#Digital

IN 30 SECONDS

- Africa will be home to 2.4 billion people within the next few decades and they will favour cities over rural life

- Technopoles aim to nurture innovation, create jobs, encourage workforce upskilling, and showcase the country's strengths – which can help manage demographic challenges

- Some countries are already seeing the benefits – jobs have been created and IT has become a key element in the economy

- From technopoles grow smart cities, fully connected to provide the infrastructure inhabitants need

Smart cities: the key to Africa's third revolution

As Africa faces dramatic demographic development, we ask how technological advances can trigger a digital revolution through the growth of smart cities

From villages to smart cities

An extraordinary period of urbanisation is underway in Africa, placing policymakers under pressure to improve infrastructure and public services. Africa should harness the connectivity that exists and develop technopoles into smart cities.

Africa's middle class

At 350 million people (and projected to reach 1.1 billion by 2060), Africa's middle class (upper, lower and floating) is roughly the same size as the middle class in India and China

Middle class spending per day:

USD10-20 Upper

USD2-4 Floating **USD4-10** Lower

Map legend:
- 1-2 phones per person
- 1 phone per person
- 1 phone per 2 people
- Less than 1 phone per 2 people

Cities marked on map: Algiers, Casablanca, Tunis, Cairo, Lagos, Abidjan, Accra, Kigali, Nairobi, Johannesburg

Incidence of smart cities

The growth of smart cities across Africa provides a unique opportunity to spur home-grown innovation and attract foreign investment

10 – smart city zones across 54 countries

Incidence of technopoles

Tech hubs have quickly spread across the continent, playing a valuable role in catalysing innovation and development
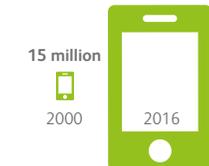
117 – total tech hubs (September 2015)
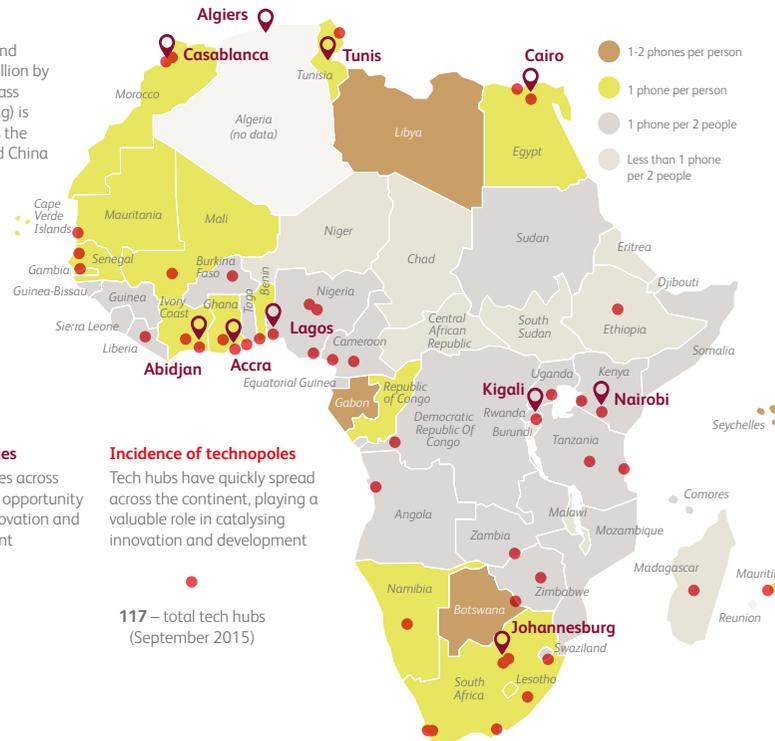
Mobile penetration in Africa

Africa is now the fastest growing and second largest mobile phone market in the world:

More than **8 in 10 Africans** have a mobile phone …

… amounting to **760 million** mobile clients

15 million

2000   2016

Africa's mobile data usage represents **15%** of total internet traffic

Sources: African Development Bank, African Endeavours, BearingPoint, The World Bank

BearingPoint. Institute

#Digital

In 2040, a young African scans the glittering skyline of her hometown. Her eyes fix on the central business district where rows of energy-efficient buildings, shaded by native flora, throng with suits during the day. Electric vehicles glide by. Distantly, she watches as one car travels toward a dark zone, tracing the city's outskirts, where LED streetlights have dimmed to conserve energy. It glows stronger as the car approaches.

