Development Implications of Digital Economies

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Digital Enterprises in Africa: *A Synthesis of Current Evidence*

RICHARD BOATENG, JOSEPH BUDU, ALFRED SEKYERE MBROKOH, ERIC ANSONG, SHEENA LOVIA BOATENG & AUGUSTUS BARNNET ANDERSON

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Richard Boateng[1], Joseph Budu, Alfred Sekyere Mbrokoh, Eric Ansong, Sheena Lovia Boateng and Augustus Barnnet Anderson

University of Ghana

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Abstract

The digital economy has become a global phenomenon and Africa has not been left out. However, though there is much potential, little is known about the digital enterprises that underpin the digital economy in Africa. This paper, in response, presents a synthesis of available practice-based and academic literature to establish what is known and uncover areas that need further research. This study found that there is a paucity of academic research on digital enterprises in Africa; at least, based on a narrow definition of "digital economy". However, there are industry reports and anecdotal evidence of both formal and informal digital enterprises.

Formal digital enterprise embraces firms in telecommunications, digital services, software and IT consulting, hardware manufacturing, information services, platform economy, gig economy and sharing economy. The informal sector embraces informal production activities like repair of digital devices, organising online training sessions, and individual entrepreneurs who leverage over-the-top services like WhatsApp and mobile money and cryptocurrency services to operate virtual businesses. There is also the growing dark economy which exists in several forms including cybercrime, digital piracy, SIM box fraud and the adult economy. These examples demonstrate some of the opportunities and threats for Africa in the digital economy: critical measures beyond regulation may be needed to address and leverage them.

To end this paucity of academic research, some research areas are suggested. These areas include but are not limited to: tracing value creation amongst digital enterprises in Africa; studying the career trajectories of people engaged in the gig economy; studying the motivations of the companies that engage the services of digital enterprises; exploring the impact of cryptocurrencies and mobile money services in digital enterprises; country and cross-country case studies of the various digital platform and digital enterprise issues; and the generation of lessons and best practices for African countries with growing digital economies.

[1] Corresponding author: richboateng@ug.edu.gh

1 Introduction

Digital technologies like Internet applications and mobile phones are changing the nature of work, business and organisations. Their extensive embeddedness in the economic exchange of goods and services is also creating digital economies – a phenomenon with growing importance. The digital economy is "that part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services" (Bukht & Heeks, 2017). For the global South in particular, the digital economy even though usually only accounting for 3 percent to 4 percent of gross domestic product (GDP), has a much larger impact when firms use it to spur competition and productivity in traditional sectors, such as retail, banking, and manufacturing (Cory, 2016). Available statistics suggest that the mobile ecosystem alone contributed US$8.3 billion to the Nigerian economy and 7% of Mali's GDP consists of the digital industry (da Silva, 2014). These contributions will only increase as many Internet- and mobile-based business solutions enable businesses to move into the digital economy (GSMA, 2015; Matinde, 2016). Despite these successes, it seems that the real beneficiaries are the large corporations in the global North as compared to workers in the global South. Generally, even though 37 million new and stable wage-paying jobs have been created over the past decade in Africa, only 28 percent of the continent's labour force holds such positions (Fine et al., 2012, p. 12). The same could be said about the structure of the digital space. Thus this paper seeks to explore digital enterprises in Africa. Specifically, it presents a synthesis of available practice-based and academic literature to uncover areas that need further research.

This paper has seven sections; the first section presents the background and purpose of this synthesis paper. The second section contains information to paint the digital economy landscape of Africa. The third section describes the methodology used to write this paper. The fourth section is a discussion of available evidence about the various formal digital enterprises in Africa. The fifth section discusses business models that characterise informal digital enterprises in Africa, followed by the sixth section which is a discussion of possible future research areas about Africa's digital enterprises. The seventh section is a conclusion and summary of the main points from the evidence presented.

2 African Digital Economy Landscape Review

Africa's digital economy seems to be primarily based on its mobile market. Africa's mobile market has huge potential for growth and is second only to that of the Asia-Pacific region (Abba-Goni & Bidan, 2016). By the end of 2015, nearly 557 million people had a mobile phone subscription, that is 12% of the world's total individual subscribers, generating 6% of global revenue (Abba-Goni & Bidan, 2016). The top countries in terms of mobile phone penetration and the digital economy in general are Nigeria, Egypt, South Africa, Ethiopia, Kenya and the Democratic Republic of Congo; in addition to others like Mali, Gambia, Gabon and Botswana (Bonorchis, 2016; Rice-Oxley & Flood, 2016). Most of the top countries are from the sub-Saharan region which has been the fastest-growing region in the world for mobile telephony in recent years (Fawcett, 2015).

