# Inequality, Poverty, and Jobs: South Africa's relationship to the Fourth Industrial Revolution

### (Heading Update 31/01/2018): And their relationship to South Africa's Electronic Communications Amendment Bill 2017

## A Short Essay on their Interdependencies

*The world is in the midst of a technological revolution, a radical change of how the human species lives, works, and survives in this era of great change. The revolution itself is manmade: the application of human knowledge to create the technological tools that enable human survival, growth, or self-destruction. The choice between the three possible scenarios remains a stark human choice, one that impacts every nation irrespective of its economic and political strengths, geographic location, linguistic preferences, wealth, or any other feature that distinguishes one nation from another. This "Fourth Industrial Revolution" (FIR or 4IR, the latter acronym will be used in this essay) is today's global reality, the only choice left to the world's political, economic, and social leadership is how to engage with it. South Africa's National Integrated ICT Policy White Paper (the White Paper) process is a potentially useful tool to shape the nation's engagement with the 4IR – using national policy to favour its developmental capabilities instead of the stagnation and decay that its absence or misuse can bring.*

*This essay reviews the relationships between technology as represented by the 4IR, and the three factors recognised by most South Africans as being the major threats to the country's economic growth and social stability: the triple threats of Inequality, Poverty and Joblessness. How can we use the 4IR to neutralize these threats before they become major barriers to South Africa's growth and development? The White Paper now in its final stages of refinement and adoption as the national ICT policy, presents a potent tool for the control and management of the triple threats.*

**What is the 4IR?** The Fourth Industrial Revolution is a relatively simple concept with complex application of Science, Technology, Engineering and Mathematical (STEM) knowledge at its core. In its simplicity, it is nothing more than extensions of: (1) the First Industrial Revolution (1IR) comprising the introduction of mechanization to steer productivity increases that catered for an increasing human population; (2) the Second Industrial Revolution (2IR) comprising new mass production techniques, new ways of organizing and using labour, and the advent of electrical power; (3) the Third Industrial Revolution (3IR) comprising the growth of electronics and automated production techniques through information systems. This 4IR is merely an evolution of its predecessors, adding intelligence to the 3IR machines, the advent of Artificial Intelligence (AI) built into machines that can think and do most things that were the sole prerogatives of the human species in the past. In actual fact, we could even extend the evolutionary path of this 4IR way back into the original evolution of our species as a cognitive animal – the invention of tools by our very distant common African ancestors that enabled their survival and expansion in an era of hostile environmental challenges. The core capabilities that define the 4IR may be predominantly in the hands of the technologically advanced economies, but its humble evolutionary roots extend its ownership and impact to humanity as a whole, and Africa in particular.

**Threat 1: Inequality:** Throughout the history of the human species, philosophers and social scientists have wrestled with the reality of inequality amongst humans. Today, this concern has extended to politicians, economist and all other national leaders. The rest of the population either enjoys the fruits of privilege that inequality brings, or plots the demise of the privileged few in the hope that a more egalitarian society will emerge out of the ashes of inequality. Engineers and the architects of the 4IR have also joined the fray in the inequality

debate; the "Digital Divide" is recognised as a major component of socioeconomic inequality. South Africa is especially vulnerable to the full range of inequalities, the country is considered to be the home of the most unequal society on earth by many South African and international analysts. South Africa's political leaders are very much aware of this, but find the solutions to be particularly evasive. The racial characteristic of South Africa's inequality is arguably its most provocative feature, which may in time derail all the socioeconomic and political remodelling of the country that held so much promise for sustainable growth and socio-political stability. The chart below provides a "snapshot" of the levels of income inequality in South Africa, a phenomenon that the 4IR can, if positioned appropriately by South Africa's White Paper, help to reduce.