For a continent more known for wars, famines and chronic poverty, this utopian imagery is not typically associated with Africa – more with scenarios for the West. Yet this is exactly the sort of long-term vision advocates of the 'African smart city' propose – and it may not be as far-fetched as you think.

Since the 2000s, Africa has been among the fastest-growing continents in the world[1]. A decade-long commodity boom, buoyant foreign investment inflows, and relative political stability have quickened the pulse of the region, and it has not gone unnoticed. Today, alongside the traditional, dark narrative of 'Africa's plight' is the narrative of 'Africa rising'; a story that symbolises not only how far Africa has come, but also how far perceptions have changed.

2.4bn people will live in Africa within three decades

Demographic trends and pressures

But headwinds are gathering on the horizon with a looming demographic challenge. Within three decades, the continent will be home to some 2.4 billion people[2], more than double today's population, and the majority will flock to the cities. The proportion of Africans residing in urban areas is set to grow from 40 per cent in 2010 to 60 per cent in 2050[3], representing the highest urbanisation rate globally[4], exceeding even that of China.

As elsewhere around the world, the policy challenges of such a rapid influx of migrants to the cities are legion. On the one hand, swelling cities can perpetuate inequalities and urban poverty, fomenting social unrest and dragging down growth. Africa's urban slums are evidence of this squalid truth. On the other hand,

cities can be an engine of economic development, whilst also driving social justice, environmental sustainability and human development.

The technological promise

Technological advances are seen as the best answer to these challenges. Equally, they might also represent the new frontier of opportunity for an innovative Africa. The prime example is mobile phones, which are ubiquitous (extending even to remote African villages); and internet penetration is estimated to climb to 50 per cent in the coming decade[5]. The prevalence of low-cost technologies has spurred a wave of innovation amongst home-grown firms as they strive to meet the surging demands of new migrants – such as mobile banking in Kenya, which has brought millions of unbanked individuals into the financial system[6].

#Digital

Whatever the merits of these technological breakthroughs, a technical approach to addressing Africa's rapid urbanisation by itself may lead to counterproductive outcomes. Instead, African policymakers must pursue a much broader industrial reform agenda, which fully harnesses the best innovations in a ballooning urban landscape.

But what shape will the reform agenda take? It is safe to say that African leaders rummaging in their policy toolkit are unlikely to reach instinctively for 'smart cities' as the solution. Arguably, smart cities will find the best staging ground in advanced developed economies, and surely not in a region that still struggles with weak infrastructure, chronic power shortages, and severe deprivations in basic human needs. In any case, they bear scant resemblance to African cityscapes today.

Low-cost technologies has spurred a wave of innovation amongst African firms as they strive to meet the surging demands of new migrants

Yet the reality is smart cities form the most potent and holistic framework available, which can give shape to the overarching development goals of African states whilst staying true to the plural voices of thriving cities. These increasingly connected populations will demand ready access to the global economy - for example, through platform technologies and other digital networks - rather than having to be situated at the confluence of a river and ancient road. Africa is well-placed to embark on the smart city journey, to lay the groundwork for building and evolving smart cities in practice.

#Digital

Towards the urban dividend: the third revolution

After thousands of years, the vast majority of people will leave the countryside en masse and pour into urban areas in search of work. The profile of Africa's cities will alter permanently and, in the process, radically challenge policymakers to leverage these forces for sustainable and inclusive growth.

But this is good news. History suggests that population density is essential for economic prosperity, and that urban expansion is a critical precondition for accelerated growth: 'Long-run growth needs an efficient system of urban centres that produce industrial goods and high-value services, along with transportation networks to link national economies with regional and global markets'[7].

Taking the challenges seriously

Compared with developing countries confronting similar pressures, Africa's institutional development lags far behind, fraught as it is with gross inadequacies. All of its countries require smarter infrastructure and smarter urban management and planning. Key elements – the usual suspects - include more jobs and better workplaces, schools, universities, universal access to power, healthcare facilities, and robust transport networks necessary to link these facilities to the people who need them. Managing this urban network comprises the crux of Africa's development challenge.

Appreciating the real benefits

For all this, there may in fact be advantages here. Unlike other countries seeking to implement a smart city program, African countries are not burdened by obsolete, legacy infrastructure. They are not encumbered in the same way as western states by having to navigate complex, politicised government programs and systems.

Further, Africa's own technological progress is yielding solutions that may help forge a path towards a positive future. For instance, mobile phones are pervasive across the continent. This opens up the possibility for the vulnerable and marginalised in society to transmit messages, access political news, health and consumer information, and even search for jobs and engage in mobile banking. Activity of this sort kindles the emergence of social networks[8]. As the

Africa is well-placed to lay the groundwork for building and evolving smart cities in practice

BBC reported, 'You cannot talk about Africa without talking about mobile. Most innovation involves mobile devices and wireless technology in some way or other'[9].