A related development is the growth in Internet penetration which then fosters the development of the African digital economy as evidenced in the top nations e.g. Nigeria has

48.8 percent internet penetration (Internet World Stats, 2017). The relatively high Internet penetration may be a result of the combination of mobile telephony and Internet ("mobile Internet") which can bypass poor fixed-line penetration on the continent (Malakata, 2015). The investigators of the Digital Evolution Index point out that African countries have a "rapidly increasing proportion" of people with Internet access, high cell phone penetration rates and a well-developed telecommunications network (Africabranding, 2015). In Nigeria, Facebook has more than 15 million monthly active users (Sage, 2016). Another reason for high Internet penetration is the reduction in mobile and broadband tariffs, making affordability and related adoption increase, as is happening in South Africa for instance (BrandSouthAfrica, 2016; Dahir, 2016). The top ten websites that Africans frequently visit are all social networking and/or dating sites, a number of which are Africa-specific: Africanzone, Blueworld, Africanplanet, Afroterminal, Bongoline, Yookos, Twitter, LinkedIn, Facebook, and MXit (Sheree, 2013). Such a condition tends to create a conducive environment for technology companies both inside and outside Africa, resulting in an ecosystem which contributes significantly to the continent's economies. Nigeria's digital space for instance contributed US$8.3 billion to the economy in 2016, representing 1.4% of GDP (Matinde, 2016).

There are several other effects of these digital activities on various aspects of the economy. Whilst some organisations are retrenching and reducing their staff numbers (Bonorchis, 2016), some routine jobs will become automated (Dahir, 2016), and create the need for African governments to deliver citizen-centric services with innovative solutions (Abdella, 2016). Such innovative activities have already begun to spin formal and informal digital enterprises across the region. The informal enterprises include smartphone repairs in markets and souks, whilst formal enterprises include mobile payments aggregators, such as Selcom in Tanzania, Cellulant in Kenya, Zambia and Botswana, and eTranzact in Nigeria and Ghana (Fawcett, 2015). More such formal enterprises are springing up in several tech hubs emerging in Lagos, Nigeria and Nairobi, Kenya and in 2014, African start-ups raised around £200 million in venture money, proving that a solid digital infrastructure can fuel tech savvy and success hungry individuals (Lamb, 2016).

The development activities of such enterprises have resulted in a wide range of mobile applications although some are sometimes inconsistent with the actual needs of a large and disadvantaged proportion of the population. For example, only few of these applications are available in the customers' regional and national languages (Bonorchis, 2016). Nevertheless there are many useful mobile apps that have emerged over time. Giraffe, for instance is an on-demand recruitment app in South Africa which has attracted over 200,000 jobseekers since launching in 2015, placing thousands of them with hundreds of South African businesses (Diptesh, 2017). By far, the most downloaded apps by category are social networking, gaming, instant messaging, banking/finance, education, health & fitness. Striking examples – a number of which are developed in Africa – include WumDrop, iROKOtv, Esoko, HelloFood, Leti Arts, Safaricom M-Ledger, Vula Mobile, EtCal, 2Go, Uber, and Ramlocator (Africa.com, 2017). Among these, Ugandan, Ghanaian and Kenyan millennials have more game and entertainment apps downloaded on their smartphone than any other application (Wangari, 2017). Some other popular useful apps include Find-A-Med which is a location based mobile application that allows users to find the closest health centre; PesaCalc, which streamlines the use of mobile money services; SnapnSave – a shopping app that gives cash back on your everyday grocery purchases wherever you shop

in-store; and Slimtrader which allows users to perform e-commerce transactions such as buying or paying for goods and services via SMS or WAP, effectively shopping by text messages (Linington, 2015).

The several existing and upcoming initiatives are encouraging the development of more mobile apps, which would hopefully meet the specific needs of Africans. Most of these initiatives are organised competitions that seek to bring out the innovation in young African developers. There are stand-alone competitions like the Kipokezi Apps Challenge in Kenya (Heim, 2012), Jobonology Mobile App Challenge in Malawi (Gondwe, 2015), MTN Business App of the Year Awards in South Africa (MTN, 2016), the Digital Changemakers in Tanzania (Mulligan, 2016a); and those organised as part of digital conferences like Mobile West Africa's app developer competition (Jackson, 2015). Encouragingly, some government agencies seek funding to organise app development competitions like The Africa Mobile App Challenge in Kenya (Birkelo, 2015).

