March of the robots ...

Besides the strikes, sometimes workplace related, often politically-motivated, that continue to play a role in keeping SA among the world's least productive economies, the biggest talking point for business today is the fourth industrial revolution (4IR), or the offloading of decision-making to algorithms, writes **Legalbrief**. Artificial intelligence is already with us, but will the entry of the robots make workplaces more efficient, thereby improving productivity? And will it aid that other hot button workplace issue in SA, transformation? These are questions constantly wrestled with by business, big and small. A **TimesLIVE** report raises the issue of financial institutions looking to shake off their pale, male and stale reputations. But, it asks, will handing over hiring decisions to machines make workplaces more diverse? Experts in the field of artificial intelligence (AI) and recruitment weigh in on whether bias in machine learning models is a problem and, if so, what's being done about it. 'I don't think the goal should be to completely eliminate all possible biases in one fell swoop but to do better than the status quo and keep improving over time,' says Ariel Procaccia, associate professor in computer science at Carnegie Mellon University in Pittsburgh, in the US. **Procaccia says significant progress has been made in tackling the problem of bias in machine learning but that a complete fix is still a long way off.** Researchers have identified sources of bias, defined formal notions of fairness, and designed AI algorithms that are fair according to those ideas, he says.

However, Procaccia says there are two obstacles to putting this into practice. 'First, ironically, there is an embarrassment of riches when it comes to definitions of fairness and potential fixes, and it's still unclear how to choose among them,' he says. 'Second, researchers have identified inherent trade-offs between notions of fairness and other qualities of AI algorithms; it seems that pushing bias out of algorithms must come at some cost to their effectiveness. It's a multi-step process,' says Ashutosh Garg, CEO and co-founder of Eightfold.ai, an AI-powered recruiting platform based in Mountain View in California. Despite all the scepticism about the technology, according to **TimesLIVE**, Garg says it's possible to train machines to be unbiased. You start by collecting data and models from thousands of sources, he says. You then remove 'anything that can create division like gender, race and ethnicity' from the data. Machine learning systems can be optimised for equal opportunity, Garg says, and analytics can be used to detect and measure bias. But Joy Buolamwini, founder of the Algorithmic Justice League and a research assistant at MIT Media Lab in Massachusetts, says: **'You'll think you're being neutral because you're using data, but our research shows that's not always the case.'** Buolamwini says researchers have been finding algorithmic bias in machine learning systems for years. 'Now these systems are being sold and incorporated into the tools we use every day,' she says. 'This is part of why we're seeing the algorithmic bias.' Buolamwini says in some cases machine learning tools are still at an early stage and aren't an appropriate foundation for commercial applications such as recruiting bots. 'If you don't have (the right) foundation for building these systems, you're going to perpetuate discrimination.'

There are growing fears that new technologies will trigger job losses, but there is evidence that in Africa, digitalisation could create new opportunities, particularly for entrepreneurs, and bring more inclusive growth through real job creation. According to Mignon Reyneke, an associate professor of digital marketing at UCT, in **Business Report**, the World Bank estimates that digital transformation could enhance regional economic growth by up to 2% per year, creating new opportunities for growth through innovation. 'There is a window of opportunity here to re-imagine Africa's challenges as opportunities, using technology to innovate new products, services and business models to improve service delivery and address unmet demand,' says Reyneke. 'We are already seeing African business take advantage of this. One of the latest technology firms to list on the New York Stock Exchange, for example, is Jumia – an e-commerce platform with more than four million customers in 14 African countries. Its listing on 12 April saw shares jump by around 70%, putting the company's market capitalisation at close to $2bn (R30.42bn), cementing its status as Africa's first technology unicorn. But, notes Reyneke, for Africa to realise these kinds of gains there needs to be a clear strategy and serious commitment from policy makers to ensure that the continent is better prepared. **A major concern is that Africa's education and labour system appears not to be ready for the shifts that may result from the 4IR.** The World Economic Forum (WEF) says, while much has been said about the need for reform in basic education, it is simply not possible to weather the current technological revolution by waiting for the next generation's workforce to become better prepared. Instead it is critical that businesses take an active role in supporting their current workforces through re-training.'

