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Wireless access
- introduced to combat extortion
- Mexico/Kenya intense appetite to using all the spectrum in the country
- restructuring its highly concentrated, inefficient use of the spectrum, to services and reducing barriers
- Government assigning the role of private-public partnership between the two
can be fully operational before any implementation emerge
- SA despite not facing these issues, wireless 51% state-owned with

Changing nature of State
Changing nature of state in globalized world
- centrality of the state to any outcome
  - positive or negative
- sector dimensions to the role the state can

variations
- relations with different players

regulation in which public

and Economic regulation
- zero rating

infrastructure systems - dynamic

or vertically integrated or
Changing nature of State

Changing nature of state in globalized world
- centrality of the state to any outcome, positive or negative
- sector dimensions to the role the state can effectively perform as a result of the differing production requirements and modes of governance
- each sector presents distinctive constraints and opportunities for state involvement.
- a role or combination of roles fosters the growth of a particular sector depends on the state's capacity to play the roles in question
Sectoral variations

- State different relations with different sector
- Autonomous regulation in which public and private players avoid state or industry capture
- Competition and Economic regulation - static efficiency - zero rating
- Complex adaptive systems - dynamic efficiency
- what may appear vertically integrated or dominant relationship may in fact be competition enhancing at different levels.
- Instrumental competition regulation can produce unintended outcomes - inhibit innovation and + consumer welfare
Politics & institutions

- characterised by policy failure and institutional incapacity
- poor institutional arrangements (principle agent problems)
- dysfunctionality of key regulatory and delivery institutions
- politicisation of bureaucracy and weak cadre deployment (absence of specialisation)
- absence of evidence base for policy (ideologically-driven)
- where policy evidence based under certain political leadership subject to change of electoral cycle
- lack of appreciation of centrality of ICT to modern economy
- split of the Department of Comms flexibly holding the line - policy subverted by ideological or political agenda
NDP Diagnostic Report - national inequalities and uncompetitiveness of markets reflected in ICT sector, but untapped potential for growth and job creation

- Lack of affordable always-available, high speed and quality bandwidth required by business, public institutions and citizens impacted negatively on the country’s development and global competitiveness
- Significant sector in own right but key service sector
- High input cost for business/ disincentive for investors, negative impact on job creation – e.g. BPO
- Considerable sector growth despite economic downturn
- But universal access objectives not met
- Unintended, negative outcomes of policy – access/pricing
- Descent down global indices – ITU Development Index, WEF E-readiness Index, WEF Competitiveness Index, Human Development Index
WEF Global Information Technology Report's Networked Readiness Index (NRI) 2016

- SA jumped 10 places to 65th position worldwide. "South Africa's digital transformation is mostly business driven, as the country notably performs best in business usage (32nd), followed by individual usage (77th), followed by government usage (105th)"
National statutory and policy framework
“... improve the quality of life of all citizens and free the potential of each person” and, in doing so, enables equality in the rights, privileges and benefits of citizenship, including the guarantees of freedom of expression and association in the Bill of Rights in digital world.
New Growth Path

One of the job creation drivers identified as part of the New Growth Path, the national 5-year economic plan for the country, is the element of the knowledge economy – an economy that is underpinned by access to affordable high speed broadband...
NDP
The ICT sector by 2030 will underpin the development of a dynamic and connected information society and a vibrant knowledge economy that is more inclusive and prosperous. A seamless information infrastructure will...
SIP 15
Presidential Infrastructure Commission
Expanding Access to Communication Technology which “to ensure universal service and access to reliable, affordable and secure broadband services by all South Africans... prioritising rural and un-serviced areas... stimulating economic growth.”
Rationale for prioritising Broadband

- Strong evidence of linkages investment in broadband economic growth and improvements in the economy
- Direct opportunities for manufacturing, service provision and job creation, but primarily enhancement of communication flows that improve productivity and efficiency
- Need to reach critical mass to enjoy network effects access, use and price right general purpose technology
- Historically state owned monopoly transfer to private ownership and risk a public-private interplay where the relative powers and resources of both sectors are leveraged to achieve wide-based national benefit
- Success dependent on appropriate market structure, clear institutional arrangements, high levels of state coordination across sector, and tiers of government.
Economic impact

DIGITISATION INDEX
The economic impact of digitization is measured through an endogenous growth model that links GDP to the Fixed Stock of Capital, Labor Force and the Digitization index

Katz, Koutroumpis and Callorda (2013b)
1. Employment

**How many jobs** will *South Africa Connect* be capable of generating as a result of network deployment?

2. Economic Impact

How large will the **employment creation effect** be once the National Broadband Network is deployed?

