FROM DIGITAL DIVIDE TO DIGITAL INEQUALITY: The connectivity paradox

Alison Gillwald (PhD) Executive Director, Research ICT Africa, Adjunct Professor, University of Cape Town, Graduate School of Development Policy and Practice.

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In September 2015, UN Member States and the UN General Assembly formally agreed on the Sustainable Development Goals (SDGs) and set out a global agenda for development based on "economic prosperity, social inclusion and environmental sustainability", known as the '2030 Agenda for Sustainable Development'. The UN's Broadband Commission for Sustainable Development since its establishment in 2010 by ITU and UNESCO, has sought "…to promote the adoption of effective and inclusive broadband policies and practices in countries around the world, with a view to promoting development and empowering each and every individual and society through the benefits of broadband" (2016:1). Since the 2030 Agenda was finalized it has focused its efforts on identifying the ways in which ICTs can be applied to the 17 sustainable development goals and 167 indicators to measure their progress. Despite the references to development there is in fact little engagement with development beyond the rhetoric of its mandate. [1]

The underlying rationale for such ICT and development initiatives, is the expanding body of literature on the correlation between ICT and economic growth and its potential in poverty alleviation that has emerged since the World Summit on the Information Society a decade ago with rise of the information society and knowledge economy on the G8 agenda. [2] Deeply invested in by development banks, UN and aid agencies,

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[1] The Council of the Broadband Commission is constituted by senior representatives from the largest global ICT companies. Besides the couple of representatives from UNESCO, UN Women and an educationist from an African university, there are no development practitioners or researchers. Nor are there of course, anti-development or post development researchers or activists appointed who might take a more critical approach to the instrumental application of ICT to development.

[2] For instance, Flor (2001) identifies an ''indisputable link'' between a higher human poverty index and a lower penetration rate of ISPs, telephone lines, PCs and television sets in Southeast Asia. In contrast, a higher value of ICT indicators was found in countries with lower poverty index. The World Bank in 2002 addressed the issue of ICT as a tool for empowerment and income generation in less development countries (LDCs) in a study investigating the cost effectiveness of radio, telephony and the internet in an LDC case (Kenny, 2002). A study by Obayelu and Ogunlade (2006) describes how ICT could be used for gender empowerment and poverty alleviation in Nigeria, concluding that poverty alleviation is unlikely to be achieved without an appropriate use of ICT. Another study based on the linkages between ICT access and poverty conducted in Uganda in 2007 reveals that access to traditional ICTs is associated with lower incidence of poverty; however, ICT access alone is not enough as a tool for poverty alleviation and needs to be complemented by other measures (Ssewanyana, 2007).

and used extensively to drive communications sector market reforms these are essentially economic growth, not development perspectives. The results of aggregate analysis of indicators of investment and the diffusion of advanced digital technologies that claim that digital investment is strongly associated with reductions in economic inequality (Pepper and Garrity 2015 in Mansell 2017: 3) fail to acknowledge the relative differences between those enjoying the benefits and those that do not, within the countries being compared.

Measuring progress in terms of the economic value in growth indicators that mask inequality will not create the conditions for digital equality required for sustainable development. Like other forms of inequality, which digital inequality largely mirrors or amplifies, inequality will only be addressed by targeted interventions that redress the underlying factors of inequality.

As Castells and Himanen (2016:1) point out, the conditions in which development operates have significantly changed in the global information age, "…a historical period characterised by the technological revolution in information and communication, the rise of the networking form of social organisation, and the global interdependence of economies and societies". In his book with Pekka Himanen on *Reconceputalising Development in the Informational Age*, Castells moves from a fundamentally different assumption from that which underpins logic of the SDGs. He assumes that the increase of material wealth does not necessarily lead to greater wellbeing. This short paper builds on this understanding of development. Highlighting the underlying assumptions of dominant reform and international best practice in relation to digital development from a developing country perspective and briefly explores what alternative policy and regulatory strategies might address the challenges of digital inequality.

