

Book Proposal: Digital Entrepreneurship in Africa

Authors

All three authors collaborate on a five-year research project ('Geonet') based at the Oxford Internet Institute that seeks to explore Sub-Saharan Africa's emerging knowledge economies. The project asks whether the 'digital revolution' in Africa represents a new era of development. Specifically, it focuses on whether the diffusion of information and communication technologies (ICTs), broadband Internet, and other digital technologies affect Africa's traditional economic dependence, underdevelopment, and extraversion. While many studies have been conducted into the impacts of ICTs on older industries and sectors, research into the emergence of a new digital economy in Africa is practically absent. It is now that we need empirical research to understand precisely what impacts are observable, who benefits, and how these changes match up to our expectations for change.

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Nicolas has a dual appointment as Research Group Lead Innovation & Entrepreneurship at the Humboldt Institute for Internet and Society (HIIG) in Berlin and as a postdoctoral researcher at the Oxford Internet Institute (OII), where he also obtained his PhD. He is interested in the interplay of digital technologies, geographical contexts, and economic opportunity. For the OII's Geonet project, Nicolas studies the practices and processes of digital entrepreneurship in African cities as environments that are far more challenging than Silicon Valley, Boston, or London. His dissertation research focused on technology innovation hubs in Africa. The thesis explained how hubs work, and how they differ from known forms of entrepreneurship support, such as business incubators.

For his comparative grounded research, Nicolas has done extensive fieldwork in thirteen cities across the Global South, including Accra, Addis Ababa, Harare, Kampala, Kigali, Lagos, Nairobi, and Pretoria/Johannesburg. In addition to his academic work, Nicolas has published a number of reports and practitioner articles, for instance, for the World Bank and the Stanford Social Innovation Review. His research was also featured in *The Economist*. Nicolas was a Fulbright and Clarendon Scholar, and he is currently a Junior Research Fellow at Kellogg College, Oxford.

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Michel is a researcher at the Oxford Internet Institute. Her doctoral research at the University of Edinburgh investigated the socio-materiality of digital entrepreneurship in Nairobi, Kenya. She is more generally interested in the interaction of science, technology, and society. Her previous research has been concerned with the trajectories of adoption for 'clean' technologies and financing arenas for pharmaceuticals for rare and neglected tropical diseases. In recent years, she has turned her attention to digital technologies. She has worked on studies examining the use of social media with respect to the topic of security in Kenya. Other work has included analyzing the construction of computer science knowledge in academic institutions in East Africa. Her current research on the Geonet project has seen her conduct fieldwork in Abidjan, Dakar, Johannesburg, Kampala, Maputo, Nairobi, and Yaoundé, in order to investigate how digital entrepreneurship is manifested in these locales. Michel's professional background includes practice-oriented research for innovation and science policy advisory for use by governments and international bodies.

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Mark is the Professor of Internet Geography at the Oxford Internet Institute, University of Oxford. His research focuses on information geographies and the difference that changing digital connectivities make at the world's economic margins. As principal investigator of the Geonet project, his current work looks at changing 'knowledge economies' in Sub-Saharan Africa, focusing on geographies of information production, virtual labor and microwork, as well as innovation hubs and the digital economy in Ghana, Kenya, Nigeria, South Africa, and Uganda.

Recent books include *Society and the Internet: How Networks of Information and Communication are Changing our Lives* (2014, with Bill Dutton) and *Research and Fieldwork in Development* (2014, with Dan Hammett and Chasca Twyman). His forthcoming book with MIT Press is titled *Digital Economies at Global Margins*.

His research has been featured in the Economist, the BBC, the Washington Post, CNN, the Guardian, and other international media. He is an editor or editorial board member of Information, Communication, and Society, Geo, Environment and Planning A, and Big Data & Society.

Project Description

Brief Description

Digital entrepreneurship is widely believed to be an engine for Africa's development in the 21st century. From Mark Zuckerberg to Emmanuel Macron and Paul Kagame, technologists and policymakers have proposed hopeful narratives, arguing that digital technologies are enabling Africa to "leapfrog" and experience ground-breaking economic progress. Entrepreneurs and innovators who exploit these opportunities are construed as the driving forces of "Africa Rising" and the "African Century." Accordingly, Africa has seen a digital entrepreneurship boom: in just a few years, hundreds of millions of dollars have been invested in tech cities, entrepreneurship trainings, coworking spaces, innovation prizes, and investment funds.

In this book, we unpack aspirations concerning "the digital" and "entrepreneurship," contrasting them with insights into what is actually happening on the ground. The book grapples with the large gap between boundless ambition on the one side and sobering statistics on the other: in any imaginable measure for digital economies, Africa does far worse than any other continent, and global divides seem to be widening.

Our book draws on research conducted as part of a five-year research project, including fieldwork in 11 African cities. In doing so, it seeks to go beneath the hype, and explore, document, and analyze the phenomenon of African digital entrepreneurship. It aims to understand opportunities as well as limits that the rise of the Internet has brought to ventures in Africa, painting a richer and more realistic picture than media articles and policy documents have done.

We show that the average African digital enterprise does not grow exponentially, does not scale internationally, does not attract venture capital, and does not disrupt cumbersome analog value chains. Instead, we see entrepreneurs who are creatively and productively applying and adapting digital technologies to their local economic, social, and political contexts. This has many of the wished-for positive socio-economic effects, just not at the rate and scale that the widespread narratives suggest.

Our book is thus able to build a nuanced review of what the digital revolution means in, and to, some of the world's economically most marginal places. The space-transcending, bridging, scale-free, and zero-marginal-cost properties of digital tools and technology are sometimes in evidence, but can only be brought into being by select actors in certain places. It is by looking to, not just the successes and failures, but also the everyday activities of Africa's digital entrepreneurs that we can offer guidance for those who look to distinguish between possible, probable, and implausible futures for African economies.

Extended Description

What you are doing is the right thing. Get the undersea cable, lower the cost, and everything will flow to Kenya. You will have flattened the world to which you can do any work globally.—Thomas Friedman speaking to Bitange Ndemo, Kenya's Permanent Secretary to the Ministry of ICT in 2006 (Bright & Hruby, 2015, p. 156).

