research project, led by the Lisbon Council and supported by Workday, a leading provider of enterprise cloud applications for finance and human resources. Throughout, Workday served as a key knowledge partner, often answering questions from the curious authors and opening the doors to the proverbial engine room of artificial intelligence as it is being developed and applied in the workplace. The project team and lead authors would like to thank Jens-Henrik Jeppesen, Tia Loukkola, Chandler Morse, Anna Pizzamiglio, Anshul Sheopuri, Michael Stamback and Lev Sugarman. Any errors of fact or judgement are the project team's and lead authors' sole responsibility.

2 Organisation for Economic Co-operation and Development, *Education at a Glance 2022: OECD Indicators* (Paris: OECD, 2022).

3 Ms Loukkola spoke at the Lisbon Council at the launch of *Education at a Glance 2022* on 03 October 2022.

- Despite this trend, employers are reporting an unprecedented level of skills shortages and hiring difficulties. A recent McKinsey study found that nine in 10 executives or managers are having trouble hiring people with the talent they need or expect to have that problem in the next five years.[4] A European Foundation for the Improvement of Living and Working Conditions study reported that 72% of European companies have difficulties finding employees with the skills they need.[5]

- Meanwhile, more and more vacancies are going unfilled even as the job market tightens and interest rates rise. Collectively, the 27 European Union member states reported a 3.0% job vacancy rate in the second quarter of 2022, the highest level in more than a decade.[6]

- The skills shortage has reached such an endemic state that it risks fuelling inflation and prolonging the current crisis. The rising cost of energy and the disruption in global supply chains have sent prices soaring – so-called "supply shocks" – felt around the world. Working people have, so far, avoided being dragged into a damaging "wage-price spiral" which could lock in inflationary expectations and take years to tame.[7] But economists warn that skills shortages and labour-market tightness must be urgently addressed to keep the short-term crisis from going medium- or long-.[8]

- And the great flow of history is not moving in Europe's direction. The European Commission calculates that by 2050, Europe will have 49 million fewer people of working age.[9] No wonder European Commission President Ursula von der Leyen announced in her State of the Union 2022 address that 2023 will be the European Year of Skills.[10]

- Despite the job-market opportunity, the available pool of office workers keeps shrinking in important ways. More and more knowledge workers are opting out of commutes and desk jobs, resolving not to return to the office after the long COVID-19 lockdown or bailing on dead-end jobs they would rather not do. Many calculate, correctly, that in the war for talent, talent has won.[11] Dream jobs might not be lying on the street, waiting to be picked up. But workers themselves can do a lot more to take their fate into their own hands. If they're ready for the added effort and responsibility, they can become, essentially, managers of their own career paths and skills portfolios, dictating their own terms of employment and developing their own talent along lines that suit them.

'The number of full-college-degree holders in the workplace is exploding.'

4 The same report calculates that 375 million workers globally "might have to change occupations in the next decade to meet companies' needs." McKinsey and Company, *Beyond Hiring: How Companies are Reskilling to Address Talent Gaps* (New York: McKinsey and Company, 2020).

5 Eurofound and Cedefop, *European Company Survey 2019: Workplace Practices Unlocking Employee Potential* (Luxembourg: Publications Office of the European Union, 2020).

6 A job vacancy is a paid post that is unoccupied, newly created but unfilled or about to become vacant. The rate is the percentage of those jobs relative to the overall labour market. See Eurostat, *Job Vacancy Statistics*, September 2022 update.

7 Curiously, labour market tightness has not led to rising real wages in most places, as it normally would; nominal wage growth continues to trail productivity gains in most developed economies. But the overall shortage of skilled workers could embed inflationary expectations and transform into a wage-price spiral, putting an end to efforts to tame inflation in the medium term. For this reason, many economists advocate early action on upskilling and resolving labour-market blockages. See Mark Carney, *Value(s): Building a Better World for All* (New York: PublicAffairs, 2021).

8 Curtis Dubay, "How Fixing Our Worker Shortage Can Right Inflation," *U.S. Chamber of Commerce*, 07 July 2022; International Monetary Fund, "The Fog of War Clouds the European Outlook," in IMF, *Regional Economic Outlook: Europe* (Washington DC: IMF, 2022); Megan Leonhardt, "Here's How the Worker Shortage is Contributing to Sky-High Inflation," *Fortune*, 15 December 2021.