Innovation and digitalisation for development

With the rise of broadband, over the top services (OTTs) and applications and the emergent platform- and sharing economy, the assumption that digital innovation will, rather than can, improve the lot of humanity informs most of the policy frameworks of multilateral agencies, development banks and many research institutes concerned with development. Epistemic communities of bank advisors and consultants that come with bank loans or tied aid to developing countries reinforce the dominant conceptions of the relationship between technology, innovation and the economy as inexorable, complex, adaptive and self-correcting. Reform measures based on international 'best practice' seeks to stimulate economic competitiveness and the commercialization of digital technologies in order to catalyse economic growth and by its internal logic, economic inclusion.

This instrumental approach to technology and development derives primarily from neo-classical economics where technological innovation and liberalisation of markets are understood from a policy perspective to only require the extension of markets to reach more people more rapidly. Complementary

to the neo-classical economic perspective is the science, technology and innovation tradition. As Mansell (2017) points out this school of thought is more concerned with the complex factors that give rise to creative destruction of dominant companies by entrepreneurial innovation. In both traditions innovation is seen as "essential feature of the processes in the economy that generate economic growth, productivity gains and improved social welfare." (Mansell 2017:3) – though the latter is seldom actually assessed in this literature or practice.

From this perspective policy intervention is generally seen as the death knell of innovation and progress. Indeed, interventions by institutions that are not as nimble as these complex adaptive systems that make up the Internet can undermine innovation and this presents a major challenge for public interest outcomes in developing countries which generally lack the institutional endowments to regulate effectively in the public interest. The policy default is that as innovative technologies have potential, they should be rushed to market on the basis of public and private investment in research and development. The need for policy intervention to deal with the shocks associated with innovations in areas of automation, artificial intelligence, algorithm computation and big data analytics and machine are not entertained in the digital economy policy that has emerged from these dominant traditions (Mansell 2017).

Associated with the STI area of research and practice another subfield that emerges in this discourse and applied instrumentally (though often within utopian conceptions) to development challenges is in the area of computer science and information systems and that has become known as ICT for Development (ICT4D). Even more technologically deterministic than some of the STI innovation and diffusion research, ICT4D research generally focuses on narrow applications of ICTs to different development issues from health to education and rural development. Generally, little attention is paid to the socio-economic dimensions of technology in development, and even less so the political dimensions. Although ICT4D characterises itself as contributing to development the instrumental application of technological solutions generally only assesses the technical merits of the solution in address the particular problem, not whether the solution has contributed to well-being, reduced inequality or influenced power relations[3].

This is not to suggest that technological innovation and liberalisation of markets, particularly the advent of mobile phones, have not revolutionised communications with significant impacts on the lives of the poor across the global South. There is sufficient evidence to indicate that commercialised, competitive mobile services delivered more to the poor over the last two decades than a hundred years of public provisioning under conditions of neo-colonial underdevelopment did. The rise of mobile Internet offers considerable potential to developing countries across the globe. But how has and can this contributed to development and has it reduced inequality? Paradoxically, digital inequality has become amplified. Even though more

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[3] The weakness in both practice and in the near absence of theory in the field has been highlighted in recent more critical accounts of ICT4D. Kentaro Toyama (2015) calls for a more people-centric view of the value of ICT to development, highlighting the failures of many ICT development initiatives as does Tim Unwin (2017) tries to draw the connection between theoretical conceptualisation and practice action

people are connected to the Internet, as those who have the resources to access the Internet fully make more productive use of it.