Improving Internet connectivity has inspired hope for drastic positive change in Africa (McKinsey & Company, 2013; World Bank, 2012). Now that connectivity has diffused and “democratized,” a range of actors are betting that fundamental economic shifts will ensue (Deichmann & Mishra, 2016; World Wide Web Foundation, 2014). The analog, traditional economic world is deemed to be on the verge of “transformation” and “revolution” (Murphy & Carmody, 2015; Ndemo & Weiss, 2017b).

Digital entrepreneurship is widely believed to be a key driver of these changes (Drouillard, Taverner, Williamson, & Harris, 2014; Ndemo & Weiss, 2017a).¹ Policymakers, donors, investors, and media have fueled a boom around this agenda. For instance, outgoing UN Secretary General Ban Ki Moon told an audience at iHub, Africa's best-known digital entrepreneurship organization, that they “are the hope of Africa” (Wakoba, 2014). Mark Zuckerberg, Facebook's founder and CEO, when visiting Nairobi stated that places like iHub are “where the future is going to be built” now that “things [in Africa] are moving from a resource-based economy... to [an] entrepreneurial, knowledge-based economy” (Shapshak, 2016). Widely read media outlets like National Geographic, proclaim that “Africa's Tech Generation Is Changing the Continent” (Draper, 2017) and Al Jazeera has produced an entire TV series showcasing how “lives are being changed across the continent by home-grown innovations” (Al Jazeera English, 2014). Hundreds of other such stories proliferate in the media (cf., Nothias, 2014). These hopeful imaginaries of African digital entrepreneurship tend to deploy two particular narratives.

According to the first narrative, digital technologies enable Africa to experience *fast-paced and ground-breaking economic and technological development* (McKinsey & Company, 2013). Notably, Africa can leapfrog developmental stages which the Global North has already gone through. Africa is thus catching up with, or even overtaking, richer countries (Bright & Hruby, 2015). Having missed the industrial revolution, so the argument goes, Africa will now be at the forefront of the ongoing digital revolution. Young Africans are depicted as the “mobile first” or “mobile only” generation, and low-tech “inclusive” or “frugal” innovations such as Kenya's mPesa or the Pan-African eSoko are cited as examples for this progress (Mbiti & Weil, 2011; Morawczynski, 2009; Omwansa & Sullivan, 2012). Africa is deemed capable of developing its own innovations for home-grown problems (Avle & Lindtner, 2016), for instance, “rugged” technology like the Kenyan-made BRCK, a “backup generator for the Internet” (Sotunde, 2013) that works even in rural areas without cellphone coverage. Kenya's president Uhuru Kenyatta, recently argued that “MPESA, M-Kopa, GroIntelligence, Andela and others, show that we can lead the world with innovations that drive financial inclusion, access to energy, better data to drive our agriculture, and the essential skills required to support the young innovators of the future” (Government of Kenya, 2018). Africa is argued to be better positioned than any other continent due to improving political stability, strong economic growth, and its “demographic dividend” (Ahmed, Cruz, Go, Maliszewska, & Osorio-Rodarte, 2016). The continent is seen as a unique opportunity for financial investors, given that a number of African nations (incl. Ghana, Ethiopia, and Cote d'Ivoire) continue to be among the fastest-growing countries globally (Bright & Hruby, 2015; Signé, 2018). As a result of these factors, the Economist coined the slogan “Africa Rising” (“Africa rising,” 2011), and politicians across the continent have proclaimed the “African Century.”

The second narrative proclaims that, through digital technologies, African entrepreneurs are becoming part of a *globalized and increasingly level opportunity landscape* (Autio, Nambisan, Thomas, & Wright, 2018;

¹ We define digital entrepreneurship as the novel creation of market and opportunity-driven initiatives that is enabled or deeply impacted by digital technologies (Nambisan, 2017), including the Internet, mobile applications, social media, cloud computing, and artificial intelligence.

Mavhunga, 2017; Nambisan, 2017). Markets for software development are globalizing, which is argued to bring enormous potential for African coders and outsourcing businesses, who can offer competitively low labor prices (Takhteyev, 2012). Digital entrepreneurship is understood as a global movement (Auerswald, 2012; Honig, 2017): ideas like the Lean Startup or the business accelerator have spread worldwide, organizations such as Seedstars, TechCrunch, or the Global Entrepreneurship Network have run events in most African countries, and online learning providers and elite universities such as Stanford are offering courses on technology entrepreneurship to anyone with a reliable Internet connection. As the Internet has made digital tools and infrastructures easily and cheaply available to startups (Aldrich, 2014; Tilson, Lyytinen, & Sørensen, 2010), entry barriers to digital entrepreneurship are deemed to be relatively low (Dy, Marlow, & Martin, 2017; Greengard, 2010). The Economist also coined a phrase for this development, picturing a Cambrian Moment (Siegele, 2014) at which the Internet enables a plethora of new organizations that create value through technologies in any place on earth. A key argument is that, while talent has always been distributed equally across the globe, now the Internet gives everyone the same opportunity to be creative and make money. Paul Kagame, Rwanda's president and a respected African leader, sums up that "[d]igital innovation means ideas do not have borders and cannot be landlocked" (Tumwebaze, 2014).

It is no coincidence that these two narratives are so commonplace when African digital entrepreneurship is discussed. In this book, we argue that they derive directly from typical aspirations concerning "the digital" and "entrepreneurship." Namely, digital technologies and the Internet have long been framed by African policymakers, international development agencies and the private sector as footloose and placeless, giving them potential to level economic opportunity and include or upgrade geographies that had previously been deprived or excluded (Avgerou, 2003; Friederici, Ojanperä, & Graham, 2017). This aspirational component of digital technologies explains why they have been so central to African development discourse: digital technologies offer an imaginary within which there is a pathway for the African continent to overcome and overturn its historically peripheral global position and its history of colonial extraction, exploitation, and denigration (M. Graham, Andersen, & Mann, 2015a).