The impact of policies on the digital ecosystem cannot be overemphasised even as the GSM Association (GSMA) which represents operators, manufacturers and other producers stresses the importance of a new regulatory framework for the digital ecosystem. Encouragingly, there are several regulatory bodies in charge of implementing policies for the digital space. These include the Kenya ICT Authority, La Société Nationale de Développement Informatique (in Ivory Coast), National Information Technology Development Agency (in Nigeria), and the National Information Technology Agency (in Ghana). The presence of such bodies seems to encourage collaboration amongst various stakeholders to achieve set targets. For instance, government departments in countries like South Africa are working together with social partners and the private sector, through smart partnerships, to enhance connectivity efforts, up-skill citizens, and consolidate e-government and related e-strategies. The resulting e-services are based on realising the objectives of a Broadband Policy which seeks to create digital readiness, digital development, digital future and digital opportunity. Some of the objectives of the Broadband Policy are to develop a comprehensive Digital Entrepreneurship programme aimed at supporting all businesses to embrace digital technologies and exploiting social media; and creating opportunities for young people to innovate (DTPS, 2017).

We can find another fascinating policy in Nigeria which has also tried to increase its participation in international digital space by requiring foreign information and communication technology (ICT) companies or multinationals to maintain at least 50% local content by value either directly or through outsourcing to local manufacturers engaged in any segment of the product value chain, by the end of 2015. "The guidelines are intended to help restructure and develop a strong indigenous ICT industry by addressing three core areas as follows: driving indigenous innovation; developing the local ICT industry; and establishing intellectual property regulation and protection standards" (Matinde, 2016). Mali also has the Digital Plan 2020 which seeks to reorganise its digital economy, boost economic growth and create jobs (da Silva, 2014). Specifically the plan intends to expand access to digital networks and services, develop production and digital content, diversify digital use and services, strengthen the existing legislative framework, and develop human capital and the local digital industry. To add to the above, Rwanda aims at becoming the ICT hub in East Africa and has drafted short- and long-term ICT policies. For instance, the Rwandan government is building the Kigali Innovation City on the outskirts of Kigali to house the Rwanda campus of Carnegie Mellon University, in addition to domestic and global ICT

companies, such as Ericsson, research centres and universities (CMU, 2016). Overall, we see that the leading digital economies are such because of their pro-innovation public-policy agendas (Osiakwan, 2016).

Private entities are also pursuing certain policies driving the continent's digital economy. For example, Vodacom in South Africa has zero-rated job sites like Giraffe so that users can use them free of data charges. Facebook's Free Basics has also done same with Jobberman so that job seeking and application can be undertaken at low cost. There are also free wi-fi initiatives, such as Project Isizwe in South Africa, and Rwanda's Smart Kigali initiative (Diptesh, 2017). Similarly, US$150bn dollars of private investment is to be pumped over the next 10 years into connecting another 130 million Nigerians to electricity as a way of solving one of the most critical issue holding back Africa's digital development (Rice-Oxley & Flood, 2016).

Unfortunately, some policies and actions in other countries pose threats to the development of the digital space. For instance, taxes are having detrimental effects on the development of mobile services in countries like Democratic Republic of Congo, Ghana, Tanzania and Tunisia, notably (Bonorchis, 2016). Till date, there are high costs of licensing and taxes on imports such as mobile phone accessories (cables, headphones, cameras, flash disks) (Abba-Goni & Bidan, 2016). In Cameroon, several government promises about developing the digital space remain unfulfilled. Interestingly, there was Internet blackout in two of the country's English-speaking regions massively affecting the finances, advancement and morale of the once flourishing tech businesses in Cameroon's 'Silicon Mountain' (Atabong, 2017). Ghana tends to have a similar story. There is a 20% tax on the import of smartphones and the Government of Ghana is yet to enforce its 2015 national budget plan to remove this tax. The Communication and Service Tax Act, 2008 (Act 754) also imposes a further 6% charge for any communication service payable by consumers of the service. In future, it hoped that governments would work on promoting digital enterprises and electronic services by reducing or removing technology-related taxes; simplifying regulations for mobile/digital payments; moving toward mobile/digital public services; and investing in education programmes for digital technologies (such as software engineering) (Handjiski, 2015; Boateng, 2016).

3 Methodology for the Synthesis

The purpose of this paper is to present a synthesis of available practice-based and academic literature to uncover areas relating to digital enterprises in Africa that need further research. To this end, the paper started with a literature search in Google Scholar to have a general sense of available literature sources. The search terms used were "digital enterprise", "digital firms", "electronic enterprise", and "electronic firms". These terms generated results that pertained to the global North therefore, "Africa" was added as a keyword. Yet, the results were no different. The same approach was used in searching for articles in specific journal databases such as the AIS Digest, Emerald Insight, JSTOR, EBSCO Host, Wiley Online Library, Sage, and Science Direct. Similar to the preliminary results from Google Scholar, the results pertained to the global North. The few relevant studies – when we added "Africa" as a search term – related to electronic business, mobile commerce,

mobile payments and electronic commerce. Understandably these are well-developed research areas in this context. Due to the need to stay in the *narrow definition* of the digital economy, all such papers were discarded, or used as peripheral references. Overall, these search results suggest a serious lack of academic literature on African digital enterprise, and highlight a need for more research on this topic domain.