Technological innovation and economic liberalisation of markets have indeed caused a fundamental shift in the global economy in the past four decades, dramatically affecting power relations and productive forces at global, national and local levels. The outcomes of such processes of globalisation are highly uneven. While some nations and some interests within nations are able to harness the benefits of these innovations, others are not. In today's information era (Castells, 2005), information generation, processing and transmission critically affect who benefits from the transformative potential of information societies, as information and knowledge are central to human freedom and development (Sen 1992 , Benkler, 2003). This following sections highlights some of the issues of digital inequality on which public interest policy should focus and that are often obscured in policy preoccupations with connectivity at the expense of other bottlenecks to Internet diffusion, aggregated global and national data that masks intersectional inequalities and priority on creating the conditions for optimal digital innovation and appropriable returns on investment above public and social goods.

Digital inequality

The technological determinism of such positions is reflected in the SDG focus on the digital divide and the use of ICTs to deliver on other SDG goals. The divide has been conceptualised, measured and targets set in relation to 'connectivity'. The policies and strategies to bridge it focus primarily on supply-side and infrastructural strategies aimed at closing the "digital divide" by "connecting the last billion", to use the mantra of the multilateral agencies, donor organisations, special interest foundations and NGO that have rallied to this call.

Although the focus on connectivity uses the language of inclusion, this is understood to be 'solved' through connectivity. There is little attempt to locate ICTs in the broader context of social and economic inequality. Connectivity alone does not reduce information inequality. While it is a necessary condition for digital participation, it is not sufficient to ensure that all people are able to exercise their rights as citizen, consumers and producers equitably. In fact, what is arguably the central policy challenge as we move from voice to data services and beyond to Over the Top platforms, the Internet of Things (IOTs) and Artificial Intelligence (AI) – is that as we increase ICT access and use so digital inequality is amplified.

Even where we have strong supply side interventions in developing countries with over 90% mobile coverage and even 50% of the population owning smart devices, in many countries we cannot reach the 20% penetration necessary to reach the critical mass required to enjoy networks effects or positive multipliers associated with economic growth and wellbeing (Gillwald 2017). There is evidence that the real gains are associated not only with levels of connectivity but the intensity of use, which reflects not only the extent of time online, though this appears to be a good indicator too, but the range of services used and the activities undertaken with them. Generally, the data or public statistics to undertake such analyses are not even available in most African countries.

Affordable access

The advent of mobile broadband may have driven Internet uptake in Africa, but over 75% of Africans still lack access to the Internet and are largely untouched by the digital revolution and its potential dividends (ITU, 2016; World Bank, 2016:6; Broadband Commission, 2016). Even African countries with favourable ICT environments struggle to reach the critical mass of 20–30% broadband penetration believed to trigger network effects associated with economic growth, job creation and innovation (Koutrompis, 2009).Marginalised communities, including women, remote populations and people with disabilities face greater challenges to accessing the Internet. With more women than men amongst the poor (Deen-Swarray et al., 2012) Africa has the largest regional gender gap (25%) between men and women accessing the Internet (ITU, 2016). Barriers to access for women and other Africans who are not connected to the Internet are multiple and interrelated, mirroring the socioeconomic reality of offline conditions (for example, UN Broadband Commission Working Group on the Digital Gender Divide, 2017; Ya'u & Aliyu, 2017; Deen-Swarray et al., 2012; GSMA/LIRNEasia, 2015; APC, 2015; A4AI, 2015).

Lack of affordable access remains a major barrier to more equitable use of communications services in Africa . Arbitrary targets and measures based on average communications cost or use plans as a percentage of GNI deployed by well-intended foundation research or unreconstructed global indicators for communications conceal the extreme inequalities behind these averages, especially in countries with some of the highest gini-coefficients in the world do not provide the adequate demand side evidence base for policy makers, in fact they are misleading.

Supply and demand side analysis made possible by the evidence base built by Research ICT Africa over the last decade shows that in even in countries where competitive markets have been regulated relatively effectively, and prices are close to cost, the poor, who constitute the vast proportion of the population, can still not afford to use the Internet in any sustained and meaningful way based on current technology and market models. Existing policies will have to change and sustainable ways of aggregating demand to complement current paid access more comprehensively explored.

