



## 2<sup>ND</sup> ANNUAL CAREER DEVELOPMENT STAKEHOLDERS CONFERENCE CAREERS IN A CHANGING WORLD

28 - 29 JUNE 2018

# Information for a changing world

Social inclusion in a changing world

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We all have a role  
to play in the education  
of our children.



Human Resource Development and the 4<sup>th</sup> Industrial Revolution

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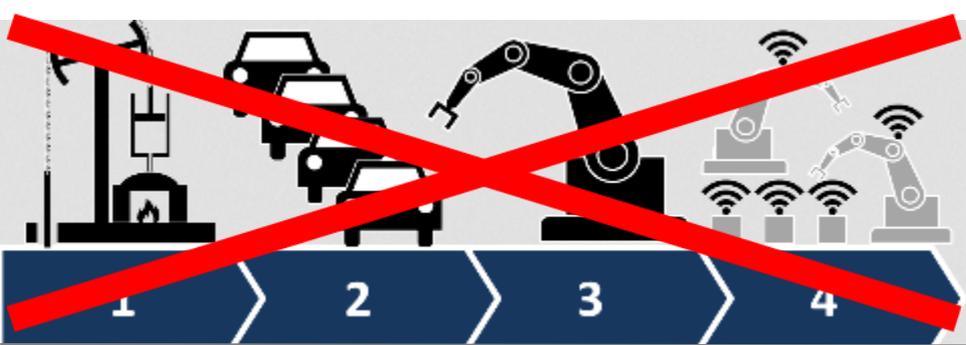
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## CAREERS IN A CHANGING WORLD

### Presentation Format: Addressing South Africa's social challenges

1. 25 slides with critical statistical data and other details, and just 20 minutes to deliver the whole presentation
2. Each chart, Image and several slides have direct ***clickable links*** to the reference documents – please obtain a soft copy of the presentation to access these references, or just google the topic
3. Only the highlights of each slide will be covered to meet the time constraints
4. Apologies for all typos

The presentation is about South Africa's Triple Threats of Inequality, Poverty and Unemployment, and how the education system, supported by technology, can alleviate them



# DEMYSTIFYING The 4IR

- The “4IR” is **NOT** a revolution: even if it is, it is NOT the 4<sup>TH</sup>
- The 4IR is an **Evolution** that began ± 100,000 years ago, in Africa:
  - “Time Machine - the origins of innovation”: Blombos Caves and Kilpdrift Shelters – South African-born [Professor Christopher Henshilwood](#) – [WATCH VIDEO HERE](#)
  - [First Techno-industry at Sibudu](#), KZN, 70,000 years ago: Stone tools, bone needles, insect-repelling mattresses, [BALLITO Boy \(2017\)](#) adds centuries to age of humanity
- Revolution destroys or discards past knowledge in favour of today
- Evolution refines past knowledge to create today’s and tomorrow’s worlds

## **THE 4IR IS EVOLUTIONARY, NOT REVOLUTIONARY**

- *ALL modern technology that forms the 4IR: IoTs, Autonomous Machines, Internet of Things, 5G and now 6G, Machine Learning and Artificial Intelligence, have refined previous technologies to what they are today, and will be tomorrow.....*
- *If we accept this, we will be better positioned to understand and use the 4IR*
- **We should not fear the new technologies, we should embrace them as a path towards final freedom from inequality, poverty and injustice**



- If we don't understand & use it, the 4IR is a truly frightening world
- If we ignore it, it will damage South Africa irretrievably.....
  - Massive job losses as the world automates work and labour to “keep up” with the global economy and **Information Society**
  - Vast knowledge deficiencies – as the “Knowledge Society” grows inexorably elsewhere, the “**Information & knowledge excluded**” will fall further behind

*“The fight between metered taxis, mini-busses, Uber and Taxify has just started, what if driverless cars and pilotless air taxis arrive?”*

*With ±80% of our grade 4 children unable to read, how do we survive the 4IR world, and its demands for critical and creative thinking?”*

- Technology has always supported humankind's quest for a better life
- Failure to embrace it inhibits human development, or destroys it
- The abuse of 4IR technology is a threat to human progress worldwide
- Nations have a choice – growth with 4IR, or failed statehood?

