

Employing ICT to Leapfrog the South African Economy into the Fourth Wave¹



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Apartheid privileged certain racial groups at the expense of other members of South Africa's population. Today, nearly two decades into our democratic dispensation, poverty cuts across colour differences. While apartheid policy was once politically and economically detrimental to the oppressed, all races are now affected by deteriorating economic conditions.

Although this country witnessed a political miracle in 1994 when a new democratic dispensation was ushered in, tangible economic development did not automatically follow political change. In fact, since 1994, the opposite has occurred and South Africa has de-industrialised rapidly. Despite the African National Congress's (ANC) good intentions, little political will was demonstrated by its government to address important economic issues. Consequently unemployment has been growing steadily and at present about 25% of South Africa's population depends on social grants. Instead of dealing with the triple challenge of poverty, unemployment, and inequality, the government has abdicated its economic responsibilities, thrown money to alleviate the worst effects of spreading poverty and ignored growing inequality in our post-apartheid society.

Poor economic conditions are not unique or permanent. Germany, for example, during the course of the war, suffered huge losses in terms of lives and manufacturing plants. Heavy bombing caused severe damage to cities and infrastructure. The dire situation was exacerbated when Germany was divided into two. This split, noticeably marked by the Berlin Wall, existed from 1945 to 1989 and cast a bleak pall over the country. Since reunification though, Germany's infrastructure, reconstruction, and economic development has been growing rapidly and is generally referred to as the German Economic Miracle. From the ashes of two world wars, Germany has emerged as the economic leader of the European Union and a beacon of hope to the continent's debt woes.

If you look east at South Korea and Vietnam, these two Asian countries were once subjugated by foreign powers, military autocracy and wars. Their economies were backward and mainly relied on agriculture. But a combination of both political and economic reforms led to massive economic development. The much-celebrated Asian economic growth points to a significant connection between ICT and education. Well crafted and implemented ICT and education policies played a critical role in expanding the extraordinary rate of Asian economic development.

South Africa can also have its own economic miracle. In his famous book, *The Third Wave*, Alvin Toffler (1980) agitates for a post-industrial society that has moved away from the Second Wave into what he called a Third Wave Society. Waves are major

economic milestones that are sometimes referred to as economic revolutions. The world has so far experienced three major waves, namely, mining and agriculture, the Industrial Revolution and knowledge-based production.

A few authors have postulated that there will be a Fourth Wave, which would mainly be characterised by a post-capitalist society. Alvin Toffler's historic wave theory does not cater for the Fourth Wave. Contemporary authors such as Mihaly Csikszentmihalyi, Jeremy Rifkin, Robert Heibroner, Bob Debold and Peter Drucker refer to the Fourth Wave as the *post-market era, post-capitalist society and new world order*. I do not subscribe to the views of the aforementioned writers. I think materialism and capitalism will be around for centuries. My view is that the Fourth Wave is an era where ICT, especially broadband, will play a major role in the economic and development landscapes. In my view, the Fourth Wave will be a society in which almost all aspects of our lives are driven by ICT and this force will become the main driver of economic development.

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First Wave: Mining and Agriculture

The First Wave was preceded by the Stone Age and took place about 10 000 years ago when people turned to agriculture for survival and stayed together in villages for the first time. This period encompasses the first widespread use of technology in human evolution.

Pastoral people turned to crop cultivation for survival and agriculture led to stability. Villages, language, culture, innovation, and leadership were consequently established. It was during this time that some animals were domesticated and mining started (smelting of iron copper ore to produce metal).

This was the first major wave in human evolution. It is painful to note that whilst developed countries have moved away from the First Wave, South Africa is still, to some extent, entrenched in this wave. The economy of South Africa still relies heavily on the primary forms of production such as agriculture, forestry and fishing. At present, agricultural production is declining steadily and the country is often an importer of food.

South Africa has been the biggest gold producer for nearly a century, but production has recently fallen, and South Africa is now the third largest gold producer, after China and Australia.

