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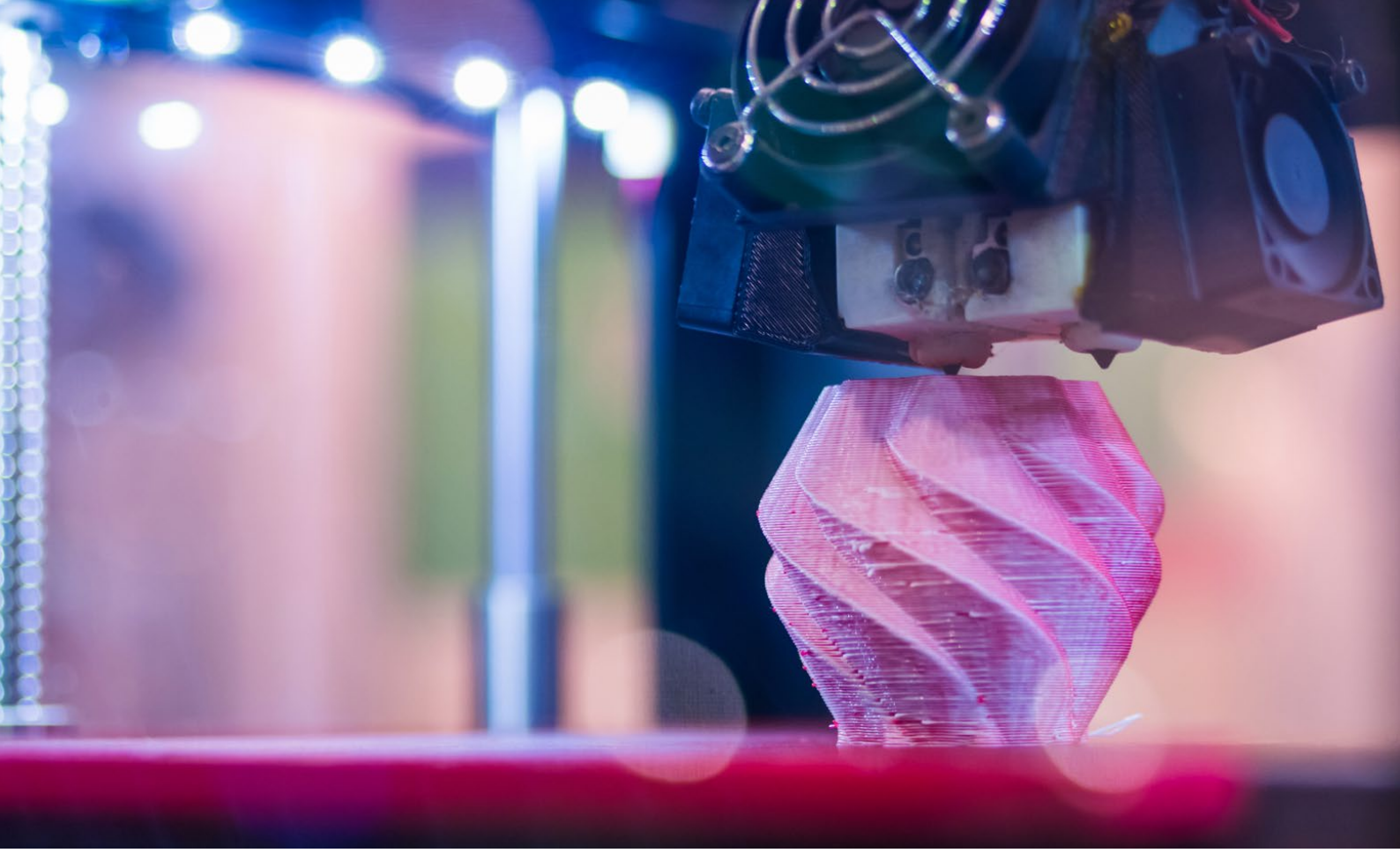

New technologies are changing the face of manufacturing—from 3D printing, robotics, the industrial Internet of Things, to autonomous vehicles. Factories are becoming increasingly connected, as machines talk to one another and to humans. Automation and autonomy reach new milestones, too, as robots become more independent, mobile and take on more human attributes. However, employees are jittery over 4IR's impact on job security and changing roles.