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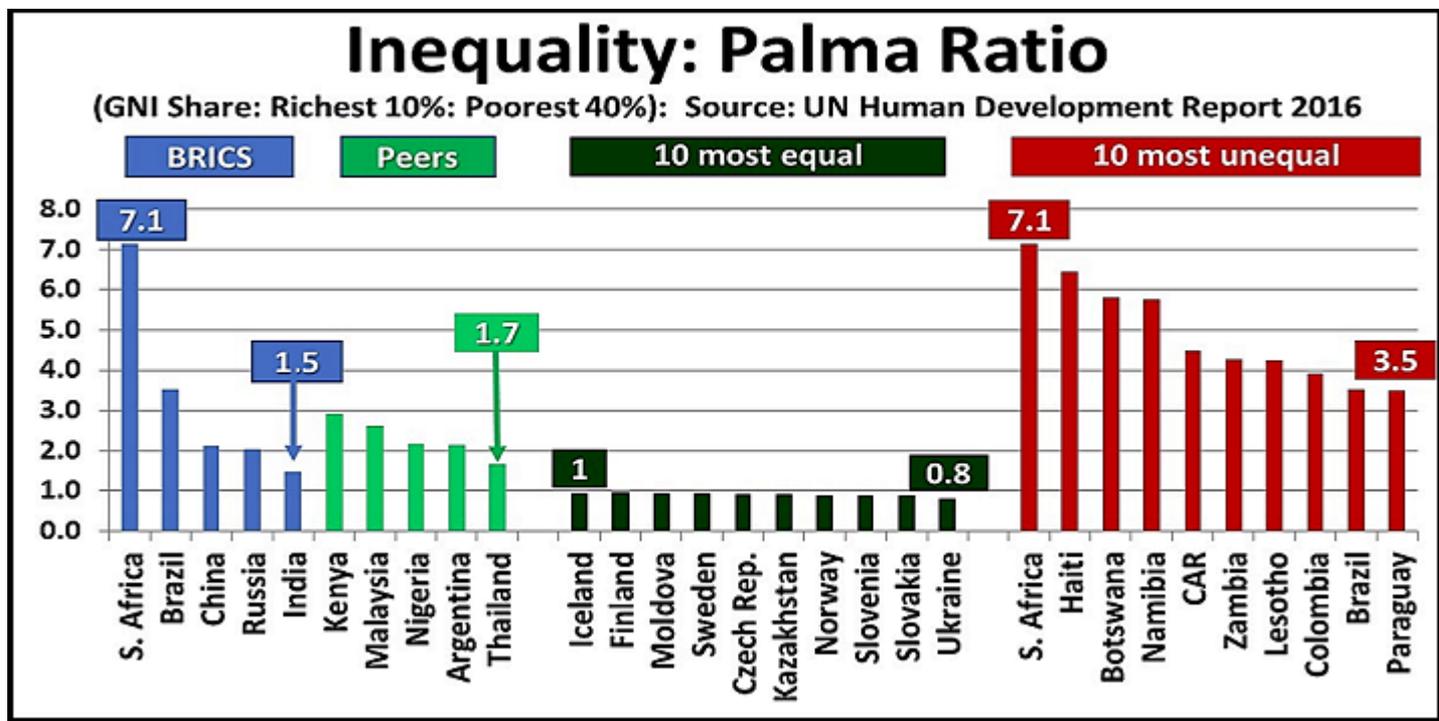
**A short survey of South Africa's  
key societal challenges follows**



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## CAREERS IN A CHANGING WORLD

The most unequal country on earth today: A major threat to social stability



South African data compiled by STATS SA

Can the application of 4IR alleviate and reverse this threat?

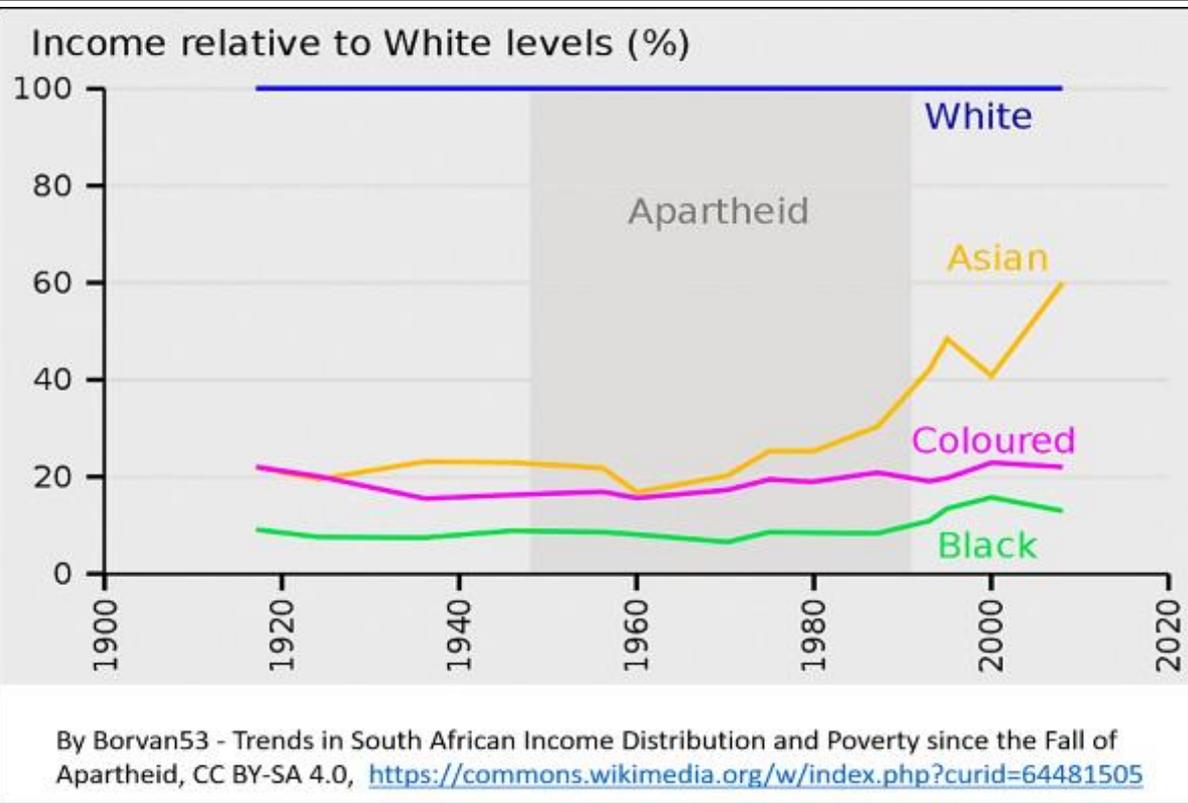
Evidence is that it can, and must. But it must be positioned to do so....

