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**PRESS RELEASE**

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**‘African businesses face threat of becoming obsolete’ – Aurecon COO**

If African businesses do not adapt to the fourth industrial revolution (4th IR), they will become obsolete. At the very least, they will become isolated and unable to compete globally.

## This was said by Dr Gustav Rohde, Chief Operating Officer of global engineering company Aurecon, at the 54th Hendrik van der Bijl Memorial Lecture, hosted at the University of Pretoria by the Faculty of Engineering, Built Environment and Information Technology, in partnership with the South African Academy of Engineering.

Speaking on the Fourth Industrial Revolution, Dr Rohde cited an African proverb: “If the rhythm of the drum beat changes, the dance steps must adjust.” He added, “I would prefer to see the 4th IR as an opportunity for society and specifically engineers to play a much more constructive role in embracing the digital age. New technology enables us to offer deep scientific knowledge and solutions to complex problems.”

He explained that in South Africa, there are pockets of excellence and areas of significant innovation. “Digital technology is rapidly evolving but the industry in South Africa is not adapting fast enough. A major concern is the lack of government-mandated Building Information Modelling standards and practices.” These standards are critical for the integration of infrastructure-design models developed by different parties in a collaborative digital process.

“Without standard practices, creating sustainable smart buildings and cities will not be possible. BIM standards have been set in most countries by governments in cooperation with trade associations and professional associations. As a country, it will become increasingly difficult and expensive for South Africa to catch up if we don’t urgently address this.”

He referred to examples in Australia of smart buildings that measure the temperature, light, movement, humidity, keep a record of assets, and switch off the lights when people are not around. Another innovation is the use of Big Data in Cape Town, where two young people produced an app that uses pattern recognition in satellite photographs to determine the surface area of paved streets. “The length and width of all streets were determined in a space of hours, instead of sending out technicians for three months to measure the roads.”

Cubic meters of crust rock on local construction sites are also being measured using drones, geolocation, tracking and spatial measurements. Historically, this activity required manual surveying followed by detailed quantification. Ironically, some older engineers still verify designs developed in a three-dimensional digital model by printing it on paper and checking the design in 2D. But technological developments in the fields of augmented and virtual reality are rapidly changing this practise.

Dr Rohde cited a McKinsey report that estimates that by 2030, at least one third of the activities of 60% of occupations will be automated. This means that, globally, up to 375 million people will need to change jobs or learn new skills. Mundane, machine-replicable jobs are most threatened. “However, every previous industrial revolution led to job creation, and I can see an increase in job types that did not exist in the past.  New technology will spawn new industries, but the type of jobs will change.”

For Dr Rohde, the challenge for formal industry will be to ensure that workers have the skills they need to transition to new jobs. But the 4th IR will allow broader and more affordable access to new technologies and applications – and this should enable more start-ups and entrepreneurs to enter the labour market.

Engineers would have to re-engineer themselves: they are solution-driven and oftentimes not good communicators, he explained. “Many of the things engineers do are repeatable. They are trained to jump to ‘solution mode’, based on their experience and knowledge of what works. But within the 4th IR, many of society’s real problems will not be solved with a linear analytical approach – and this includes solutions related to basic infrastructure.”

Engineers require a human-centric approach, which means they need to spend more time “understanding if we (and our clients) are solving the right problem – and by engaging with the end users and broader stakeholders, it allows us to create better and more sustainable solutions. It simply means that we put the people who we are creating a solution for, at the very centre of our thinking.”

This will require holistic thinking and going beyond purely technical solutions. The Engineering Council of South Africa continues to promote that “humanistic” skills be included in basic training by institutions and then further developed as a prerequisite to register as a professional engineer. “Engineering practitioners will have to consider psychology (how people think, act, decide and behave); sociology (how groups interact); communications (how engineering solutions are communicated); and ethics (understanding the social and economic impact of their solutions).  It will also require holistic thinking and going beyond purely technical solutions.”

According to a report by the World Economic Forum on the top skills needed by 2020, some of the skills required for the future include: complex problem-solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, service orientation, and negotiation.

Dr Rohde asserts that universities are teaching nearly the same engineering curriculum that was taught 20 years ago. “Knowledge and skills that helped us to succeed in the past will not guarantee a successful career in the future. Our rapidly changing world means we all run the risk of becoming obsolete at work – what I call our ‘sell-by date’.

Life-long learning is no longer an option. It is an imperative to stay relevant. I think academic institutions  can play an important part by focusing on relevant and continued learning offerings.”

He said the biggest challenge is how to adapt the content of what universities teach, to provide industry with the new skills and capabilities that will be required. “The pace at which we are confronted with changes today requires much closer collaboration between academic institutions and industry so that we shape appropriate future workforces together.”

Meanwhile, statistics indicate that there are more than 18.5 million smartphone users in South Africa. This growing proportion of future voters, citizens, and clients of government and the private sector are now globally connected through many new platforms and social media. Technology not only empowers citizens to hold their leaders to account, but also allows governments and the private sector to engage with their stakeholders in a more transparent way than ever before, meaning they will demand more, said Dr Rohde.

“The future is going to be different from the past. We need to dance with disruption. I do remain optimistic in general though that the great entrepreneurial promise of Africa’s people and our proven ability to leapfrog technological advances will stand us in good stead to leverage the opportunities of the 4th IR.”

## *This lecture was held in honour of Hendrik van der Bijl, a scientist, entrepreneur and industrialist who founded Eskom, Iscor and the Industrial Development Corporation.*

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