South Africa's White Paper recognises this challenge, and the urgency to use ICTs to help reduce it, by linking the policy directly to the nation's long term development strategy, the National Development Plan (NDP):

> *"By 2030, we seek to eliminate poverty and reduce inequality. We seek a country where all citizens have the capabilities to grasp the ever-broadening opportunities available. Our plan is to change the life chances of millions of our people…"* (NDP 2030)
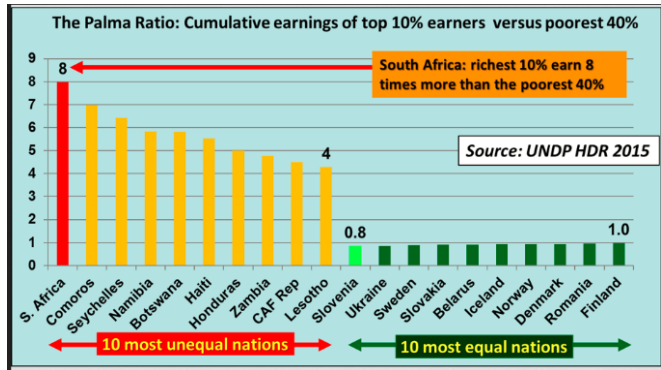


The challenge for South Africa is how to interpret and translate this long term national vision and principle into direct action by all stakeholders active in the implementation of the 4IR. Currently, the focus of nearly all the White Paper objectives and targets tend to be on the technical components of the 4IR, ICT development and usage indicators. The links to the triple national threats are somewhat tenuous; this must change. The foundation principles of ICTs as tools to spread the information and knowledge needed for human development must be reinforced. South Africa's triple threats must become the primary focus of the national policy, the technology must be the means to that end, not the end itself.
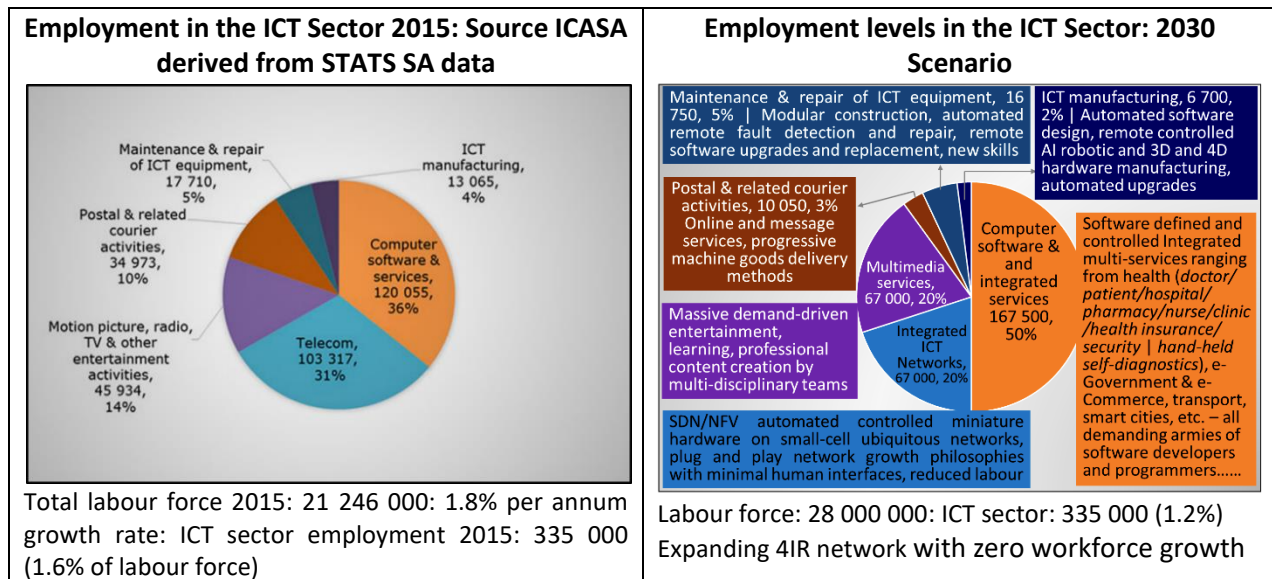
**Threat 2: Poverty:** Intricately linked to South Africa's high levels of inequality are the intractably high levels of poverty that defy most efforts to reduce them. The most threatening feature of South Africa's high poverty levels are their impact on children. South Africa's "Child Gauge" for 2016 states that 63% of South Africa's children live in poverty, and 30% of them in households with no working adult ([Report here](#)). Thus 63% of South Africa's children are deprived of nearly all opportunities for development. The future of South Africa, which lies in the hands of its children, is clearly undermined by these alarming statistics. Without direct and urgent intervention, South Africa clearly will be unable to participate effectively in the 4IR, and will therefore most likely suffer the consequences of failure to do so. History has shown that extreme inequalities are capable of reversing the best thought out plans and strategies for national development, and even the well-intentioned democratic gains that result from these plans and strategies. South Africa's current response to extreme inequalities and poverty tend towards public dissent in the forms of violent service delivery protests, movements like #FeesMustFall, and occasional xenophobic outbreaks. The White paper, like the 4IR itself, is not a panacea for the triple threats, but it is a potent tool that can reduce the threats over time, and contribute towards the nation's Sustainable Development Goals (SDG) that dominate today's development discourse. South Africa must seize the opportunity to steer the 4IR towards resolving extreme poverty and the related socioeconomic inequalities, as visualized in the nation's National Development Plan 2030.

