

Research Note

Bridging the Digital Divide - The African Condition

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Abstract – While affecting every part of the world, the effect of the digital divide on the continent of Africa is more pervasive and dire than in any other region. Attempts by external stakeholders are being made and sparks of innovation across the continent have been witnessed in the effort to bridge the divide, however they have proved insufficient in matching the pace of technological innovations in the developed world due to the underlying challenges facing the continent.

The African Manifesto for Science, Technology and Innovation recognizes these challenges and presents a roadmap to a technologically independent Africa. In response to the manifesto's call for enhancements, this research note reviews the key tenets of the document and seeks to augment it further by offering concepts with which the foundational impediments preventing the continent from bridging the digital divide can be overcome.

The digital divide, is understood to be “the gap between those who do and those who do not have access” to digital technology, computers, and the Internet¹ wherein the term access is defined as the motivational, material, mastery and manipulative access to technology. Depending on the discipline or perspective of the subject, the digital divide could refer to the inequality of accessing and using these technologies within a local community or the more global issue pertaining to the gross inequality of accessibility and usage between the developed world and that of developing nations. Due to the broad nature of this concept and the brevity required within this research note, some specificity is required before proceeding. The digital divide as an issue in developed worlds is, more often than not, a concern of the ‘haves’ and the ‘have-latters.’² A problem that, while noteworthy, may be better categorized as digital latency rather than a true divide. The focus moving forward therefore will be on the latter concern, regarding the inability to utilize technology in developing countries to allow for innovation. Dissimilar to the issue of digital latency, the notion of the digital divide in this instance is amplified due to the substantial delay of technologies and its magnified scope.

This research note seeks to address this disproportionate utilization of technology to further innovation in developing countries compared to that of the developed world, a more accurate digital divide. Although the concepts that follow are applicable to regions that could be categorized as ‘developing,’ the continent of Africa will serve as the context for this research note due to the broader impact across the continent as a whole. While acknowledging that Africa is a vast continent, with countries that number almost three scores, the research note will refer to the continent as one due to the reality that the divide spreads across its entire span, with limited exceptions. The continent of Africa, the second largest in the world, is arguably one of the worlds’ least technologically advanced. Currently, there are a minute fraction of countries across the 54-nation continent, which can be considered innovative in terms of technological prowess, however even within those nations innovations are segmented to but a few cities.

Admittedly there are a multitude of factors that gradually led to the continent’s digital divide however two key deficiencies are most prominent as the cause of the increasing wedge. A lack of knowledge or ability to develop technological solutions independently (mastery) and

the insufficient infrastructure with which to create or support technologies (material) has drifted the continent apart from the developed world in terms of technological innovations. In a world where information is power and innovation the tool with which to wield it, the continent can ill afford to continue its reliance on the knowledge and resources of the developed world. According to a United Nations Educational, Scientific and Cultural Organization report “38% of the adult population in sub-Saharan Africa, or 153 million adults, lack the basic literacy and numeracy skills needed in everyday life”³ a number five times greater than that of the United States.⁴ The infrastructural landscape is equally bleak, an Africa Infrastructure Country Diagnostic report commissioned by the World Bank⁵ states that electrical power is the continent’s largest infrastructure challenge, and also noting the lack of telecommunications, poor water handling capacities and, inadequate transportation networks across the continent.

This issue is not novel and is one that external parties looking in have attempted to resolve by implementing initiatives to address the rift. Such initiatives as One Laptop Per Child (OLPC), which sought to deliver subsidized laptops to the continent, attempted to bridge the

divide through aid. However in most cases within the continent, it encountered educational and infrastructural challenges⁶ whereby the devices could either not be electrically sustained or wherein teachers didn't have the necessary skills to leverage the device in the classroom. Another such initiative was an information and communications technology for development (ICT4D) initiative, which deployed 'telecenters' in the hopes of making distance education and telemedicine a reality. However it too encountered similar challenges whereby either the services were used for ulterior motives over the pursuit of knowledge or wherein the infrastructure could not be supported long term.⁷ While these are but a few examples, the trend is one of recurrence for such initiatives deployed to bridge the divide, which while well-intentioned, primarily focus on one deficiency without addressing the other.

When examined closely, the primary misjudgment that affects these initiatives deployed by external stakeholders is the expectation that they can be done without fully understanding the local context within which they will be implemented. This is often the result of an absence of situational awareness or overwhelming assurance in the ability to overcome the educational and infrastructural challenges by

sheer force of will. For instance, deploying computers in regions where there is no established infrastructure, schooling is poor, and similar critical concerns are unaddressed is akin to putting the cart before horse, to borrow a classic idiom. Implementation of such initiatives after first consulting local experts, not necessarily in the field of technology, to either serve as counselors or intermediaries could have served the function of informing the decision on how best to implement the initiative, specific to that community, thereby increasing the chance of success while also potentially providing a socioeconomic boost to the region.