Entrepreneurship complements the aspirational component of digital technologies by offering a more local and bottom-up vision of who will bring about change. Inside and outside of Africa, the actors who have tried to "develop" the continent in the past are rarely looked at favorably (cf., Escobar, 2011). Multilateral development organizations like the World Bank and IMF have been mistrusted latest since the Washington Consensus (Easterly, 2001; Moyo, 2009). Multinational corporations have extracted Africa's resources without creating significant benefits for its peoples. Bilateral donors, foundations, and non-governmental organizations (NGOs) are accused of waste and inefficiency, as well as "distorting markets" and creating "perverse incentives" (Ferguson, 1990). Many African governments are blamed for supporting particular tribal groups, ethnic groups, or political and economic elites rather than the public good. In contrast, the grassroots entrepreneur's image is wholly unblemished. Young, smart Africans, often with college degrees from elite universities in the US and Europe, are easily construed as impatient, driven, and astute change makers (Avle, 2014; Bright & Hruby, 2015; Olopade, 2014). "Entrepreneurship" thus offers the hope that this particular group of Africans may be better-positioned than any other type of actor before them. France's president, Emmanuel Macron, argues that digital innovation is therefore "the best way to provide the solution made by, and for African people" (Olupot, 2018).

Together, far-reaching aspirations and narratives have paved the way for concrete actions and interventions: there has been an *African digital entrepreneurship boom*. The number of African incubators and innovation hubs² has risen to several hundred within just a few years (Bayen & Giuliani, 2018; Firestone & Kelly, 2016) (see Figure 1), notwithstanding a total lack of evidence regarding their effectiveness (Friederici, 2018). There are no good figures on the number of smaller-scale initiatives,

² Incubators typically offer a clearly defined set of hands-on support services (e.g., work space, mentorship, networking) while innovation hubs provide only lightweight support and mostly help entrepreneurs form communities (cf., Friederici, 2017).

such as innovation prizes, hackathons, and events, but it is safe to say that thousands per year happen in cities across Africa, sponsored by a mixture of philanthropists, development organizations, technology corporations, and (more rarely) local governments. To name just three recent and high-profile examples: the GSMA Innovation Fund³ injected mentorship and between \$1 and \$2.3 million into African digital enterprises in just its first round (Mulligan, 2017); the World Bank's XL Africa program created an elite community of 20 startups from across the continent and connected them to investors (Kapil, Andjelkovic, & Lu, 2018); and Google's Nigeria-based accelerator recently funded startups with \$3 million, in addition to in-kind support (Jackson, 2018). The Tony Elumelu Entrepreneurship Programme has committed \$100 million in grants for African early stage entrepreneurs. In 2018, the French Development Agency launched the Digital Africa initiative, committing around \$76 million to a startup fund (Olupot, 2018). The large-scale technology park Konza City in Kenya will cost the government and investors an estimated \$14.5 billion. Similarly ambitious—and similarly expensive—plans exist in Senegal, Nigeria, Rwanda, Ghana, and South Africa (Giles, 2018). An illustrious group of celebrities and decision-makers—from Mark Zuckerberg through Christine Lagarde to Bono—has visited places like iHub in Nairobi, CcHub in Lagos, MEST in Accra, or kLab in Kigali, showering these organizations with praise and encouragement.

Our book probes into this boom – offering insights into what is actually happening on the ground. It will explore whether any of these high-flying ambitions are translating into palpable economic development, or if they simply risk to mislead and distract from real potentials and opportunities.

Thereby, the book grapples with the large gap between boundless ambition on the one side and rather sobering statistics on the other. In practically any proxy measure of digital entrepreneurship that is available, Africa does far worse than any other continent. Internet and smart phone penetration has been growing, but growth has recently stagnated, and Africa is still far behind the rest of the world. The gaps are even wider for bandwidth and affordability (Chen, Feamster, & Calandro, 2017; Deichmann & Mishra, 2016). While apps like YouTube, WhatsApp, and Facebook have achieved continent-wide reach (Chen et al., 2017; Stork, Esselaar, & Chair, 2017), there are no African-made, African-owned, or Africa-based smartphone apps that are widely used within or outside of the continent, and even leading African nations only represent a fraction of the global app economy (Caribou Digital, 2016). Few software developers outside of the continent take note of those within it (see Figure 2). Similarly, for measures of digital production available at global scale, Africa barely shows up in the statistics (see Figure 3).

Against the backdrop of these sobering statistics and powerful imaginaries about the potentials for change, our book draws on research conducted as part of a five-year qualitative research project in 11 African cities. In doing so, it seeks to go beneath the hype, and explore, document, and analyze the phenomenon of African digital entrepreneurship as it has become observable in recent years. It aims to understand opportunities as well as limits that the rise of the Internet has brought to ventures in Africa, painting a richer and more realistic picture than media articles and policy documents have done. Our mission is therefore to ground the conversation that scholars, practitioners, and policymakers have begun, without getting lost in the descriptive detail on any particular success story or aspect.

While no book could perfectly capture the diversity of African cities while also discussing the continent as a whole (Cheeseman & de Gramont, 2017; Noorloos & Kloosterboer, 2018; Phillips, 2014; Watson, 2015), we will attempt to do justice to local contexts without losing sight of continent-wide themes that have emerged from our analysis. Namely, we will mostly highlight generalizable patterns, but go into contextual detail whenever locally specific findings defied these patterns or gave them a particular shape. For instance, we will explicitly discuss variations in dimensions of digital entrepreneurship which we found to vary rather starkly across the continent, such as the size of domestic digital markets and the local labor force. Similarly, we will elaborate on cultural and policy-induced differences across

³ The GSMA Innovation Fund also illustrates how the agendas—and funds—of development organizations and technology corporations are co-mingled in the support of African digital entrepreneurship: the fund is administered by GSMA but financially supported by UKaid and AustralianAid, which contributed undisclosed amounts.

entrepreneurial ecosystems (e.g., locally specific narratives about particular barriers or the role of certain actor groups). Moreover, we will include an appendix with factsheets for each case study we analyzed, directly focusing on local idiosyncrasies. We excluded North African nations from our analysis for two reasons: first, Sub-Saharan Africa⁴ has been shown as only poorly integrated in global digital production networks (Carmody, 2013; Ojanperä et al., 2017), and second, most Sub-Saharan nations (with South Africa as the primary exception) have a shared Internet connectivity history, as submarine and overland fiber-optic cables arrived in these countries later than almost anywhere else in the world (M. Graham, Andersen, & Mann, 2015b).

