Use existing infrastructure to benefit from 4IR

By Thapelo Petje

23 Jul 2019

If South Africa is to reap the economic benefits of the Fourth Industrial Revolution, it needs to look at existing infrastructure within the country's state-owned enterprises (SOEs) and municipalities (metros) as a foundation for innovation and creating technology-driven opportunities for local innovators.

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Many SOEs and metros have high-speed fibre networks that should form the basis for exploring opportunities being ushered in by a range of new technologies currently disrupting traditional economies and industry sectors.

Entities such as Broadband Infraco, Eskom, Transnet, Telkom and metros all have fibre networks that are economic assets, and this infrastructure must be harnessed and maximised to deliver solutions that add value and create employment for the young people of South Africa.

It is important to realise that the fourth industrial revolution is not just about gadgets, but also about the infrastructure backbones on which smart devices run. While the government is talking about the Fourth Industrial Revolution, they forget that for it to be harnessed it starts with infrastructure development. The reduction of high youth unemployment begins with how infrastructure is procured and built to create the skillset that upskills the youth instead of making them technology consumers.

It all comes down to infrastructure

All technological innovation is based on the infrastructure which will upskill and create opportunities in the Fourth Industrial Revolution, and it is up to the government to bring youths into the fold and upskill them to become innovators of smart tech solutions that can transform economic sectors and improve service delivery.

Specifically, the public transport sector is one where the government is missing out on opportunities to empower the youth through infrastructure.

Take, for example, mass transport, with Metrorail ferrying more than two million people a day in South Africa, yet the state of trains and general condition of old and dilapidated rolling stock makes this an unappealing transport mode for many commuters.

In 2014/15 the government announced new rolling stock with the possibility of creating 33,000 new jobs and 19,000 technicians in PRASA infrastructure and rolling stock over ten years. These plans or projects need consistency, upskilling and the ability to bring the rail sector into the 4th Industrial Revolution.

While the Passenger Rail Agency of South Africa continues its modernisation programme to address commuter dissatisfaction, this also creates opportunities for innovators to get involved with the development of smart stations, smart ticketing and biometric solutions, for instance.

Smart technologies offer smart solutions

Current public transport policies which are EMV (Europay, Mastercard, Visa) standard are legacy technologies have been disrupted by smart technologies that have an artificial intelligence base on analytics and have shown how financial transactions have evolved. Ticketing can be done with smart technologies very cost-effectively without expensive infrastructure. Smart technologies solutions for smart stations with fingerprints, facial recognition, biometrics etc. are for millennial youths who are tech-savvy with smartphones and applications that enhance local developments.

High levels of foot traffic and occupancy at train stations mean that another innovative solution that could potentially be developed is to revamp stations to become Smart Rail ecosystems.

In other words, when looking at the innovation potential the fourth industrial revolution brings, there are many components that can be harnessed to develop a new rail network ecosystem.

For example, the development of IT systems and integration of the systems to existing rolling stock to enable real-time download of the diagnostic data, to perform analysis of what is happening onboard, is vital for the operator to enable preventative and correctional maintenance, central intelligence management for fleet analysis and to improve the reliability of rail operations.

Enabling preventive and corrective maintenance operations

The central intelligence management centre must be equipped with a system that enables preventive and corrective maintenance operations with software that enables management of the repair and maintenance process by monitoring the wear and tear of components and scheduling replacements and repairs.

An advanced system is required to monitor fleets, traffic and railway operations. Analysing train diagnostic data downloaded remotely, engineers are able to anticipate failures of rolling stock and supervise depot operations.

As a result, clients have better availability of rolling stock and better management of resources and employees in depots. The interpretation of data can be engineered with rules that allow it to point out, with a very low margin of error, the real damage. Even troubleshooting must be engineered providing technicians with procedures that reduce the time and cost of corrective maintenance. These 4th industrial Revolution components can ensure that local value-add infrastructure creates job opportunities for our youth in rail than just importing solutions to our shores.

It is up to the government, which is on a push to create jobs; to embrace the opportunities presented by the Fourth Industrial Revolution and explore how best young people can participate in infrastructure creation.

Procuring technology from global markets

One of the issues that need to be addressed is South Africa's reliance on sourcing technology from international markets, as well as hiring foreign engineers and implementers to install this technology locally.

For instance, a country such as China, when rolling out a telecoms network in South Africa will often not only supply infrastructure and technology components – in terms of hardware and software solutions – but also bring a workforce that physically builds the network and implements the technology.

We know that South Africa is mainly not an Original Equipment Manufacturer (OEM) in high technology sector however is important that equipment is planned, installed and commissioned by local skills with the help of the OEM to enable skills transfer that make local customisation inexpensive as a local skill will be highly skilled.

In other words, the rand will circulate more in the economy and be able to create alternative jobs in support and maintenance of OEM equipment.

If a project is not carried out this way, it means no local jobs are created, not a cent is spent sourcing local technology and no skills transfer takes place. So, it is really a matter of relooking at how government and business procure technology and what it can source locally.

There needs to be a greater understanding of the components that underpin the fourth industrial revolution and how much local content can be used during the rollout of new technologies.

Even if certain technologies are not available locally and have to be sourced from overseas, there is no reason why we cannot rely on local integrators to implement solutions. The skills are locally available. There is an abundance of telecom or mobile skills in South Africa who have been laid off that have been engineers, solutions integrators and other specialists in the field.

Relooking at infrastructure

We need to start looking strategically at the infrastructure that creates the Fourth Industrial Revolution and how we can invest in it for the benefit of our country. This is key to stop money from leaving our shores.

The automotive industry is a good example of how the local economy and job market benefit from building cars in South Africa. For instance, Mercedes-Benz has a plant in East London, where it imports components assembled by locals. While Mercedes is a German brand, it can be built anywhere and has created an export market for South Africa.

This kind of mindset has not yet filtered down to the Fourth Industrial Revolution, which means we are killing job creation opportunities and not creating a value chain of local input. If South Africa is a developing economy the government has to change its policies of how it brings the Fourth Industrial Revolution to the masses, by reviewing how it procures

technologies to enhance job creation amongst the youth who are more tech-savvy than current policies are set in the old economy.

What we need to develop is a mindset of driving development within the economy and investing in skills that enable young people to become entrepreneurs. To be an entrepreneur or to work smart you need an environment that will support and create a conducive environment to flourish with a good infrastructure to create local value-add and the young people being solution architects that give pride in participating meaningfully in the economy.

As a country, to take advantage of the Fourth Industrial Revolution we need to ensure which technologies are procured, how we make the youth part of the infrastructure, planning, installation and maintenance, what should be locally manufactured based on volume and scalability. We need to apply our skills where we can be most competitive and constructive, and we need to build human capital with our Integrated Development Plan.

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