There was optimism at the World Economic Forum that 4IR could help provide much-needed jobs across the continent, observes **Legalbrief**. Looking to the future, job creation must be the core of Africa's approach, and the

4IR – underpinned by forward-looking trade agreements and support systems for entrepreneurs/SMEs – has the potential to supply much of that need, according to a commentary by Alex Liu, one of the seven co-chairs at last week's WEF gathering in Cape Town. In a report in **Business Day**, Liu notes that in April this year government announced the launch of a new Affiliate Centre of the World Economic Forum's Centre for the 4IR. This, he says, **signifies a shift from increasing recognition that the 4IR has a critical role to play in securing Africa's future, to a new era in which efforts to capture its value will be orchestrated at national level and beyond.** 'The centre will act as a focal point for dialogue and co-operation on the challenges and opportunities presented by advanced technologies, which are merging our physical, digital and biological worlds. These include a number of tools that, combined, will disrupt Africa's dominant agricultural, extractive and manufacturing industries, offering the continent an unparalleled opportunity to transform and thrive.'

How prepared is SA? Remarks by Employment & Labour Minister Thulas Nxesi, were more practical than encouraging, notes **Legalbrief**. He said the 4IR would be disruptive to everyone, and upskilling and retraining would be necessary to ensure the workforce could adapt. According to a **Fin24** report, he said: 'Some jobs will go, because there will be new jobs that need skills. The issue of retraining and upskilling will be key.' SA's current workforce does not necessarily have the skills required for artificial intelligence and robotics, he added. 'The reality is, we cannot stop that technological change. We just have to be ready for it. It has the potential to be disruptive. It will disrupt our lives. That is why upskilling and retraining is going to be very important. It is at the top of our agenda,' Nxesi said. He added that the various existing training programmes should no longer operate in silos, instead they should come together to develop training programmes for workers. **The first draft of the Presidential Commission's 4IR blueprint is expected to be released in October,** according to Communications, Telecommunications and Postal Services Minister Stella Ndabeni-Abrahams, notes a second **Fin24** report. The commission was appointed in April to develop a plan for the 4IR through a co-ordinated approach. 'This not a government initiative, it is a societal initiative,' Ndabeni-Abrahams said. Given the pace of changes in the technology space, the Minister said there would continuously be 'plans' for the 4IR. On the need for spectrum to enable the 4IR, Ndabeni-Abrahams said government was being careful with the pace at which it rolled out spectrum to ensure the benefits could be shared by all. Ndabeni-Abrahams added that there needed to be an overhaul of legislation to keep up with changes in the technology space.

The impact of automation on workplace skills and career prospects is highlighted in a report published by consultancy business McKinsey. According to a commentary on the **Out-Law.com** site in its report, 'The future of women at work: transitions in the age of automation', McKinsey said that, across 10 major economies – Canada, China, France, Germany, India, Japan, Mexico, SA, the UK and US – the automation of manual processes could result in one in five women, and 21% of men, losing their current jobs by 2030. According to the research, women in service sector employment are at most risk from losing their jobs, while automation is most likely to impact men who are machine operators and craft workers. Up to 24% of women and 28% of men could have to switch occupations by 2030 as a result of the impact of automation on their existing roles, it said. However, there is an upside. According to the report, **factors such as rising incomes, spending on health care due to ageing populations, the adoption of technology and investment in infrastructure, construction and energy could spur new job opportunities for both women and men.** For women, the health care sector is likely to see the biggest job gains. McKinsey said that to move with the shift in where jobs are as a result of the impact of automation, women would need to acquire different skills, be better qualified, be mobile and able to work more flexibly, and tech-savvy. Women will be more prone than men to partial automation of their jobs but more productive, better-paid work is available to women who make that transition, and the change could see women's share of employment grow and the existing gender pay gap narrow, it said.

The workplace theme is picked up in a recent **ITweb** *report.* The human-machine collaboration will present significant unexpected challenges within organisations, according to Ranjit Rajan, associate VP, Middle East, Turkey and Africa at IDC. He explained: 'As more organisations create workplaces run by robotics, the AI agent in most cases will be expected to work alongside the human agent. This will present significant challenges around how human resources (HR) teams will enforce and assess things like key performance indicators and employee goals, which are aligned to the company's execution strategy. **For many organisations, the relationship between human workers and machines will be one that will prove difficult to manage.** Therefore, organisations will have to adopt an efficient approach in dealing with such issues, as well as other unexpected challenges presented by the man-machine collaboration.' A report issued by Accenture, titled 'Creating South Africa's Future Workplace', found that over a third of current jobs in SA are at risk from technologies like robots, AI, machine learning and automation, with both white and blue-collar workers' positions being in the firing line. While there are fears that automation will result in significant job losses, experts say most jobs in the global economy will not be replaced by

automation, but AI will rather pave the way for humans to work alongside digital agents.