⁴ We are aware of criticism that the division of Africa in North Africa and Sub-Saharan Africa can be understood as a postcolonial and racist social construct. We use the term “Sub-Saharan Africa” in a strictly geographical sense, referring to nations that are situated South of the Sahara Desert.

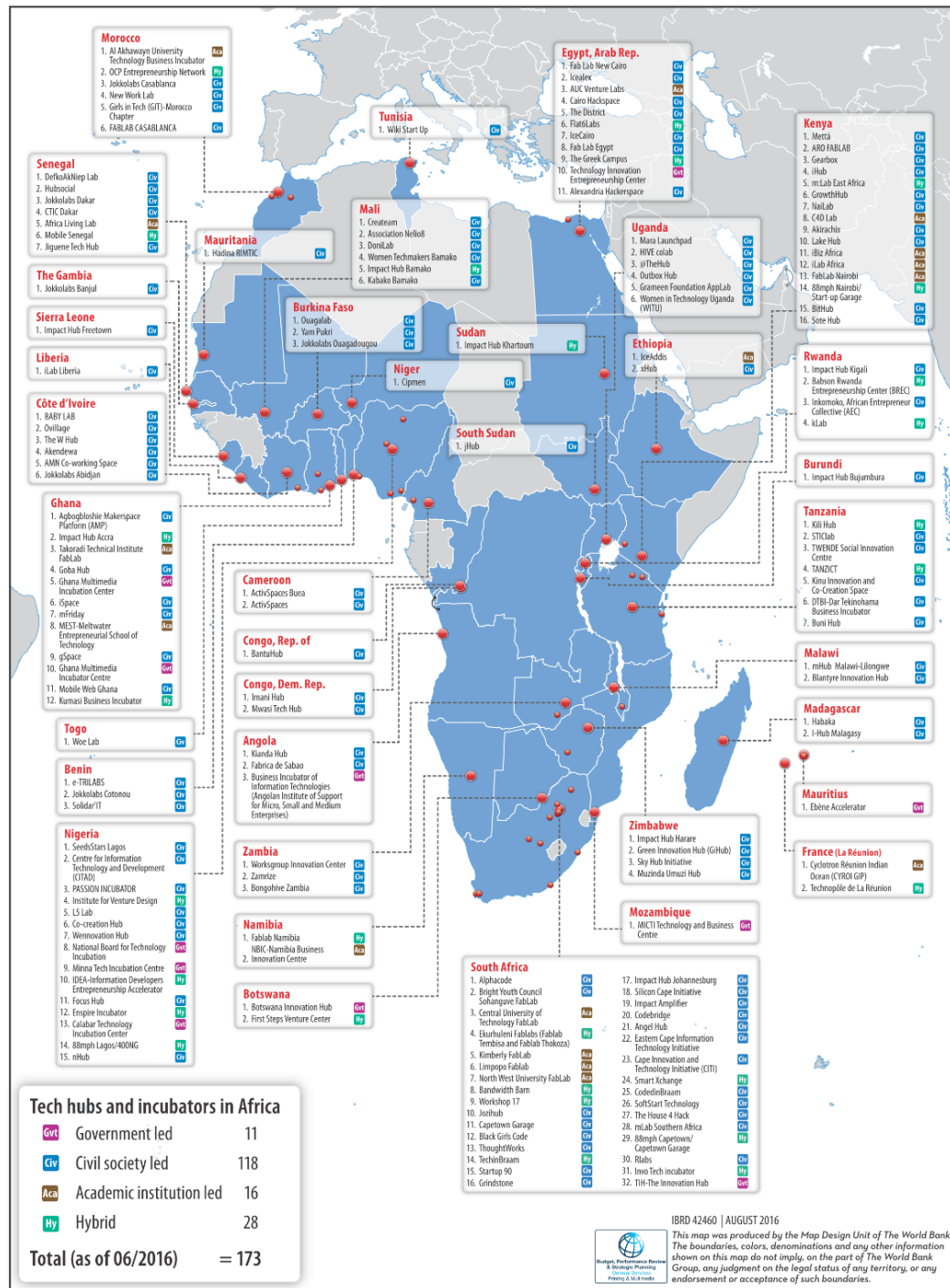


Figure 1: Technology innovation hubs in Africa mapped by World Bank. Source: Firestone & Kelly (2016).