**Threat 3: Jobs, Joblessness, Unemployment**: The relationship between jobs, work and ICT, particularly in this 4IR unfolding era in which machines easily replace labour, is complex, emotive, excessively hyped, and in general grossly misunderstood. The subject dominates many global think-tanks such as the World Economic Forums (WEF) convened by the world's public and private sector leaders. The core themes of the 2016 and 2017 WEFs were the potential of the 4IR to decimate labour and change the nature of work, and its potential to create new forms of human existence that leverage the 4IR to improve human wellbeing in a sustainable way. As technology replaces

labour, what social orders and related national development policies will protect the rights, privileges and well-being of the newly unemployed, underemployed, unemployable, or differently employed masses? How will the small minority of highly skilled individuals who build and maintain the 4IR be replicated, rewarded and expanded? What skills will be needed to manage the vast new 4IR security systems needed protect the whole world of nations and their citizens from criminal abuse of the 4IR? Will the 4IR fuel global and national inequality, or will it offer ways of building an egalitarian world order? The answers to these questions rest entirely in the hands of the world's policy makers, and specifically in South Africa's case, the White Paper.

South Africa will be hosting the World Economic Forum for Africa 2017 from 3 – 5 May 2017. Can South Africa's Department of Telecommunications and Postal Services (DTPS) use this occasion to extend the debates on the impact of the 4IR which began in the global forums, to get the whole world of nations to help South Africa to find ways of fine-tuning its White Paper so that it addresses the nation's triple threats directly? South Africa must join the technologically advanced nations who will use the 4IR to advance human wellbeing, while at the same time mitigating the negative aspects of mass labour replacement that is inherent in the 4IR.

**How will South Africa's world of work change as the 4IR unfolds?** The following illustration provides an optimistic-leaning scenario of the situation in 2030.



**Employment in the ICT Sector 2015: Source ICASA derived from STATS SA data**

Total labour force 2015: 21 246 000: 1.8% per annum growth rate: ICT sector employment 2015: 335 000 (1.6% of labour force)

**Employment levels in the ICT Sector: 2030 Scenario**

Labour force: 28 000 000: ICT sector: 335 000 (1.2%)
Expanding 4IR network with zero workforce growth

The speculative scenario for year 2030 illustrates one outcome of the 4IR: zero direct ICT workforce growth with the expanding ICT network, its coverage and modernization. Massive skills reorientation will be needed as the traditional skills sets used by the economy undergo deep and fundamental changes. The age-old trusted education systems will not cope with the new skills demands, new models will be needed. These new skills will require advanced Science, Technology, Engineering and Mathematics (STEM) foundation competencies. South Africa's comparative achievements in the STEM disciplines suggests that exceptional efforts will be needed to develop the required 4IR workforce, given the country's well-publicised indignity of being ranked amongst the lowest achievers in global mathematics and science, the building blocks of the 4IR (see DST discussion here).