- Vertical inequality amongst humans is normal, acceptable
- Horizontal inequality is dangerous – intergroup violence an outcome
- South Africa has extremes of both – a volatile social threat

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## Horizontal Inequality: RACE – a dangerous national provocation!



- Racial intolerance remains a challenge in 21<sup>st</sup> century South Africa;
- Education and social integration are effectively reducing this provocative threat;
- Income inequalities along “racial” lines continue to fuel the legacy of racism;
- Government continues seeking policy and legislative interventions to control this phenomenon.

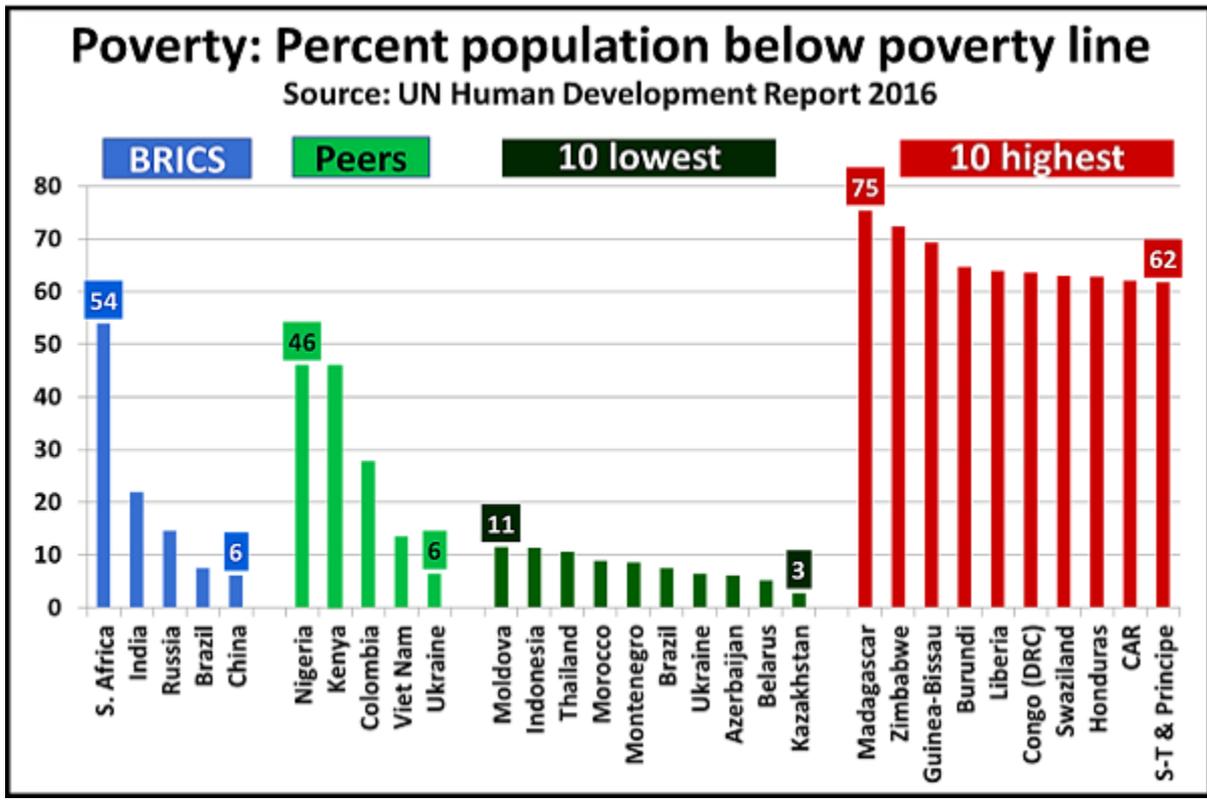
- “Race” has no scientific basis – mass education IS the best defence...
- But huge race-based disparities remain even in the educational systems
- Creative application of the knowledge components of the 4IR will help



# ANNUAL CAREER DEVELOPMENT STAKEHOLDERS CONFERENCE

## CAREERS IN A CHANGING WORLD

Too many South Africans living in poverty – a threat to growth and stability



54% of South Africans live below the national poverty lines: more than 30 million citizens

Under such conditions, socio-political stability is not sustainable

- Reducing inequality and poverty is complex – long term effort needed
- Much more than Policy and/or Ideology is needed – action now!
- Interventions must begin with children and youth, build the future

