# *Development Implications of Digital Economies*

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# Digital Labour in Africa:
## *A Status Report*

**Jean-Paul van Belle & Selina Mudavanhu**

University of Cape Town

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**Abstract**

Digital labour has been touted as a potential pathway to socio-economic development and unemployment alleviation in Africa, especially under an outsourcing model where the work originates in more-developed countries. The promise is of extreme importance given that Africa is simultaneously the continent with the youngest population but the highest youth unemployment rate; this is likely to form a socio-political time-bomb.

This report aimed to survey the state of digital labour in Africa combining a systematic and pragmatic literature review approach. The report first identifies a number of digital labour types and attempts to present the few macro-level statistics which are available. It also explores selected country-level initiatives and dynamics. Although it is evident from the research that many researchers, governments and organisations have bought into the promise of digital labour, it appears that the actual incidence and impact of digital labour has been rather limited.

The report therefore looked at academic research focussing on current macro- and micro-level issues and barriers, which are both diverse and numerous. From the survey, it is evidenced that huge knowledge gaps exist in our understanding of digital labour in Africa and specific research directions are suggested to both address some of our pertinent knowledge gaps but also to inform policy and initiatives which aim to deliver on using digital labour as one pathway to socio-economic development in Africa.

# 1. Introduction

## 1.1. Context and Rationale

Africa has the youngest and fastest-growing population and labour force of all continents; however, its formal employment figures are the lowest, with a particularly worrying high youth unemployment rate. The human, social, economic and political cost of this situation is staggering and set to increase further unless solutions are found. Of course, the problem is extremely complex and dynamic, and it would be extremely naïve to assume that silver bullets and quick fixes are possible. However, the rise of the digital economy, estimated to grow at between 15% to 25% annually in emerging countries (WEF, 2017) has been touted by governments, policy makers, researchers, social entrepreneurs and philanthropists as one of the pathways out of the downward spiral (Page & Shimeles, 2015). The purpose of this paper is to assess the current status of digital labour in Africa, raise some of its issues, and identify research and knowledge gaps which can inform the future debate on and research into how digital labour can contribute to the economic and human development of the continent.

Most African countries have a rapidly growing and therefore young population but are faced with high un- and under-employment rates. Although the World Economic Forum (2017) estimates a youth unemployment rate for the continent of 13% (men) to 15% (women), the actual figures are likely to be much higher (Trading Economics, 2017), and many Africans have no or little hope of earning a decent wage in the formal sector commensurate with their education. Sadly, although much of Africa has experienced economic growth, its "production structures" have largely failed to translate that into employment. Not only are unemployment ratios amongst the world highest, it hits the youth hardest who account for 60% of Africa's unemployed; with 72% of them estimated to live on less than $2 per day (Ramalingam, 2016).

A strong, native and growing digital economy could potentially provide employment to a young and dynamic generation of African digital labourers (Lehdonvirta, 2016). Internet connectivity varies hugely in cost, quality and capacity across Africa, but the International Telecommunication Union (ITU) (2016) estimates that up to 25% of Africa's population is connected to the internet. About 40% of this connectivity is through mobile broadband and this type of access continues to increase (ITU, 2016).

The World Bank/Dalberg report on global online outsourcing (Kuek et al, 2015) estimates that, across six of Africa's largest economies alone (South Africa, Nigeria, Kenya, Egypt, Morocco and Ghana), 2 million youngsters enter the job market annually but only 41,000 digital jobs are being created, satisfying only 2% of the labour supply. The picture is somewhat better if the entire IT, financial services and outsourcing industries are taken into account, since these are estimated to create close to 100,000 jobs annually each.

## 1.2. Key Research Objectives

The main research objective of this report is to investigate the phenomenon of digital labour in Africa. This objective can be broken down into the following sub-objectives:

- What is the current status of digital labour in Africa i.e. what facts do we have about its uptake?
- What are the current barriers, constraints and issues relating to the low level, and slow growth of digital labour in Africa?

- What are the main academic knowledge gaps around digital labour in Africa?

This report does not *in itself* propose policies or inform best practices towards stimulating digital labour. However, it is intended to inform a research agenda so that future research can, hopefully, provide the empirical and theoretical basis for formulating such policies. In particular, the underlying value driving the research questions is the hope that digital labour in Africa can contribute positively to economic, social or personal development.

### 1.3. Research Approach

The research methodology followed was an intensive and systematic academic literature review using Google Scholar. The paucity of specific regional research necessitated the pragmatic inclusion of relevant grey literature including white papers, not-for-profit and supra-governmental studies, and media reports. To overcome bias and in an effort to ensure comprehensiveness, two senior research students were asked to perform a similar research review in parallel. This was complemented by the use of two fourth year students who were sub-tasked with a review of micro-work specifically.

## 2. What is Digital Labour?

There are substantial differences in scholarly views as to the exact scope of what digital labour encompasses. This paper will take a fairly restricted view on digital labour even though, broadly speaking, two dimensions can be identified along which the definition can be extended. Fuchs (2014) provides an extensive view of digital labour that includes all labour that is integral part of the value chains producing digital products and services; this includes the mining of the raw materials and the manufacturing of digital infrastructure products such as computers and telecommunications equipment (Fuchs, 2013). It therefore also includes everyone employed in these industries such as telecommunications and their support industries, even if the nature of their job has only a small direct digital component. A second dimension refers to the amount of digital activity in one's work: most manufacturing and service industries have been revolutionised by IT and major components of traditional work processes have been digitalised, including most clerical tasks performed in larger traditional organisations.

Given the objective of this paper, a restricted definition is adopted and the focus is on digital labour whereby the nature of the work is both entirely of a digital nature *and* the job would not have been possible (i.e. would not exist) if it were not for the technological infrastructure put in place and the capabilities provided by the IT revolution. The first criterion excludes traditional jobs such as clerical work (accounting, purchasing, administration, …) in traditional manufacturing and service industries, even if many of these workers now spend close to 100% of their time interacting with computer-based information systems. The second criterion excludes jobs considered by us to be part of the primary (mining, agriculture), secondary (manufacturing) and many in the service sector; Heeks (2017b) refers to these jobs as being ICT intensive.

Finally, the distinction between digital labour and digital work is also important: digital labour refers to digital work that has been valorised monetarily, i.e. there is a monetary compensation associated with the work (Fuchs & Sevignani, 2013). Although some digital work is provided free of charge (e.g. open source software or open educational resources contributions), some of this work can be effectively valorised by the platform providers but

without any of this value-added surplus being returned to the creators of these reviews (gamification rewards are here obviously not seen as monetary compensation) (Fuchs, 2015). Digital work *excluded* from this definition of digital labour includes the use of (voluntarily-provided) customer reviews and ratings on accommodation provision, e-commerce or social media platforms; the harvesting of other user-generated content or the commodification of personal data; this is contrary to the views of scholars such as Fuchs (2014) and Scholz (2012) who classify this as unpaid digital labour. By contrast, commissioning click-farmers or paying micro-workers to provide product reviews, even if morally questionable, will be seen as digital labour. Note, however, that the monetary valorisation does not have to be provided by an 'employer-like' agent; it can be provided by the market or the labourer him/herself, as is the case of digital entrepreneurs, including phishers and online scammers.

What remains as digital labour includes the activities of high technology professionals such as software engineers, mobile developers and offshored research contractors, to web designers, content providers, to call centre workers, click farm labourers and micro-workers (Casilli, 2016). Kuek et al (2015) provided a nice categorisation of the continuum of digital labour task complexity ranging from high (web and software development, IT and engineering services, and business services such as accounting), medium (customer service, writing, translation, multimedia design) to low (reviewing, data entry, social media postings, click farming). This research is particularly interested in the following categories of digital labour, given that they are the ones that could fuel employment and development in Africa: online outsourcing, microwork, other platform economy jobs and crowdwork (Heeks, 2017) but we believe some other job categories should be included as well, such as purely digital telework and other network-mediated pure knowledge work.

Thus, there are many digital economy jobs and no consistent classification is found in the literature. Some jobs do not lend themselves to easy categorisation such as local content innovators and other e-entrepreneurs (Dalberg et al, 2013). For purposes of this paper, we distinguish between the more traditional digital labour i.e. digital labour in the context of existing industries and organisations using traditional employment structures, and the digital gig economy for more flexible online labour arrangements, typically platform-driven "one-job-per-contract" based labour, using Heeks' (2017b) taxonomy. Our discussion excludes the physical gig economy where the service is tangible or physical-location bound (e.g. Uber, AirBnB) even though these services are also part of the platform economy.