Second Wave: Industrial Revolution

The Second Wave of economic-social evolution happened in the late 18th and early 19th centuries, and is commonly referred to as the Industrial Revolution. The Industrial Revolution marked a significant turning point in society because of the major changes in the manner in which agriculture, production and transportation began to be conducted. A manual labour-based economy gradually shifted to machine-based manufacturing. Trade was expanded with the introduction and improvement of canals, roads, and railways. Steam-powered ships were introduced and in the 19th century the internal combustion engine was invented and electrical power was harnessed. This period saw a fundamental shift in the developed world from a reliance on raw agricultural, mining, and forestry products to manufactured goods. Unfortunately, South Africa has not completely moved into the Industrial Revolution phase, but appears to be stuck in a declining First Wave-based economy.

Prior to the Second World War, South Africa developed some elementary manufacturing. The country was unable to import manufactured products from European countries due to the war and, consequently, South Africa was forced to develop its own manufacturing firms². This industrial activity attracted the attention of other countries and they started to import goods from South Africa. This led to the economic expansion which involved immigrants from Europe.

The economic surge continued long after the war, essentially until the early 1960s, when apartheid policy unintentionally destroyed the manufacturing industry. Some political developments attracted international media rage. These included the Sharpsville Massacre, which occurred on 21 March 1960 when about 200 black Africans, who were protesting against pass laws, were wounded and 69 killed when the South African police shot them. This bloodbath led to covert armed confrontation in South Africa and signified the beginning of enormous worldwide denunciation of South African apartheid policies. After this incident, both local and international investors lost confidence in the future of South Africa.² This led to major capital withdrawals and a decrease in investment in the manufacturing industry. In the 1970s and 1980s, the situation was made worse by South Africa's inability to produce highly developed machinery and equipment. When the democratic political dispensation was ushered in and the apartheid system was discontinued in 1994, the new ANC government wanted to turn around the social, economic and political consequences of apartheid policy.

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Third Wave: knowledge-based production

Although South Africa has faltered with the second wave, the country has made positive steps towards catching the Third Wave. Alvin Toffler used various terminologies to describe the Third Wave; these include post-industrial society, information age, global village, and electronic era. I prefer the concept of referring to the Third Wave as an era of knowledge-based production. South Africa is a shining light in the area of knowledge-based production, where knowledge is a commodity and is more vital than a physical product. Some of our companies are notables in the Third Wave, including Naspers, Vodacom and MTN, all of whom sell intangible products and are doing exceptionally well. One could argue that South Africa has jumped from the First Wave to the Third Wave.

Notwithstanding a shortage of skills for the manufacturing industry, the country has produced some of the best brains in ICT. This has led to a lot of ICT related inventions. Many mobile telephony innovations were invented or refined in South Africa, such as prepaid cell phone services, mobile fax and data transmissions, and banking via cell phone. These inventions could not have happened in a country with a less developed cellular communications industry, such as the United States of America. The services sector is boosted by local ICT innovations, which is why South Africa has one of the most sophisticated electronic and mobile banking systems in the world.

The banking industry in South Africa boasts wireless ATMs in remote areas and wireless signals that are used to link a point-of-sale credit card reader into a banking system, allowing small vendors to accept credit cards. The level of mobile

commerce in South Africa is unsurpassed and is powered by the huge availability of cell phones. Proportionally, there are more cell phones in South Africa than in the United States, which are used not simply for social purposes, but are viewed as a broader commercial resource.

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Fourth Wave: Ubiquitous ICT

The Fourth Wave will not come as a big bang or revolution, but rather it will evolve gradually. South Africa will start to experience some of its manifestation in 10 years time. During this era there will be abundant broadband and ICT will become pervasive. Other characteristics of the Fourth Wave are: broadband will be everywhere, and very cheap; telephone call costs will fall by more than 50%; mobile/home phone will

be a fixed rate – eat as much as you want; the mobile device will dominate; most new appliances and furniture will come network ready (you will be able to communicate with fridge via your cell phone and defrost your vegetables or tell your bed to warm up while you are at work); all cell phones, laptops, tablets and mobile devices will have video and TV capacity; you will be able to watch burglars while away from home and communicate with them; wireless will have more speed; management of utilities will be automated (you will be able to use your cell phone to switch your geyser on and off while you are away).

The convergence of technology will become pervasive. According to Thornton, “convergence is a term used in the information and communications industries to apply to the blurring of the lines between information services, the technologies or media used to carry services and the entities that provide services or technologies. Thus, the term encompasses the convergence of services (for example, telecommunications, computing, consumer electronics, publishing and broadcasting), technologies or media (wireless and wire-line communications conduits, computers, newspapers and other traditional print media) and companies”.³ It will take about 25 years for South Africa to experience a fully-fledged Fourth Wave.