Nevertheless there were some relevant industry literature available on various websites and online report repositories. Such literature (like GSMA, 2016; Osiakwan, 2016; Raja, 2016; Sage, 2016) proved very valuable and insightful to the synthesis. These were discovered by using the same search terms in the Google search engine. Further, the specific aspects of the digital economy were also used as search terms. Thus we used terms like "telecommunications Africa", "digital services Africa", "platform economy Africa", "gig economy Africa, and "sharing economy Africa". The resulting discussions are presented in the subsequent sections.

4 Digital Enterprises in Africa – Formal

With references to the core and narrow scope of digital economy, this synthesis should focus on the digital (IT/ICT) sector – hardware manufacture, information services, software and IT consulting, and telecommunications – and digital services, platform economy, sharing economy and gig economy (Bukht & Heeks, 2017, p. 13). However, as noted, research on their enterprise aspects from an African context is scarce. We are therefore somewhat forced to expand the discussions with some issues from the digitalised economy: use of digital technology in the wider economy. Such expansion is necessary because the digital economy in Africa, despite its economic contributions, is rather limited in its distinctive development, hence still rather unweaned from traditional economic activities. Further, the scarcity of research literature begs the inclusion and discussion of practitioner research and reports mostly published online, and even anecdotal and experiential evidence for a thorough understanding of digital enterprises in Africa. In addition, it is worth noting some overlap between enterprise activities in the core digital sector, and the *narrow* digital economy. For instance, there are telecommunications companies that offer digital services, and bolstering the platform economy. The enterprises to be considered here are those to whom ICT is *extensive* i.e. the underlying business activity only exists because of ICTs (Heeks, 2017). To have a clearer understanding of the enterprises, their core activities and business models would be described, and further categorised as either formal or informal (Deen-Swarray, Moyo, & Stork, 2013). The current section will study formal enterprise, leaving discussion of informal to the following section.

4.1 Telecommunications

The first formal enterprise sub-domain to be discussed are the many telecommunications enterprises on the continent. The main players are MTN, Vodafone, Safaricom, and Airtel (Curwen & Whalley, 2011). MTN has operations in twenty-two African countries; Vodafone is in nine countries, Airtel is in twenty-six countries, and Safaricom is in seventeen. Amongst these, the top mobile network operators ranked by the number of subscribers are MTN, Vodafone, MobiNil, Vodacom and Glo Mobile (Blycroft, 2014). These telecommunication companies traditionally offer voice and text communication services to subscribers. They earn revenue from subscribers making phone calls to other subscribers whether on-net or

off-net (or even international). These traditional services are being augmented with new ones such as phone book backup, mobile money, and insurance products. Telecommunication companies also provide mobile Internet connectivity for both individual and corporate subscribers. From television and radio commercials, we see some networks analysing the communication needs of corporate entities, and providing tailor-made solutions for them. Some like MTN have built a data warehouse and accounting software for rent to interested entities (see www.mtneasyaccounting.com).

4.2 Digital Services

The second set of formal enterprises are those firms which are digital services developers, some of which are in collaboration with or working for the telecommunication operators. The provision of digital services somewhat lies beyond the scope of telecommunication companies, hence they sometimes contract these developers for such services. Some of the services these developers offer include mobile applications for smartphones, and voice- and text-activated applications (Budu & Boateng, 2015). These enterprises create mobile services for electronic payment, social networking, instant messaging, gaming and entertainment and electronic banking. The top games developed in Africa include Toxic Bunny, The Harvest, Bladeslinger, Pocket RPG, and Snailboy (Linington, 2014). Further, other firms also provide web hosting or cloud services for African firms. Some of the notable web hosting enterprises are IBS North Africa (Morocco), Web4Africa (Ghana), Domains Africa Technologies (Kenya), and WhoGoHost Limited (Nigeria).

Available data also suggests a mix of digital enterprises in the top thirty IT companies in Africa (Koutonin, 2011). This mix includes M-NET – a pay television service, Grintek – which supplies electronic systems to telecommunication companies, Sage Group – which supplies high end business management software. There are other digital service-oriented firms engaged in digital or online marketing e.g. RDM Africa (Nigeria), Wild Fusion (Kenya), Dragon Fly Digital (South Africa), and CliqAfrica (Ghana). In addition, there is a top list of music streaming mobile applications which includes Simfy Africa (South Africa), Spinlet and Las Gidi Tunes (Nigeria), Tigo (Tanzania/Ghana), and Mdundu (Kenya). One thriving digital service is that of financial technology or FinTech. There is an ecosystem of FinTech startups in Africa providing various solutions around payments and money transfer. Some of these include Biskoko, IMB, Mujuru, PayDunya, Kobocoin and the famous M-PESA (Kate, 2016).

