4IR - Its implications for South Africa

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What is the 4th industrial revolution (4IR)?

Digital Economy
Knowledge Economy
Information Society etc

and the real economy are not separate.

They all refer to the same economy.
It’s the technologies that make it seem as though we are talking about different economies.

So what is this 4IR?
From Industry 1.0 to Industry 4.0

First Industrial Revolution
Based on the introduction of mechanical production equipment driven by water and steam power.
- First mechanical loom, 1784

Second Industrial Revolution
Based on mass production achieved by division of labor concept and the use of electrical energy.
- First conveyor belt, Cincinnati slaughterhouse, 1870

Third Industrial Revolution
Based on the use of electronics and IT to further automate production.
- First programmable logic controller (PLC) Modicon 084, 1969

Fourth Industrial Revolution
Based on the use of cyber-physical systems

Degree of complexity
Evolution of mobile phone communications

1980 - 1G - TACS
First UK mobile phone call

research & standardisation

1990 - 2G - GSM/GPRS/EDGE

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commercialisation

2000 - 3G - WCDMA/HSPA/HSPA+
3G spectrum auction

2010 - 4G - LTE/LTE Advanced
4G spectrum auction
2.3 GHz & 3.4 GHz auction

2020 - 5G

2030
4th Industrial Revolution

Characterised by a convergence of different technologies

Robotics, artificial intelligence, genomics, autonomous vehicles, mobile computing, smartphones, virtual reality, Internet of Things (IoT), 3D printing, quantum computing, peer-to-peer technologies, materials sciences, bioengineering, new energy technologies, digital currencies and the blockchain, metadata, analytics, crowd funding and crowdsourcing.

New products & services with increased efficiency providing better quality of life

Ability to order a cab (Uber), book a flight or accommodation, buy a product, make a payment, listen to music, watch a film, share files, play a game

impacting on social & economic sectors

seamlessly merging physical, digital, and biological spheres
Impact of 4IR

Understood that there are advantages and risks

Connection

Efficiency

Management of assets from organisations to natural assets

Improve lives

New opportunities

Inability to adapt

People not ready and skilled

Not able to capture benefits

Inequality may grow

New security concerns
The Fourth Industrial Revolution is synonymous with uncharted growth in digitisation and internet connectivity.

It has the potential to drive Africa forward like never before, enabling innovation, spurring new business models and improving the delivery of public services.
4IR is disruptive & affects all economies

All industries are being impacted by this disruption

We have to consider:

Prioritise **development of skills** this is paramount

Underpinned by **partnerships** across all stakeholders. Powerful levers for change.
Gearing up for 4IR

Some of the **important activities** for SA & Africa:

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<th>ICT policy, infrastructure implementation and broadband connectivity</th>
<th>Mainstreaming of ICT in the integration projects</th>
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<td>Roaming charges and termination rates</td>
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<td>Harmonisation of SIM registration regime</td>
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“What is being done with technology, and not technology itself, is the essence of 4.0, which has at its core the use of data and the ability to analyse and apply that data.”
Critical skills needed

Influence curriculum

Influence approaches to teaching & learning

New skills and competencies required

- Critical thinking
- Communication
- Collaboration and teamwork
- Complex problem solving
- Creativity
- Emotional intelligence
- Global awareness
- Financial, economic, business and entrepreneurial literacy
- Civic literacy
- Health literacy
- Environmental literacy
- Computational thinking
- Judgement and decision making
- Service orientation
- Negotiating
- Cognitive flexibility
7 forerunners in the world

Finland
Switzerland
Sweden
Israel
Singapore
the Netherlands
the United States

generating economic impact from investments in ICTs

Currently, there are more than 3 billion searches/day on Google.

2011 was largest growth year in search query volume.

Source: DefineMG.com
19.7B threats blocked daily
Education, as we know it, is obsolete. It still acts as a gateway to knowledge that is no longer needed with the rise of Internet.
Understanding the system

For nearly a decade, talking about the opportunity technology presents to unlock effective citizen service delivery, enhance customer experience and bring about innovative solutions, for a better life for all.

Not known at the time – how the entire system of production, management and governance is affected.

More importantly the societal aspect was largely missed.

Today addressing youth unemployment & harnessing human innovation forms part of the whole.
The time is now to support skills development.
In 2013 the Department of Communications launched the concept of iNeSI aligned to the NDP.

Today, the DTPS together with NEMISA (becoming iNeSI) is developing the required enabling legislation.

DTPS together with NEMISA has:
- Developed a decentralised model for e-skills in the country
- Developed local evidence-based research through its provincial e-skills collaboratories (which are hosted by local universities across the country)
Some threats and opportunities…

Increase of mobile and internet use comes with own threats – cybersecurity – become a massive global problem. We need the e-skills to combat this.

Cybersecurity: protecting organisations and their customers’ data, assets and reputations. Also fundamental to successful digital transformation.

Digital skills enable services growth. Service industries require digital skills as part of transitioning its population from low-skill and low-pay jobs to high-skill and high-pay jobs.
“Going forward, it will be important to reinforce data gathering efforts in order to more closely track the distributional impacts of the current transformations.

This will make it possible to shape the digital economy in a way that delivers broadbased gains.”

*Silja Baller, World Economic Forum*
Collaboration for impact

Is 4IR synonymous with digitisation and the internet?

Is there potential to drive South Africa forward?

The answer to both is yes but we need a platform for collaboration as the need is greater than the work of one stakeholder opportunity for to make 4IR work for our local conditions – inequity, poverty and unemployment especially among our youth.

NEMISA invites you to join in making South Africa an e-skilled nation by 2030.
Before

Carbon Monoxide Detector

After
Vision 2030 Summit

Thank you