## 2.1 Software Engineering, Software Development and Other Pure Digital Jobs

Many purely knowledge-based jobs (consultants, researchers, engineers, …) take on an almost purely digital character since they are now performed almost exclusively with the aid of computer technologies. However, the restrictive definition given above limits the discussion to new job types which did not exist before the advent of modern IT. These include software engineering and development, website design, film animators etc. Much, but not all, of this pure digital labour happens in the information technology industry. However, the IT industry is hard to delineate since many pure IT jobs are not just found in IT companies, but also in other primary, secondary and tertiary sector organisations. Vice versa, many jobs in the IT industry cannot be classified as digital labour (secretaries, sales persons, managers, …). A complete consensus list of pure digital labour jobs is unlikely to be forthcoming, given the wide spectrum of definitions of digital labour. However, they include software

engineers/developers, digital content developers (websites, graphic design, news media, film animation) and digital entrepreneurs (in Africa often focussed on mobile innovations).

## 2.2 Information Technology Outsourcing, Business Process Outsourcing, Impact Sourcing

Business process outsourcing (BPO) is a strategy employed by companies with the aim of improving efficiency and performance. Business processes are analysed and selected components, usually support services and more generic processes not considered of strategic competitive advantage, are contracted out and executed outside the organisation, usually through the support by ICTs. This enables reductions in staffing levels, overheads and, arguably, improved productivity, increased agility and greater focus on the core competencies of the outsourcing organisation (Kietzmann, 2016). However, the most common purpose in offshoring – outsourcing across country boundaries – is to achieve cost reductions by outsourcing to lower-income countries to take advantage of the labour cost differential. Information technology outsourcing (ITO) focusses on the outsourcing of IT processes, including software development or information system maintenance. The rationale here is often a reduction in management complexity i.e. avoiding having to deal with the complexities of IT whilst the organisation being outsourced to can make use of economies of scale and specialisation (Abbott, 2013).

While the outsourcing company's work force is reduced, jobs are created in the BPO/ITO service provider; sometimes these workers are the former employees working under lower wage or worse working conditions although occasionally they may enjoy better conditions e.g. for highly skilled, scarce staff (Lacity, Rottman & Carmel 2014). Offshoring results in a net-loss of jobs in the outsourcing country but with corresponding employment gains in the recipient country; this explains the quest of many middle- and lower-income countries to become favoured BPO destinations. The classic perceived success stories are India (ITO and call centres), the Philippines (services) and China (manufacturing) although the latter has partly given way to even lower-income countries such as Vietnam. The focus of this paper is on the outsourcing of knowledge-based services using technology platforms e.g. call centres, software development, web development and the like.

Outsourcers rarely consider the needs of BPO workers, in terms of equitable wages, working conditions and the like; in fact not having to consider these is often one of the main motivating factors for outsourcing (Heeks, 2013). To counter this, *impact sourcing* intermediaries have been established to enable socially-responsible global organisations to outsource while enhancing economic and social development in lower-income countries or, at the very least, ensuring that working conditions of the workers are equitable (Domfe et al, 2013). Impact sourcing therefore explicitly targets people who are less privileged or have a disadvantaged background so that they can obtain critical benefits such as raising their skill and knowledge levels or earning a decent income (Rogan, Diga, & Valodia, 2013). Although these workers may live in slums or rural areas, they often possess high-school or even tertiary education (Heeks, 2013). In addition to socially-responsible global organisations, Wayde and Rogerson (2014) argue that governments should make more use of impact sourcing to achieve some of their national development goals. (This could possibly apply to Global North governments as well for in terms of their international development aid?) Apart from the imbalance between supply and demand of work, other potential issues with impact sourcing include potential for

exploitation of the disadvantaged workers, the presence of fraudulent workers and the lack of IT access experienced by most disadvantaged workers (El Maarry, Güntzer & Balke, 2015).

## 2.3 Digital Gig Work

**Online Freelancing**

Larger digital jobs can be offered in flexible contracting arrangements; better known as online freelancing jobs. These relate to clearly identifiable pieces of work such as web development, graphic design, document translations, report writing, book editing and similar, normally performed as one integral piece of work by one contractor. If these jobs are offered to an open market of potential contractors using an internet platform, this type of work forms part of the (digital) 'platform economy'.

**Crowdsourcing**

Crowdsourcing is "the practice of outsourcing work to an unknown group of people via the internet, instead of assigning it to internal employees" (Kucherbaev et al, 2014). Apart from cost-savings, it can help an organisation be more creative or innovative by soliciting outside ideas (Tripathi et al, 2014). It differs from online freelancing in that no single contractor is used. The complexity of the work varies and is normally constituted of tasks that cannot easily be automated such as translation, transcription, image object recognition, annotations and similar tasks (Ford et al, 2015). Crowdsourcing is a way of distributing a workload over a number of people (Mtsweni & Burge, 2014). A recent survey found the most popular tasks on Amazon Mechanical Turk (nominally no longer available to African 'turkers') to be (completing) academic surveys, categorisation, providing business feedback, sentiment rating, content review, data processing and tagging (Deng, Joshi & Galliers, 2016).

Crowdsourcing can be paid or unpaid (Pilz, 2013; Borromeo & Toyama, 2016) with the better-known platforms being used for paid crowdsourcing, e.g. Amazon Mechanical Turk (also called MTurk), CrowdFlower, Microworkers and more than 50 others (Samdaria, Mathur & Balakrishnan, 2012). Some platforms, such as Crowd4U and Zooniverse, focus on unpaid crowdworkers i.e. volunteers (Borromeo & Toyama, 2016) but unpaid digital labour falls outside the scope of this paper. Crowdsourcing categories include collective intelligence or 'the wisdom of the crowds' (to solve complex problems or create innovations), crowd content creation, crowd voting, crowd funding and micro-work or micro-tasking (Chiu, Liang, & Turban, 2014).

**Micro-work or Micro-tasking**

Although some authors use the terms micro-tasking and crowdsourcing interchangeably, the former is really a sub-category of crowdsourcing (Kietzmann, 2016). Micro-tasking involves splitting a job up into small or even tiny manageable pieces work (the micro-tasks) and allocating them to a large number of workers using an internet-based platform (Kobayashi et al., 2014). Micro tasks are usually generated from larger tasks such as translating an entire book, which are broken up into smaller pieces (translating a few pages); most micro-tasks require few skills or training (Mtsweni & Burge, 2014). Tasks that are considered as micro tasks can be analysed in terms of the task itself, the targeted workers and the compensation that workers receive for the microwork (Paolacci & Chandler, 2014). Factors that drive micro-workers include the financial reward that is received but often also other intrinsic (fun, learning, experience) and extrinsic (status, networking) motivators (Paolacci & Chandler, 2014).

As mobile phones are the sole technology platform for most potential workers in Africa, some platforms have focussed on micro-tasks which can be performed on mobile phones only, with selected tasks arguably even being feasible on feature phones using SMS functionality only (Murugesan, 2013 ).

The above categories are not necessarily fully exclusive and there are also other terms in use delineating work categories differently. The terms gig economy and platform economy include different combinations of the above, although the use of a technology platform which brings demand and supply for digital work together is explicitly required for the latter, but can also drive physical or location-specific services. Standardising the terminology around digital labour is an ongoing academic discussion although Heeks (2017b) has summarised the literature and proposed some consensus views.

## 3. The Africa Digital Labour Landscape

The attractiveness of digital labour in Africa results from the huge prevalence of un(der)employment coupled to the fast increasing internet penetration on the continent (Graham, Hjorth & Lehdonvirta, 2017). The potential of digital labour in Africa has obviously not gone unnoticed by both private and public players. Several initiatives have been launched, most at the local (e.g. CiTi, 2017) or national level but there are a few (especially private sector-based ones) attempting a continental approach.

An early initiative is the Digital Jobs Africa (DJA) initiative by the Rockefeller Foundation, established in 2013. This initiative is targeted at disadvantaged young people in Africa who are trained with IT skills necessary for digital jobs and then linked to relevant job opportunities. Around the same time, 'Skills for Africa' was initiated by SAP Africa for development in technology skills and entrepreneurship (Murugesan, 2013).

More recently, IBM has launched its campaign to train millions of people in Africa to include them into the digital workforce: "IBM is ramping up its digital-skills training programme to accommodate up to 25 million Africans in the next five years, looking towards building a future workforce on the continent" (Independent Online, 2017). IBM's country manager for South Africa, Hamilton Ratshefola contends that the "move might help bring and keep digital jobs in Africa instead of losing them to India."

An example of a focussed national government initiative is the Ajira Initiative in Kenya which provides a portal to unemployed Kenyans, especially the youth, for online work. The portal also provides online training, support and certification to impart the necessary skills (ITNewsAfrica.com, 2017). In 2013 Nigeria launched its Microwork for Job Creation Naijacloud initiative although current impact reports could not be found.