4.3 Software and IT Consulting

The third set of formal enterprises are involved in development of computer software. The software ranges from desktop applications to enterprise-wide systems. Examples of these enterprises are Africtek which is a consulting company that builds computer software and is based in Togo and Ivory Coast; Infosage Ghana Limited and theSOFTtribe Limited also provide IT solutions in Ghana, and Caseray Solutions, a web information technology company that operates in Nigeria and provides web development services including web animations and web advertising (Koutonin, 2011). In addition, there are some enterprises that are resellers for *imported* software. The resellers also sometimes customise the software for local customers, and offer training and after-sales support.

4.4 Hardware Manufacturing

The fourth set of enterprises is the hardware manufacturers. It seems that this set is quite underdeveloped on the continent. Most of the enterprises to which we could attribute this

business model are more engaged in assembly. Examples of such companies are Omatek (Ennin, 2007) and rLG (Yeboah, 2011); both in Ghana and Nigeria.

4.5 Information Services

Fifth, the provision of information services is dominated by traditional radio and sometimes television broadcasting enterprises. These companies extend their news and entertainment offerings on dedicated websites some of which are separate business entities from the traditional broadcasting organisation. However, there are some information services entities that either do not have a brick-and-mortar arm, or even a physical presence on the continent even though they may specialise in hosting and providing Africa-related information. Examples are given in Table 1.

Type of Information	Example
General news about Africa	http://www.bizcommunity.com www.africanews.com www.theafricareport.com www.allAfrica.com
Technology news	http://www.itnewsafrica.com www.biztechafrica.com www.afriqueitnews.com www.siliconafrica.com
Africa business news	www.africanbusinesscentral.com www.africanbusinessmagazine.com www.venturesafrica.com
African entertainment news	www.ghanaweb.com www.sunnewsonline.com www.informationnigeria.com

Table 1: Some Top News Websites in Africa (source: Google and Alexa rankings)

4.6 Platform Economy

The presence of platform enterprises in Africa suggests a new business sector for the continent. Current platforms seem focused on solving problems that hold the potential to accelerate the development of dynamic next-generation markets. However, the sector faces constraints like poor infrastructure, limited banking institutions and wary customers (David-West & Evans, 2016). The platform economy manifests in various industries such as social networking; internet auctions and retail; online financial and human resource functions; urban transportation; mobile payment; and clean energy (Raja, 2016). Amongst Africa's notable social networking platforms are Yookos (www.yookos.com) and MXit (www.mxit.com), both of which have an excess of 10 million users.

There are also crowdfunding platforms. In 2015, there were 57 active crowdfunding platforms headquartered and operating in Africa. South Africa led with 21 operational crowdfunding portals, followed by Nigeria with nine (Afrikstart, 2016). In the same year Africa had 21 donations-based platforms, 19 equity platforms, 13 rewards-based portals, two peer-to-peer lending platforms, and two hybrid platforms. Donations and equity platforms are the fastest growing crowdfunding models. Whilst some like Naijafund, Lendico, Thundafund and Yomken are country-specific, others like PitchOffice, Affineety and M-Changa are pan-African. Despite the seeming low adoption of crowdsourcing platforms in Africa, there are a few that have seen significant usage like Ushahidi in Kenya, Uchaguzi in

Tanzania, and txteagle in Rwanda (Chuene & Mtsweni, 2015). Other examples are shown in Table 2.

Country	Platform Name	URL	Active Y/N
Gabon	Needabeat	www.needabeat.com	N
Ghana	Farmable	www.farmable.me	Y
	Getmefund	www.getmefund.com	N
Kenya	Crowdpesa	www.crowdpesa.com	N
	Hatari	www.hatari.co.ke	Y
	Huduma	www.huduma.go.ke	Y
	Mocality	www.mocality.co.ke	N
	WildlifeDirect	www.wildlifedirect.org	Y
	Ushahidi	www.ushahidi.com	Y
Nigeria	CasaGrupo	www.csagrupo.com	Y
	ReVoDa	www.revoda.org	Y
	Enough Is Enough	www.eienigeria.org	Y
Uganda	FEZAH	www.fezah.com	Y
	Somesha	www.somesa.org	N
Zambia	Hubs in Africa		Y
Morocco	Reforme	www.reforme.ma	N

Table 2: Sample Crowdsourcing Platforms in Africa (source: Chuene & Mtsweni, 2015, p. 3)

To add to the above, some online education platforms include those offered by the University of the Witwatersrand in South Africa, University of Rwanda, Ahmadu Bello University, African Virtual University, and the Kenyatta Digital School of Learning (Maseko, 2017).