The industrial manufacturing (IM) industry is a crucial multiplier of economic growth, an engine of development and a significant contributor to South Africa's GDP. The diversified manufacturing sector continues to be competitive in the global economy and has proven to be a key player in the country's employment market through its ability to create ample job opportunities in labour-intensive environments. The jobs from this sector also tend to be better paying and stable, thus increasing standards of living of employees. In 2021, the sector contributed 13% towards South Africa's GDP[1]. However, prior to the COVID-19 pandemic, the sector had contributed significantly more, employing approximately 1.8 million people. But this number has declined to about 1.4 million people post-pandemic[2].

The manufacturing industry continues to be an important driver of valuable employment opportunities. Exciting disruptions within the sector are causing business leaders to pivot due to rapid innovation of new digital technologies such as IoT, automation, artificial intelligence and machine learning. What is being manufactured and how it is produced is also changing; this is evident in the automotive manufacturing industry which is currently seeing a global shift to vehicles that do not produce emissions[3]. South Africa is a prime manufacturing hub and these tech-enabled innovations will efficiently allow various sub-sectors in the industry to meet the growing demands of the country's ever-evolving economy faster and smarter. But, the ongoing industrial revolution and technological evolution in the industry has given rise to contending thoughts on their impact on the future of work and what this means for the workforce.

As organisation's in the Industrial Manufacturing Industry evolve, it is pertinent that they consider how the different changes and trends are impacting their workforce; these include sustainability and digital trends which are shaping the future of work in the industrial manufacturing industry.

1 *https://www.engineeringnews.co.za/article/a-10-increase-in-manufacturing-investment-could-yield-a-13-boost-to-the-economy-2022-09-08*
2 *https://www.engineeringnews.co.za/article/a-10-increase-in-manufacturing-investment-could-yield-a-13-boost-to-the-economy-2022-09-08*
3 *https://theconversation.com/auto-manufacturing-is-changing-how-south-africa-can-adjust-to-protect-workers-and-jobs-188004*

Success through Sustainability

Industrial manufacturing companies' response to net-zero is currently being underpinned by a number of imperatives, with digital transformation embedded as the enabler for much of the systemic changes that are occurring. Sustainability is essential not only from an impact point of view but also in attracting investors. PwC's Global CEO survey highlighted that investors are more likely to invest in companies which efficiently manage sustainability risks and opportunities, and 79% agree that the consideration of sustainability risks and opportunities is a significant factor in their investment decision making[4]. Forty-percent of worldwide CO_2 emissions are created via industrial production.

South Africa's relative passivity in decarbonisation efforts is the reason why it is the most carbon-intensive country within the G20[5]. Over and above this, load shedding has a severe impact on production, resource management and the bottom line. Business leaders need to rethink energy sources to enable sustainable production and growth into the future. The case for change is real - industrial manufacturing companies need to re-look at their sustainability strategies and enable their workforce to execute upon them through:

1. Enabling the workforce to master new skills in order to understand the impact of carbon-intensive practices on the just transition

2. Engaging all employees through cultural change initiatives to embed a company's sustainability strategy. People's choices and behaviours will determine the trajectory of our collective transition to a sustainable world. The workforce should be at the heart of every sustainability transformation.

3. Creating waves of change through onboarding sustainability champions to drive sustainability initiatives throughout a company

4. Relooking Industrial Manufacturing's companies Employee Value Proposition (EVP) to meet employees' personalised purpose drivers. In a competitive market attracting top talent in manufacturing, it is all about putting together the best possible employee value proposition. Employees' needs have shifted and, in order to meet this change, manufacturing companies need to think through aspects such as reward over and above standard practices, supporting flexible ways of work as well as wellbeing to name a few. In South Africa, 90% of workers feel more inclined to work for an organisation that will positively contribute to the society[6]. Employees want to be part of purpose-driven work that makes a difference.

Sustainable transformation across the organisation is a complex task, it requires buy-in from the C-suite to the shop floor and realignment of the entire workforce to a sustainable 'true north'. All sustainable aspects must be integrated into the journey, otherwise there is a risk that some employees will be left behind.

Creating a digitally-enabled and connected Industrial Manufacturing workforce

The fourth industrial revolution comes with a wealth of technology that brings opportunities for production cost reduction, productivity and earnings improvement, and the development and introduction of new business lines. Technology on the factory floor can be used to create more insightful dashboards, analyse production in greater depth, enable the use of predictive analytics to detect quality problems early as well as automatic rework suggestions, using real-time resource planning in order to meet the target output, using intelligent maintenance, and being digitally lean to identify waste and increase efficiency[7].