From consumption to production

Further, strategies that target affordability purely from a consumptive perspective as have those of development banks and regulatory interventions over the past two decades will not redress digital inequality on their own, either. Strategies need to shift from narrow technological deterministic conceptions that characterise the digital divide discourse that focus on access and consumption alone, to broader notions of digital inequality. A demand-side value of infrastructure development recognises the value generated by information infrastructure as inputs into a wide range of productive processes. The outputs not only produce economic value but public and social goods that benefit society (See Frichmann 2004). As we have shifted globally from public utility to private provisioning of communications infrastructure we have increasingly ignored these beneficial outputs in our policy, focusing only on outputs with appropriable returns. We need to shift this consumptive lens to one that includes production, and from technological

deterministic policy approaches to a rights-based understanding of the role of internet if critical resource management is to be transformative**.**

Similarly, the emergence of innovative production practices globally are reshaping economies, introducing opportunities and challenges for African decision-makers. The digitisation of work, for example, enables job seekers in poor countries to enter labour markets in previously inaccessible rich countries (World Bank, 2016). Virtual labour mobility can raise incomes by decoupling workers from the geographical constraints of local labour demand, but also erode established labour protection standards and workers' rights, especially for women (for example, Nakamura, 2017; Gurumurthy & Chami, 2017). There is already evidence that online labour platforms exacerbate the frictions that result in inferior labour outcomes for women, ethnic minorities and other disadvantaged groups (Galperin & Greppi, 2017).

Human Development

Even where connectivity and affordability issues are being address on a significant scale evidence increasingly points to human development being the primary challenge to realising digital equality. Public policy for Information and Communication Technologies (ICTs) cannot have a narrow sectoral focus any longer. ICT cut across modern economies and societies. For purposes of social and economic inclusion policy formulation needs to deal with the Internet as a general-purpose technology, a cross-sectoral issue, necessary for effective citizenry and economic engagement.

Castells and Himanen (2016:6-7) highlight the reciprocal relationship between informational and human development. Resources obtained by the process of informational development are critical for the sustainability of human development and it in turn feeds back into informational development, "thus enhancing the productivity of the production process characteristic of this mode of development. This is because informational development ultimately results from the increasing capacity of humans to create and innovate while reducing negative externalities in the ecosystem and in the social system."

In modelling undertaken by Research ICT Africa, on nationally representative ICT access and use surveys across 12 African countries, sex-disaggregated descriptive statistics confirm that women and men are not equally able to access and use ICTs. Although men and women now have similar ownership of mobile phones women generally have less access to ICTs and use them sub-optimally and this increases as the technologies and services become more sophisticated and expensive. Modelling of the data however demonstrate education and income are the major factors determining ownership and use of ICTs. The positive and causal relationship between education and income further points to the importance of ensuring equity in education between boys and girls and women and men (and therefore job/income generation opportunities).

To redress digital inequality far more attention will need to be paid to demand stimulation measures. Ensuring affordable access is a necessary condition but even where enabling environments conducive to investment have been created for the extension of networks, the limited demand-side data available in Africa illustrates how the socially and economically marginalised – particularly those at the intersections of

class, gender, race or ethnicity – are unable to harness the Internet to exercise their political, social and economic rights. Until fundamental inequalities off-line are addressed they will be replicated and indeed, amplified on-line.

Rights and wrongs

Universal affordable access is also a precondition for the other rights of freedom of expression and right of information in the information era. But redressing digital inequality extends beyond connectivity to affordable services. Relevant and local language content, content unconstrained by algorithmic curation and reasonable quality and latency are critical to citizens equally exercising their fundamental rights in a modern economy and society.There remains a lack of relevant data to understand context-specific barriers that are denying large numbers of Africans access to the Internet. This denial prevents them from exercising not only their rights to freedom of opinion and expression, but also a range of other human rights (La Rue, 2011). Yet a growing number of governments across the continent are curtailing citizens' rights to access and use the Internet in a private, safe and secure way.