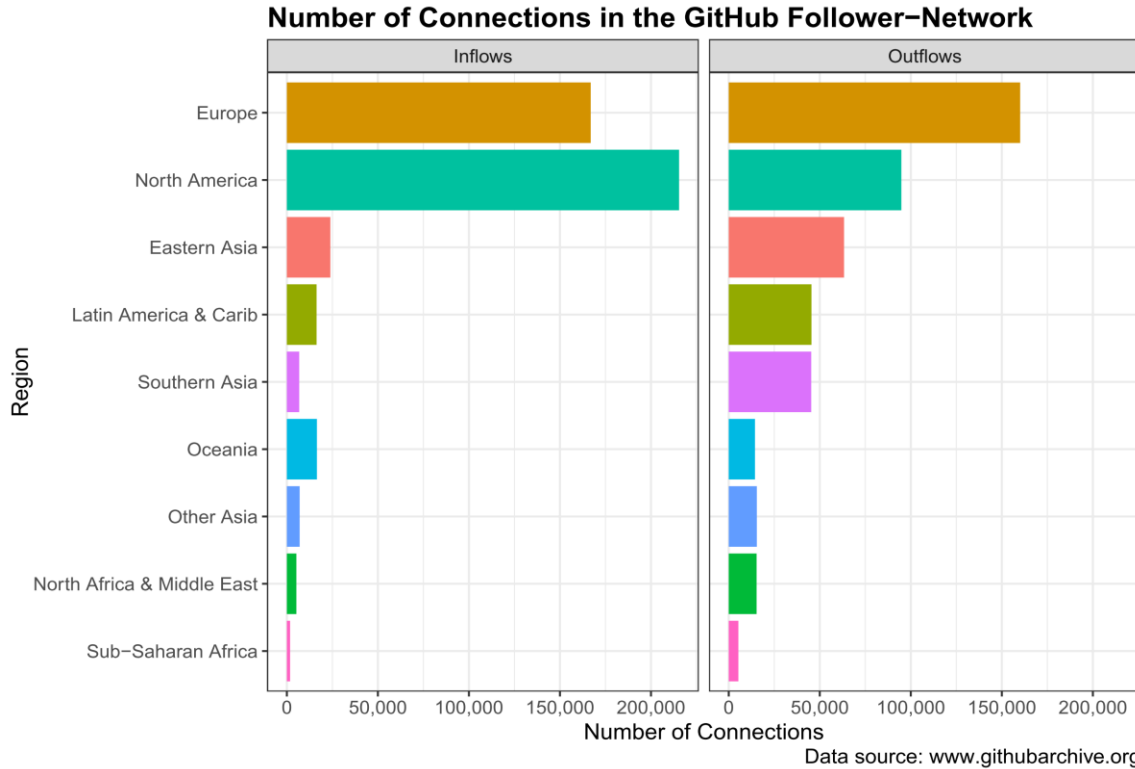


Figure 2: Number of connections in the GitHub follower network. This graph derives from Geonet’s research into Africa’s presence within the world’s largest repository of software (GitHub). Users upload code and follow each other for updates. We see that Sub-Saharan African users are followed only by 1,767 users outside of the region (i.e., the “inflows” represent 0.4% of the total follows between regions). This means that only an insignificant fraction of software developers worldwide takes note of coders in Africa. Conversely, 5,292 users based in Sub-Saharan Africa follow others outside the region, illustrating that coders in Sub-Saharan Africa are three times more likely to follow someone from outside of the region than being followed. The graph also shows the very low level of GitHub activity in Sub-Saharan Africa in absolute terms.

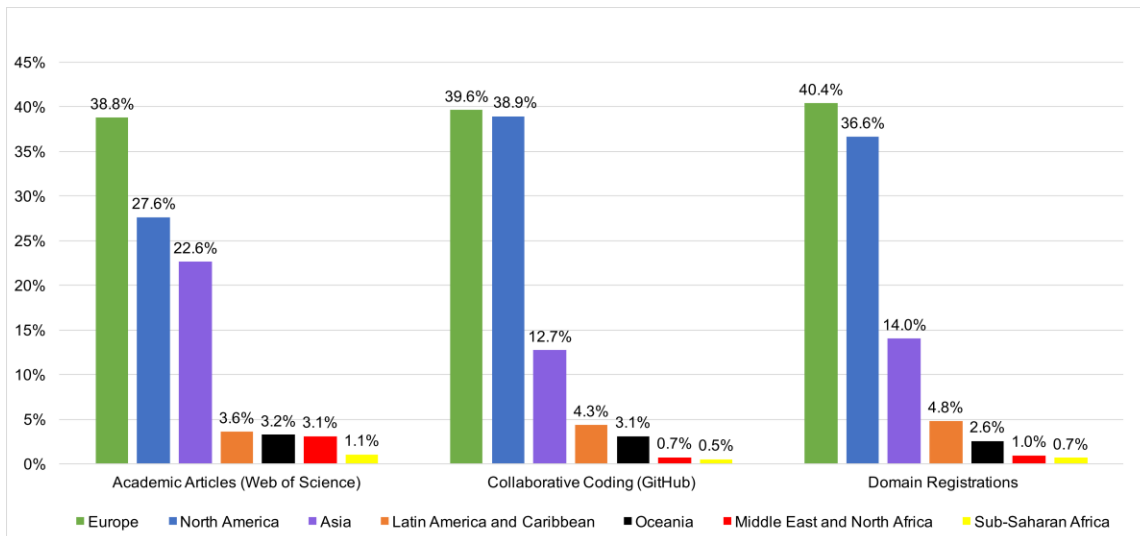


Figure 3: Content creation across continents. This graph stems from a Geonet study (Ojanperä, Graham, Straumann, Sabbata, & Zook, 2017) examining Africa’s knowledge production in comparison with other world regions. The study juxtaposed a traditional form of knowledge production (academic articles) with Internet-enabled forms (GitHub commits, that is, contributions to the world’s largest coding platform, and website domain registrations). The findings confirmed prior research showing Africa’s extremely limited share of academic work globally, but they also highlighted that Sub-Saharan Africa seems to play an even smaller role for global digital production: despite having about 13% of the world’s population, only 0.5% of GitHub commits and 0.7% of domain registrations come from Sub-Saharan African nations.

Ultimately, our book provides readers with a broad-strokes summative overview of African digital entrepreneurship, while also offering analytical depth and highlighting previously undiscovered effect chains and patterns. Our arguments can only ever be as strong as the evidence we have to support them, and so we have sought to gather a compelling and comprehensive assembly of datasets and observations on African digital entrepreneurship. To this end, we draw predominantly from the Geonet project at the Oxford Internet Institute, which all of the authors have been involved in. For this five-year research program, field-based case studies on the digital entrepreneurship landscapes were completed for 11 African cities: Abidjan, Accra, Addis Ababa, Dakar, Johannesburg/Pretoria, Lagos, Kampala, Kigali, Maputo, Nairobi, and Yaoundé. This effort included 202 of in-depth research interviews conducted between January 2017 and March 2018, including with 143 digital entrepreneurs. Further, we draw from access to Geonet's quantitative mapping and digital outsourcing work, as well as a previous project on the business process outsourcing sector in Kenya and Rwanda, providing us with a wide-lens view of Africa's emerging digital economies. Finally, two of the authors (Friederici and Wahome) have completed doctoral theses before joining the Geonet project. They investigated digital entrepreneurship organizations in Nairobi, Kigali, Accra, and Harare, conducting strategic ethnographies and sociologies of digital spaces, including 166 interviews. This means that we have been deeply immersed in African digital entrepreneurship for years: together, we have conducted months of fieldwork across the continent, conducted and rigorously analyzed hundreds of interviews, interpreted hundreds of charts and maps, participated in dozens of events, and read hundreds of media articles and thousands of tweets. This book captures the essence of what we have learned during this process, codifying what we find to be an accurate, realistic, and insightful account of African digital entrepreneurship in the early 21st century.