9 Jean-Michel Boussemart and Michel Godet, "Europe 2050: Demographic Suicide," *European Issues*, 2018.

10 Ursula von der Leyen, *A Union that Stands Stronger Together: State of the Union 2022*, 14 September 2022.

11 Gartner, *Who is Winning the Talent War? Post-COVID-19 Edition* (Stamford: Gartner, 2020).

- The pace of change just keeps getting quicker. The advent of artificial intelligence and data analytics is also bringing transformation in its wake. Contrary to popular opinion, artificial intelligence is not destined to replace human beings in the workplace on a large scale – though job patterns will shift and the skills needed to do certain jobs will evolve and change.[12] But artificial intelligence is destined to become more and more ubiquitous in the workplace – much as typewriters did for previous generations and personal computers for a more recent one. This is why digital skills – or even more importantly, the ability to operate effectively in a world permeated with digital technology – have become so important. The discoveries of yesterday are fast becoming the even more sophisticated breakthroughs of tomorrow. Skilled workers – and successful employers – will want to keep up with these developments, building symbiotic coalitions for working, learning and sharing outcomes.

What, after all, lies at the heart of all of this? How can so many workers have so much education and yet so many employers say they can't find workers with the skills they need? What is our education system missing here? Or perhaps more to the point, what are we missing – or not doing – that would bring the supply of labour more in line with the demand for the right skills and serve as an important leveller in an age defined by its insistence on equal access and diversity? How do we convert this situation from a confusing conundrum to a double win for workers and employers alike?

'How can so many workers have so much education and yet so many employers say they can't find workers with the skills they need?'

The answers surely are found in many places, but there is one key reform which would go a long way towards resolving mounting bottlenecks and a baffling economic situation. First and foremost, we must urgently de-couple the oversold link between academic qualifications and on-the-job skills. We must find a way to maximise the talent and creativity of the workforce – perhaps by assessing and auditing skills better and translating those assessments into actionable programmes for employees and employers alike. And in this endeavour we may have a promising new ally – artificial intelligence – a technology often seen, in some circles, as an unwelcome intruder in the workplace. In fact, judicious use of artificial intelligence and machine learning, a subset of artificial intelligence, could be the key to resolving the ongoing skills shortage, to driving employment growth throughout the economy and to increasing worker satisfaction with the jobs they are in.

This special report will look at the novel ways that artificial intelligence is being used in advanced human resources practices and skills development. Section I will discuss the emerging world of skills – and the important role that new tools can play in helping companies and workers to identify gaps and resolve hiring bottlenecks. Section II will look briefly at artificial intelligence in the workplace. Section III will focus on the emerging regulatory framework for artificial intelligence. Section IV will look at "dos and don'ts" in the debate on the Artificial Intelligence Act, an omnibus piece of European regulation whose parameters are being set and negotiated right now.[13]

12 Robert D. Atkinson and John Wu, "False Alarmism: Technological Disruption and the U.S. Labour Market, 1850-2015," *Information Technology and Innovation Foundation*, May 2017.

13 European Commission, *Proposal for a Regulation of the European Parliament and of the Council: Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts* (Brussels: European Commission, 2021).

Rising Skills and Evolving Labour Markets

Technological innovation has often brought skills mismatches in its wake. The plow, for one, made agriculture much more efficient – i.e., more land could be cultivated with fewer people – but it also required people with the knowledge and patience to use the new tool, often with the help of stronger-than-human livestock, which required, in turn, its own set of skills to keep the animals healthy and ready for work. Later, the assembly line allowed for an explosion of sophisticated new goods to be made available to more and more people, but it also made many craft skills that had dominated the Middle Ages obsolete and triggered a migration to cities and a reconfiguration of the countryside that continues to this day. The transition from a manufacturing-based economy to an economy where highly-developed companies compete increasingly on their ability to provide advanced services – a process known as servitisation – has been devastating on communities where blue-collar life failed to transition or keep pace.[14] The outcome has been a dearth in some places of the investment needed to modernise production, create new jobs, breathe renewed life into old industry or develop the vibrant, accessible life-long-learning culture crucial to success in the modern economy.