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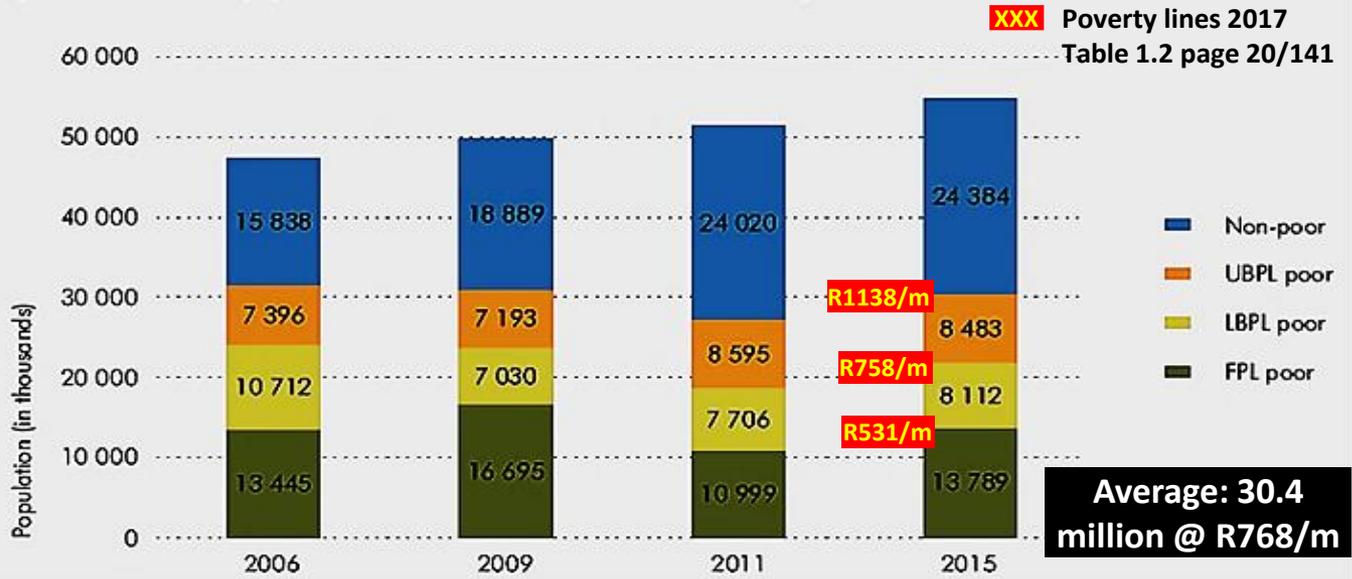


## A closer look at South Africa's poverty

### Poverty Trends in South Africa

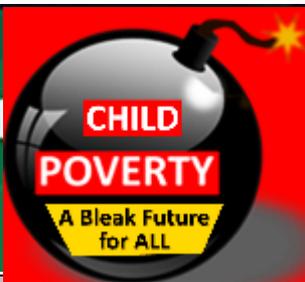
An examination of absolute poverty between 2006 and 2015

Figure 2.2: The number of poor and non-poor persons in South Africa (in thousands) (2006, 2009, 2011 and 2015)



1. Population living below UBPL of R1138 per month = 30.4 million (55.5%)
2. Average monthly disposable income = **R786 (0.2% of 2015 GNI/capita)**
3. At global average and target of 5% of disposable income for transformative ICTs, target price for ALL ICT services in this population is R39 per month
4. How can **AFFORDABLE ICT** help Education?

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## The most devastating aspects of South Africa's poverty – IMPACT ON CHILDREN



- Child poverty is linked to adult unemployment: nearly one-third of children (5.5 million) live in households with no working adult.
- Unemployment remains stubbornly high. In 2016, official unemployment stands at 27%, and increases to 36% if one includes discouraged work-seekers.<sup>3</sup>
- Where there is little or no income from work, social grants can help families meet children's basic needs.