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Each chapter will have 8-10,000 words (or 30-35 pages).

Chapter 1: Deconstructing the Boom Around Digital Entrepreneurship in Africa

Digital connectivity is now a norm for the majority of the world's population. 2018 marks the first year on record where there are more Internet users in the world than non-users. Even in Africa, the continent with the world's lowest penetration rates, over a third of the total population is online. To many, these statistics herald a radical moment of change. Paul Kagame, the President of Rwanda, perhaps best captures hopes for change with his famous quote:

In Africa, we have missed both the agricultural and industrial revolutions [but] in Rwanda, we are determined to take full advantage of the digital revolution. This revolution is summed up by the fact that it no longer is of utmost importance where you are but rather what you can do—this is of great benefit to traditionally marginalized regions and geographically isolated populations.

Digital tools and technologies have properties that seemingly allow their users to transcend traditional constraints to economic activity. By being relatively cheap and ubiquitous, and by embedding their

users in a global network, they suggest previously unthought-of market opportunities for entrepreneurs in Dakar, Addis Ababa, Maputo, Cape Town, and everywhere in between. Digital products can be reproduced at close to zero marginal cost, and products and services can now be delivered to the furthest corners of the world almost instantaneously. These possibilities have sparked an unprecedented rush into digital entrepreneurship across Africa. Eager to transcend local constraints, investment has poured in, innovation hubs have been set up, and technology parks have been built.

This chapter surveys both the breadth of African digital entrepreneurship activities and the imaginaries they are based upon. Decades of research in the Global North have shown that, far from eliminating the frictions of distance, local economic geographies continue to matter, while digital technologies can often amplify inequalities rather than transcend them. Why then do policy makers, investors, and entrepreneurs themselves continue to reproduce visions of the profound change that the ‘digital revolution’ can bring about in Africa? By unpacking some of the most prominent African digital entrepreneurship hopes, and comparing them to earlier literature and theory on imaginaries of technological transformation (S. Graham, 1998; Marinetti, 1909; Massey, 2005; McLuhan & Fiore, 1967; Mitchell, 1996; Standage, 1999), this chapter lays the groundwork for the research presented in the rest of the book. By unpacking hopes, visions, and proclamations, this chapter establishes what people expect to change, as well as the mechanisms and processes through which they expect this change to occur. It thereby sets the stage for the remainder of the book, which will analyze where and for whom those hopes turn into realities.

Chapter 2: Taking Stock

This chapter establishes a basic understanding about the realities of African digital entrepreneurship, providing further contextual knowledge for the remainder of the book. To this end, it collates an array of sources with reliable descriptive evidence. This is more difficult than it may appear at first glance: digital entrepreneurship is a dynamic phenomenon with fuzzy boundaries, and statistical sources are unavailable or of low quality for most African countries (Jerven, 2016). Against this backdrop, the chapter’s contribution is to present a unique compilation of existing data sources which are proxy measures for digital entrepreneurship or its specific facets, such as financing. In effect, the chapter does not claim to measure digital entrepreneurship directly, but it uses triangulation across data sources to arrive at a representation of the phenomenon that is as complete and accurate as possible. Data will be visualized through rich maps and data visualizations. Data sources will include established ones, such as World Bank indicators, the Global Entrepreneurship Development Index, and industry reports, but also non-traditional ones collected by our research cluster at the Oxford Internet Institute, such as geo-coded GitHub and StackOverflow data and subsets of the Online Labour Index (Kässi & Lehdonvirta, 2018). We also distill descriptive information from interview data, presenting those findings that were reported most consistently by participants.

The analysis first delineates common practices and strategies underlying business models and traction in various locales. For instance, it highlights that firms catering to other businesses (B2B) are more likely to thrive in most contexts, given the multi-faceted and systemic shortcomings in digital consumer markets (Drouillard, 2017; Onsongo, 2017). The chapter then shows three broader trends that emerged from analysis. First, Africa is far behind the rest of the world in digital production—even when data are normalized by GDP or Internet penetration (Ojanperä et al., 2017). It is, for instance, further behind in the production of digital codified knowledge than in traditional codified knowledge (such as academic articles). Second, stark divides exist within Africa: a few countries (South Africa, Kenya, Nigeria, and Egypt) account for almost all digital entrepreneurship activity. Countries such as Ghana, Tanzania, Senegal, Cameroon, Uganda, Tunisia, Morocco, Cote d’Ivoire, Mauritius, and Rwanda account for a noteworthy but much lower level (cf., Wentrup, Ström, & Nakamura, 2016). Most African nations show activity levels that appear negligible in international comparison. Also within countries, extreme divides exist: interview data from all case studies show that the user base for most types of digital products can be found almost exclusively in large cities, that is, close to where the enterprises themselves are located. Third, we show that digital enterprises in Africa predominantly

create value by digitizing segments of existing value creation processes in close geographical proximity, while they rarely attain scaling economies or reach customers abroad.

Chapter 3: Digital Market Boundaries and the Lure of Scalability

This chapter further explores one finding from the previous chapter that is particularly at odds with African digital entrepreneurship narratives, namely that African digital enterprises rarely scale across pre-existing analog barriers, such as city or national borders. In many of the interviews we conducted, participants specifically mentioned that they hope that digital technologies would help their enterprise scale quickly. The chapter thus adopts an entrepreneurial strategy perspective (Ott, Eisenhardt, & Bingham, 2017), juxtaposing the assumption of unbounded digital markets (Amit & Zott, 2001; Huang, Henfridsson, Liu, & Newell, 2017) with an analysis of why enterprise scaling is actually slow and spatially confined for African enterprises.