So what is so new and different about the age we live in? For starters, complex technology is arriving in the workplace much faster than before. Gordon Moore's famous law – that processing power will double every two years even as the price of hardware goes down – means that yesterday's innovation is being overtaken as quickly as it is rolled out.[15] The result is an extremely fast-moving marketplace – one where multi-tasking, continuous learning and ongoing restructuring are the norm and not the exception. In the United States, for one, the overall job market has grown enormously in the last 30 years, but not always evenly. Jobs that require a high level of preparation, such as training, experience and education, rose 68% between 1980 and 2015; jobs requiring little preparation only grew 31%.[16] Jobs requiring advanced analytical skills grew 77% in the same period. And those demanding sophisticated social skills rose 83%.

'Judicious use of artificial intelligence and machine learning could be the key to resolving the ongoing skills shortage.'

In the old days, to get a job, you would prepare a packet of information – a curriculum vitae, a university or vocational-training degree, a board certification, some recommendations, perhaps some training certificates. But the problem is, these were extremely blunt instruments – as easy to misinterpret as to judge correctly. And they often showed only one of two things: the ability to do well in an academic setting, which included studying for tests or producing written papers on time, or a knack for presenting oneself well in job interviews, giving an edge to candidates with good job-seeking skills over candidates who might be considerably better at the job itself.

14 Marko Kohtamäki, Tim Baines, Rodrigo Rabetino, Ali Ziaee Bigdeli, Christian Kowalkowski, Rogelio Oliva and Vinit Parida (eds.), *The Palgrave Handbook of Servitisation* (New York: Palgrave Macmillan, 2021). See also Technopolis, Dialogic and University of Cambridge, *Study on the Potential of Servitisation and Other Forms of Product-Service Provision for EU SMEs* (Brussels: European Commission, 2018).

15 Some argue that Moore's Law – first proclaimed by Intel CEO Gordon E. Moore in 1965 – is reaching its natural limit as chip components get closer and closer to the size of atoms. Others point out that engineers continue finding ways to increase chip speed through, for example, stacking chips, so the law remains a valid guideline for industry growth. See the fascinating discussion in Shara Tibken, "CES 2019: Moore's Law is Dead, says Nvidia's CEO," *CNET*, 09 January 2019.

16 The figures are cited in Kyaw Khine, "A Greater Number of Jobs Require More Education, Leaving Middle-Skill Workers with Fewer Opportunities," *Weldon Cooper Center for Public Service, University of Virginia*, 20 May 2019.

But as the economy has grown more complex, it is increasingly apparent that

1. Modern jobs depend a lot on analytical capabilities and emotional intelligence.

2. Degrees do tell us something. But they don't tell us everything. And, with an estimated 70% of workplace knowledge acquired on the job, they may well overlook the single most important part of a talented worker's qualifications: the skills and know-how they have acquired along the way.[17]

Policymakers are not unaware of this development. In fact, with the help of the private sector, they have begun sprucing up national workforce databases and devising tools that will help employees understand the skills they must develop to pursue the careers they want to pursue. Those same databases can also be used to help employers understand the skills they need – from both prospective employees and existing employees – without having to guess based solely on educational qualifications. And this isn't theory. It is happening in the workforce around us already. See the box on page 6 on the IBM Learning Platform, a novel way of sharing learning and tailoring knowledge experiences in ways that empower workers and give them more control over their careers. See also the box on page 8 on the Workday Talent Marketplace, a new system which helps internal skills matching and early-skills identification within teams.

'Artificial intelligence is not destined to replace human beings in the workplace on a large scale – though job patterns will shift and the skills needed to do certain jobs will evolve.'

One major initiative is the European Skills, Competences, Qualifications and Occupations (ESCO) project, launched by the European Commission in 2010.[18] The framework provides standardised definitions of 3,008 occupations and 13,890 skills linked to those jobs, all in the form of an application programming interface (API), which can be downloaded for free and used by any company or person to run skills-based analyses on human resources data. The goal is to give technologies and organisations that analyse skills a common platform upon which they might understand each other, because developing understanding across sectors and labour-market segments is crucial in this game. With greater insight into the skills inside companies, the education establishment and individuals, it becomes possible to use a common framework for understanding and discussing skills and skill-related issues – and ultimately in finding better fits, identifying gaps and making recommendations for further work and improvement.