In this wave, ICT will drive manufacturing, supply chains, financial services, health care, education, agriculture, media and entertainment. In the Fourth Wave there will more spending on ICT-related research. Some elements of the Fourth Wave are already taking place in Asia where broadband is abundant and very cheap. Asia has begun to erode the pre-eminence of the United States and Europe with regard to research, development and innovation. This paper strongly suggests that South Africa is not far behind and within the next two decades will form part of the Fourth Wave. This is because labour costs in Asia are starting to rise and multinational companies are looking to Africa for investment and growth opportunities. South Africa will thus benefit from the attention given to Africa. Investors will most likely begin a shift into Africa where the consumer market is growing as a result of the increase in population. The populations of China, Russia and Japan are aging and this discourages investors. Other factors that may drive investors from Asia to Africa include the fact that Asian countries are largely export markets, and often have unfavourable property laws.

First Wave related sectors that have sustained South Africa for centuries are in decline. While the export of raw materials has increased substantially, the absence of the manufacturing sector to process the raw materials into finished goods means

that South Africa loses money in terms of beneficiation. Moeletsi Mbeki (2009) stated that in 2005, base metals and minerals products constituted 71% of South Africa's exports to China and during the same year, machinery and car components, textiles, and footwear comprised 64% of all of China's exports to South Africa.⁴ Mbeki's argument is supported by the utterances of the then Deputy President, Kgalema Motlanthe (2009), who reasoned that: "Our economy has become more open, and since 1994 it has steadily become integrated into the global system. Our financial institutions are a force of good example which has somewhat sheltered us from the global economic storms. Yet, the extent of their reach within our society remains far below expectations. Our economy remains largely reliant on mining and agriculture for exports. Except for the services sector, we have not seen a large enough expansion in critical sectors, especially manufacturing".⁵

The Congress of South African Trade Unions (Cosatu), one of the South African tripartite alliance partners, has lambasted the government for neglecting the manufacturing sector and largely relying on minerals. Petrochemicals, mining, basic iron and steel accounted for the 69% of South Africa's total exports. The mining industry is highly capital and energy intensive. Cosatu has argued further that unemployment in South Africa was sitting at around 39%. Due to de-industrialisation, South Africa has the lowest labour force participation rate amongst the emerging markets. But all is not lost.

These waves are not necessarily sequential. South Africa can simultaneously strive to "catch" the Second and the Fourth Waves, whilst maintaining momentum in the Third Wave. This can only happen if ICT is integrated into the production process.

South Africa can catch the Second Wave if it follows the following four recommendations: put emphasis on human capital development; resuscitate technical colleges; embark on an Agriculture Revolution; and listen to advice.

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Put emphasis on human capital development

South Africa's emphasis should be on skills development and knowledge creation. The South African National Planning Commission, which was led by Minister in the Presidency, Mr Trevor Manuel and prominent businessman, Mr Cyril Ramaphosa, released a diagnostic document in 2011, which amongst others, attributes the lack of job creation to poor schooling and lack of knowledge. This analysis is supported by a renowned educationist in South Africa, Professor Jonathan Jansen (2011).⁶ Moreover, the five million jobs that have been promised by the economic strategy unveiled by the South African Minister of Economic Development, Ebrahim Patel (2011), will require the injection of knowledge and technical skills into our economy.⁷

Based on the evidence provided above, one can deduce that knowledge can and should play a fundamental role in leapfrogging South Africa to a manufacturing and a knowledge economy. Countries such Japan, Malaysia, Germany, and Singapore are not endowed with rich mineral resources like South Africa, yet they are prominent players in terms of manufacturing and a knowledge economy because they have knowledge and technical skills. The presence of raw materials in a country that does not have knowledge and technical skills will not lead to economic growth.

Revive technical education

South Africa is the only country in the world which has a higher number of its students in universities instead of technical colleges (Further Education and Training Colleges). Thus, the country is in dire need of artisans. You cannot have manufacturing plants without artisans. The existence of artisans creates jobs for both unskilled labour and university graduates. Unskilled labour will physically push a wheelbarrow, carrying pieces of wood to the artisans. The artisan will assemble the pieces of wood to complete a piece of furniture e.g. a table, and pass it to the university graduates in the firm who will take care of marketing and supply chain management. One artisan can create an average of ten other jobs.