**How can South Africa's White Paper process address the challenges of inequality, poverty and jobs?** In its current form, South Africa's White Paper correctly focusses on connectivity, the first and most obvious gap that defines the nation's Digital Divide and its relationship with the 4IR. But, successful delivery against the set connectivity objectives will most likely give rise to new highly disruptive challenges. Jobs and Skills will be at the centre of these new disruptive outcomes of South Africa's 4IR. Direct ICT jobs will decrease in quantity and focus;

different skill sets will be required for both the ICT industry and the broader ICT user economy. Most importantly, everyone who lives and works in South Africa will require digital literacy as a foundation for a productive future. The primary focus must be on South Africa's children, the 63% of the nation's children that are currently deprived of most opportunities for development, or jobs. In their not-too-distant adult lives, they will become either the victims or the winners of the decisions made today. These factors/possibilities must be escalated in the current and ongoing debate about the implementation of the White Paper.

**How to "Steer" the White Paper process towards the reducing the triple national threats?** The debates over the final draft of the White Paper, and subsequent implementation of its prescripts, have generated much heated argument over the most effective ways of applying the policy to meet the national objectives of access to ICT for all. At the centre of these debates is how the radio frequency spectrum will be allocated and assigned to the key ICT industry players tasked with providing the national services to all, and steering the national path towards South Africa's full participation in the 4IR.

The debates so far illustrate an invaluable and strongly shared will by all seemingly adversarial parties to meet the socioeconomic development needs of the country, but the devil remains in the detail, how best to achieve this shared vision. The arguments seem to have drifted into the realms of near unresolvable ideological splits: a strongly socialistic approach by government to resolve the social challenges of inequality, poverty, and jobs; and a strong free market ideological approach by the ICT industry; the belief that the "trickle-down" model of growth, in which those that have much will drive growth of those that have too little, is the only way forward. This is further complicated by the desire to protect the huge investments the ICT industry must make. Can these conflicting positions be balanced through decisions made at this White Paper policy level?

The recent "**Ministerial Engagement Regarding the Implementation of the White Paper**" (17th February 2017) made significant progress in narrowing the ideological gap between Government and the ICT Industry, but the question remains: Will this narrowing of the ideological gap in the race to find the "right answers" be enough to resolve the nation's triple threats before they get out of hand and threaten even the progress made to date to address them? Will the final outcome of the White Paper process as currently structured result in "correct answers" to perhaps the wrong questions? The direct links between the solutions proposed so far, the significant published opinions favouring one side or the other, and the triple challenges of inequality, poverty and jobs seem to be tenuous at best. The consensual solutions likely to emerge from the current round of consultations will not be "wrong", but if they are to have a direct short-term impact on South Africa's triple challenges, the questions and responses could be extended. The following suggestions will not change the thrust of the significant progress made in crafting the White Paper to date:

**Extension of the fundamental question: Connectivity:** How can the final National Integrated ICT Policy continue to foster rapid growth of the ICT industry and its national/local infrastructures within the framework of South Africa's current free market economic model, while at the same time addressing the dangerous societal challenges of inequality, poverty and job creation? Possible responses to this question, which need far broader consideration and consultation, are:

1. The Open Access Network philosophy which is central to the White Paper has been accepted in principle by nearly all stakeholders, however its extension into the mobile networks, dependent as they are on the limited natural resources of the radio frequency spectrum, has been problematic. Variants to the original thinking of a single national wireless open access network (WOAN) has generated much dissent, mainly the strong reservations concerning the reintroduction of monopolies, irrespective of whether or not they are state owned or privately owned. Compromise solutions are emerging, and may to some degree address this concern.

2. The WOAN envisaged in the White Paper targets the whole national ICT ecosystem. Given the huge disparities that exist in South Africa today, a vibrant free market economy existing alongside a massive underserved, and

perhaps unserviceable (under the free market economic model) population group, is it possible to rethink the "one policy fits all" philosophy? Is there room for strongly supporting the free market model of ICT growth through the compromises now on the table, while at the same time making special policy provisions for the underserved and unserviceable masses?