4 *https://www.pwc.co.za/en/press-room/global-investor-esg-survey-2021.html*
5 *https://www.pwc.co.za/en/press-room/south-africas-just-energy-transition-moving-from-planning-to-action-in-2023.html*
6 *https://www.pwc.co.za/en/press-room/hopes-and-fears-2021.html*
7 *https://docs.google.com/presentation/d/1gTzVZc6ZNtN9UE8jx0UIpNhdpdalVd0s/edit#slide=id.g12df507cd1b_0_2016*

However, how does all these ‘tech-advancements’ affect the workforce?

The 4IR in manufacturing is often associated with robots, smart machines and automation which will result in widespread unemployment. In South Africa, 72% of workers are concerned that automation is threatening many jobs[8]. While it is expected that there will be a decline of repetitive tasks for assembly and factory workers, material handlers and many other roles, the decline will be counterbalanced by an increase in new, often formal, wage jobs being created, especially in the service sectors, at a faster rate, as well as earnings improvements in the informal sector. A World Economic Forum report asserted that technology adoption will remain a key driver of business transformation in the next five years. Over 85% of organisations surveyed identify increased adoption of new and frontier technologies and broadening digital access as the trends most likely to drive transformation in their organisation[9].

The deployment of 4IR technology and rapid growth in technological developments is changing the type of jobs and skills needed in industrial manufacturing and therefore requires continuous investment on accelerating workforce re-skilling, building new capabilities and establishing change management initiatives. The World Economic Forum, Future of Jobs report 2023 found that employers estimate that 44% of workers’ skills will be disrupted in the next five years and six in ten workers will require training before 2027[10]. Although the analogy of ‘lights-out’ (Lights-out is a manufacturing methodology in which manufacturing is fully automated and requires no human presence so that the lights and even ventilation can be shut off[11]) is not yet a reality, Industrial Manufacturing companies need to keep this at the top of mind to re-skill and upskill their workforce to be prepared for the changes ahead. While lights-out might put tens of thousands of factory workers out of work, it will also create a demand for a new type of workforce that designs and develops the necessary hardware and software for these systems. This will add skilled workers to the talent shortage in the skilled workforce, especially in data analytics[12].

Technologies such as Virtual Reality (VR) and Augmented Reality (AR) are becoming popular tools in workforce training and development by enabling workers to simulate real-world scenarios in a controlled environment, providing them with hands-on experience. This allows the workforce and the manufacturing industry to leverage and benefit from the opportunities brought by the 4IR. It is crucial to create a digital transformation journey through the use of a variety of applications and technologies to empower, retain and attract the workforce. The effective implementation of this would increase efficiency, decrease cost, improve customer experience and facilitate the company’s growth[13]. The upskilling of employees through this digital journey would create value for the industrial manufacturing industry.

It must be stated that the transition of the workforce to enable the development of new skills and career pathways must be done in a responsible way with proper planning. Tools need to be used to determine which and how many jobs will become redundant as well as which or how many will be created. The negatively impacted staff need to be given the first opportunity to be trained into occupying the new jobs created. This will require 3-5 year planning horizons through a robust strategic workforce planning strategy.

We also need to reinforce the point that South Africa’s competitors are all adopting 4IR technologies and developing their workforce. South Africa will continue to fall behind and deindustrialise if we don’t follow suit.

8 https://www.pwc.co.za/en/press-room/hopes-and-fears-2021.html
9 https://www.weforum.org/reports/the-future-of-jobs-report-2023/digest/
10 https://www.weforum.org/reports/the-future-of-jobs-report-2023/digest/
11 https://www.luxresearchinc.com/blog/lights-out-manufacturing-still-a-moonshot-or-a-closer-reality/
12 https://www.luxresearchinc.com/blog/lights-out-manufacturing-still-a-moonshot-or-a-closer-reality/
13 https://www.pwc.co.za/en/press-room/digital-automation-platforms.html

Conclusion

The industrial manufacturing industry in South Africa needs leaders to invest in strategies which are more technology and sustainability focused in order to create a culture which will help them stay relevant, attract and retain employees, improve productivity and make an impact, both inside and outside of the workplace. This strategy should be enabled through embedding cultural shifts through exciting employee value propositions and continuous upskilling, cross-skilling and reskilling of the workforce. This will in turn position industrial manufacturing companies in South Africa to gain a competitive advantage, future proof their workforce, as well as attract investors who are sustainability-inclined.

For more information reach out to:

Marthle du Plessis
Partner, Workforce of the Future Platform Lead

Vinesh Maharaj
Associate Director, Smart Manufacturing

Harshini Vallabh
Senior Manager, Workforce of the Future Industrial Manufacturing Industry Lead

Daniel Reddy
Senior Manager, Smart Manufacturing