Unfortunately, between 1994 and 2009, the ANC government neglected the technical colleges. The technical college sector was characterised by paralysis, and high student dropout and failure rates. The current Minister of Higher Education, Dr. Blade Nzimande, has shown some noteworthy interest in technical colleges and one hopes he will succeed in revitalising them to produce the artisans, which South Africa really needs to re-industrialise the economy.

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Embark on an Agriculture Revolution

The decline in agriculture production that I mentioned earlier is a matter that needs to be attended to urgently. Mills argues that South Africa needs an Agricultural Revolution before an Industrial Revolution.⁸ Personally, I would like to see several interventions being implemented concurrently. Be that as it may, it

is important to note that East Asian economic development was preceded by the freeing up of agriculture. Once productivity gains and food security were achieved, Asian countries moved to manufacturing. This was the same trajectory in Europe where the Agricultural Revolution laid the base of the Industrial Revolution.

Agriculture, unlike manufacturing, does not require huge investments in technology. Agriculture is also not capital intensive and thus it creates jobs. However, ICT can play a prominent role in terms of automating agricultural utilities and activities. ICT can also contribute in marketing the agricultural products. The Zambian National Farmers Union has established commodity information for their members.⁹ The service enables farmers to access pricing and other relevant commercial information via cell phones. Zambian farmers can also use the service to negotiate prices. Illustrating the importance of agriculture, Mills writes: “Costa Rica shows what can be achieved in going from an agricultural to high-tech and services base; and from coffee and bananas to computer chips, medical equipment and high quality services”.⁸

Government should listen

The governing party should listen to analysts and experts – the conscience of our nation. Moeletsi Mbeki (political economist), Jonathan D. Jansen (educationist), Greg Mills (political economist), Zwelinzima Vavi (unionist), Prince Mashele (political analyst), Archbishop Mpilo Desmond Tutu and many others, have been telling the ANC and the government what to do to fix the country, but to no avail. Their advice has been met with suspicion, contempt and rebuke. In contradistinction, Germany, whose infrastructure and cities were ruined by the bombardment of the

Allied Forces, enthusiastically took the advice of its scholars and theorists and thus it realised the renowned German Economic Miracle. Most of the German theorists were based at the University of Freiburg. One such scholar was Walter Eucken. Eucken advised Germany to implement “ordoliberalism” which is an alternative to neoliberalism. According to the ordoliberalism theory, the state has a responsibility to provide the economic framework for economic freedom instead of a government that has a *laissez-faire* attitude towards the economy (Eucken, 1950; Eucken, 1951)^{10&11}.

In the short term the South African economic trajectory will remain suppressed due to the lack of political will. The problem in South Africa is not the lack of planning and strategies, but rather the lack of implementation.

If South Africa implements its ICT policies and infrastructure, and improves the level of education, the country will be riding the Fourth Wave in the near future. The most fundamental question is: will the Fourth Wave lead to economic development and job creation? The answer is yes, it will lead to massive economic development in the medium (25 years) to long term (50). In the short term the South African economic trajectory will remain suppressed due to the lack of political will. The problem in South Africa is not the lack of planning and strategies, but rather the lack of implementation. Politicians in the governing party spend most of their time vying for positions and fighting factional battles. There is a general dearth of credible leadership in the country. Although the Minister in the Presidency for National Planning, Trevor Manuel, produced a very laudable National Development Plan, it has appeared to outsiders his cabinet colleagues don't take his National Planning Commission work seriously.

When Dr. Blade Nzimande released his Green Paper for Post-school Education and Training, he completely ignored well-researched, good ideas contained in Manuel's Draft National Development Plan pertaining to education. Minister of Economic Development, Ebrahim Patel, produced the New Growth Path before the National Planning Commission produced its Diagnostic Overview.

For South Africa to do well economically, two economic waves – the Second and Fourth – should run concurrently. In the medium to long term, re-industrialisation in South Africa will take place despite the lack of political will and skills shortage. There are many positive economic activities that have taken place in South Africa, despite the government's poor policy formulation and the country's skills shortage. The growth of the cell phone industry happened without any plausible policy intervention. The outgoing apartheid government and the ANC didn't take the potential of the cell phone industry seriously in terms of influencing economic growth and enabling universal access to ICT services by the people in underserved areas. The ANC perceived cell phones as luxury devices of middle and upper class people.¹¹ The ANC insisted that access to telecommunications by needy people would be achieved through the fixed line telephony. It is Alan Knott-Craig, the current CEO of Cell C, who reasoned with Andile Ngcaba of the ANC and predicted that cell phones would yield more positive effects to all South Africans than television.¹² Many years later, Ngcaba paid tribute to Knott-Craig's vision.