Beyond these individual benefits, the spoils may be wider still owing to the big data generated from this social activity. By utilising the city's large data volumes, smart-city designers are in a better position to improve citizen safety, the efficiency of transport and telecommunications networks, optimise energy consumption and waste collection, and even solve thorny problems in public health. The value is immense.

A lack of resources has long blighted Africa's effort to produce goods and services to scale. Now, low-cost technologies are bequeathing to the region a heightened ability to participate in the global economy, albeit with marked differences between countries. When you couple that with the prospect of a swelling middle class, it is not difficult to see some merit to the claim that Africa is on the brink of a 'third revolution'.

#Digital

From technopoles to smart cities

Part of the reason why people are increasingly upbeat about the notion of smart cities in Africa has to do with the region's experiments with technology parks. Diverse as they are, these parks have acted as development catalysts: inducing foreign investment, augmenting infrastructure networks and, more recently, fibre-optic connections.

Leading the charge was Egypt, Morocco and Tunisia. Having their early initiatives crowned with success paved the way for industrial hubs to propagate across the continent. These tech clusters hatched innovative businesses, creating thousands sometimes tens of thousands of jobs, and serving to integrate IT throughout their economies[10].

For example, Egypt's SmartVillage technopole, which debuted in 2001, bolstered ITC growth in the country by 10 per cent in 2014, resulting in upwards of 50,000 people being employed in the sector. In Tunisia, meanwhile, the El Ghazala Technopark in 2015 accommodated some 250 businesses (including 10 multinationals), with almost 3,000 jobs on site and more growth anticipated[10]. It forms a showcase for the country's ITC and microelectronics innovations.

10%

ITC growth in Egypt in 2014, catalysed by its SmartVillage technopole

WHAT IS A TECHNOPOLE?

A technopole (technology park) is a business area comprising manufacturing and service companies in the high technology sector. Characterised by an intermediate level of technological innovation, the hub brings together a diverse ecosystem of stakeholders drawn from a variety of sectors with the aim of fostering creativity, innovation and, crucially, employment and training, in the digital sector[10].

Technopoles may be planned or not; and financed privately, publicly or via public-private partnerships. Today, they are increasingly seen as an important development tool for policymakers.

Typically located on the outskirts of major cities close to research organisations (universities, private laboratories) – Silicon Valley being the most famous example - they began flourishing in the West from the 1980s. More recently, developing countries have tuned into the importance of innovation to their future competitiveness and have been actively developing technopoles. African states have been no different in this regard.

#Digital

In the next phase, more technopoles will take root and become the seedbeds from which smart cities grow – cities synonymous with supreme connectivity that optimises digital capacities, sustainability and economic growth. These smart cities are digital ecosystems, based as they are upon platform technologies. And they are already springing up in ten of the continent's 54 countries[10]. If this trend continues, Africa will leapfrog to the 'third revolution'[10], vaulting over traditional development phases straight to the high-tech new world of the digital economy.

At present, there is little doubt that North African cities (such as Cairo, Tunis, Algiers and Casablanca) are ahead of the game (for example, Casablanca's smart city cluster, e-madina), but they are not the only ones to watch. Accra, Lagos, Abidjan and Nairobi are enclaves that are agglomerating urban and peri-urban areas, which are attracting new investors. Johannesburg and Kigali, too, are benefitting from the emergence of a dynamic and connected middle class[10].

Due to the geographical, historical and cultural variations across Africa, there is no one-size-fits-all model for any city in Africa. Each country is at a different phase of development and there are widely varying levels of political and economic stability. Further, when projecting forwards and considering the evolution of smart cities in Africa, in response to rapid urbanisation and emerging technologies, smart cities will establish and take full advantage of these resources.

Smart cities are springing up in many parts of Africa. If this trend continues, Africa may leapfrog to the 'third revolution'

WHAT IS A 'SMART CITY'?

A smart city is a digital ecosystem within the city that enhances its liveability, workability and sustainability.

Smart cities are zones within a territory where technology and connectivity play a central part in infrastructure. They address issues of urbanisation, economic development, and the technological needs of its inhabitants and visitors. They offer a place to live, learn and work; a space to develop innovative businesses and entrepreneurial activity in the digital arena, while also providing healthcare - a crucial issue in Africa. Equally crucial, smart cities are built upon sustainable energy infrastructure. Indeed, one could argue that smart cities will be a crucial means by which Africa may avoid a demographic, political and human disaster over the next three decades[10].