4.7 Gig Economy

The gig economy is "a labour market characterised by the prevalence of short-term contracts or freelance work, as opposed to permanent jobs" (Wilson, 2017). Participating in this aspect of the digital economy presents several job opportunities especially when there is some preference for African gig workers. For instance, African professionals such as programmers are perceived by some to be more suitable for gig work than their western counterparts: seen as more enthusiastic and eager to work, and with greater flexibility of working hours and salary costs (Spruyt, 2016). Consequently, there are many gig-related platforms that are being increasingly accessed by gig workers on the continent. Some of the popular ones include Upwork and Fiverr (Elizur, 2017). Whilst the gig economy signals a window of opportunity for professionals on the continent, it also means global competition. There are also issues pertaining to bargaining power and economic inclusion which need to be addressed around the gig economy in Africa (Graham, Hjorth, & Lehdonvirta, 2017).

4.8 Sharing Economy

There are argued similarities and differences between the gig and the sharing economy (Lionesses of Africa, 2016). The sharing economy is one based on “access over ownership” and decentralised networks of people connected through new technologies (Tatum, 2017). It could also be described as accessing, sharing and lending of goods and services via an online marketplace. Africa’s economic, demographic and infrastructural profiles suggest viability for the ideas associated with the sharing economy, and have attracted companies like Uber and Airbnb (Luedi, 2017). For instance, Africa and the Middle East is reported to have a 68% rate of willingness to participate in sharing communities as compared to North

America's 52% and Europe's 54% (GSMA, 2016; van Welsum, 2016). The new trend seems to be offering solutions to some infrastructure challenges and improving access to affordable goods and services (Mulligan, 2016b). However, the viability of the African market is attracting the global giants such as Uber and Airbnb. Airbnb, for example, now offers more than 4,000 homes for rent across Kenya; more than double the number in 2015. In addition, the number of guests choosing to stay at an Airbnb in Kenya has more than tripled in the same period (Constable, 2017).

Nevertheless, African companies are also exploring and using local expertise to create and overcome the global players such as Uber. For instance Taxify, launched in 2015, has secured 10% of South Africa's ride sharing market, offering 15% lower fares than Uber while providing higher proportional driver pay-outs. Similarly, Zebra Cabs – an existing South African taxi firm – has adopted electronic taxi hailing via its own app. Even more locally, Jozibear, launched in late 2016, services Johannesburg, Cape Town and Durban (Luedi, 2017). It important to note that Uber's arrival in Africa has spurred the birth of some of these African ride sharing companies who are now giving Uber some competition. For example, in Ghana, there are now three other ride sharing companies (Uru, Yenko Taxi and Dropping) after the launch of Uber. Uber takes 25% of driver's earnings, but Yenko takes only 20% and also enrols traditional taxis whereas Uber does not (Technovagh, 2017a; Technovagh, 2017b).

Country	Name of App / Platform	Sector of Operation
South Africa	Taxify	Transportation
	Zebra Cabs	
	Jozibear	Employment
	Accommodation Direct	Hospitality
	Medici	Health
	SweepSouth	Job search
Kenya	Little Cabs	Transportation
Tanzania	Worknasi	Employment
Ghana	Swiftly	Maritime transportation
	Uru	Transportation
	Yenko Taxi	
	Dropping	
Rwanda	SafeMotos	Ground transportation
Kenya	Lynk	Ground transportation

Table 3: Selected Sharing Apps and Platforms in Africa (sources: Luedi, 2017; Mulligan, 2016b; Technovagh, 2017a)

5 Digital Enterprises in Africa – Informal

There are some digital commercial activities which are difficult to capture under the formal digital economy. Such activities would also not exist but for ICTs. Therefore, they merit discussion. The activities in the informal digital economy range from repairs of digital devices to organising online training sessions. The increased mobile internet penetration

across the continent has been accompanied by a growth of individual digital entrepreneurs. Many such entrepreneurs leverage the over-the-top services like WhatsApp and available mobile money payment systems to undertake their business activities which manifest in several forms.

In the first form, individuals and organisations offer to teach or send a documented tutorial to any interested learner how to undertake certain activities for a fee. Some of the activities include how to tweak mobile data bundles for sale, how to start a mini importation business, how to play a musical instrument. Whilst these sound legitimate, there are others that may not be. For instance, there are offers for people to learn how to shop online ostensibly with stolen credit cards and hacked PayPal accounts. Others use the same WhatsApp groups to generate leads and to close sales of various products from cosmetics and fashion to automobile and electronics. Within such groups however, it is purported that some members piggyback to advertise products they do not have in stock, nor have any intention of supplying to an interested buyer. The end result is that the buyer makes payment via mobile money or cryptocurrency, but never receives the product or service.