The Americans have a similar project – the O*NET Online database, run by the U.S. Department of Labour.[19] The U.S. database is, in general, vastly more user-friendly than its European counterpart, though experts suggest that it could be more timely and granular in its approach. It includes an "occupation key word search" function, where you can find out what skills are required in a profession such as, say, "dental assistant" or "office clerk, general." One box on the home page hopefully suggests: "Start the career you've dreamed about, or find one you never imagined. Discover your interests with the O*NET Interest

17 Michael M. Lombardo and Robert W. Eichinger, *Career Development Planner* (Golden Valley: Lominger, 1996).

18 For more, visit the European Skills, Competences, Qualifications and Occupations website at https://ec.europa.eu/social/main.jsp?catId=1326&langId=en.

19 For more, visit the O*NET Online website at https://www.onetonline.org/.

IBM Learning Platform

International Business Machines Corporation (IBM) has 282,000 employees. But what do they know and what can they do? To help workers develop their skills and spot unknown opportunity, IBM rolled out the IBM Learning Platform, which is available to every employee of the company. The platform uses artificial intelligence to identify employee skills – and refer them to online resources and other training facilities where they can beef up their profile and pick up additional skills. The product has been immensely popular internally, with more than 98% of IBMers consulting it worldwide on a regular basis.

Profiler and find more exploration options at My Next Move." But there is still some way to go with the larger government databases to get them detailed and timely enough to allow governments and employers to understand real-time labour market and skills trends.

And more recently, European and American data scientists have teamed up to create an ESCO-O*NET "crosswalk," which brings interoperability to these two giant job classification frameworks. The goal is not so much to help punters find work – but to use the larger database to drive additional insight and guide policy in the field of education and training. The projects' makers promise "a high level of quality and reliability," brought about in part by the larger body of data to aggregate and analyse.

The Role of Artificial Intelligence in Labour Markets and Jobs Matching

Grounding labour markets in skills, and unlocking the data necessary to do so, promises to bring benefits to both workers and employers. But it is only by deploying and enabling artificial intelligence (AI) and machine learning that we will be able to make this happen. Large companies, governments, even individuals are dealing with huge troves of data when it comes to human resources.[20] Much of it is beyond the ability of any human eye to visualise or human brain to analyse. AI can crunch that data to identify patterns and tease out key learnings, sifting the data not just to measure performance or analyse outcomes but labouring to better understand a company's overall skills profile, including its skills needs. AI can also offer helpful suggestions – a bit like Netflix recommendations – on how those skills might best be developed. The data is interesting on two levels. On the aggregate level, it can help companies assess the skills of its existing workforce, allowing them to understand the talent that is already in-house and how to develop it more effectively or deploy it on a better company-wide basis. But at the individual level, so long as privacy is maintained and trust is secure, it can also help individual workers understand their own skills profile – and the way that profile can best be developed to achieve their career goals or be presented to prospective employers. AI can help in both cases – with one major proviso. The data needs to be purposeful and clean; it should ideally be based on an agreed,

'Jobs that require high degrees of training, experience and education rose 68% between 1980 and 2015.'

20 The EU, for one, uses an advanced artificial intelligence algorithm to make the ESCO system run. ESCO uses "bi-directional encoder representations from transformers (BERT)," a natural language processing system powered by machine learning, to map skills and make crucial connections. For more, visit https://esco.ec.europa.eu/en/about-esco/faq.

broadly understood and accepted classification system. And that classification system should be based on open source, freely shared among relevant parties, with a larger community (probably best including the government) acting as referee and standard setter.

Not surprisingly, this type of analysis is starting to become the norm rather than the exception. In a 2018 survey, *Harvard Business Review* reports that 70% of the companies polled say they consider "people analytics" a "high-priority."[21] A recent study from SkyQuest Technology Group, a global market intelligence company, forecasts that the human resources technology market will grow almost 50% in the next six years, reaching €37 billion of sales by 2028, up from €25 billion in 2021.[22]

Workday, the U.S.-based human capital management firm, is at the forefront of much of this effort. Among numerous software offerings and services, the Pleasanton, California-based company with more than 16,900 employees has created a complex programme for embedding skills and skills-based talent practices into its human capital management software. Known as Workday Skills Cloud, the technology maps skills used in the workplace and relates them to each other, enabling organisations to speak a "common skills language." The company started out with an unwieldy database of 200 million identified skills. With the help of AI, these were narrowed to 55,000 "canonical" skills with around 100,000 "synonyms" by which these canonical skills were sometimes identified. The application and pick up have been impressive. Many companies – including several Fortune 500 firms – now use the programme in various ways, for example to provide skills-based suggestions for worker trainings, or to help leaders identify and deploy in-house talent across the organisation for short-term gigs and projects based on their skills and career goals.[23]