When local solutions are developed to address local problems, the results are quite impressive. For example, Kenyan owned Safaricom, released M-Pesa⁸ a mobile payment system operating outside of the traditional banking system has been touted as a mobile banking catalyst for its unique conglomeration of features. Uchaguzi, a derivative of the Ushahidi platform,⁹ is a crowdsourcing platform that was instrumental in seeing the 2013 Kenyan elections to a peaceful result, an antithesis of the country's previous general elections. Another innovation, which many in the tech industry and even those not on the continent may be familiar with is Ubuntu.¹⁰ The enterprise-

grade server platform developed in 2004 is currently one of the world's premier open source operating systems. These innovations originating from the continent, which have been of significant value to its local population and even beyond, are exemplary not only of the benefits of locally developed technologies but also the potential of African innovation.

Regrettably these instances, while exceptional, are typically isolated and quite infrequent. As mentioned previously, these innovations occur in but a fraction of the continent and are found in only few key locations, such as capital cities and major business hubs of a handful of countries. Unfortunately, some ignore that reality and point to them as proof that this digital divide is merely a further decelerated version of digital latency. To substantiate this claim, they may point to the proliferation of mobile technology across the continent. Touting statistics of mobile phones outselling computers at a ratio of 4-to-1 and indicating that over half of the Internet connections across the continent are exclusively mobile¹¹ as signs of progression. The reality is that while a 65% penetration of mobile across Africa has certainly had a social impact on the continent through the exposure of injustices¹² and mobilization of peoples leveraging social media,¹³ it is

worth noting that the division remains vast since mobile phones inherently bear limitations in the software and hardware of the technology. The benefits of the ICT platform, past the social value that it provides, become isolated to the app builders and service vendors. This therefore only serves to perpetuate the cycle of technological dependency rather than self-sustainability and innovation.

Bridging the digital divide can neither be done by simply infusing technology into the continent nor by the propagation of these technological ‘walled gardens.’ To earnestly bridge the divide, an environment must be developed in which innovation thrives, one that empowers Africans to develop homegrown innovations that address African needs and do so with more frequency and rampancy than currently exists. This is essential, to replace the need for aid infusions by external stakeholders, however well intentioned, that are often either truly unexposed to the needs of Africans or detached from the genuine interests of the continent. It is in the awareness of this need that the *African Manifesto for Science, Technology and Innovation*¹⁴ was developed. The manifesto, declared as “a tool for shaping shared visions about science, technology and innovation (STI) in Africa, for Africans, by Africans, in a multi-lateral dialogue, with the rest of the

world” provides a framework with which African nations and regions can begin to design governmental policies to bridge the divide.

The architects of the manifesto sought to provoke a living dialogue among Africans, who bear the responsibility to bridge the divide, and urge the sharing of ideas in contribution to the document. It is in response to this call that this author seeks to evaluate the manifesto’s potency in truly alleviating the aforementioned deficiencies, following a deconstruction of the suppositions raised, and enhancing the document where necessary in the interests of providing a more robust framework. One which pan-African policies, that create an environment primed for technological innovation, can be established.

With regards to the educational deficiency and the need to develop Africa’s knowledge, especially in the realm of science and technology, the manifesto offers considerable insight into the circumstances that brought about the status quo and provides a broad direction to which Africans must move towards to overcome the shortcoming. Firstly, the Manifesto duly exposes the knowledge dependence in which Africans currently exist, a trickle-down position that has resulted in Africa’s constant race to catch-up. Rightfully noting

that in terms of potential for growth “‘have’ and the ‘have-nots’ will be synonymous with the ‘knows’ and the ‘know-nots.’” It calls for the investment in academia and research to foster innovation while also noting that Africans should strive to create their own unique innovations rather than imitating that of the developed world’s since for implementations to be effective, they must be “fully embedded in Africa’s societies, cultures and human experiences,” a criteria neither the OLPC nor some of the ICT4D deployments could accomplish. While not specifically outlining the manner by which the educational gap can be improved, it does call for an increase in governmental allocation to these interests.

Investing in research and higher education is certainly a step in the right direction, and essentially, this endowment is crucial to continued innovation. However, adjoined to this idea needs to be the focus on improving the primary and secondary school systems which form the cornerstone with which a bridge to span the digital divide can be built. Science, Technology, Engineering and Math (STEM) must be integrated at every level since cultivation during this period is vital in developing an innovative mind. Young minds are especially adept at ‘thinking outside the box’ and in them lies the continent’s hope of

furthering the innovation which this generation shall begin and even overcome challenges which were previously presumed insurmountable. This however relies on proper investment in the schools, teachers and curriculum to build outstanding students. The continent could look inwards at the examples set by Mauritius and South Africa, which have strengthened their investments in education and seeing the socioeconomic boost it brings.

In addition, strategies should also be enacted that seek to expose the innovative amongst us. The Manifesto speaks to the recognition of an “African Head of State or Head of Parliament who has demonstrated strong and visible leadership for [science, technology and innovation]” but explicitly deprecates the awarding of such ‘prize’ to scientists. This however is the first point of contention. Such acknowledgment is instead best designed around the merits of the Nobel Prize, which is awarded to the innovator rather than the facilitator of such innovation. If prizes must be awarded to the Heads, a better strategy would be to base it off separate distinctions and whenever possible awarded to alternate countries, to strengthen its effect. Exposing the continent’s innovators allows for cross-boundary collaboration to further build on

the continent's, currently dispersed, knowledge and expertise in education, innovation, and policy making.