Following the typology suggested above, and to avoid overlap with the companion report on the Digital Economy in Africa, the discussion below is limited to software engineering, business process outsourcing/impact sourcing, online freelancing (including website development, web content management, and social media content development), crowdsourcing and micro-work.

### 3.1 Software Engineering, Software Development and Other Knowledge-Based Digital Jobs

The IT and telecommunications sectors account for the lion's share of digital labour employment on the continent. The mobile telecoms sector alone makes up a not-insignificant share of the continent's GDP. The IT sector is more concentrated in the more developed economies on the continent (e.g. Kenya, Egypt, South Africa, Nigeria). However, many if not most of the jobs in the IT and telecommunications sector cannot be classified as 'digital labour' e.g. mobile money agents or mobile phone retailers perform traditional, non-digital jobs but within a digital economy environment. Statistics and details about the IT and telecommunications sectors as a whole are discussed in detail in the companion report about Africa's digital economy (Boateng et al, 2017).

However, a brief discussion on two important types of digital labour is in order. Software development and software engineering is a particularly attractive way of creating value (and employment) in countries, given that almost all the value added is local and much if not all of the work can be done remotely. This usually requires highly skilled individuals, because larger software development projects require not just programming skills but also project management, testing, evaluation, analysis and other skill sets. Sometimes they are employed by software development companies such as Entelect (South Africa), Grintek (South Africa), Softline (South Africa) and Africtek (Togo and Ivory Coast). Other times they are digital entrepreneurs creating and marketing their own applications; in Africa these are often mobile apps making use of the particular contexts of their country.

Another type of digital labour that is probably even more popular in many African countries is website development and web content management. This work is done by web consulting companies or individuals that offer services in website design, web content development, website hosting, logo design and online marketing. The skill set required for this is arguably less than that for software development. As with the African software development sector, not much research has been done to establish the extent of web development on the continent. Similarly, a lot of social media content development is done both by professionals and amateurs. There is an interesting trend of bloggers in different African countries working as collectives. For example, the blogs True Africa and #africablogging are managed by bloggers in various countries in Africa. Currently, blogging, citizen journalism and user generated content on social media are mostly unpaid labour and the politics and ethics around this content production need to be interrogated further (Hesmondhalgh, 2010).

### 3.2 IT and BP Outsourcing and Impact Sourcing in/to Africa

Outsourcing constitutes a major part of corporate expenditure and offshoring has become a default for most global organisations (Deloitte, 2016). However, the amount of work outsourced and offshored is near impossible to measure. One estimate of just China's offshoring value, measured by means of its tie-ins into global supply chains, amounts to 700 billion US$ just for 2013 alone (Feenstra, 2016), although this covers all sectors including manufacturing. Despite concerted efforts of a number of national and local governments (e.g. Kenya, Ghana) to capture a significant share of the global outsourcing market, the only significant offshore outsourcing successes have been in South Africa and Morocco. Sadly, academic research on African ITO/BPO is relatively scarce, despite a large amount of public media articles (Lacity, Willcocks & Craig, 2014). The value proposition by Africa for offshore

outsourcing is based on the fact that it is in the same time zone as Europe (although this is *not* always desirable), European languages such as English and French are spoken widely (with a few African countries also having German, Italian or Portuguese speakers) and a number of companies retaining historical links to the continent (Keeler, 2009).

For instance, Kenya placed very high hopes in BPO for its 'Silicon Savannah' (Iraki, 2013; Waema, 2009) and made it a priority policy in its Vision 2030 initiative with key indicators such as ease of doing business and total BPO costs initially looking favourable (Bryce, 2011). However, the lack of established large outsourcing centres, a dearth of managerial or project management skills, lack of reliable or cheap telecommunications infrastructure and a relative lack of highly skilled staff (engineers, designers, programmers) means that the value proposition usually remains favoured towards traditional Asian offshoring destinations (Kundu, 2008; Abbott, 2013). In the case of Kenya, many BPO companies went out of business and many of the ones that survived (KenCall, TechnoBrain, Gorilla BPO, etc) did so by refocussing on work procured from local and East African companies (Free, 2015). This type of work is far less lucrative and this type of BPO job proved to be far less attractive to employees. However, this may be a more sustainable and less volatile market, and also ensures the continued survival of local as opposed to foreign-owned BPO companies (Mann & Graham, 2016).

The two exceptions to the lack of African BPO successes are South Africa which has become an attractive BPO destination for companies such as Amazon, Shell, T Mobile and Lufthansa. Despite its relatively high costs, its competitive advantages are language, skills and infrastructure (Lacity, Willcocks and Craig, 2014) And Morocco, appealing particularly to the French ITO sector (Kuek et al, 2015). Each have had an estimated 40,000 job creations resulting from BPO (Dalberg, 2013)

Abbott (2013) presents a comprehensive framework for ITO/BPO success factors with recommendations around policies and practices that African countries could take; apart from the ones already mentioned, she proposes the following factors: political risk, cultural differences, linkages through diaspora, institutional support and reputation. Importantly, it is suggested that African countries should start with low-end (low-skill) BPO to gain entry and establish trust, along with a careful building of selective partnerships.

## 3.3    Digital Gig Work

**Online Freelancing in Africa**
Little is known about digital freelancers and the size of their contribution to the economy. The global online outsourcing market was estimated at $2 billion in 2013 and growing faster than the global economy, with about 5 million active workers (Kuek et al, 2015). Although this is only a small fraction of the corporate offshoring and outsourcing market, it is still about ten times the size of the microwork economy. It is growing fast, was expected to have more than doubled to $4.4 billion in 2016 and is estimated to more than triple in size by 2020 (Kuek et al, 2015). One statistic shows that 40,000 Kenyans alone were registered on Elance in 2014, one of the online freelancing platforms (Melampy, 2015). Another more recent statistic claims that the Kenyan-owned KuHustle platform alone provide work to 21,000 Kenyans (Miriri, 2017). However, the overall participation rates in Africa are a tiny fraction of the 'up to 8% of Americans' online gig-participation reported in a US survey (Smith, 2016).

Recent fieldwork in Kenya and South Africa, the two leading African countries in this space, confirmed that digital gig workers (including crowd-sourced and micro-task workers) face intense competition within their countries and globally. This contributes to high employment insecurity and very uneven income streams. However, a significant minority of these workers appear to have overcome the barriers of prejudice, technological and other issues mentioned to earn decent income, suggesting that digital gig work can indeed be a vector for net African employment generation (Anwar, 2017). Popular gig platforms include Upwork and Fiverr (Smith, 2016).

A recent trend is to open up more traditional professions and occupations for offshoring and remote work, including radiography, medical diagnosis, accountancy and the like (Beerepoot & Lambregts, 2015). Unfortunately, it appears that Africa is losing in terms of its relative position globally in respect of knowledge economy, with other developing (especially Asian) countries improving faster than most African countries; reasons given include lack of R&D funding, eroding educational systems, brain-drain and corruption (Asongo, 2014, 2017). This is reflected in the very low participation rates of African contractors on sites such as oDesk (now Upwork) and similar (Beerepoot & Lambregts, 2015) when compared to e.g. Asian countries.

In a completely different category are the cybercriminals. Although their impact is usually seen in terms of the cost to the economy lost through cybercrime (scamming, phishing, digital piracy, SIM box fraud), it must be realised that the other side of the equation constitutes employment and revenue to the operators. Popular perceptions of Nigerian online scams must be moderated by the fact that the huge majority of Nigerians are law-abiding, moral citizens and many of the scams attributed to them are actually operating from other, better connected centres including South Africa. Although estimates of the cost to various economies exist – e.g. upwards of US$500 million for Nigeria and South Africa each (IDC, 2013) – the *income* side for African countries has not been reliably estimated (Boateng et al, 2017).

**Crowdsourcing in Africa**
Although crowdsourcing in Africa brings many opportunities, it is still a relatively small phenomenon (Chuene & Mtsweni, 2015). A recent Dalberg/Rockefeller Foundation report on digital jobs in Africa provides World Bank estimates of a market of US$300 million accessed by approximately one million African workers, of which many are inactive. This translates to an average income of only US$300 per worker. Although there is a predominance of providers from the global North, Africa's share is slowly growing with an estimated 10,000 providers from Nigeria and 22,000 from Kenya (Dalberg et al 2015).

Much of the crowdsourcing in Africa takes place using global platforms, which typically originated in the USA. For instance, the uTest global testing and quality assurance platform claimed to have QA professionals in Morocco, Algeria, Tunisia, Egypt, Mali, Senegal, Kenya, Ethiopia, and Uganda with over 100 testers in Kenya alone (Chiura, 2012). However, there are a few African-born platforms, mostly limited to specific countries. For instance, the Ushahidi platform in Kenya was initially used to monitor and report violence in the 2002 elections but then morphed into a popular crowdsourcing platform. Since then other African crowdsourcing platforms have been developed; Chuene & Mtsweni (2015) list a number of crowdsourcing platforms although almost all are related to voluntary crowdwork or

crowdfunding instead of digital labour. A noteworthy exception is TxtEagle, now called Jana, for mobile-based microwork.