Another growing phenomenon in the informal digital economy is the proliferation of Ponzi-like schemes (see https://helpnations.club/). Individuals who market themselves as heads of reputable organisations recruit unsuspecting victims via social media to make payment to an *upliner* who is also supposed to pay to an upliner and so on – in networking marketing fashion. Whether they are Ponzi schemes or not is a big question that remains unanswered in the long term. Despite such negative prevalence in the digital economy, there are others that attempt to build legitimate businesses with the community in mind. These (like www.globalsuccessminds.com) have built actual digital applications or services unto existing services like mobile telephony to offer unique commercial income-earning opportunities to interested persons.

There is also the dark (and cybercrime) economy which exists in several forms. To mention a few, there is cybercrime, digital piracy, SIM box fraud and adult economy. A study conducted by International Data Group Connect reported that each year, cybercrime cost the South African economy an estimated US$573 million. For Nigeria and Kenya, that cost is estimated to be US$500 million and US$36 million respectively (IDC, 2013). Concerning pirated software, the countries with the most affected ICT infrastructure are: Libya (98%), Zimbabwe (92%), Algeria (84%), Cameroon (83%), Nigeria (82%), Ivory Coast (81%), Kenya (78%), Senegal (78%), Tunisia (74%), Morocco (66%) and Mauritius (57%) (BSA, 2012). In a closer look, the 78% penetration in Kenya has a commercial value of 12 billion Kenyan shillings (about US$120 million).

Further, SIM box fraud, the technique which allows international telecommunications to bypass normal channels and be treated as local calls, costs Ivory Coast almost 926 million CFA francs (about US$1.7m) in 2014 (Shiloh and Fassassi, 2016). Ghana reports that a collaboration between the national police and a private company saved the country over US$77 million in 2016 (Larbie, 2016). Lastly, concerning the adult economy, Similar Web reported that the top 10 countries in the world with highest adult websites include Egypt (second) and Morocco (eighth) (Hussey, 2015). It is also reported, countries with the longest average session time includes South Africa which placed third.

These examples demonstrate some of the opportunities and threats in the informal economy, for which critical measures of regulation and beyond may need to be taken.

6 Discussion and Future Research Areas

In May 2017, preliminary findings from this synthesis study were presented at the first workshop organised by the DIODE Network in Yogyakarta, Indonesia. Based on the valuable feedback from research network members, this synthesis study modified its initial approach and coverage of issues pertaining to the digital economy in Africa. For instance, the presentation dwelt on only the *formal* digital economy, but after the presentation, this study has been extended to cover the *informal* despite the risks associated with, and the technical skills required to have in-depth knowledge about such activities. Thus, the discussion of the issues presented herein would also be extended to address the issues raised during the workshop, due to their pertinence.

First, with respect to research, the scarcity of studies in peer-reviewed journals cannot be overemphasised. The unavailability of such scientific studies made it difficult to have a solid grasp of digital economy issues, and to undertake a systematic literature review as part of this synthesis. It may not be entirely accurate to suggest that the digital economy is a *new* phenomenon considering that e-commerce and e-business are at least a decade or two old – and they are part of the *digitalised economy* – which is in the broader scope of the digital economy. It is popular knowledge that there are many published reviews and empirical studies on the broader scope of the digital economy, but the same cannot be said of the narrow scope especially from the African context – making it somewhat constraining. Nevertheless, this scarcity also spells rich grounds for areas that new research could and should explore, and phenomena to explain.

The provision of products and services in the digital economy suggests the growing importance of data as an economic raw material, and the value addition that is occurring, forming part of a nascent "data economy". This notion is evident from the various manifestations of formal digital enterprises previously detailed. For instance, digital platforms collect personal and professional data about individuals and job vacancies, which is processed into profiles which are further used to match available job openings. When a candidate is successfully placed, value would have been created using the data that was previously gathered. This scenario presents a research opportunity in undertaking a more specific trace of how such value is created in the various digital enterprise forms – from digital services to sharing economy. Extensions could be made to similar studies into value creation in other digital spaces such as mobile services (see Budu & Boateng, 2015; Li, Heck, & Vervest, 2009; Peppard & Rylander, 2006).

In addition, the vast amount of data generated by these platforms tend to be amenable to big data analysis techniques. Yet, only if such data would be available in the spirit of open data, could we gain insights into the demographic profiles of platform users, and inform policy. Yet data about and from platforms in Africa is very hard to obtain. Similarly, knowledge about the adoption of such platforms is not sufficient. There could be more knowledge created by studying the career trajectories of people who engage in the various aspects of digital enterprises – especially the gig economy. Currently, we do not know what happens to gig economy workers over a long period of time, neither do we know the

determinant factors. We do not even know the workers' motivations for participation, and whether their aspirations are met. For instance, are there any positives beyond the gloomy picture that current research has painted about the digital economy in the developing world (see Graham *et al.*, 2017)?