Our findings show that African digital enterprises are almost always users of new global digital infrastructures, but this access rarely helps them scale across distance. Instead, we observe that the home locations of digital enterprises in African cities consistently play a residual bounding role. Our findings suggest that those digital technologies enjoy high deployment that best integrate into local ways of doing, as well as those able to recruit or replace pre-existing economic structures (cf., Drouillard, 2017; Ekekwe, 2017; Olayinka David-West & Evans, 2015; Onsongo, 2017). For those businesses that seek users in the general populace, having the resources to develop extensive distribution and logistics infrastructures or relationships that enable them to latch onto those of more established entities is a must. As African digital entrepreneurs thus recognize and pursue opportunities through a contextually specific lens, they become further and further enmeshed in the analog realities of their local geographies. Digital tools and global platforms undoubtedly allow some enterprises to pursue distant opportunities. Yet, such distant markets tend to either be piecemeal or dominated by better-resourced enterprises based outside of Africa. These findings lead us to argue that, the more digital (and thus layered and scalable) products are, the less likely they are to be created and controlled by digital enterprises founded in economic peripheries. We also highlight areas of opportunity for African digital enterprises going forward.

Chapter 4: Africa's Digital Entrepreneurs

This chapter evaluates how actors' identities, values, and visions influence their decisions and practices. The data has been coded with the aim of bringing out these particular themes. The richness of the data enables us to produce and reinforce cross-cutting findings. We will also pull from specific cases and experiences and highlight them in 'boxed' vignettes in order to bring the cross-cutting findings to life and illustrate them in practice. The chapter discusses how actors' interpretations of digital entrepreneurship and its promises impacts their characterization of opportunity and success, as individuals and as a collective. It aims to engender an understanding of how they perform digital entrepreneurship, and the kinds of knowledge and skillsets that enable them to pull off this performance (Katila, Laine, & Parkkari, 2017; Mainela, Pernu, & Puhakka, 2011).

Our findings reveal that entrepreneurs are acting based on a nuanced understanding of the opportunities and constraints that are specific to their situations (cf., Avle & Lindtner, 2016). This is especially true of those who have been involved in this arena for some time. They are better able to navigate the paradoxes of the logics of digital entrepreneurship as interpreted and enacted in their geographies. Thus, we encounter actors who, aside from having to know how to run a business organization, also need to know how to wield mythologies and expectations embedded in the global digital entrepreneurship agenda in order to drive interest and resources towards digital entrepreneurship in Africa.

Chapter 5: Innovation Hubs and Entrepreneurial Ecosystems

In this chapter, we examine more closely the social contexts within which African digital entrepreneurs are operating. We first look at support organizations, with particular emphasis on innovation hubs as the dominant organizational form across the African continent. We then examine contexts at the city-

level, analyzing entrepreneurial ecosystems that have emerged. To avoid imagining entrepreneurs as acting in isolation, the chapter aims to identify key stakeholders of African digital entrepreneurship ecosystems, and also highlight how ecosystems have developed.

Our analysis highlights that the number of innovation hubs and other support organizations has undoubtedly increased sharply in just a few years (Bayen & Giuliani, 2018; Firestone & Kelly, 2016), with financial and in-kind support coming from a wide range of sponsors, such as international foundations, corporations, multilateral development organizations, and local governments (Friederici, 2018). Yet, we also show that organizational models and practices had to be revisited as hubs and incubators have struggled with sustainability and with gaining legitimacy locally (cf., Tracey, Dalpiaz, & Phillips, 2018). We further highlight how such organizational dynamics interrelate with ecosystem evolution (Dutt et al., 2016; Friederici, 2017; Goswami, Mitchell, & Bhagavatula, 2018). At the ecosystem-level, we first identify commonalities across Africa, highlighting a number of typical bottlenecks towards generating sought-after catalytic effects of support interventions. In this context, we also discuss African governments' support efforts and the relatively larger influence of foreign development organizations, highlighting why their support has mostly fallen short of bold ambitions or had significant unwanted side effects. Finally, we show locally specific dynamics, stressing the diversity of African entrepreneurial ecosystems and illustrating the most important contextual differences.

Chapter 6: Reach and Inclusion

In many locales, digital entrepreneurs are seen as the progressive, modernist vanguard. This a factor of the sociomaterial contexts and institutional logics of digital entrepreneurship (Davidson & Vaast, 2010; Hill & Mudambi, 2010; Katila et al., 2017) which characterize digital entrepreneurship as futuristic and scientific (cf., Suchman, 2011). As a result, their roles extend beyond commercialization of technology into leadership and activism on behalf of mores associated with progressiveness and development. Some ventures' self-representation as "social enterprises," seeking to attract "impact investment," reflect such quests for legitimacy and status. At the same time, the knowledge and skillsets associated with digital technologies are often considered to be relatively accessible. There is a sense that digital technologies represent an opportunity for livelihoods to be supported anywhere. The chapter shows some of the tensions, contestations, and politics arising from this contradiction (Marttila, 2013). For example, we highlight how funding is often reserved to particular small social groups (Strachan Matranga, Bhattacharyya, & Baird, 2017), and a number of other instances where digital entrepreneurship ambitions may not translate to situated realities. Some of the contestation is visible in discourses around whether to challenge predominant narratives or play into them (Dolan & Rajak, 2016; Seth, 2016; Suchman, 2011). For instance, the institutions that have proliferated in the wake of enthusiasm for digital entrepreneurship (like hubs, incubators, and government agencies) have recently had to justify their existence, sometimes by attempting to reignite the earlier sense of optimism and opportunity, sometimes by developing new and more practical arguments.