AI-powered skills technology could also bring enormous advantages to highly-qualified workers without a university degree – providing a helping hand to those workers in need and bringing benefits to society as well. Recent research in the U.S. found that roughly 70 million highly skilled workers were being overlooked for promotion because they lacked the formal qualifications that other workers had.[24] Needless to say, they – and many others – would benefit immensely from revised human resource and hiring practices – especially if those practices were able to shed light on their skills and bring those skills to the attention of employers and potential employers in a transparent, privacy-respecting way. Today's technology doesn't close doors. It opens them.[25]

'Complex technology is arriving in the workplace much faster than before.'

Artificial Intelligence and Regulation

AI is often seen as an unruly intruder in the workplace. And, to be sure, like any new technology, it will require new rules and guardrails to ensure that its use by the public is safe and secure. The intent behind AI regulation is to enable society to reap the benefits of the technology while mitigating its potential risks. Yet too often we in Europe have seen AI as an existential threat – ignoring the fact that we humans created the technology and we humans are best placed to harness it to our own use – and not the

21 Paul Leonardi and Noshir Contractor, "Better People Analytics," *Harvard Business Review*, November-December 2018.

22 SkyQuest Technology Group, *Global Human Resource Technology Market Insights*, September 2022.

23 Workday, *Skills, Credentials and the Workforce of the Future: The Promise of Technology and the Role of the Public and Private Sectors* (Pleasanton: Workday, 2022).

24 Reach for the STARs, *The Potential of America's Hidden Talent Pool* (Washington DC: Opportunity@Work and Accenture, 2020).

25 See also Peter Q. Blair, Tomas G. Castagnino, Erica L. Groshen, Papia Debroy, Byron Auguste, Shad Ahmed, Fernando Garcia Diaz and Christian Bonavida, "Searching for STARs: Work Experience as a Job Market Signal for Workers without Bachelor's Degrees," *NBER Working Paper*, March 2020.

Workday Talent Marketplace

How much talent do you have in-house? Too often, managers fail to ask that question – looking instinctively to hire externally when the solution itself might be right there under their noses. One way around this is to make better use of internal skills mapping, working to match the talent on the team with the emerging needs of the organisation. Workday, for one, has produced the Workday Talent Marketplace tool – a comprehensive system which both maps skills inside of companies and analyses the emerging needs that managers have identified. The interesting thing is how the tool works. Rather than looking externally for new talent, it focuses on better understanding the talent within – and matching it to emerging needs and opportunities within the same organisation.

other way around. In the debate about AI, it is sometimes forgotten that strong labour market protections and other regulation already exist to safeguard against risks, including anti-discrimination protections and data-privacy laws. Simultaneously, we have too often ignored the upside, the tremendously liberating potential of this new technology, the power it has to help us develop a better world that sits more comfortably with the values we embrace.[26]

The concern about AI in the workplace arises from several areas. Some have speculated that the data needed to power AI tools will lead to violations of privacy rights when some workplace data is collected and analysed. Others believe the new technology will be used to monitor performance – and is being used to monitor performance – with the intention of giving managers aggressive new tools to squeeze ever higher productivity out of employees. The laundry list of potential technology abuses is gathered extensively in "AI and Digital Tools in Workplace Management and Evaluation," an 84-page study prepared for the European Parliament.[27]

'One major initiative is the European Skills, Competences, Qualifications and Occupations (ESCO) project, launched by the European Commission in 2010.'

Much of the fear about AI in the workplace arises from the potential use of artificial intelligence in hiring and promotion decisions, and in particular, AI systems that might make fully automated decisions that lack human involvement. Yet in reality, the HR sphere – if one is to succeed at it – is much broader than a set of datapoints. It is, in fact, as one analyst has observed, a "push and pull between empathy and objectivity," and while data, credentials and skills are surely very important, very few AI algorithms can "pick up on a person's amazing backstory, how they took risks and should be given a chance or how they'll fit into the company's culture."[28]

Perhaps for that reason, there exists a broad spectrum of workplace AI and machine-learning applications, the vast majority aimed at enhancing human decision making, not replacing it.