However, it is difficult to assess the awareness, popularity, activity levels and impact of these. So far, relatively little empirical research has been conducted on crowdsourcing in Africa (Chuene and Mtsweni, 2015), although support for mobile phones and lack of awareness are argued as key issues for African platforms. Apart from baseline studies looking at the major actors, crowdsourcing studies generally discuss its (potential) benefits to Africa, mainly its potential to help in alleviating socio-economic problems such as high youth unemployment and poverty (van Etten, 2011). "*[…] digital initiatives such as crowdsourcing and on-demand mobile microwork services are emerging as potential solutions in minimizing the high unemployment rate in developing and under-developed economies*" (Mtsweni and Burge, 2014:2). Research conducted by Graham et al. (2017) found digital workers in South Africa who originated from other sub-Saharan African countries (Kenya, Mauritius, Lesotho and Cameroon) who see digital labour as their only way of overcoming the regulatory constraints that they faced with finding work in their temporary country of residence (South Africa).

Other researchers have looked at the challenges around online work (Melampy, 2015). Scholz (2011:48) suggests that *"[crowdsourcing] simultaneously inspires unambiguous excitement about the potentials of the Open Web and moral indignation about the exploitation of new forms of labor.*" Similarly, Anwar (2017) argues: "*Digital freelancers face intense competition and employment insecurity. We are also seeing workers experiencing a complex interplay of historical and socio-political constraints, technological challenges, prejudices (gender, racial and national identity), and class relations, thereby, giving rise to very complex forms of precarious work."*

Very little analysis has gone into understanding the aforementioned challenges. Hardly anything is known about how this form of labour affects the livelihoods of African workers (Chuene and Mtsweni, 2015). This means that there is currently also a dearth of empirically-based recommendations towards informing and formulating national policy frameworks (Brown and Adolwa, 2017).

Sadly, crowdsourcing initiatives and their advantages appear to be not very well-known or accessible in developing countries (Thies, Ratan & Davis, 2011). Primary constraints appear to be the lack of ICT infrastructure and development and insufficient awareness of crowdsourcing (Mtsweni and Burge, 2014).

**Microwork in Africa**
Similar to crowdsourcing, much research on microwork in Africa focusses on exploring its possibilities and barriers. Mtsweni and Burge (2014:2) conducted a literature review to establish "the potential benefits of mobile microwork services." Table 1 below lists some of the possible benefits accruing to workers and 'employers' (Mtsweni and Burge, 2014).

| Micro worker | Micro employer |
|---|---|
| Access to various job opportunities | Access to special skills (e.g. translation from Zulu to Afrikaans) |
| Work experience | Value co-creation |
| Profiling | Work-force identification |
| Financial gains | Costs savings |
| Recognition | Diverse solutions |
| Flexibility | Scalability |
| Channel agnostic access | Diverse channels |
| Improved productivity | Increased productivity |

Table 1: Potential benefits of mobile microwork (Mtsweni and Burge, 2014)

In addition to providing employment, microwork allows workers to gain valuable work experience by participating in various tasks (Irani, 2015). These tasks tend to vary in complexity and this then provides microworkers with the opportunity to engage in work of varying levels of complexity which could lead to long-term job opportunities in the formal sector where microworkers could potentially earn higher wages (Jiang et al, 2015). Another benefit of microtasking for employers is that they can save costs as most tasks that are posted are for a very low wage (Chuene and Mtsweni, 2015).

Research on microwork has looked at how people who cannot afford computers often attempt microwork in cybercafes, e.g. the study on India and Kenya by Gawade, Vaish, Waihumbu and Davis (2012). Alternatively, there is the attractive option of mobile phone-based microwork (Narula & Kulkarni, 2011). Unsurprisingly, some research on microwork originates from organisations that have established the microtasking platforms. In South Africa, for example, an organisation like Money For Jam (M4JAM) provides statistics based on their own work. Nkabinde (2015) interviews the founder of M4JAM, Andre Hugo who states that up until 2015, M4JAM had about 87,000 users with ages between 25 and 35. However, little if any research looks at microwork in Africa in a realistic and holistic manner.

## 4. Issues and Barriers Facing Digital Labour in Africa

Despite the acclaimed benefits of digital work, developing countries also face significant barriers in respect of digital labour (Heeks, 2017a). Some of the challenges are related to the lack of/limited access to the internet, limited infrastructure, low education and lack of awareness of platforms. Kuek et al (2015) compare five leading frameworks for assessing country competitiveness in attracting offshoring and the criteria map onto many of the ones listed below.

However, authors such as Brown & Adolwa (2017) or Heeks (2017a) question even the potential of digital labour to provide sustainable employment and resilient economic growth or foster innovation within Africa given the global competition, thus warning that this policy pursuit should not be chased blindly. Thus it is important to contrast the macro-issues advanced by most digital-labour-for-development (DL4D?) advocates with issues at the micro-level. Macro-issues are here seen as those issues which can only addressed by national intervention, whereas micro-issues – although also affected by national policies and contexts – could possibly benefit from lower-level interventions, such as platform-based policies.

## 4.1 Macro-Issues

**Low Internet Access and Weak Technology Infrastructure**

The lack of affordable and reliable bandwidth in most if not all of Africa is one of the major obstacles to its development. Not only are the many businesses that rely on internet access hampered, but obviously so are the actual and aspirant digital labourers. Bandwidth is still very expensive and fixed line internet (ADSL/fibre) is either unavailable or unaffordable for most workers. Latency remains a problem (e.g. for SaaS applications or web hosting) and there are still reliability issues across most of Africa: this includes the occasional cuts to the undersea telecommunications cables, power cuts but also politically inspired government-imposed internet shutdowns (UN, 2017).

BPO, telework, crowdsourcing and microwork all rely on internet infrastructure and platforms; where internet penetration is low and internet access devices (personal computers or mobile devices) relatively expensive, this becomes a significant issue (Samdaria, Mathur, & Balakrishnan, 2012). Of course, the lack of reliable or affordable technology infrastructure does not just pose a problem for digital labour but also for economic development at large. Additionally, most Africans can only afford low-cost and thus low-capability feature phones instead of smartphones (Murugesan, 2013 ) although the latter are spreading fast due to innovation and cost-reductions in the smartphone industry Chuene and Mtsweni (2015). A serendipitous trend is the popularity of social media applications which has spread the adoption of smartphones but also equipped Africans who initially had low ICT literacies with electronic communication skills and other basic ICT skills (Bornman, 2016; Stork, Calandro & Gillwald, 2013).

Sadly, even where suitable internet infrastructure exists, governments often impose temporary blocks on global or selected internet access, usually to prevent social dissent but often disguised under other claims. This costs local economies and digital workers dearly, not just for the period of the outage but also in terms of long-term damage to reliability reputations of digital labour providers. In 2016 alone, Ethiopia, Gambia, Uganda, Chad, the Democratic Republic of the Congo (DRC), Gabon, Mali, Zambia and Zimbabwe all experienced internet shutdowns (UN, 2017).

The high cost of data, sometimes orders of magnitude higher than in other developing countries in much of Asia, acts as another huge barrier, although prices are slowly coming down. Given the very low penetration of computers and fixed-line access, giving a specific focus on the capabilities of the mobile smartphone to enable digital labour will be an extremely important and cross-cutting concern for future research: initiatives for large-scale e-skilling and providing digital labour opportunities to the masses will only succeed if they are smartphone-enabled.

A related infrastructure challenge is the lack of reliable electricity supply in most African countries, affecting even mobile-only users who often have no affordable means of charging their mobile phones (Chuene & Mtsweni, 2015).

**Low Education Levels and Shallow IT Skills Pool**

In much of Africa, illiteracy and low educational levels act as a barrier to digital labour participation (Mtsweni & Burge, 2014). Many prospective workers lack the skills or education to participate effectively in the digital economy. IT and other skills are essential for Africans in order to be globally competitive (Sabbagh et al, 2013). Even basic ICT skills, which are

important for the use of information and the internet to support economic, as well as social and cultural activities, are often unequally spread (Bornman, 2016).

Although workers with world-class skill sets are available, both in IT and other knowledge professions, they are generally rather limited in number, given the challenges in the education sector as well as contextual limitations such as statutory limitations to migration. There are significant skills bottlenecks in areas such security, business intelligence, big data, enterprise architecture, etc. On the whole, IT, management and other high-end skills can be found but often at a high cost relative to the average labour cost on the continent. This is in marked difference to many Asian developing countries which have traditionally placed a high value on quality education.