3. The idea that the invaluable radio frequency spectrum can be split between the free market growth model and the socialistic growth model that caters for the underserved and unserviceable is not new. In March 2011, ICASA launched a public consultation on the use of the Digital Dividend spectrum. In the South African Communications Forum's submission, a strong plea was made to divide this "Digital Dividend bonanza" to cater for the two prevailing South African needs, a market-driven allocation of spectrum using any allocation systems including spectrum auctions, and a "social" spectrum allocation to address the growing inequalities and poverty traps. This was well received by ICASA, and provides an example of how the WOAN approach can be split to meet the needs of South Africa as a whole. The submission to ICASA must still be available in the ICASA document archives, and can be made available to those who request it.

4. Can the White Paper finalization be extended to meet the twin needs of South Africa's divided economy as suggested above? Is it feasible to reserve a suitable spectrum allocation to address the triple challenges facing South Africa? This is possible. The lower (UHF) frequency bands of the Digital Dividend, namely the IMT 450, IMT 700, and IMT 800 spectrum bands lend themselves to low cost connectivity for both rural and urban areas, and especially to economically marginalised communities. Single hop high capacity broadband links using these frequencies have been extended to beyond 250 km, have created an invaluable ecosystem of low cost off-the-shelf equipment, and are progressively using new technological innovations to double their current broadband capacities. The specific details must be examined during the implementation planning stages resulting from the White Paper.

Can this possibility be part of the White Paper outcomes to address the costly rural communications and related Universal Services obligations that aim at connecting the currently unconnectable? A reservation of say the whole of the 450 and 700 MHz spectrum bands for the delivery of social services to poor communities is feasible as a specific outcome of the White paper. Moreover, South Africa has a significant "army" of competent small businesses that are already using a variant of the model visualized to run viable small businesses in the ICT sector. There are more than 200 small businesses providing similar services within the Wireless Access Providers Association (WAPA), even with the regulatory restrictions that govern their operations. Can this model be used to extend their services as WOANs using strategic spectrum assignments through the White Paper? The competencies already available in the WAPA community can with ease be extended to new BBBEE entrants.

There are even more variants to the proposed model of spectrum reservations for South Africa's social challenges: the buildout of fixed fibre-based backhaul networks to reduce the national dependency on spectrum for high capacity broadband coverage and backhaul. The value of fixed optical fibre everywhere is well known and understood by all ICT stakeholders, but the high construction costs involved are discouraging, depending as they do on labour intensive civil works. The high costs of civil works need not be an insurmountable barrier - many developed and developing nations have found ways to overcome the seemingly insurmountable administrative barriers of infrastructure sharing with other utilities to provide broadband connectivity. For example, the national energy grid extends to nearly all areas and communities in South Africa, and thus presents an invaluable low-cost opportunity for joint use of the physical infrastructure – broadband fibre cables sharing the electricity distribution network. Introducing a single state-owned monopoly to utilize this capacity has been attempted, the Broadband Infraco (BBI) model remains in existence but, has not worked as planned.

This infrastructure sharing model is prevalent in many fully developed and developing economies, including the United States of America (e.g. Google's GB fibre networks which began in Kansas City is a very recent example). It is well-known and understood in South Africa, but the national will to implement it effectively through policy and

other provisions has been lacking or has failed. The Broadband Infraco experiment is an example of this failure, but is the BBI failure due to structural inadequacies, or is it a failure of the fundamental concept of infrastructure sharing? Experience in other economies suggest that structural shortcomings lie at the heart of BBI's ineffectiveness. Can this vital under-utilized resource be revisited as part of steering South Africa's White Paper towards the nations triple threats? Getting this right, difficult as it may be, will save vast sums of development and investment costs directly, and indirectly by releasing huge radio frequency spectrum capacities for other developmental uses.

There are of course pitfalls and dangers even to this model of policy intervention: the pro-poor WOAN intervention must not be monopolized, either as a state-owned monopoly or a private sector monopoly. The 2004 failed and now abandoned Under-Serviced Area License (USAL) experiment may have some value in avoiding monopolization, by using the new Integrated National ICT Policy to avoid the pitfalls that caused its failure. Numerous new entrant SME ICT competing as network operators using spectrum reservations as suggested in paragraph 4 in the preceding section can thrive, and take the first steps towards 4IR competency, without the inefficiencies associated with any monopoly.