Implementing these means to technological mastery however requires the material to create and support it, and this is an issue, which the Manifesto addressed poorly. While acknowledging that “the human and physical infrastructure” are in “very bad shape,” it proposes that to “build these infrastructures requires devoting consistently a high proportion of the national budget to higher education and improving the incentive structure for scientists and innovators.” This prioritization of higher education and research would be accurate save for the oversight that scientists and innovators would still be hindered by the limitations of the existing infrastructure. Hypothetically, even if Africa's leaders were to ignore the rest of the population and focus on this privileged cluster, an unreliable power supply and scant telecommunications cabling channeling less than optimal data speeds ensures very little, if any, innovative research can be executed.

This should not be misunderstood as a desire for funding to critical research to be diverted or even lessened, it however should be seen as a call for equal investment in the critical infrastructure that this research relies on. Investing in reliable power grids and robust

telecommunications ensures that critical research is maintained while also increasing the well-being of the general citizenry. This also increases the potential for the serendipitous innovation that is possible when the public at large has access to innovative resources. As the Manifesto, in summation, appeals in its “call to action” we must “reject knowledge dependence” and this is not done by simply relying on the ICT benefits that mobile communication brings to the continent but to invest in the physical infrastructure that supports the development of African-focused software and hardware. Appealing for “bottom-up innovation,” similarly, does not occur by awarding Heads of States but rather by empowering the masses to innovate. Ushahidi, mentioned earlier, was developed in an “open Space for technologists, investors, tech companies and hackers in Nairobi.”¹⁵ The continent requires additional investment in such facilities most urgently while the rest of its infrastructure matures.

While the deployment of the material access that makes this technological innovation possible is being implemented quite late, relative to developed worlds, and the mastery of these tools has been primarily scattered in pockets across the continent. Only recently has it been developed in a broader effort. An initial disadvantage, to be

certain, however leaves the continent in a prospectively favorable position to learn from the mistakes made by the technological trendsetters and leveraging that status to leapfrog the technologies of the developed world. Harvard professor, *Calestous Jumas*, states, “Africa’s potential for transforming itself and the world market through emerging technologies lies in the very nature of being a latecomer.”¹⁶ This potential has caught the eye of major technology players in the developed world seeking financial growth. Companies such as IBM, Orange™, and Baidu, to name a few, are all focused on the continent and its untapped population.¹⁷ Africa should examine these interests with caution and effectively assess the benefits and risks of each company before engaging in trade. Negotiations must embody an investment in the growth of the continent and knowledge transference, long term, lest it faces a renewed period of exploitation.

Holistically, the Manifesto presents strong evidence for the need for Africa, as whole, to rely on self-innovation through collaboration if it wishes to bridge the digital divide. The recommendations supplied by the Manifesto require further refinement, as the authors readily confess, but offer an excellent foundation for policy development. The true power of the document is in its potential to stir discourse among

technologists and leaders in the continent, the first and arguably most critical step in building the mastery and material infrastructure Africans need to bridge the divide. This however must be a progressive enterprise that cannot be stalled or derailed. Historically “Africa has numerous initiatives started, stalled, abandoned and gone to waste in the past”¹⁸ however due to the urgency and importance of bridging the divide, this is a practice the continent can ill afford to continue. The onus is on regional African organizations such as the Economic Community of West African States¹⁹ in partnership with pan-African organizations such as the African Union²⁰ to increase oversight and strive to maintain stability across the continent to ensure the interests of the continent are paramount. Pan-African groups must also set broad guidelines and values for which the continent as a whole should strive to accomplish with a vision of where the continent should be in at a certain future target. The regional groups, being more focused and representative of the needs of that specific region can then create more stringent policies based on the pan-African agenda, that encourage continued development of the material and mastery infrastructure that enables innovation. These policies must be accompanied with detailed roadmaps to gauge success throughout its

progression because failure to plan is a plan to fail, to cite the popular adage.

A concluding addendum to the Manifesto is on the application of the over 100,000 ‘highly educated’ African migrants the continent has lost.²¹ As a result of past instabilities, and individuals in search of better education and jobs, the continent has suffered from considerable ‘brain drain.’ The renewed effort for bridging this divide should lean on these experts that have a connection to Africa, not only for their input in policy making but also in directly supporting the continent in its effort to address the deficiencies it is laden with, especially that of mastery.

The expanse is vast, and the project challenging, however it is not impossible. *The African Manifesto for Science, Technology and Innovation* lays out a sound framework with which governmental policies can be developed. As requested by the writers of the document, it has been reviewed for reinforcement where appropriate and reevaluation where needed. The true labor however is yet to be done. Africans, home and away, must unshackle themselves from the physical and psychological confines formed in the colonial era and unilaterally answer this call to service. This digital divide must be bridged with all deliberate speed.

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