### Visibility and Awareness
Many qualifying Africans are still not aware of suitable outsourcing and microwork platforms and can therefore not make use of the work possibilities available (Samdaria et al., 2012). An awareness campaign by government, the platforms themselves and other organisations is necessary to alert potential workers (Samdaria et al., 2012).

### Payment Systems
Suitable payment mechanisms to pay crowd and micro-task workers in developing countries is a major problem that is affecting the uptake and growth of digital labour (Samdaria et al., 2012). Only a small proportion of Africans are part of the formal banking system which makes it difficult for digital platforms to effect payments (Mtsweni & Burge, 2014). Additionally, most African countries place onerous constraints on the free flow of money, given that their currencies are often not freely traded, and transaction costs for financial transfers are on average twice as high as the global norm. The availability of alternative mechanisms such as PayPal or even credit card account deposits remain the exception rather than the norm. Crypto-currencies may become a future option but currently these are too cumbersome and technical. Mobile payment systems are fast becoming the norm in many African countries.

In Kenya, the majority of the population accepts M-Pesa. Other countries have similar systems e.g. Ethiopia has the equivalent M-Birr (Asfaw, 2015) and South Africa has a large number of mobile-based payment systems, each proposed by different financial institutions and thus leading to a very fragmented market with no or little interchange ability and therefore low market acceptance. Sadly, these mobile payment systems tend to be unique to each country and generally do not allow for international transfers. Some other payment systems suitable for online workers include Payoneer, allowing for direct transfers into debit cards, Skrill, TransferWise or PayZa (Dasgupta, Mahato & Kumar, 2017).

### Government Policy and Governance Issues
Like most other developing countries, the African countries contend with a huge variety of political, governance and policy issues. There is a dearth of practical and appropriate policies in African countries which are critical for enhancing ICT adoption, innovation, education, research and development (Asongu, 2017). Although many developing countries seek foreign investments, they often lack the necessary policies for ensuring enforceable contractual agreements, equitable technology transfer, or financial transactions (Luther, Osabutey & Debrah, 2012). Even though many countries enact national policies to promote fixed-line or mobile broadband, existing telecommunication oligopolies and other vested interests prevent these from being implemented (Dalberg, 2016). Additionally, ICT policies are often

shaped by values and priorities from developed countries making ICT policies difficult to implement in contexts with a different culture, poverty or low level of education. Meltzer (2014) discusses in detail thirteen sets of trade policy reforms which governments should undertake if they want to promote internet-based trade, including more balanced IP frameworks, cross-border data flows, dispute settlement options, access to international payment systems, etc.

The government's role is seen to be to target specific markets strategically, ensure the correct training to workers, improve infrastructure, raise awareness, and provide a supportive framework by creating suitable labour laws but otherwise making doing business easier (Kuek et al, 2015). Attempts to support better government policy are underway, such as the online toolkit for national policy makers available at [www.ictforjobs.org](www.ictforjobs.org).

A particularly promising but so far unused option would be for governments to kick-start demand for microwork and crowdsourcing through its own procurement procedures and policies: the digitisation of government records, capturing and quality control and various other government tasks could be opened up to online outsourcing platforms instead of contracted via traditional tendering mechanisms to larger operators (Kuek et al, 2015).

Apart from issues at the macro-scale, there are also more individual- and platform-based issues for digital labourers, as noted next.

## 4.2  Micro-Issues: Employee Issues

Many of the issues affecting digital labourers who work in a more traditional environment, e.g. software developers or knowledge workers who work for an outsourcing company, are common to traditional workers, and these will not be discussed here. There are many empirical and critical studies around employee-employer relationships, workplace issues, cultural barriers, etc. although there are relatively few focussing on Africa as a continent or even on specific African countries – South Africa appears to be an exception with a fairly well-established body of local research.

However, skilled IT workers occupy a privileged position in most African countries, along with other scarce skills professions. This brings definite benefits such as higher wages, better employment benefits, more employment opportunities, better bargaining positions and relatively easier trans-national mobility. However, there are concomitant disadvantages to the scarce skills situation: unfilled vacancies means high workloads, resulting in significant stress, strain, negative work-life balance and even burn-out being experienced by e.g. South African IT workers such as developers and programmers (Blaauw et al, 2013; Oosthuizen et al, 2016; Van Belle et al, 2017). A number of IT staff also reported feelings of professional inefficacy, leading to lower job satisfaction and, ultimately, intention to leave organisations or even the IT industry altogether (Van Belle et al, 2017). However, it is not known whether these issues are prevalent across all of Africa, the more developed African economies or even relatively worse/better than the rest of the world.

The situation is reversed for lesser skilled employees. Even in the IT sector, employees with lower IT skill levels (e.g. IT helpdesk) feel not adequately rewarded or valued for their work (Jackson, 2014). Jackson (*ibid.*) attributes this to weaker labour institutions and regulations (a macro-issue) but the consequences are felt at individual level and are insufficiently researched, including feelings of exploitation and job insecurity (Horwitz, 2017). These

uncertainties, stresses and power imbalances are further accentuated in non-IT jobs which are found in the outsourcing/offshoring economy: the often irregular work supply, high unemployment levels and lack of bargaining power leads to stress, insecurity and uncertainty, feelings of exploitation in both outsourcing organisations as well as traditional employers where the risk of outsourcing/offshoring to lower-cost countries is ever-present (Mann & Graham, 2016).

## 4.3 Micro-Issues: Independent Worker and Platform-Related Issues

There are also a number of concerns in developing countries regarding digital labour at the level of the workers or the platforms themselves, such as quality control, exploitation of workers, and task assignment (Allahbakhsh et al., 2013), as well as lack of bargaining power, economic exclusion, intermediation, and skill and capability development (Graham, Hjorth & Lehdonvirta, 2017).

**Quality Control**
Consistent and reliable quality control and management is still a huge facing outsourcing, crowdsourcing and microwork (Ipeirotis, Provost, & Wang, 2010). This concerns the quality of work produced but obviously also affects how the tasks should be designed and allocated (Allahbakhsh et al., 2013). Platforms embed quality ratings for workers but these can be circumvented, abused (e.g. workers with high ratings sub-contract work to lower-rated workers) or present entry barriers for newer workers to procure work.

**Lack of Bargaining Power and Exploitation**
The exploitation of workers is another factor naturally arising from the desire of organisations to save costs (Mtsweni & Burge, 2014). Many people in developing countries are at a disadvantage in terms of their wage: as "low-cost, low-capability buyers" they become price takers without bargaining power. This phenomenon is also referred to as electronic/online sweatshops or the race to the bottom. The situation is exacerbated by the fact that most online platforms manage to fall outside the scope of local labour legislation or protection laws (Lehdonvirta, 2016).

The asymmetry between the two parties is accentuated even further by the huge oversupply of labour on most platforms. According to a study using April 2016 data on one major platform, the oversupply ratios for the three largest sub-Saharan economies were 9,400 unsuccessful (registered) workers against 800 successful workers i.e. 12:1 in South Africa, 20,200-to-1,500 or 13.5:1 in Kenya and a staggering 9,400-to-800 or 34:1 in Nigeria. Although the ratios were similar to those in Asian developing countries, the total number of African successful workers constituted less than 1.3% of the global total (Graham, Lehdonvirta, Wood et al, 2017).

**Task Assignment**
Equitable task assignment is also an important factor for digital platform-based work (Mtsweni, Ngassam & Burge, 2016). Aspirant crowd- and micro-workers either have to bid for microtasks or these can be directly assigned by the work providers. However, both the processes of bidding for and assignment of tasks are often opaque to the workers who do not fully understand the underlying technicalities and rationale of the processes (Mtsweni & Burge, 2014). Additionally, as mentioned already, matching skills and prior quality performance to tasks or jobs remains another issue which platforms have not fully resolved yet.

**Discrimination and Economic Exclusion**

Even though platform mediation is supposedly a fairer way of allocating work on the basis of objective skills, it turns out instead that many platforms enable discriminatory practices which can even exclude certain groups from participation. Sadly, a number of African digital workers report explicit or implicit discriminatory practices or statements, often based on preconceived notions and prejudices around race, ethnicity or disability rather than on objective ability to perform work (Graham et al., 2017). In addition, it appears that some work providers automatically assume that African workers are either uneducated, unable to speak proper English, or in any case willing to work at ridiculously low pay. These discriminatory practices again tend to exclude large numbers of potential workers in developing countries (Graham et al., 2017).

**Intermediation**

In theory, platform-mediated digital labour removes transaction costs and therefore allows for the full value added by the work to be shared or 'captured' by buyer and seller (Coe & Yeung, 2015); even if this 'sharing' is not equitable due to power imbalances. But again, it appears that often some of this value is captured by intermediaries on the labour supply side (Morris *et al*, 2017; Graham et al., 2017). These intermediaries are usually digital labourers who have become successful and achieved a high platform quality rating and end up exploiting newer, lower-skilled, lower-ranked or less experienced workers (Benghozi & Paris, 2016). This introduces inequity between digital labourers.