**EDUCATION** is the exit route out of poverty – but – education for whom? For what? How?

The 4IR is most demanding on education – it **MUST** focus on **CHILDREN!**

**Extreme inequality amongst children has a devastating impact on a nation's future**

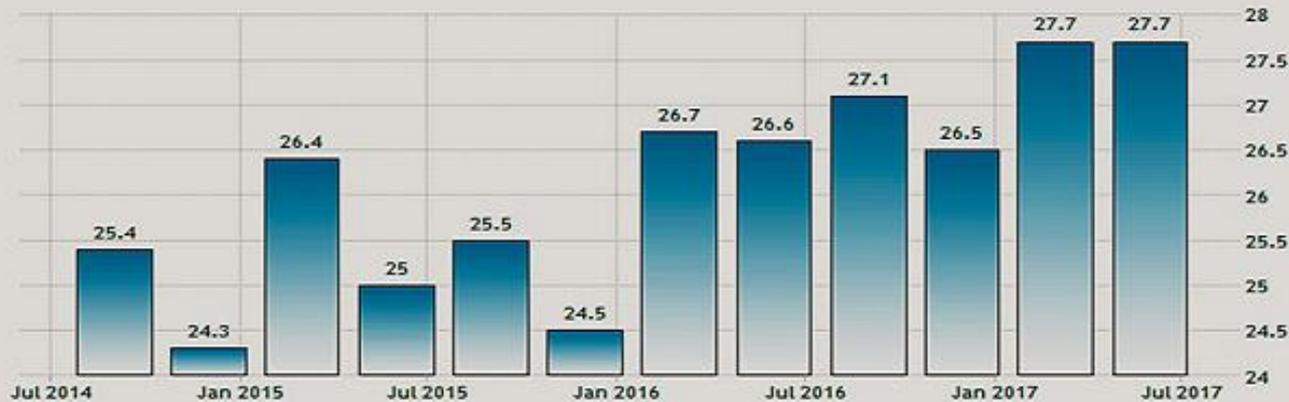
- Poverty reduces children's cognitive development
- Education systems in this 4IR age are obsolete, need to change
- How can/must education change? Deep creative thinking with action!

# Productive Human Labour: The path to economic growth

Economic Growth is fuelled by WORKERS – creating goods and services that generate wealth

## Employment: a major antidote to extremes of inequality and poverty

SOUTH AFRICA UNEMPLOYMENT RATE



SOURCE: TRADINGECONOMICS.COM | STATISTICS SOUTH AFRICA

## Unemployment will continue to rise as the 4IR unfolds:

- Education systems worldwide cannot keep pace with 4IR skills demands;
- Technology is the employment disrupter;
- Technology CAN be the employment creator;

**Youth unemployment in 2016: 52%. In 2030: ?????%**

## GDP Growth Africa (IMF 2017) (% pa)

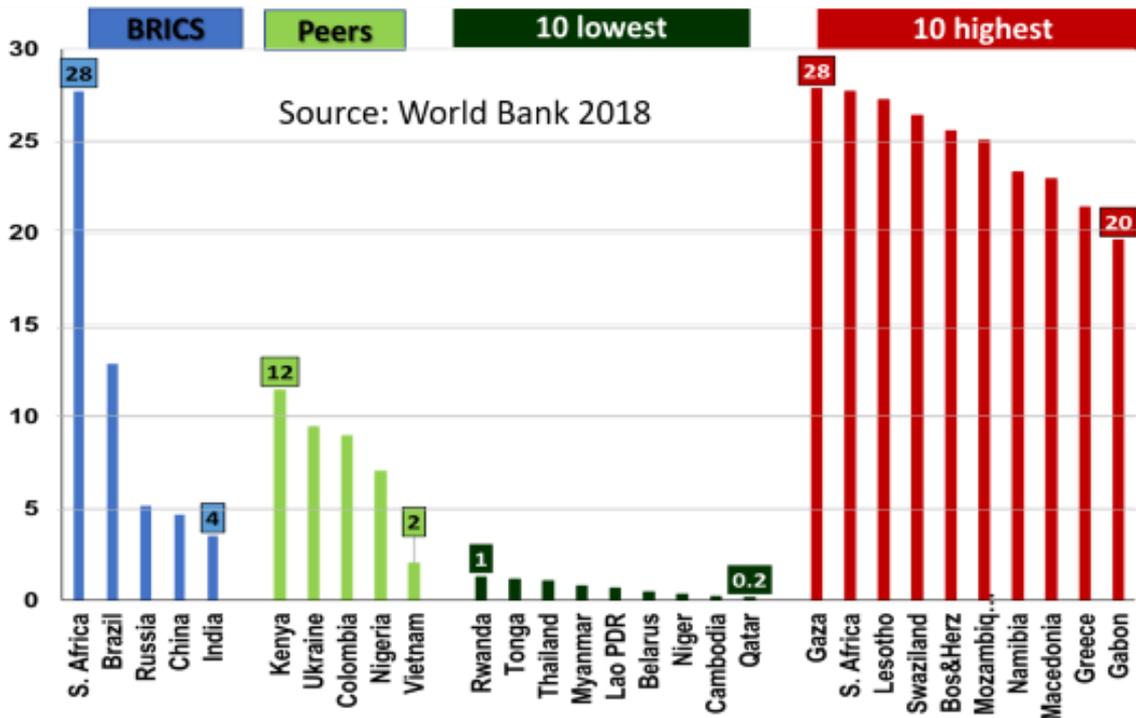
High		
	Ethiopia	8.5
	Cote d'Ivoire	7.6
	Senegal	6.8
Medium		
	Kenya	5.0
	Mozambique	4.7
	Botswana	4.5
Low		
	Nigeria	0.82
	South Africa	0.70
	Swaziland	0.25

- The 4IR WILL decimate traditional jobs, the nature of work will change greatly
- Different skill sets will be needed – how are they to be provided? By whom?
- Europe has spent the last 10 years studying this challenge – Creativity needed now!

# South Africa's unemployment benchmarked against the rest of the world

Additional data not included in the presentation of 29 June 2018

## Unemployment (% of total labour force)



South Africa ranked alongside The West Bank and Gaza, Lesotho and Swaziland as the nations with the highest levels of unemployment must be of concern to all South Africans and their businesses.