26 Paul Hofheinz, *The Ethics of Artificial Intelligence: How AI Can End Discrimination and Make the World a Smarter, Better Place* (Brussels: The Lisbon Council, 2018).

27 European Parliamentary Research Service, "AI and Digital Tools in Workplace Management and Evaluation: An Assessment of the EU's Legal Framework (Brussels: EPRS, 2022).

28 Charlotte Bull, "Facial Recognition in Candidate Screening: What We've Learned so Far," *LinkedIn Blog*, 14 February 2021.

AI can – and in many cases already is – used to analyse résumés and make job experiences or other information more transparent.[29] In other cases, AI can sift enormous piles of information and provide human recruiters with recommendations to look more closely at promising candidates with the relevant training and experience.

But, as is sometimes the case with new technology, some organisations have gone too far, applying AI-assisted facial analysis to video-based interviews to assess candidates' sincerity or emotional state.[30] However, these efforts never went far – and after a brief flirtation they have drifted palpably to the outer fringe of the industry and are clearly in retreat. HireVue, for one, a U.S. data science company, withdrew its video-based facial analysis technology from the market after criticisms that the judgements it formed were questionable and could perpetuate received stereotypes.[31] In general, responsible employers have shied well away from putting their fate in the hands of fully automated hiring processes or relying on dubious machine-generated conclusions, regardless of the legality or illegality that might be implied. Instead, most AI technologies employed in the workplace have a very different aim: they are used to surface information and identify helpful patterns to humans who remain very much "in the loop," so those humans are able to match skills and opportunities more effectively and to make better, more objective data-driven decisions.

'Large companies, governments, even individuals are dealing with huge troves of data when it comes to human resources.'

And these emerging practices have evident and well-established advantages for workers, too. The fact is, run well and properly regulated, well-tuned algorithms and ethically-focused programming can surface unseen talent among people whose principal skill is doing their job well. They can provide human decision makers more context and understanding. And they make the hiring process more transparent and data-driven, with improved outcomes for candidates and employers as well.

What's more, on the topic of discrimination, Europe has a well-stocked arsenal of tools at its disposal – rules which go well beyond the relatively tight focus of machine-generated bias. The overarching framework is provided by Article 21 of the Charter of Fundamental Rights of the European Union, which states that any discrimination based on any ground shall be prohibited.[32] This paves the way to a wide array of secondary legislation: the Council Directive 2000/78/EC of 27 November 2000 establishes a general framework for equal treatment in employment and occupation, covering discrimination on the grounds of religion, belief, disability, age and sexual orientation.[33] Directive 2000/43/EC introduces a framework on racial and ethnic origin.[34] Directive 2006/54/EC addresses gender discrimination in matters of employment and occupation, supplemented by Directive 2010/41/EU, covering self-

29 For a comprehensive survey, see Franca Salis Madinier, *A Guide to Artificial Intelligence in the Workplace: Your Rights on Algorithms* (Brussels: European Economic and Social Committee, 2021).

30 Manish Raghavan, Jon Kleinberg, Solon Barocas and Karen Levy, "Mitigating Bias in Algorithmic Hiring: Evaluating Claims and Practices," *arXiv*, 2019.

31 Roy Maurer, "HireVue Discontinues Facial Analysis Screening," *Society for Human Resource Management* (SHRM), 03 February 2021.

32 The 17-page Charter can be found in the 21 European Union Treaty languages on the European Commission website at https://ec.europa.eu/info/aid-development-cooperation-fundamental-rights/your-rights-eu/eu-charter-fundamental-rights_en.

33 See the Council Directive establishing a General Framework for Equal Treatment in Employment and Occupations in 23 European languages at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32000L0078.

34 See the Council Directive on Implementing the Principle of Equal Treatment between Persons Irrespective of Racial or Ethnic Origin at https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0043:en:HTML.

employment.[35] EU anti-discrimination provisions do not require plaintiffs or regulators to prove that there was intent to discriminate to sustain a ruling. It is enough that discrimination be shown to exist *de jure*. The discrimination itself is illegal, whether it was automatically generated by an algorithm or based on human agency.[36]

And other laws – including the General Data Protection Regulation (GDPR), which took effect in 2018 – provide additional backstops. Article 22 of GDPR states clearly:

> *"The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her."*[37]

Indeed, European courts and data protection authorities have made ample use of Article 22, generating a substantial body of case law in the GDPR's short lifespan.[38] In addition to this provision, Article 35 obliges so-called "data controllers," the entities with oversight over how and why personal data is processed, to perform *ex ante* impact assessments "where a type of processing in particular using new technologies, and taking into account the nature, scope, context and purpose of the processing, is likely to result in a high-risk to the rights and freedoms of natural persons" before deploying the new technology, including algorithm-driven machine-learning procedures.