To add to the above, it seems that current knowledge about digital enterprises in Africa is quite restricted to industry statistics and observation-based anecdotal evidence. Thus, we could say that the growing area of digital enterprise on the continent is perhaps the development of mobile software/apps and websites especially for organisations. However, there is neither industry-based nor academic research to justify such an assertion. This lack of scientific data further suggests that we cannot measure anything very much about the digital economy (or digital enterprises) in Africa. It therefore becomes necessary that new research begins to provide answers in this regard periodically and regularly – beyond the cow paths that we are currently treading. We could further want to find out the motivations of the companies that want digital presence and mobile apps developed for them, and the development impact of their decisions on those who work on such requests especially if they are *gig workers*. In addition, we may also need to extend future research to investigate the impact of cryptocurrency systems like Bitcoin on the digital economy and enterprises in Africa. For example, cryptocurrency systems like BitPesa have been introduced to support cross-border transactions in East Africa. There is also evidence of adoption of such currencies in Nigeria and South Africa (Fioramonti, 2017).

One major point discussed at the Indonesia workshop is that the digital economy transforms, destroys and weakens institutions. The related outcomes could however be positive or negative. It would be useful to understand the processes underlying such outcomes at the firm-level, industry-level and country-level. Moreover, it is not enough to generalise all the foregoing issues without understanding what takes place within the individual countries. Over time, we have seen how context matters in digital systems adoption, use and impact. Therefore, it becomes imperative that country and cross-country case studies of the various platform and digital enterprise issues are undertaken to have a thorough understanding of the similarities and differences, and lessons that countries could learn from each other. Lessons from digitally advanced countries such as South Africa, Kenya and Nigeria, could be useful to those in the nascent stages of developing their digital enterprises so that they may avoid any previous pitfalls.

One big question that remains unanswered relates to knowing who exactly is benefiting from the digital economy in Africa. Similar questions have been raised elsewhere, but they are doubly pressing in Africa, given the region's development goals and aspirations (Luedi, 2017). The perception is that it is the global giants like Uber and Airbnb that are entering the market in the global South to harvest. However, research is need to establish the veracity of this claim and any other dimensions that such a study may discover. For instance, whilst the gig economy signals a window of opportunity for professionals on the continent, it also means global competition. Yet there are also those who argue the disbenefits of gig economy involvement (Graham *et al.*, 2017). Thus it would be interesting to know the true beneficiaries, and also the coping mechanisms of the losers.

7 Summary and Conclusions

This paper set out to present and synthesise available evidence on digital enterprises in Africa. The presentation and synthesis surrounded the *narrow* definition of digital economy which suggests a focus on the activities of enterprises in telecommunications, digital services, software and IT consulting, hardware manufacture, information services, platform economy, gig economy, and sharing economy. Available evidence suggests some countries are quite advanced in the digital economy, which advancement reflects in the level of development and abounding availability of digital enterprise activities. Some of these countries include South Africa, Nigeria, Kenya and Ghana. Nevertheless, the phenomenon is rapidly spreading across the entire region potentially because of the entrance of established players coming from the global North. One important observation about the available evidence is that it is mostly industry-based and mostly country-specific. In other words, there is barely any academic literature on digital enterprises across Africa, save those that one could consider if the *broader* definition of the digital economy rather than the narrow is adopted (see Bukht & Heeks, 2017). This study has thus been limited by this constraint, resulting in a somewhat narrow discussion and shallow evidence base. An attempt was however made to compensate for the shortfall, using a discussion of some evidence about informal digital enterprises.

Based on the available evidence, a discussion ensued to point interested researchers to some possible research areas for consideration. These areas include, first, undertaking studies that trace value creation amongst various forms of digital enterprises. The second suggestion relates to studying the career trajectories of people who engage in the various aspects of digital enterprises – especially the gig economy; in order to understand the factors determining their involvement. The third relates to undertaking periodic and regular research to find out the motivations of the companies that want digital presence and mobile apps developed for them, and the development impact of their decisions on those who work on such requests especially if they are *gig workers*. The fourth, is to undertake country and cross-country case studies of the various platforms and digital enterprise issues, and to generate and lessons and best practices for countries that are now picking up. Lastly, one big question that remains unanswered relates to knowing who exactly is benefiting from the digital economy in Africa, therefore it would be interesting to know the true beneficiaries, and also the coping mechanisms of the losers.

In conclusion, there is a paucity of academic research on digital enterprises in Africa. In order to end this paucity, more research needs to be conducted around the phenomenon in the global South. Such research could begin with the areas derived and discussed in this synthesis study.

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