The unemployment rates suggest a massive gap in South Africa's education systems, and major threats to economic development in general, and socioeconomic stability in the 4IR era, S. Africa could automate up to 60% of medium/low skilled work.

# 4IR Skills: e-Skilling a Lifeline to Stability

Skills are critical for economic growth: Education is critical for skills development

- 78% of Grade 4 learners can't read in home language or any language ([PIRLS 2016](#))
- 45% learners drop out before Matric.
- Of the 55% that pass Matric, only 18% are able to enter university each year
- Of these 18% entering university, 50% to 60% drop out in first year ([Van Zyl, 2015](#))
- **We do have high achievers from private and public schools in wealthy suburbs**
- **These are too few - their successes over the failure of the majority effectively fuels inequality further (see 33-country study – the [Hechinger Report 2015](#))**
- **We MUST uplift the majority to “catch up” with these high achievers**

## **IMPACT OF THE 4IR**

*“Most education systems today are based on models put in place over a century ago. Fragmented attempts at reform and modernization have proven, in most cases, insufficient in addressing the growing gap between conventional education systems, the demands of modern life and new labour markets. Governments, businesses and individual learners must grasp the need for real, comprehensive change in order to close the preparedness gap as the world enters the Fourth Industrial Revolution” (Report [here](#)).*

# Success stories are numerous

Planet named after Mthatha-born Siyabulela Xuza – when he was 25-years old!



Please click  
image to view  
the video



The story of a  
young genius  
lucky to rise out  
of poverty and  
inequality traps

- We choose to tell the story of SIYA – South Africa-born NASA Rocket Scientists, through the words of one of the most significant **Black Women** today
- We could tell Siya's story through his own videos, or through media coverage, but this video, **(CLICK the image to access it)** – demonstrates the global recognition of his genius
- There are thousands of South African children like Siya – their opportunities are severely limited by poverty and inequality..... ***“it takes a whole village to bring up one child”***

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## CAREERS IN A CHANGING WORLD

### Summary of our 4IR Social Challenges: Compulsory viewing

#### Some Children are More Equal than Others: Education in South Africa



*“Although I see the tragic education stats on a daily basis, it really hits home when you see the pain and anguish of black parents who see and understand that education is the route out of poverty for their kids and are trying their hardest to get their children into “good” schools but failing at every turn.*

*Watch the documentary and ask yourself “What can I do to change this tragic, dangerous and deeply unfair situation?”: Nic Spaul, 18th February 2015. With 63% of South Africa's children living in poverty, and 30% living in households without a working adult in 2016, there is a clear need to mount a mammoth programme to complement the huge and therefore slow national schools development agenda”. ([Click the image to access the documentary video](#))*

# Consequences of doing nothing or too little

63% children living in poverty often leads to crime and drug abuse



Boksburg  
2015

[Click here for video](#)

0:46 / 1:31

Nyaope addicts talk about their painful experiences: "I need help; education; to make my parents proud": Ages 12 to 17 years



Delmas  
2015: BBC  
Documentary

[Click here for video](#)

Nomsa Mahlangu says her family no longer wants her because of her addiction. Crime for survival led to the massive scar on her face.



Income generation for too many parents



Will our "Trickle-down" economic models and education systems reverse this very dangerous situation?

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## CAREERS IN A CHANGING WORLD

4IR Commercial and Subsistence Farms, Rural Dwellers

# Information for changing farms and rural villages

Social inclusion in disconnected rural areas

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# AI & IoT in Agriculture

# FOOD – the lifeblood of nations



## Productivity

Crop Yield  
Maximization



## Preventative maintenance

Disrupting the  
mating patterns of  
pests



## Preservation

Drought response,  
minimize waste



## End-to-End lifecycle monitoring

Tracking product  
lifecycle in real-time



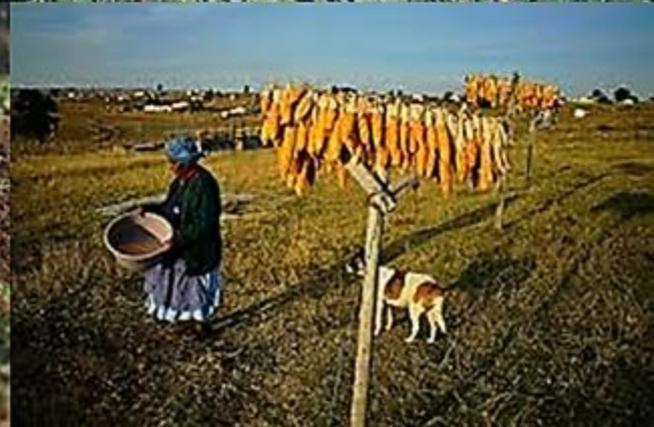
AGRICULTURE

**Happening NOW in South Africa**

**The future farm is alive and well in South Africa today.....**

- Vital to feed a growing population and economy – Massive efficiency gains....
- Vital to be globally competitive – Feed the nation, the region, and the world
- *Challenge is job decimation – machines don't strike for more money or vacations*