The EU institutions, meanwhile, are gearing up to add additional layers to this framework, using the proposed AI Act to restate some fundamental rights already guaranteed under EU law and offering an elaborate new layer of product-safety regulation, which would look at the safety of the algorithms themselves based on *ex ante* conformity assessments and a rigid classification system. The proposed law seeks to divide all AI applications into four categories – unacceptable risk, high-risk, limited risk and no risk. Each would have its own rules and parameters. If an AI-driven process, for example, is classified as an "unacceptable risk," such as the social ratings applications which the Chinese government uses to monitor and control its population, it would be outright banned. If the algorithm is classified as "high-risk," it would be subject to several specific legal requirements, such as *ex ante* data set evaluations and detailed documentation obligations. And if the risk is rated as limited or low, there will be few rules – except for some transparency requirements, which would require the service provider to tell customers when they are interacting with an AI algorithm so they can make an informed choice whether to continue or not. The European Commission notes pointedly: "The vast majority of AI systems currently used in the EU fall into this category."[39]

'AI can crunch data to identify patterns and tease out learnings, sifting the data to offer helpful suggestions – a bit like Netflix recommendations.'

35 See the Directive on the Implementation of the Principle of Equal Opportunities and Equal Treatment of Men and Women in Matters of Employment and Occupation (recast) at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006L0054 and the follow up at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32010L0041.

36 See Raphaële Xenidis and Linda Senden, "EU Non-Discrimination Law in the Era of Artificial Intelligence: Mapping the Challenges of Algorithmic Discrimination" in Ulf Bernitz, Xavier Groussot, Jaan Paju and Sybe A. de Vries (eds), *General Principles of EU law and the EU Digital Order* (Alphen aan den Rijn: Wolters Kluwer, 2020).

37 European Union, *Regulation (EU) 2016/679 of the European Parliament and of the Council on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of Such Data (General Data Protection Regulation)*, 27 April 2016.

38 See Sebastião Barros Vale and Gabriela Zanfir-Fortuna, "Automated Decision-Making Under the GDPR – A Comprehensive Case-Law Analysis," *Future of Privacy Forum*, 17 May 2022 at https://fpf.org/blog/fpf-report-automated-decision-making-under-the-gdpr-a-comprehensive-case-law-analysis.

39 Visit https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai/.

The ideas behind the new legislation in principle makes sense, but – as so often happens in human affairs – it has had some slightly strange and unintended side effects. Because so much depends on the classification that a specific AI-based application might receive, a monumental effort has gone into writing the definitions of what constitutes artificial intelligence and what specific applications will be in scope – a huge task, which has exposed widely diverging opinions on the subject and left the legislation open to controversy and extensive lobbying. Moreover, even if the vast universe of AI applications can be correctly categorised, the law doesn't directly attack the risks that could arise from misuse, such as bias, discrimination, unfair decisions, transparency and data-privacy violations. Instead, it focuses on attempting to tame the technology itself. What's more, many members of the European Parliament believe an even more complicated approach may be necessary. Some have banded together to propose mandatory "third-party conformity assessments" as a "precautionary measure." Under these provisions, outside companies would be given access to the AI systems and underlying data sets to give the product a full conformity certification before the product could be sold to or used by the general public.

'The intent behind AI regulation is to enable society to reap the benefits of the technology while mitigating the potential risks.'

Dos and Don'ts – Innovation, Skills and the Artificial Intelligence Act

What is clear is that – used effectively – AI tools can be a tremendous boost to the European employment scene. In the right context, and deployed in the right way, they can be used to implement skills-based practices in the workplace at scale, helping workers grow their skills and advance their careers and helping organisations more nimbly navigate the fast-changing labour market and reach wider pools of qualified talent.

But delivering these social goods will require building a balanced and effective eco-system in which European AI will operate – one where fundamental rights are of course protected and where innovation is allowed to flourish as well. There is a sweet spot, in other words, where citizens have the protection they need and innovators have the freedom to deliver the promise they have raised.