**Miscellaneous Factors**

Graham et al. (2017) found that many digital workers were not informed about the full value chain or business process of which they were part, or even were not aware of which clients they are working for. This information asymmetry means that the digital workers have no scope for establishing credentials or a track record but also are being deprived of further skill and capability development, remaining stuck in their current skillset and work category categorisation (Mann & Graham, 2016).

In the US, many other worker factors also surfaced, such as (lack of) transparency, fairness, security, accountability and dignity (Deng, Joshi & Galliers, 2016), all of which should be validated in African contexts.

# 5. Research Gaps and Agenda

Although 'digital labour studies' have been emerging since the 2000s, many of these focus on the macro issues or the Global North (Casilli, 2016). All of the issues discussed in Section 4 are deserving of more in-depth research through both systematic large-scale quantitative surveys and smaller mixed-method or qualitative research around the micro-issues (Mtsweni & Burge, 2014).

At the macro-scale, it is clear from the literature that very few hard facts are known. Despite the difficulties of collecting and harmonising statistics in a diverse, under-resourced continent where national statistics offices are under-resourced and often subject to political pressure, it should be possible to improve on the current statistics – possibly by focussing on some of the larger economies and some smaller stable countries which can serve as proxies for others. Identifying proxies, base lines, and trends is crucial to formulate policies around digital labour.

Another research opportunity is exploring possibilities in harnessing the data revolution (particular mobile and internet-of-things-based sources) to obtain amounts and detail of data that would be previously prohibitively expensive to collect, but also looking at ways of harmonising, cleaning, anonymising, aggregating, integrating, sharing and validating micro-data for usable macro-level analysis. (This research could also feed in directly into the SDG progress measures.)

Given the diversity of country, policy and cultural contexts in Africa, a crucial challenge is how to generalise findings from one country to other African contexts. Typically national policies are formulated in the absence of evidence, but even where they are evidence-based, often little impact analysis is done. Where impact or evaluation studies are conducted, the findings are normally unique and specific to the country context. Finding ways of conducting empirical policy review and impact studies that provide effective learning for other countries is needed; perhaps these are better modelled on qualitative best-practices and case study methodologies than quantitative economics-driven approaches.

From a more individual – but no less important – perspective, there is even less known, especially about the impacts. For instance, despite the fact at least one million workers in Africa are currently doing crowdsourced and micro-work, little is known about their experiences. This applies even more to the more formally employed digital labourers. Given Africa's very high economic inequality in the labour market, with the relative shortage of high skills versus the over-supply of un-/semi-skilled labour, individual digital labour issues right across the spectrum are likely to be much more pronounced than in the developed world. Research is needed among highly skilled IT professionals to assess the unexpected and negative consequences of their privileged position in the market (such as overwork, life-work balance, quality of life, burn-out). But perhaps more importantly, research is needed on the impact of outsourcing and impact-sourcing to African countries and offshoring away from African countries on individual's wellbeing, ideally using a partly qualitative and overall more holistic approach than just economic measures. The uniquely African cultural aspects of employees also need investigation, ranging from 'family tax' (a successful income earner is expected to support the rest of the extended family), the "ubuntu" spirit, intra-personal power relationships, decolonisation issues, ethnic and inter-racial relations. Again, research methods are needed to allow for harmonising or generalising beyond individual country contexts to allow for productive learnings and applications in other countries. As an example of what could be done using a quantitative approach, the World IT project uses a standardised instrument to collect comparable data sets across as many as forty countries, in this case around organisational and individual IT issues within a cultural, but not Western-dominated context (Palvia et al. 2017). Unfortunately, there are likely to be only two or three African country datasets (disclosure: the first author is a PI for one of the African countries).

If little research is being done on African employees, even less is known about the part-time and freelance workers. In a context in which many people access the internet via mobile phones, more research is needed to understand how people are using their devices to complete microtasks online. Apart from the 'how' or technological aspect, the personal aspect is entirely under-researched: what are the envisaged and experienced career trajectories of gig workers; what are the coping mechanisms of those who are largely unsuccessful in their attempt to participate in the digital economy (especially if significant financial and educational investments are made); what are the social networking mechanisms used in procuring work and sharing best practices (Heeks, 2015; Boateng et al, 2017). An

interesting qualitative approach is the suggestion of seven stereotypical African online outsourcing worker archetypes such as the self-supporting Kenyan student or the Nigerian community leader (Kuek et al, 2015). The latter lists a number of additional areas requiring research (mainly but not exclusively limited to online outsourcing workers) including non-monetary impacts, drop-out causes, transitioning between full and part time work, and how to start and build a reputation ('the cold start' problem).

The views of the providers of the work, especially where the works originates from a dramatically different economic/social/cultural context, also need understanding; the motivations and experiences of those on impact sourcing platforms likely form a distinct sub-category.

Apart from empirical research, critical research is focussing on the humanistic aspects such as to what extent the phenomenon of gig economy, crowdsourcing and microtasking casualises labour, removes safety nets and traditional labour institutions and allows for exploitation under names as digital or neocolonisation, iSlavery or digital sweatshops (Casilli, 2016). A separate strand of critical research is possible around digital activism such as the formation of principles, standards and organisational forms to improve working conditions and employment outcomes for digital labour. In truth, both empowerment (optimistic) and exploitative (pessimistic) narratives are possible and their interplay should be further investigated (Fish & Srinivasan, 2012).

One other aspect that has not been researched well is focussing on more original digital tasks which are particularly suited to the continent's circumstances, in particular conflict areas and least developing countries. For instance, the flexibility, low cost and scalability afforded by mobile microworkers in humanitarian and emergency relief situations or health epidemics is insufficiently explored in Africa. The use of crowdsourcing and microwork by national governments and supra-governmental development agencies working in Africa to kick-start initiatives and create local demand is another option that should be investigated; possibly this should include re-intermediators to handle the micro/crowdsourcing management. Another angle that remains almost wholly unexplored is the interrelation between digital labour and local innovation.

All of the above empirical research requires additional theoretical and academic insights as well. The digital labour domain needs better conceptualisation and theorising, in order to drive better ways of measuring the status and impacts of digital labour at the macro- and micro-level. Important is to not just focus on the financial-economic issues but also on the humanistic, social, psychological, ethical and political dimensions.

## 6. Conclusion

Digital labour has been touted as a potential pathway to socio-economic development and unemployment alleviation in Africa, especially under the assumed model where the work originates in the Global South. The promise is of extreme importance given that Africa is simultaneously the continent with the youngest population but the highest youth unemployment rate; this is likely to form a socio-political time-bomb. Many African governments and private organisations have bought into the promise of digital labour, if not in action (or policy), then at least in words or promises; but, from the sparse and very approximate data available so far, the actual incidence and impact of digital labour has been

rather limited and is below what, for instance, many developing countries in Asia are experiencing.

Apart from the lack of reliable or comparative statistics, the lack of critical and Africa-specific academic research also severely constrains both the macro- and micro-level understanding of the desirability, dynamics, promise and means to elevate digital labour into a means for development. Although the overall macro-level barriers and issues to leveraging digital labour have been enumerated and are widely understood, ways of addressing these through theoretical contingency models or pragmatic policy recommendations relevant to specific country contexts have not been forthcoming. At the micro-level, we have an even larger knowledge gap and our little empirical data is almost purely anecdotal; often biased by the researchers' objectives.

This report aimed to expose the knowledge gaps and research challenges. However, the authors are still confident that digital labour can indeed, in a significant way, help address some of the continent's urgent socio-economic challenges if more research can inform the way forward.

# 7. References

Abbott, P. (2013). How can African countries advance their outsourcing industries: An overview of possible approaches. *African Journal of Information Systems*, 5(1), 2.

Allahbakhsh, M., Benatallah, B., Ignjatovic , A., Mothari-Nezhad, H. R., Bertino, E., & Dustdar, S. (2013). Quality control in crowdsourcing systems. *IEEE Internet Computing,* 17(2): 76-81.

Anwar, M. (2017). *Digital Gig Work and Outsourcing in Africa: Update on Geonet*. Available: http://cii.oii.ox.ac.uk/2017/02/28/digital-gig-work-and-outsourcing-in-africa-update-on-geonet/

Asfaw, H.A. (2015). Financial inclusion through mobile banking: challenges and prospects. *International Journal of Scientific Research in Science and Technology*, 1(4), 232-238.

Asongo, S.A. (2017). Knowledge economy gaps, policy syndromes, and catch-up strategies: Fresh South Korean lessons to Africa. *Journal of the Knowledge Economy*, 8(1), 211-253.