The brief discussion of the WAPA community in preceding paragraphs is proof that the model can work – the WAPA operators can to some degree be likened to USALs, but driven by private sector individual entrepreneurship and innovation instead of policy. The natural "free market" learning curve as used by the highly effective WAPA community will in time weed out the less capable operators (which a monopoly cannot easily do) in this new supply side market segment. Such an initiative can also lead to some consolidation without diminishing the primary objectives of promoting new entrants. Significant job creation as providers of ICT services, and as users of those services, exists today and can be extended. The known high failure rates of new entrepreneurial entrants can be minimised by the protection provided by the new policy against destructive competition by the national ICT giants – the so-called Significant Market Power (SMP) operators. Supporting business models for new BBBEE entrants, drawing from the knowledge and experience of the WAPA community, can easily be developed as a consequence of the policy intervention and its associated regulatory provisions.

**Affordability:** The key challenge to any application of technology in South Africa's ICT industry is the huge hurdle of affordability. Cost-effective connectivity can be provided to poor and marginalized communities through this policy instrument, but the affordability factor must still be considered as part of the policy intervention. Given the extent of inequality and poverty in the country, the "trickle-down" philosophy of 4IR buildout currently favoured is unlikely to be effective. This affordability conundrum is addressed below.

**Extension of the fundamental question: Poverty:** How can the final National Integrated ICT Policy directly address the needs of the South African population who, due to circumstances beyond their choice or control, cannot afford to access and use the developmental opportunities of the 4IR in ways that will help them to "catch up" with their economically better-endowed compatriots?

1. The cost to communicate challenges have been of great concern to ALL South Africans across the political, social and economic spectrum. Over the last decade, numerous high-level conferences, symposia, workshops, roadshows, and talk shops have been convened by virtually all stakeholders, with little visible results.

2. The reality is that even if the White Paper process reaches finalization to the satisfaction of most leading stakeholders, the challenge of mass affordability will remain. A recent analysis of the cost to communicate concluded that 30 million South Africans living below the national poverty line today, as identified by STATS SA, were obliged to pay 27% or more of their disposable incomes, compared to 2.5% paid by their wealthier compatriots for the same levels of service. Clearly a free market economic development model cannot address this stark reality, poverty cannot be easily monetized. The White Paper must address this conundrum. (*Update 31/01/2018: New STATS SA rebasing of poverty lines leads to the conclusion that the*

*target price for all ICT goods and services must be in the order of ZAR 39 rand per month to meet the needs of the 30 million South Africans living below the upper bound poverty line. Can this target be met within the current ICT Policy proposal?*)

3. As currently crafted, the White Paper is geared towards the traditional philosophies of individual access to ICTs. But, is it the only model available? Public access through Telecentre and similar Multipurpose Community Centres have been tried, and failed. The reasons for these failures are well known and documented. There are, however, numerous alternative models that have worked, the PC Bangs of South Korea that are said to have helped lift the country out of the 1997 Asian Financial Crisis; China's 146 000 legal internet cafes (and more than double illegal ones) that triggered China's ICT literacy revolution, and now serve 20 million daily users; the 100 000 plus LAN Houses in Brazil's favelas that catapulted over 87% of Brazil's poor into the information age (see 2016 article here), and more. These ICT access facilities begin with entertainment and play that targets children and youth, and progress to serious participation in the 4IR world through powerful early childhood technological assimilation and digital literacy acquisition. They have been phenomenally successful in job creation and rapid growth of ICT literacy. These models must be closely examined for South Africa, and supported by the new ICT policy. South Africa's Internet Cafés are generally unaffordable by the poor, at Rand 60.00 per hour. Evidence suggests that R 3.00 per hour is feasible for marginalized users.