Many innovations related to mobile phones, mobile commerce and electronic commerce were pioneered or advanced in South Africa. The cell phone industry played a critical role as an enabler to develop and enhance the South African services sector. The Wireless Application Services and mobile money are growing rapidly in South Africa. The lack of infrastructure and crime have led to much innovation in South Africa. In other words, government sluggishness drove the private sector to become more creative. For example, seeing that customers were extremely concerned about digital banking related crimes, South African banks reacted to these crimes swiftly and with much sophistication. They have dedicated e-crime units and invest huge amounts of money on customer education. The spoof and phishing sites are removed from web environments within 48 hours whilst the perpetrators are tracked down speedily with the assistance of Interpol. In my view, South African banks are leaders in the world in terms of fighting digital related crimes.

Africa's economic development trajectory to South Africa

Developments on the African continent will drive economic growth in South Africa and this will lead to employment. Although poverty will be reduced,

inequality will increase substantially during the next 15 years. This should be attributed to lack of skills; the economy will reward those who are more skilled much more and this will lead to violent protests and tragedies similar to the one experienced in Marikana.

Although the South African economy will be growing in terms of the Gross Domestic Product (GDP) during the next 15 years, only a few jobs will be created. However, in the medium (25 years) to long term (50 years) the economy will start to produce jobs due to the growth of the manufacturing sector and the ushering in of the Fourth Wave. As I indicated earlier, the manufacturing sector will grow despite of the lack of political will. This will be a consequence of some positive developments on the whole African continent.

Of course economic developments in Africa will not just grow smoothly; there will be stumbling blocks and challenges. Lack of infrastructure, skills shortage and fluctuation of commodity prices will remain problematic for some time. Rigid labour laws in South Africa will harm the prospects of substantial foreign investments. I agree with the assertion of South Africa's official opposition party, the Democratic Alliance, that for the South African economy to create jobs, it has to grow by at least 8% for many years to come. The 8% economic growth should be applicable to the rest of Africa. Without manufacturing, this growth will not create many new jobs since it will be driven by the services and tourism sectors.

Something that has gone terribly wrong is the neglect of agriculture by African leaders for the past 50 years. Mills explains: "African development policies have been, since independence, anti-agrarian partly because African political parties (and their elites) had their roots in urban areas. Not only has just four percent of development gone to the agriculture sector, but it received on average around 1 per cent of African national budgets".⁸

Conclusion

The recent Lonmin-Marikana mine tragedy has left many people locally and around the world asking themselves if South Africa is not going down the destructive path walked by several African countries which started well after attaining independence from their colonisers, but ended up betraying their citizens. The Marikana debacle is not just political, but rather a reflection of socio-economic problems and inequality. Indeed, it is also a manifestation of poor political leadership, particularly from the government and the governing party. When this massacre happened, some Cosatu and ANC leaders were canvassing for leadership positions that would be elected during their elective congresses in September and December 2012 respectively.

But is it really doom and gloom when it comes to South Africa? Is South Africa heading for implosion and a banana republic? There are several things worrying me as an analyst. But I don't think South Africa will end up like Zimbabwe. South Africa will go through some rough patches, both politically and economically, but overall the future of this country looks good. South Africa has the capacity to leapfrog the economy into the Fourth wave if it is willing to embrace ICT. ICT has played a fundamental role in the South African services sector and, going forward, ICT will contribute immensely to the revival of manufacturing and agricultural sectors. In recent history, the much-celebrated Asian economic growth has pointed to a significant connection between ICT and education. Well-crafted and implemented ICT and education policies played a critical role in protracting the extraordinary rate of Asian economic development. Such policies could have a similar effect on South Africa's economic and social development.

NOTES

- 1 This paper builds and extends on the opinion piece I published in the Business Day on 3 August 2012 which was entitled: "ICT can help SA leapfrog to the 'fourth wave'. Certain phrases in this paper have adapted or/and adopted from the aforesaid opinion piece.
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