What will the impact be in terms of **domestic value added resulting from network construction**?

What is the **incremental GDP growth** that can be linked to broadband deployment?
## SOUTH AFRICA: DIGITIZATION ECONOMIC IMPACT (2004-2012)

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitization Index</td>
<td>20.15</td>
<td>21.89</td>
<td>23.58</td>
<td>24.18</td>
<td>24.55</td>
<td>25.61</td>
<td>26.75</td>
<td>30.61</td>
<td>33.40</td>
<td>-</td>
</tr>
<tr>
<td>GDP created (in Million Rands)</td>
<td>-</td>
<td>3,478</td>
<td>3,602</td>
<td>1,397</td>
<td>828</td>
<td>2,484</td>
<td>3,509</td>
<td>13,352</td>
<td>9,853</td>
<td>38,502</td>
</tr>
<tr>
<td>Jobs created (‘000)</td>
<td>-</td>
<td>25</td>
<td>26</td>
<td>9</td>
<td>6</td>
<td>16</td>
<td>18</td>
<td>60</td>
<td>44</td>
<td>204</td>
</tr>
</tbody>
</table>

Source: Own calculations using Katz, and Koutroumpis (2013b)

According to the economic impact model, digitization in South Africa has created R38,500 million in GDP and 204,000 jobs/year.
<table>
<thead>
<tr>
<th>Impact</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitization</td>
<td>GDP (R M)</td>
<td>69,055</td>
</tr>
<tr>
<td></td>
<td>Employment</td>
<td>306,000</td>
</tr>
<tr>
<td>Speed</td>
<td>GDP (R M)</td>
<td>2,163</td>
</tr>
<tr>
<td></td>
<td>Employment</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>GDP (R M)</td>
<td>71,218</td>
</tr>
<tr>
<td></td>
<td>Employment</td>
<td>306,000</td>
</tr>
</tbody>
</table>

Based on the spill-over impact of digitization, the incremental GDP of this scenario is R 111,000 million.
# Breakdown of NBN Required Investment (CAPEX Only) (in ZAR ‘000’000)

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>Wireline</th>
<th>Wireless</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Investment (M)</td>
<td>%</td>
</tr>
<tr>
<td>Electronics</td>
<td>12 %</td>
<td>ZAR 5,640</td>
<td>45 %</td>
</tr>
<tr>
<td>Construction</td>
<td>67 %</td>
<td>ZAR 31,490</td>
<td>34 %</td>
</tr>
<tr>
<td>Telecoms</td>
<td>21 %</td>
<td>ZAR 9,870</td>
<td>21 %</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>ZAR 47,000</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Breakdown based on Deployment numbers for NGAN European carrier (wireline) and Wimax/3G US carrier (wireless), in Katz et al. (2010)*

*Based on the breakdown benchmarks, we allocated an estimated ZAR 65B investment in three primary sectors of the I/O matrix*
### SOUTH AFRICA: DIGITIZATION CUMULATIVE ECONOMIC IMPACT (2013-2020)

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2015</th>
<th>2020 (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitization Index</td>
<td>33.40</td>
<td>52.94</td>
<td>58.98</td>
</tr>
<tr>
<td>GDP created (in Million Rands)</td>
<td>-</td>
<td>R 69,055</td>
<td>R 90,397</td>
</tr>
<tr>
<td>Jobs/Year created ('000)</td>
<td>-</td>
<td>306</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Own calculations using Katz, and Koutroumpis (2013b)

If South Africa met the policy targets and the associated metrics, it would create R90,397 million in GDP and 400,000 jobs.
Policy purpose

To present a vision, strategy and a long-term plan that is immediately instiututable and that will catalyse broadband connectivity in South Africa.

- robust and cost effective broadband solution to universal, affordable broadband access
- market structure and associated regulatory regime required to induce sufficient public and private investment
- mechanisms for greater coordination at all tiers of government, to enable more equitable access to broadband and to manage the removal of impediments to broadband network extension
- rationalisation of state owned entities through clear role definition, integration of planning, monitoring and evaluation
- Facilitate infrastructure planning through the mapping of existing broadband networks, coordination of deployment plans of operators and infrastructure sharing in order to limit the duplication of civil works
- vision, model and plan towards a world class open-access national broadband network and harnessing public and private sector contributions, capabilities and resources.
A new Broadband Plan – SA Connect

Four-pronged strategy to bridge the gap

Supply side interventions –
- Public/private investment/competition
- Core/access networks
- Infrastructure sharing/coordinate build outs
- Universal access – spectrum