**How do we skill rural citizens for this scenario today?**



**The challenge is immense – BUT – we must not fail...**

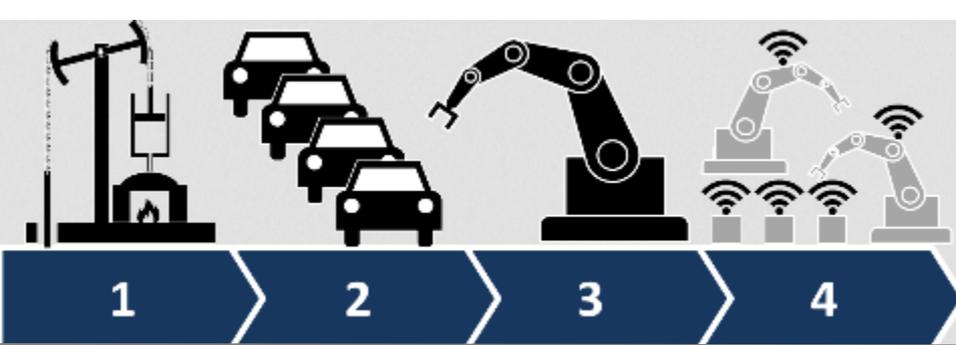
- The 4IR is both the threat and the solution: Vital actions:
- Connect villages to the 4IR information age – many ways to do it now!
- Use the 4IR to increase productivity & therefore human wellbeing



**The 4IR can change this lifestyle  
BUT – We must care, and DO IT!**

**The challenge is immense – BUT – we must not fail...**

- The 4IR is both the threat and the solution: Vital actions:
- Connect villages to the 4IR information age – many ways to do it now!
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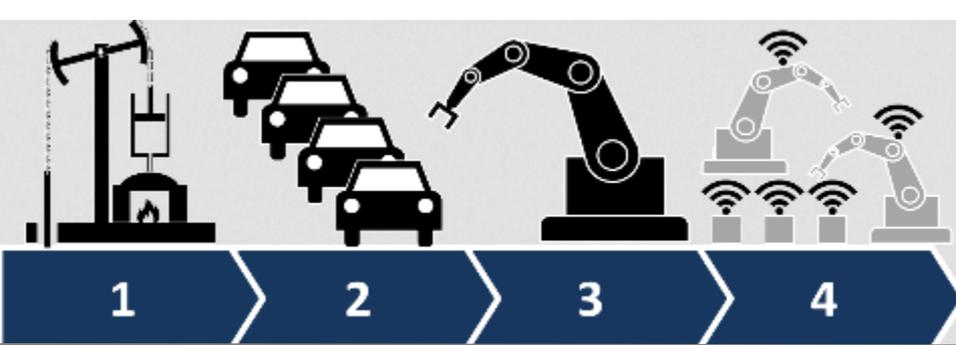


# ENGAGING The 4IR



## HOW ?

- **(1) Acknowledge Problem (2) Find Techno-solution (3) Just Do IT!**
- **First Challenge:** Deliver Information and Knowledge to those who need it
  - Focus on the PROBLEM: Ideology, Policy, Laws, will not fix it
  - No more excuses: Policy; Regulation; Competition; Money; Skills; Capacity; Spectrum; Training; Culture: **They are just tools - APPLY THEM NOW!**
- **Many nations have done it:** Emulate known successes
- **Second Challenge:** Deliver technological solutions from the Base of the Pyramid upwards – NO MORE TRICKLE DOWN PHILOSOPHIES – THEY HAVE FAILED!
- **Third Challenge:** SKILLS: On the job learning by the community members, most importantly as USERS, then as Service Providers – SMME Support
- **ENGAGE:** All Stakeholders – Capitalists, Socialists – Favour Carrots over Sticks
- **CELEBRATE:** Failure, the most important learning tool: SMME failure rate over 90%
- **PHILOSOPHY:** Adopt a “Just Do It” development philosophy, no more talk shops!