BearingPoint® Institute

#Digital

Practical steps to consider for a potential smart city project

The cascade of interest in Africa's growing metropoles drives home a larger truth. The continent is at a crossroads, and much will depend on the decisions taken by policymakers today. Most countries recognise the reform imperative[12], but the development strategies required to address the mounting challenges of urbanisation and footloose international investors are not quickly solved with traditional policy instruments.

Nurturing the smart cities of the future is a viable way forward. It builds upon Africa's already pronounced leaning toward digital technologies, and broadens this to harness the innovative ideas of the city.

So, what are some realistic steps policymakers can take when thinking about a possible smart-city project? Here are a few:

1 Define clearly the purpose of the smart city and obtain alignment

- Anchor the smart-city project in the strategic vision and development objectives of the country, but also align with the city's constituency.
- Clarify its commercial and environmental sustainability objectives, which will inform the design and implementation of all smart-city initiatives (university, R&D, technologies, business, etc.).

- To succeed with the 'third revolution' after the failure with the first and second revolutions.
- Obtain alignment with leading city decision-makers and stakeholders on the goals.

2 Anticipate the future business model and the ecosystem of partners

- Show the value created by smart cities through economic modelling.
- Think about the model for finance so as to operationalise the smart city proposal.
- Consider the ecosystem of players: with the digital revolution, smart cities should be built with the digital ecosystem partners in mind.

3 Smart city ecosystems need an IT platform

- In order to orchestrate and monetise smart city initiatives, traditional IT will not cut it. A proper platform IT solution is required, such as 'digital ecosystem management' (DEM).
- Invest in a scalable platform so that cities can collaborate with partners and embrace future technology.
- Employ an agile approach. To seize the advantage of digitalisation, smart cities must be more adaptable, open to change and act fast, whilst maintaining trust with citizens.
- Utilise lean start-up methods (iteratively build products and services etc.), not traditional IT project approaches, to fast track to a good result.

4 Quick wins to solve short-term problems as well as longer-term growth

- Identify some quick win projects to build confidence and momentum around the smart-city agenda.
- Start by experimenting with some simple service bundles.

5 Don't forget the rural space

- For the smart city vision, depicted in the introduction, to eventuate, African leaders need to explore how to build upon the fabric of technopoles to create smart cities. However, none of this is to say that smart cities are the whole answer to Africa's future development. After all, agriculture still comprises 60 per cent of the workforce in Africa[13].
- The issue of how to integrate the smart-city project in national development plans, which is in keeping with the state's regional and global economic strategy, must be thought through.

The world currently wants access to Africa's commodities, and they are investing in Africa's services[14]. But in the future it will want to source tertiary services from Africa's smart cities. The question for all stakeholders today is whether to support and channel this development or to sit back and observe. ◆

BearingPoint Institute

#Digital

KEY TAKEAWAYS

- Africa will be home to some 2.4 billion people within the next few decades, and people will increasingly move to cities, leaving rural areas behind

- Fast-growing cities present policy challenges, particularly in Africa where the typical problems associated with urbanisation –overcrowding, access to public services, jobs, crime etc. – are often more severe

- Fast-growing cities also present opportunities: cities are the world's 'engines of growth'

- Technology is playing a leading role in building cities that can cope with growing numbers of inhabitants.

- Key to this are technopoles – technological hubs that create jobs, encourage education and training, and provide a showcase for a country's innovation

- Pioneering technopoles have been developed in Egypt, Morocco and Tunisia. Innovative businesses have been established, creating jobs and integrating IT into economies

- The next step from technopoles are smart cities, fully connected and making effective use of technology to analyse citizen data, which in turn enables infrastructure improvements

- A technological revolution spreading across Africa is making connectivity a reality. Investment here is not without its challenges, and there are vast inter-country differences, but the opportunities are too compelling to ignore

- To be successful, smart city ecosystems need a monetisation and orchestration platform that's scalable so cities can collaborate with partners and embrace future technology

#Digital

About the author

Jean-Michel Huet
Partner, BearingPoint, France

Jean-Michel leads the emerging markets business unit at BearingPoint and advises more than 25 institutions including governments, think tanks, utilities, telcos and media companies, with a particular specialism in incubator, innovation and social development. Jean-Michel led the launch of BearingPoint's office in Morocco, and has written more than 600 articles, white papers and publications on telecoms, management and ITC impact in Africa. Formerly marketing manager at Orange, he graduated from NEOMA Business School and Institut d'Etudes Politiques de Paris.