Demand side interventions –
- Affordability of services/devices
- Government leadership
- Regulation
- ICT skills development/e-literacy
- Local content, applications, niche manufacturing stimulation

Current state

Digital readiness:
Policy, regulation & institutional capacity
Monitoring and Evaluation

Digital Development:
Public sector demand aggregation to address critical gaps

Road mapping

Digital Future:
National Broadband Network

Digital Opportunity:
Skills & institutional capability, R&D, Innovation & entrepreneurship
Content and Applications

10 year plan

Targets

Broadband vision

An effort to both conserve and increase overall output period.
jobs and ZAR income.
A new Broadband Plan – SA Connect

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Digital Future:
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Digital Opportunity:
Skills & institutional capability,
R&D, Innovation & entrepreneurship
Content and Applications

10 year plan

Broadband vision

Targets
### Supply side policies
- Investment/competition
- Core/access network expansion – public/private
- Reduction of infrastructure costs
- Spectrum allocation and assignment
- Universal access/service

### Demand side policies
- Affordability of services/devices
- Government leadership/role model - demand stimulation
- Regulation/ICT skills development
- Online local content, applications, e-gov services
- Consumer welfare/user empowerment

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**SA Connect**

**88% of the South African population resides within 10km of a fibre node**

**School distance from Fibre node**
- < 10km
- < 25km
- < 50km
- > 50km

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**Broadband Targets**

<table>
<thead>
<tr>
<th>Target</th>
<th>Penetration measure</th>
<th>Baseline (2013)</th>
<th>By 2016</th>
<th>By 2020</th>
<th>By 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadband access in % of population</td>
<td>53.7% Internet access</td>
<td>50% at 5Mbps</td>
<td>90% at 5Mbps</td>
<td>100% at 10Mbps</td>
<td>80% at 10Mbps</td>
</tr>
<tr>
<td>% of schools connected</td>
<td>50% at 10Mbps</td>
<td>100% at 10Mbps</td>
<td>100% at 10Mbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of health facilities connected</td>
<td>59% at 10Mbps</td>
<td>90% at 10Mbps</td>
<td>100% at 10Mbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of government offices connected</td>
<td>59% at 10Mbps</td>
<td>100% at 10Mbps</td>
<td>100% at 10Mbps</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**International connectivity**
- Before 2009: 0.34 Tbps
- Today: 11.5 Tbps

**Domestic backbone or National Long Distance Network**
- > 50 000km

**Metropolitan area networks**
- Considerable core network infrastructure

**Access networks**
- **Biggest gap**

**On-site (LAN) connectivity and devices**
- Mobile revolution has decreased cost significantly
- neither state nor market can provide solution on their own.
- leveraging private sector investment for public delivery
- turning capex (sunk investments) into opex (anchor tenancy)
- dark fibre commercial model is open access because incentives are to get as much traffic on network to get ROI as quickly as possible so enjoy profitability
- anchor tenancy enables raising of capital, open access enables optimisation of investment, means quicker return on investment, enabling further investment and increased profitability/dividends for investors - funds next work extension
- put public wi-fi on every public institution connected and cost effectively addressed access problem
- avoid negative impact of sector specific levies on cost of communications, reduce regulatory transaction costs, price down, stimulate demand, increased profitability, increased company tax (for allocation by national budget – and ideally for public access – commitment to digital economy)
Wireless open access model

- introduced to combat extreme market dominance
-Mexico/Kenya intense application of infrastructure sharing using all the spectrum in the digital dividend (700MHz) band
-restructuring its highly concentrated market, making more efficient use of the spectrum, reducing the cost of providing services and reducing barriers to entry.
-Government assigning the rollout and operation to a private-public partnership before the end of 2014 so that it can be fully operational before 2018, as required by law, but there have been a number of delays as the challenges of implementation emerge
- SA despite not facing these conditions, planning single wireless 51% state-owned wireless network to enable SME and BEE entry, with intention of recalling all spectrum into this single wireless network
-rather than foreboding as advised, state ownership in the wake of disastrous BBI and Telkom notion that wireless network like undersea cable erroneous
Cloud first policy

- Public sector in South Africa as one of the largest single users of ICT and services is potentially amongst the greatest beneficiaries of the cost savings, flexibility and scalability offered by cloud-computing services, but adoption of these services has been limited.
- Millions of rands in legacy software licensing replaced by commodified cloud services, software, platforms and analytics - pay what you use and higher levels of security that can be provided by self.
- UK Government cost-savings in NHS, National Security, Local Government - between 30-70%.
- Shift from capex to opex.
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