A related challenge is Africa's readiness to implement cybercrime and security laws, which form an integral part of its general digital readiness, but which are not premised on the protection and promotion of trust and fundamental human rights. Cybersecurity concerns, in response to the diffusion of mobile connectivity, have often been addressed in concomitance with privacy and surveillance implications in Africa, and are largely overlooked. While development rhetoric is often deployed to promote regulation and surveillance practices, there is a limited understanding in Africa of the potential harm that even anonymised data-driven surveillance might pose for women and other marginalised groups (Kovacs, 2017; Ditmore, 2016; Hossein & Nyst, 2013).

Internet Governance

As the Internet becomes more central to the information society, the diversity of stakeholders and plethora of platforms involved with and in its governance, have expanded dramatically (Calandro Gillwald and Zingales 2013). Mixed and often disappointing outcomes in several areas of Internet governance are symptomatic of a fundamental clash of cultures between telecommunications, nation-state and multilateral systems of governance, with the non-state, often multi-stakeholder governance arrangements that characterise Internet governance (for example, Hofmann, 2016; GCIG, 2016; Raymond & DeNardis, 2015). But, as a result of being unregulated historically and libertarian and individualistic in its dominant conceptualisation there is no tradition of public interest regulation or ensuring public interest outcomes in Internet governance.

The dynamic and complex systems that have emerged from these technological and economic developments require equally adaptive governance (Bauer & Latzer, 2016). Over-the-top services, artificial intelligence and the Internet of Things have the capacity to bolster economic inclusion and sustainable development (for example, UNGA, 2015) or to reinforce existing patterns of exploitation. What happens to

this potential depends on the ways in which the information society is governed, and whether it is curated as an open, secure and most importantly, trusted space (Smith & Reilly, 2013; Mueller, 2010).

The growing pervasiveness of cyber technologies has not only placed increasing strain on cyber governance structures, but has also produced significant governance vacuums. Without overt governance, regimes that not only ensure affordable access to citizens, but also safeguard their rights, those least able to defend their rights will become victims of commercial and political exploitation. One example is search platforms, which play an ambiguous role in both promoting and stifling digital rights, such as freedom of expression and privacy. Driven by commercial imperatives, search engines are arguably among the most important gatekeepers in today's digitally networked environment (Gasser, 2006).

Libertarian notions of freedom and openness that underpin the Internet and liberal democratic assumptions of international law have clashed with offline realities of national control and coercion, such as Internet shutdowns, to manage dissent. African countries with neither the institutional capacity nor in some cases the political will to engage in global governance or to establish national systems of digital security and trust required for digital inclusion and economic growth are likely to remain mere passive consumers of the Internet that are subject to commercial exploitation by platforms and other global stakeholders.

Concluding comments

To get Africa connected will require doing things differently from what we are doing now. We need to explore alternative policy and regulatory interventions that do not assume mature, competitive, effectively regulated markets operating within guaranteed human rights frameworks. Recognizing the constrained institutional endowments and resources generally that exist in African countries, we need to identify multiple strategies across the ICT ecosystem that will enable Africa to reach the critical mass and intensity of use needed for the network effects associated with broadband expansion and to have the digital skills and awareness to exercise their rights online.

While cyber policy decision-makers from the global South must find ways of participating more effectively in global forums of Internet governance, it is equally important for them to navigate the local spaces available for addressing and raising awareness of the various challenges to leveraging digital opportunities for nations in an equitable and just way. Global governance system based on assumptions of liberal democracy, and effectively regulated, competitive markets and multistakeholderism are bound not to find traction where their conditions do not exist in practice in nation states. The disjuncture between offline and online rights have to be reconciled for the Internet to be harnessed for development.

While highlighting only some of the challenges facing African cyber policy makers and researchers, the challenges illustrate the overarching need for promoting trust in the developmental potential of evolving cyber realms. This will require understanding the very different political economies, institutional capacities

and human capabilities from the countries and regions from which existing Internet governance and cyber law have emanated.

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