**Extension of the fundamental question: Jobs:** If the suggestions in the preceding paragraphs on connectivity and poverty are adopted, significant new job opportunities consistent with the 4IR world can be created: ICT service providers in the special pro-poor allocation of spectrum; thousands of SMME businesses providing affordable public connectivity to communities and individuals through public internet cafés and similar; multitudes of new mainly young entrepreneurs accessing e-Commerce platforms from internet cafés to run SMME businesses (see New York Times article about a China case here); Internet café owners extending their businesses to operations and maintenance support in their communities; platforms for the launch of artistic talent by budding artists in the communities, using low cost video and sound recording systems and internet streaming from the Internet Cafés; and much more. The possibilities are endless, but none are possible unless serious attention is given to their creation, and ICT policy provisions for their support.

One major potentially valuable outcome of the White Paper process is the ongoing discussion on the revisions of the current Universal Service and Access Fund (USAF). This fund, through provisions in this White Paper, can be channelled to ensure success of the proposed path to the reduction of inequality, poverty and joblessness through ICT and the 4IR. The debates over whether or not to increase industries' contribution to this USAF from its current value, are meaningless unless and until clear strategies of how it can/must be used productively are developed.

**Conclusion: How are other nations and regions dealing with the 4IR challenges?** The European Union's leaders recognised the new global challenges imposed by the unstoppable 4IR phenomena as early as 2004, long before the 4IR concept, its title or its acronyms were coined. Numerous studies were commissioned leading to equally numerous and very lengthy reports – which were read and understood by the region's economic/political leaders. These led to a massive regional conference to debate the issues, held in Riga, Latvia in 2015. The results of this conference led to the Riga Declaration on e-Skills for Jobs, supported and signed by nearly all EU Heads of State, and an extension of the consultation process into the whole of 2016. The EU region took the matter of the 4IR very seriously:

*Governments, industry, NGOs, academia and other key stakeholders across Europe have joined forces in the context of e-Skills for Jobs campaign to push for further action to stimulate the creation of the digital jobs needed to build a strong digital single market in Europe. Thousands of job openings remain unfilled in Europe, while Europe's youth suffers from the unprecedented high rates of unemployment. Equipping Europe's workforce and citizens with e-Skills is fundamental for success of the Digital Single Market. Together they have drawn up the **Riga Declaration** which will guide efforts to unlock the potential of e-Skills to fuel growth and job creation.*

The challenges faced by South Africa are far bigger than those faced by the technologically advanced European Union, but the European Union has nevertheless taken serious action at the highest levels of government. Can South Africa follow this recognition first, and then use the best instrument available at present, the White Paper process, to begin to steer South Africa into the future 4IR and solve the nation's endemic social challenges at the same time?

An opportunity like that available now through the White Paper, which transcends all political and economic ideological divisions that afflict the nation, is unlikely to occur again if the current opportunities are not used. The risks of doing nothing, or too little, are very high.


Walter Brown. Johannesburg February 2017.


**Note: 31 January 2018 Update of key issues and data follows in the annex below.**

# Annex 1: 31 January 2018 Update of key issues and data

<u>SUMMARY OF MY CONCERNS OVER THE SOUTH AFRICAN SYSTEM OF EDUCATION</u>

1.  78% of South Africa's children can't read, nor can they understand what they can read, in any language ([PIRLS 2016](#));

2.  45% of school children drop out, or get forced out to inflate pass rates, before Matric. Only 18% of the remaining 55% of South Africa's matriculants are able to enter university in any year, and between 50% and 60% of these drop out in the first year ([Van Zyl, 2015](#));

3.  The few highly celebrated and very welcome Matric successes can/have become a pyrrhic victory – their successes, in the midst of massive failures, effectively fuel inequality (see 33-country study – the [Hechinger Report 2015](#));

4.  Several countries have demonstrated that national education systems can be changed for the better – Finland devoted more than 40 years to earn the highest global educational outcomes ranking in the world. Estonia, which started with high levels of inequality and a multi-cultural and multi-lingual nation after the Soviet breakup, is catching up fast – through the simple expediency of enforcing absolute equality in education;

5.  South Africa faces numerous hurdles in improving its quality of education for the poor. The video documentary "[Some children are more equal than others](#)", created through the Legal Resources Centre in Grahamstown, captures the depth of the educational crisis South Africa faces.