jean-michel.huet@bearingpointinstitute.com

Project team

Acknowledgements

BearingPoint® Institute

#Digital

Notes and Bibliography

1. 'Aspiring Africa: Pride in Africa's achievements should be coupled with the determination to make even faster progress', *The Economist*, London, UK, web: leader column, 02/03/13, http://econ.st/18Dm8ph

2. '2013 World Population Data Sheet 2013', *Population Reference Bureau*, Washington, DC, USA, web: executive summary, 09/13, http://bit.ly/265O41R

3. 'African growth: the role of demographics and urbanization', *The Center for Global Prosperity*, Hudson Institute, Washington, DC, USA, web, 13/09/12, http://bit.ly/23LoWv4

4. 'Urbanization in Africa: trends, promises, and challenges', *The World Bank*, Washington, DC, USA, web: press release, 29/05/15, http://bit.ly/1NsYNYy

5. 'Mobile phones In Africa: subscriber growth to slow sharply as companies struggle to reach rural populations and offer faster, cheaper services', *International Business Times*, New York, NY, USA, web, Morgan Winsor, 15/10/15, http://bit.ly/22zWHgl

6. 'The pioneering continent', *The Economist*, London, UK, web: subscription-only access, 23/04/15, http://econ.st/1zQsDzh

7. Africa's urbanization: challenges and opportunities, *The Growth Dialogue*, Working Paper No. 7, Washington, DC, USA, Maria E Freire, Somik Lall and Danny Leipziger, 2014, http://bit.ly/22zWo5f

8. 'Industry: the third revolution', *The Africa Report*, Paris, France, web, Nicholas Norbrook, 26/08/15, http://bit.ly/1Eks9JJ

9. 'Africa's mobile boom powers innovation economy', *BBC News*, London, UK, web, *Matthew* Wall, 01/07/14, http://bbc.in/1qeD1Pg

10. 'Des technopoles aux smart cities, vers un écosystème digital en Afrique', *BearingPoint*, web, landing page, Jean-Michel Huet, http://bit.ly/1YPMOdD

11. *Technopolis: best practices for science and technology cities*, Springer, London, UK, web: landing page, editors: Deog-Seong Oh and Fred Phillips, 14/12/13, http://bit.ly/1SH85aT

12. 'Making Africa work: the continent's future depends on people, not commodities', *The Economist*, London, UK, web: leader column, 16/04/16, http://econ.st/1VrZCt0

13. African economic outlook 2015: regional development and spatial inclusion, *African Economic Outlook*, Issy les Moulineaux, France, PDF: overview, AEO, 2015, http://bit.ly/1Hu9DcT

14. 'World investment report 2015: reforming international investment governance', *United Nations Conference on Trade and Development*, Geneva, Switzerland, PDF, James X. Zhan, 25/06/15, http://bit.ly/1IAdSEj

- 'The Emerging African Middle Class', *African Endeavours*, The Nimbler Group, The Netherlands, web, 08/07/13: http://bit.ly/1Xrl1lh

BearingPoint® Institute

#Digital

About the BearingPoint Institute

At the BearingPoint Institute, our ambition goes beyond traditional 'thought leadership'. We aim to contribute original ideas to the science of business management whilst equipping decision makers with practical advice gained in the field and through our research projects.

www.bearingpointinstitute.com

About BearingPoint

BearingPoint consultants understand that the world of business changes constantly and that the resulting complexities demand intelligent and adaptive solutions. Our clients, whether in commercial or financial industries or in government, experience real results when they work with us. We combine industry, operational and technology skills with relevant proprietary and other assets in order to tailor solutions for each client's individual challenges. This adaptive approach is at the heart of our culture and has led to long-standing relationships with many of the world's leading companies and organizations. Our global consulting network more than 10,000 people serves clients in over 75 countries and engages with them for measurable results and long-lasting success.

www.bearingpoint.com

CONNECT

Follow us on Twitter at @institute_be

Join us on LinkedIn at www.inst.be/linkedin

www.bearingpointinstitute.com

Send us your comments, thoughts and feedback:

editor@bearingpointinstitute.com

www.inst.be/feedback

DOWNLOAD

Read the BearingPoint Institute on your tablet with the mobile app:

iOS version from the iTunes AppStore

Android app on Google Play

Amazon Kindle (Fire only) store

(to guarantee a good reading experience, these apps are for tablets only)