Beerepoot, N., & Lambregts, B. (2015). Competition in online job marketplaces: towards a global labour market for outsourcing services? *Global Networks*, 15(2), 236-255.

Benghozi, P. J., & Paris, T. (2016). The cultural economy in the digital age: A revolution in intermediation*? City, Culture and Society*, 7(2), 75-80.

Blaauw, D., Ditlopo, P., Maseko, F., Chirwa, M., Mwisongo, A., Bidwell, P., Thomas, S., and Normand, C. (2013). Comparing the job satisfaction and intention to leave of different categories of health workers in Tanzania, Malawi, and South Africa, *Global Health Action*, 6(1), 19287.

Boateng, R., Budu, J., Mbrokoh, A.S., Ansong, E., Boateng, S.L. & Anderson, A.B. (2017). *Digital Enterprises in Africa: A Synthesis of Current Evidence*. Available: https://diodeweb.files.wordpress.com/2017/04?diode-paper-2-digital-enterprises-in-africa.pdf

Bornman, E. (2016). Information society and digital divide in South Africa: results of longitudinal surveys. *Information, Communication & Society*, 19(2), 264-278.

Borromeo, R. M., & Toyama, M. (2016). An investigation of unpaid crowdsourcing. *Human-centric Computing Information Sciences*, 6(11), 1-19.

Brown, A. and Adolwa, P. (2017). *Foresight Africa Viewpoint: Digital Jobs and Smart Urbanization*. Available: https://www.brookings.edu/blog/africa-in-focus/2017/01/24/foresight-africa-viewpoint-digital-jobs-and-smart-urbanization/

Bryce, J., Hartley, S., Kassam, Z., Saloojee, N., & Williams, B. (2011). *Kenya's Off-Shoring Advantage: An Emerging BPO Cluster in East Africa* (Unpublished Paper). Harvard Business School. Available: http://www.isc.hbs.edu/resources/courses/moc-course-at-harvard/Documents/pdf/student-projects/Kenya_BPO_2011.pdf

Casilli, A. (2016). Is there a global digital labor culture? Marginalization of work, global inequalities, and coloniality. Communication at the *2nd Symposium of the Project for Advanced Research in Global Communication (PARGC)*. Apr 2016, Philadelphia, United States. Available: https://halshs.archives-ouvertes.fr/halshs-01387649/document

Chiu, C. M., Liang, T. P., & Turban, E. (2014). What can crowdsourcing do for decision support? *Decision Support Systems*, 65, 40-49.

Chiura, M. (2012). *Crowdsourcing Gaining Momentum in Africa*. Available: http://www.techzim.co.zw/2012/03/crowdsourcing-gaining-momentum-in-africa/

CITI (2017). *CiTiX: Cape Innovation and Technology Initiative's Digital Skills Development Programme*. Available: http://www.citi.org.za/citix/

Chuene, D., & Mtsweni, J. (2015). The adoption of crowdsourcing platforms in South Africa. *IST-Africa 2015 Conference Proceedings*. Available: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7190561

Coe, N., & Yeung, H. (2015). *Global Production Networks: Theorizing Economic Development in an Interconnected World*. Oxford: Oxford University Press.

Dalberg, The Rockefeller Foundation. (2013) *Digital Jobs in Africa: Catalyzing Inclusive Opportunities For Youth*. Available: http://www.youtheconomicopportunities.org/sites/default/files/uploads/blog/Digital_Jobs_in_Africa.pdf

Dasgupta, A., Mahato, K., & Kumar, D. (2017). Cashless technology – a boon to environmental hazards. *International Journal of Research in Engineering, Technology and Science*, VII (Feb), 1-8.

Deloitte Consulting (2016). *Global Outsourcing Survey*, Research Paper. Deloitte Consulting.

Deng, X., Joshi, K. D., & Galliers, R. D. (2016). The duality of empowerment and marginalization in microtask crowdsourcing: Giving voice to the less powerful through value sensitive design. *MIS Quarterly*, 40(2), 279-302.

Domfe, G., Osei-Akoto, I., Amuakwa-Mensah, F. and Owusu, G. (2013). *The Labour Market and Digital Jobs in Africa: Ghana's Workforce Potential in Impact Sourcing*. Available: http://sds.ukzn.ac.za/Files/Documents/Research-Publications/SDS_RB1_Ghana_FINAL.pdf

El Maarry, K., Güntzer, U., & Balke, W. T. (2015). A majority of wrongs doesn't make it right-on crowdsourcing quality for skewed domain tasks. In *International Conference on Web Information Systems Engineering* (pp. 293-308). Springer, Cham.

Feenstra, C. (2016). Statistics to measure offshoring and its impact. In *Fourth IMF Statistical forum, Lifting the Small Boats: Statistics for Inclusive Growth*, November 17-18, Washington, D.C.

Fish, A., & Srinivasan, R. (2012). Digital labor is the new killer app. *New Media & Society*, 14(1), 137-152.

Ford, R. C., Richard, B., & Ciuchta, M. P. (2015). Crowdsourcing: A new way of employing non-employees? *Business Horizons*, 58(4), 377-388.

Free, A. (2015). 'Development', profiles and prospects: Labour in Kenya's outsourced call centres. *Critical African Studies*, 7(1), 47-65.

Fuchs, C. (2013). Theorising and analysing digital labour: From global value chains to modes of production. *The Political Economy of Communication*, 1(2), 3-27.

Fuchs, C. (2014). *Digital Labour and Karl Marx*. New York: Routledge.

Fuchs, C. (2015). Dallas Smythe and digital labor, in: *The Routledge Companion to Labor and Media*, R. Maxwell (ed.), Routledge, New York, NY, 51-62

Fuchs, C., & Sevignani, S. (2013). What is digital labour? What is digital work? What's their difference? And why do these questions matter for understanding social media? TripleC: Communication, Capitalism & Critique. *Open Access Journal for a Global Sustainable Information Society*, 11(2), 237–293.

Graham, M., & Mann, L. (2013). Imagining a silicon valley: Technological and conceptual connectivity in Kenya's BPO and software development sectors. *Electronic Journal of Information Systems in Developing Countries*, 56(2).

Graham, M., Hjorth, I., & Lehdonvirta, V. (2017). Digital labour and development: impacts of global digital labour platforms and the gig economy on worker livelihoods. *Transfer: European Review of Labour and Research*, 23(2), 135-162.

Heeks, R. (2013). Information technology impact sourcing. *Communications of the ACM, 56(*12), 22-25.

Heeks, R. (2015). The research agenda for IT impact sourcing, blog. *ICTs for Development*. 20. Available http://ict4dblog.wordpress.com/2012/05/06/the-research-agenda-for-it-impact-sourcing/

Heeks, R. (2017a) *Decent Work and the Digital Gig Economy: A Developing Country Perspective on Employment Impacts and Standards in Online Outsourcing, Crowdwork, etc*. GDI Development Informatics Working Papers; No. 71, Manchester: Global Development Institute, University of Manchester. Available: http://hummedia.manchester.ac.uk/institutes/gdi/publications/workingpapers/di/di_wp 71.pdf

Heeks. R. (2017b) *Digital Economy and Digital Labour Terminology: Making Sense of the "Gig Economy", "Online Labour", "Crowd Work", "Microwork", "Platform Labour", Etc*. GDI Development Informatics Working Papers; No. 70, Manchester: Global Development Institute, University of Manchester. http://hummedia.manchester.ac.uk/institutes/gdi/publications/workingpapers/di/di_wp 70.pdf

Hesmondhalgh, D. (2010). User-generated content, free labour and the cultural industries. *Ephemera Theory & Politics in Organization*. 10(3/4), 267-284. Available: http://www.ephemerajournal.org/sites/default/files/10-3hesmondhalgh.pdf

Horwitz, F.M. (2017). International HRM in South African multinational companies. *Journal of International Management,* 23, 208-222.

Independent Online. (2017). IBM looks to build African workforce. Available: http://www.iol.co.za/business-report/companies/ibm-looks-to-build-african-workforce-7677096

Ipeirotis, P. G., Provost , F., & Wang, J. (2010). Quality management on Amazon Mechanical Turk. *ACM SIGKDD Workshop on Human Computation*, 64-67.

Iraki, X. N. (2013). Outsourcing and Vision 2030: An analysis into Kenya's new economic frontier. *African Journal of Business Management*, 7, 1218–1223.

Irani, L. (2015). The cultural work of microwork. *New Media & Society,* 17(5), 720-739.

ITNewsAfrica.com. (2017). Kenya: Ajira digital to create 1 million digital jobs. Available: http://www.itnewsafrica.com/2017/01/kenya-ajira-digital-to-create-1-million-digital-jobs/

ITU (2016) *ICT Facts and Figures 2016*. Geneva: International Telecommunication Union. Available at: http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf.