How long will it take to fix our educational systems given that we have the highest levels of inequality in the world, and a cultural diversity with 11 official languages, that even today is leading to violent confrontation (see [Hoërskool Overvaal in Vereeniging](#)) as the only way of addressing the educational inequalities that result ?

6.  What do we know about the evolving "Fourth Industrial Revolution" (4IR) world that relates to these "challenges"?

    a.  *"Powered by learning algorithms, these autonomous systems promise to speed up a host of routine tasks that used to rely on human knowledge, reasoning, perception and manual dexterity. They can learn from experience and <u>don't need holidays or a living wage. They are also unlikely to organise themselves into unions</u>"* (IET story [here](#)).

    b.  *"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](#)).

    c.  Is South Africa getting ready for the 4IR? With 75% of the nation's labour force in the semi-skilled or low-skilled classifications ([STATS SA](#)), and the anticipated impact of the 4IR on the world of work (estimated 50% of low-skilled work will be automated in the USA), what impact on unemployment can South Africa expect from the irreversible 4IR?

7.  **A pragmatic solution for South Africa:** There are no quick fixes or short-term solutions for South Africa's deep systemic educational challenges. It is imperative therefore, that South Africa reinforces its ongoing efforts to resolve the crisis, and urgently add to these a concerted effort to drive early childhood technological appropriation amongst the vast population of the nation's poor children, so that they can acquire some 4IR

readiness without total dependence on the nation's formal education system. There are numerous tried and tested ways of doing this at relatively low cost, some of which are outlined in http://www.sakan.org.za/ .

The last two WEF meetings in Davos, Switzerland, covered these issues and threats extensively. The WEF 2018, with the theme "Creating a future in a fractured world", will continue this trend. South Africa should pay attention.

**Relevant discussions at WEF 2018:**

Talking about the triple threats of inequality, poverty and unemployment, the head of South Africa's delegation, ANC President Cyril Ramaphosa, expressed deep concern over these threats in his speech opening the Brand SA dinner in Davos on Wednesday 24th January 2018. Mr Ramaphosa said the following (see article here):

*"If we are going to grow this economy and address the triple challenge we face, (which is unemployment, poverty, and inequality) we've got to look at what impedes growth. All those things that are continuously impeding growth in our country: we've got to address them and we've got to address them honestly"*

These sentiments were also expressed in the "Press Conference: A New Direction for South Africa", featuring the ANC President Cyril Ramaphosa, Ministers Rob Davies, Jeff Radebe, Ebrahim Patel, and Malusi Gigaba. Some very interesting insights related to the above can be drawn from this press conference.

Other discussions of particular relevance to South Africa's triple threats were:

a. 23/01/2018: Can We Live with Monopolies? This discussion group focussed specifically on the impact of monopolies on inequality, poverty and unemployment, noting the emerging "Digital Feudalism" that concentrates enormous power exerted by a few global ICT companies on the products that we buy and consume, and way we think and respond and interpret information and news. Such interpretation goes far beyond the confines of materialism, into our human behavioural patterns heavily influenced by the more negative features of social media, misleading vast populations in dangerous ways, especially the more vulnerable children and youth. One key quotation from this discussion group, which is relevant to South Africa's current situation and this ICT policy discussion, is John Sherman's support of the USA Anti-Trust Act of 1890: "*If we will not endure a king as a political power, we should not endure a king over the production, transportation and sale of any of the necessaries of life*". This relates directly to the consideration of a single monopoly operator, irrespective of its private of public ownership, to deliver the proposed WOAN.

b. 26/01/2018: The State of Start-Ups. This highly informative panel discussion focused on entrepreneurs and SMME start-ups as a direct counter to private or public monopolization in this 4IR world. The key conclusions were that in order to instill the capacity of critical thinking amongst economically marginalized youth, it is vital to start the process at a very early age, from ages 7 to 9 years. By age 13, children will have developed rigidity in their thinking capacities, and will be deprived of the critical thinking capacities being demanded by the 4IR. This can be done with relative ease in South Africa, and must be a primary focus of the unfolding national ICT Policy.

End of Annex 1 Update: 31 January 2018.