Existing laws have many safeguards already written into them, which, if properly enforced, will give citizens the protection they need. An additional layer of safety – one written with the logic of "product-safety regulation," i.e., that focuses on the health, safety, and fundamental rights risks of AI systems – will give them even more. But the key will be to strike the right balance – one that preserves, protects and, yes, allows innovation to flourish as well. We have six recommendations for policymakers as they hone the final provisions of the AI Act:

1) **Avoid overlap** with and duplication of existing rules, notably GDPR.

2) **Align the definition** of AI with internationally agreed frameworks, notably the OECD Framework for the Classification of AI Systems and the OECD AI Principles, which have been negotiated and agreed by more than 60 countries.[40]

40 See OECD, *OECD Framework for the Classification of AI Systems* (Paris: OECD, 2022). See also, the OECD AI Principles overview at https://oecd.ai/en/ai-principles.

3) **Maintain a tightly-focused approach.** Ensure the AI Act is concentrated on high-risk use cases. Do not expand the scope of high-risk AI to areas that do not pose significant risks. A classification that is too broad risks overwhelming regulators and generating unnecessary bottlenecks that could have a truly negative effect on innovation without benefiting individuals.

4) **Do not impose *ex ante* third-party verification for AI systems.** This would slow the process down even more – and create an additional layer of "friction" at precisely the place where innovation should be allowed to flourish.[41] The New Legislative Framework (NLF) model which the European Commission chose as the basis for the AI Act is built on self-assessment of conformity – and there is a reason.[42] Self-assessment allows companies to certify conformity much more quickly, with fewer risks to commercial secrets, less cost and results that are – in the 14 years that the NLF has guided EU policymaking – highly effective. Bringing outside third parties into an inherently dynamic, fast-moving process could harm innovation and product development inordinately without delivering much additional protection to consumers.

5) **Ensure the requirements that high-risk AI systems need to meet are framed in a way that is flexible and realistic** enough to adapt to the many types of AI systems that will be in scope. The co-legislators should ensure that standards organisations (like the International Standards Organisation [ISO], the European Committee for Standardisation and the European Committee for Electrotechnical Standardisation [CEN-CENELEC] and others) have enough flexibility to take into account new developments and develop the robust standards that will form the heart of the compliance framework.

6) **Continue working towards international alignment on standards for AI.** The AI Act allows for compliance based on harmonised standards. It is important that these standards build on the work underway in international standards bodies. The U.S.-EU Trade and Technology Council can play a significant role in facilitating U.S.-EU alignment.[43] The U.S. National Institute of Standards and Technology (NIST), a non-regulatory physical sciences agency run by the U.S. Department of Commerce, has itself done some excellent work in this area, which could complement and enhance emerging European standards.[44] Policymakers on both sides of the Atlantic have similar objectives: ensure that societies reap the benefits of AI and manage the risks associated with some AI applications.

And there is another policy area where policymakers could gainfully collaborate: putting in place a balanced framework for AI so this important new technology can help us in the war for talent and the crucial effort to match skills with jobs and jobs with skills. Technology policy is fast becoming economic policy. And well-informed policymakers would do well to address the evident shortage of skilled workers head on – frontloading the kinds of reforms that yield major long-term benefits and moving aggressively on some of the short-term measures that would open job markets up and make talent easier to identify and mobilise. It's not about what AI will do to workers. It's about what skilled workers will do for the world.

41 Thomas Mejtoft, Sarah Hale and Ulrik Söderström, "Design Friction: How Intentionally Added Friction Affects Users'Levels of Satisfaction," *Proceedings of the 31st European Conference on Cognitive Ergonomics*, 2019.

42 Promulgated in 2008, the New Legislative Framework model aimed to "improve the internal market for goods and boost the quality of conformity assessment of products" and to serve as "a template for future Union product legislation." It has been enlarged and amended several times. For more, visit https://single-market-economy.ec.europa.eu/single-market/goods/new-legislative-framework_en.

43 For the latest on the U.S.-EU Trade and Technology Council, visit https://digital-strategy.ec.europa.eu/en/policies/trade-and-technology-council.

44 See also, National Institute of Standards and Technology, "AI Risk Management Framework: Second Draft," 18 August 2022.

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