# ENGAGING The 4IR



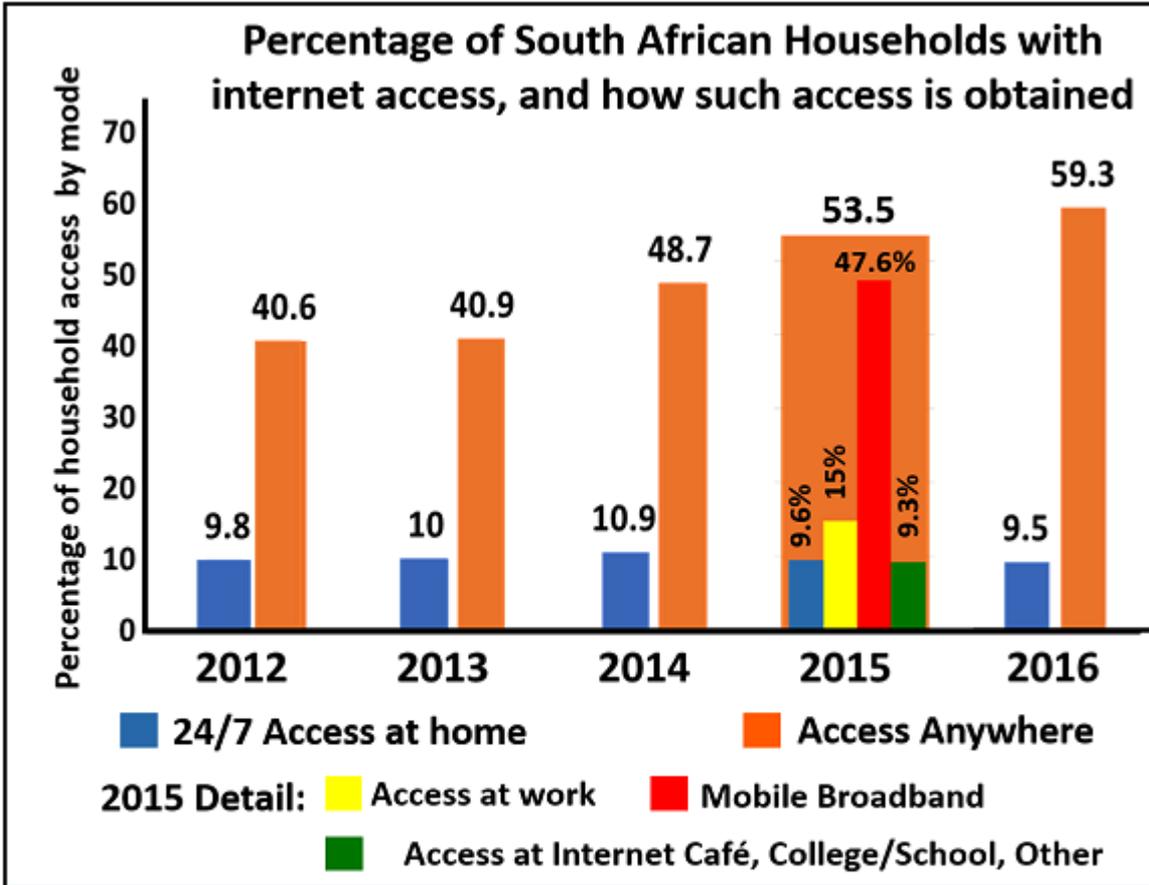
## TECHNOLOGY CHALLENGES ?

- **South Africa:** First Telephone - 1878: First International Submarine Cable – 1879: [First Communications Radio](#) – 1898 (to serve Anglo/Boer War): **We Should Know by now in 2018!**
- **Connectivity:** We can connect ANY South African Anywhere to the Information Society at a price they can AFFORD - **IF WE WANT TO!**
  - Vast broadband capacities on ESKOM grid – BUT WE REFUSE TO USE IT
  - DITTO on TRANSNET routes, BUT WE REFUSE TO USE IT
  - DITTO on SENTECH Masts, BUT WE REFUSE TO USE IT
  - Vast Radiofrequency Spectrum Capacities available: 14 years later, we still argue about who should get it!
- **There is NO CHILD anywhere in South Africa who cannot be connected to the INFORMATION & KNOWLEDGE SOCIETY today!**
- **ALL we need is the WILL to do it, and then “Just Do It!”**

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## CAREERS IN A CHANGING WORLD

Accessibility in South African homes: Children need 24/7 access for development & safety



**NOTES:** (1): 10% Household access inadequate for child/family development  
 (2): Mobile broadband unaffordable for 24/7 access  
 (3): Vast opportunity in mass community Internet Café expansion

1. 24/7 broadband internet access at home has remained stagnant since 2012
2. Fixed broadband (cable, fibre, wireless) is the most reliable and stable home access mode
3. Mobile services are convenient and popular, but are costly and subject to overload
4. **Both access AND terminal equipment costs are prohibitive for 55% of the population**
5. Wide screen terminals are best for learning – small screen handhelds are not
6. Very little development of public access for the poor – 9.3% in 2015
7. **What impact of online libraries available 24/7 @home?**

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## CAREERS IN A CHANGING WORLD

### THE WAY FORWARD

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- **The 4IR** is today's Book of Knowledge, updated instantly, delivered anywhere
- **The 4IR** "Book of Knowledge" can even learn, think, and respond to Children's Knowledge Needs – the SMART application of Artificial Intelligence
- **DHET** is the centre of South Africa's SKILLS DEVELOPMENT, – **e-SKILLS are VITAL**
  - DHET faces many challenges to meet its mandate
  - The Basic Education feeder is a major Faultline
  - The "e-Book of Knowledge" is not ubiquitous or geared to support DHET
  - Radical Transformation may be chaotic, Rapid Evolutionary Transformation vital!

**DHET is the Custodian of ALL skills development in South Africa. With this responsibility, DHET must mount a concerted effort to understand all the opportunities and risks of the 4IR, and to pull ALL stakeholders together to favour the opportunities over the risks. The 4IR can drive the Rapid Educational Systems Evolution needed. FAILURE MUST NOT BE AN OPTION.**

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Social inclusion in a changing world

# Thank you for your attention

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Yes we have!



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