Jackson, T. (2014). Employment in Chinese MNEs: appraising the Dragon's gift to sub-Saharan Africa. *Human Resource Management*, 53(6), 897-919.

Jiang, L., Wagner, C., & Nardi, B. (2015). Not just in it for the money: a qualitative investigation of workers' perceived benefits of micro-task crowdsourcing. *Hawaii International Conference on System Sciences*, 773-782.

Kaufman , N., Schulze, T., & Veit , D. (2011). More than fun and money. Worker motivation in crowdsourcing - a study on Mechanical Turk. *17th Americas Conference on Information Systems*, pp. 1-11. Detroit .

Keeler, R. (2009, June 9). Outsourcing to East Africa: Growth industry or misguided ambition?, *Ratio Magazine*. Available http://www.ratio-magazine.com/20090609681/EAC-Regional/Outsourcing-to-East-Africa-Growth-Industry-or-Misguided-Ambition.html

Kietzmann, J. (2016). Crowdsourcing: A revised definition and introduction to new research. *Business Horizons*, 60(2), 151-153.

Kobayashi, M., Saito, S., Takagi, H., & Watanabe, T. (2014). Skill development framework for micro-tasking. *International Conference on Universal Access in Human-Computer Interaction* (pp. 400-409). Springer.

Kucherbaev, P., Daniel, F., Marchese, M., Casati, F., & Reavey, B. (2014). Towards effective task navigation in crowdsourcing. *International Working Conference on Advanced Visual Interfaces* (pp. 401-404). Como.

Kuek, S.C., Paradi-Guilford, C., Fayomi, T., Imaizumi, S., Ipeirotis, P., Pina, P. & Sing, M. (2015). *The Global Opportunity in Online Outsourcing*. World Bank Group Report (with Dalberg).

Kundu, S. (2008). Kenyan BPO dream collides with reality. *IT Examiner*, 27 June. Available http://www.itexaminer.com/kenyan-bpo-dream-collides-with-reality.aspx

Lacity, M. C., Willcocks, L. P., & Craig, A. (2014). South Africa's business process outsourcing services sector: Lessons for Western-based client firms. *South African Journal of Business Management*, 45(4), 45-58.

Lacity, M., Rottman, J. W., & Carmel, E. (2014). Impact sourcing: Employing prison inmates to perform digitally-enabled business services. *Communications of the AIS*, 34(1), 913-932.

Lehdonvirta, V. (2016). Algorithms that divide and unite: delocalisation, identity and collective action in 'microwork'. In *Space, Place and Global Digital Work*, Vili Lehdonvirta (ed.) (pp. 53-80). Oxford: Palgrave Macmillan.

Luther Osabutey, E., & Debrah, Y. A. (2012). Foreign direct investment and technology transfer policies in Africa: A review of the Ghanaian experience. *Thunderbird International Business Review*, 54(4), 441-456.

Mann, L., & Graham, M. (2016). The domestic turn: business process outsourcing and the growing automation of Kenyan organisations. *The Journal of Development Studies*, 52(4), 530-548.

Melampy, E. (2015). Online outsourcing: how can developing countries benefit? Available: https://csisprosper.com/2015/06/18/online-outsourcing-developing-countries-benefit-job-market/

Meltzer, J. (2014). Supporting the internet as a platform for international trade. Available: https://www.brookings.edu/wp-content/uploads/2016/06/02-international-trade-version-2_REVISED.pdf

Miriri, D. (2017) Kenya targets 1 million digital jobs. Available: https://www.iol.co.za/business-report/technology/kenya-targets-1-million-digital-jobs-7461197.

Morris , M. R., Bigham , J. P., Brewer , R., Bragg, J., Kulkarni, A., Li, J., & Savage , S. (2017). Subcontracting microwork. *CHI Conference on Human Factors in Computing Systems* (pp. 1867-1876). Denver.

Mtsweni, J., & Burge, L. (2014, May). The potential benefits of mobile microwork services in developing nations: Research opportunities and challenges. In *IST-Africa Conference*, 1-10. Available: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6880636

Mtsweni, J., Ngassam, E. K., & Burge, L. (2016). A profile-aware microtasking approach for improving task assignment in crowdsourcing services. In *IST-Africa Conference,* 1-10.

Murugesan, S. (2013). Mobile apps in Africa. *IT Professional*, 15(5), 8-11.

Narula , P., & Kulkarni, A. (2011). MobileWorks: A mobile crowdsourcing platform for workers at the bottom of the pyramid. *Human Computation*, papers from the 2011 AAAI Workshop, pp 121-123.

Nkabinde, S. (2015). Micro-jobbing: the closest thing to easy money. Available: https://www.moneyweb.co.za/mybusiness/micro-jobbing-the-closest-thing-to-easy-money/

Oosthuizen, R.M., Coetzee, M. & Munro, Z. (2016). Work-life balance, job satisfaction and turnover intention amongst information technology employees. *Southern African Business Review*, 20, 446-467.

Page, J., & Shimeles , A. (2015). Aid, employment and poverty reduction in Africa. *African Development Review*, 27(S1), 17-30.

Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science*, 23(3), 184-188.

Palvia, P., Jacks, T., Gosh, J. Licker, P. Romm-Livermore, C., Serenko, A., and Turan, A. H. (2017). The World IT Project: History, trials, tribulations, lessons, and recommendations. *Communications of the Association for Information Systems,* 41, 18.

Ramalingam, B. (2016). *Can Digital Jobs Solve Africa's Unemployment Crisis*. Institute of Development Studies. Available: https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/8835/RRB13.pdf?sequence=1

Rogan, M., Diga, K., & Valodia, I. (2013). The labour market and digital jobs in Africa: South Africa's workforce potential in impact sourcing. Available: http://sds.ukzn.ac.za/files/SDS_RB1_SA_FINAL.pdf

Sabbagh, K., Friedrich, R., El-Darwiche, B., Singh, M., & Koster, A. (2013). Digitization for economic growth and job creation: Regional and industry perspective. In *The Global Information Technology Report,* 35-42. Available: http://www.digital.je/media/Secure-Strategic-Documents/WEF%20-%20Global%20Information%20Technology%20Report%20-%202013.pdf

Samdaria , N., Mathur, A., & Balakrishnan, R. (2012). Paying in kind for crowdsourced work in developing regions. In *International Conference on Pervasive Computing*. Berlin, Heidelberg: Springer. 343–360.

Scholz, T. (2012). *Digital Labour: The Internet as a Playground and Factory*. New York: Routledge.

Smith, A. (2016, November 17). Labor platforms: technology-enabled 'gig work'. Available: http://www.pewinternet.org/2016/11/17/labor-platforms-technology-enabled-gig-work/

Stork, C., Calandro, E., & Gillwald, A. (2013). Internet going mobile: internet access and use in 11 African countries. *Info*, 15(5), 34-51.

Thies, W., Ratan, A., & Davis, J. (2011). Paid crowdsourcing as a vehicle for global development. In *CHI Workshop on Crowdsourcing and Human Computation*. Available: https://www.microsoft.com/en-us/research/wp-content/uploads/2011/05/ThiesRatanDavid-Crowd-Final.pdf

Trading Economics. (2017). Unemployment rates. Available: https://tradingeconomics.com/country-list/unemployment-rate

Tripathi, A., Tahmasbi, N., Khazanchi, D., & Najjar, L. (2014). Crowdsourcing typology: a review of IS research and organizations. *Proceedings of the Midwest Association for Information Systems*. 4, 1-9. Available: http://aisel.aisnet.org/mwais2014/4

UN (2017). Uproar over internet shutdowns. Available: http://www.un.org/africarenewal/magazine/august-november-2017/uproar-over-internet-shutdowns

Van Belle, J.P., Scholtz, B., Njenga, K., Palvia, P. & Serenko, A., (2017) 'Should I Stay or Should I Go?' – Antecedents of Turnover Intentions of IT Staff in South Africa. [Under review.]

Van Etten, J. 2011. Crowdsourcing crop improvement in Sub-Saharan Africa: A proposal for a scalable and inclusive approach to food security. *IDS Bulletin*, 42(4), 108-110.

Waema, T. (2009). *Development of a Business Process Outsourcing Industry in Kenya*. IDRC. Available: http://idl-bnc.idrc.ca/dspace/bitstream/10625/41277/1/129133.pdf

Wayde, R. P., & Rogerson, C. M. (2014). South Africa's call centre industry: The emerging challenges of a growing destination in the global South. *Mediterranean Journal of Social Sciences*, 5(8), 208.

World Economic Forum (2017). *The Africa Competitiveness Report 2017: Addressing Africa's Demographic Dividend*. Available http://www3.weforum.org/docs/WEF_ACR_2017.pdf