Beyond these wider observations, we find that African digital enterprises are inspired by narratives around supposedly vast rural development and market potentials at the "bottom of the pyramid;" however, they experience difficulties turning these expectations into sustainable businesses. Ironically, digital or digitized value chains that reach rural customers (especially subsistence farmers) fundamentally depend on analog connectivity (e.g., transportation infrastructure, face-to-face interactions, etc.). This implies that distribution cost per customer often becomes prohibitive for the most remote areas, and that businesses' understanding of rural consumers remains limited. Another issue is that of technological affordances in technology design. Often technologists make assumptions about market readiness based on rates of uptake of mobile technologies and other digital services. Low rates of uptake of technologies often reflect an inability to take into account end user capabilities (Wyche & Steinfield, 2016). Digital enterprises thus suffer from rural market access challenges that are surprisingly similar to those of analog businesses. This leads to tensions with the donor landscape, as funders typically expect the opposite to be the case. Entrepreneurs respond with a critique of donor

funding infrastructures that generally provide small grants relative to the vast amounts thought to be available through investment financing. Ultimately, the chapter thus shows the pitfalls of seeing digital technologies as counterforces to exclusion: market access but also identification and understanding remain hampered by analog divides.

Chapter 7: Global Asymmetries of Place and Power

Following on from the discussion of local ecosystems and inclusive development, this chapter will discuss the continuity between Africa's historical and current place in the world, and how this global positioning might impact on the continent's technological aspirations (Mavhunga, 2017; Nyairo, 2015; Zeleza, 2009). This analysis builds directly on the previous chapters and their engagement with the topics of the development of local capacities, accessibility of capital, and access to markets for the purpose of building the ideal digital entrepreneurship ecosystem. Previous chapters have challenged the assumption of the universality of the opportunities that digital entrepreneurship models present (Saldanha, 2012; Suchman, 2011). We show that the hegemony of Silicon Valley looms large over the digital entrepreneurship imaginary (Avle & Lindtner, 2016), and we illustrate in detail the effects of the influence of this model. Given that the logics of digital entrepreneurship have been spawned in Western sites, primarily Silicon Valley, can actors from other geographies capably enact them? One observation emerging in chapter six is that the entrepreneurs that are most successful at navigating the promissory landscape of digital entrepreneurship and signaling legitimacy are those that are steeped in 'Western' modalities (Ascione, 2016; Fan, 2016; Gikandi, 2001; Seth, 2016; Suchman, 2011).

The chapter shows that global asymmetries of privilege and capability are replicated in the local microcosm. They are clear in patterns of mobility and relocation, that is, which actors (and firms) are able to travel and settle in new areas. Asymmetries are also made evident in the institutional practices of financing technological commercialization. 'Pattern recognition', a process through which predictions and expectations about startups are generated, leads to white, male entrepreneurs securing financing at higher rates and valuations than their non-white counterparts (Strachan Matranga et al., 2017). In order to compensate, local actors then develop the strategy of 'white fronting' as a means of recouping their agency. This chapter goes on to reveal how the constitution of local politics and global geopolitics are integrated. It is evident in the sites where digital enterprises emerge. As the previous chapters have shown, activity is centered in urban areas with cosmopolitan credentials. The meta-narrative is the pervasive marginalization of some places as non-modern (Ascione, 2016; Fan, 2016; Law & Lin, 2017; Suchman, 2011), which reinforces age-old asymmetries.

Some actors have expressed concern about the 'fetishizing' of digital entrepreneurship in lieu of other strategies for mitigating against inequality. The question is whether places are able to develop their own strategies or whether they must constantly appropriate others' agendas in order to meet their own needs and aspirations (Seth, 2016). These questions and critiques engage with broader critical discourses in development, post-colonial studies and science and technology studies (Anderson, 2017; Ascione, 2016; Fan, 2016; Gikandi, 2001; Law & Lin, 2017; Mavhunga, 2017; Mbembe, 2001; Mosselson, 2016; Nugent, 2009; Olivier de Sardan, 2005; Zeleza, 2009) and relate it to the framing of digital entrepreneurship and technology adoption as a means to bridge inequality. Discourse on the coloniality of modernization is often overlooked within digital entrepreneurship scholarship (Gikandi, 2001; Mavhunga, 2017; Suchman, 2011). This chapter not only points to the gradients of power within its logics but also questions how these frameworks can be modified to take into account the agency of local actors, if at all.

Chapter 8: A Path Forward: Acknowledging Limits and Making Long-Term Investments

This final chapter summarizes the key findings of the book and analyzes their implications. African and international media, policymakers, and analysts have overly focused on success stories and aspirations, glancing over thorny issues such as digital entrepreneurship's impacts on inequality, countless vicious cycles in development processes, or the slower-than-expected pace of change. In sum, the average African digital enterprise, according to our findings, does not grow exponentially, does not scale internationally, does not attract venture capital, and does not disrupt cumbersome analog

supply chains and economic processes. Instead, we see digital enterprises that are creatively and productively applying and adapting digital technologies to their local economic, social, and political contexts. This has many of the wished-for positive socio economic effects (e.g., improved efficiencies and service quality, high-quality job creation, etc.), just not at the rate and scale that the widespread narratives about African digital entrepreneurship suggest. In line with this, we also see significant waste and misguided efforts in the entrepreneurship support landscape: it appears that most supporters are too removed from the realities of digital entrepreneurs to design helpful and effective interventions.

By reviewing the ways that African entrepreneurs are harnessing digital tools, and contrasting the changes that they bring about with the transformative hopes shared by so many, this final chapter is able to build a nuanced review of what a digital revolution means in, and to, some of the world's most economically marginal places. The space-transcending, bridging, scale-free, and zero-marginal-cost properties of digital tools and technology are sometimes in evidence, but can also only be brought into being by select actors in certain places. It is by looking to, not just the successes and failures, but also the everyday activities of Africa's digital entrepreneurs that we can offer guidance for those who look to distinguish between possible, probable, and implausible futures for African economies.

Appendix A: Ecosystem Factsheets

For each of the 11 cities that were analyzed as case studies, 2-page factsheets of entrepreneurial ecosystems are provided. Key information about 9 ecosystem facets will be summarized in a short paragraph for each case study, including:

1. Digital Markets
2. Entrepreneurial Mindset, Knowledge, and Culture
3. Business Models and Value Creation
4. Narratives, Symbols, and Myths
5. Failures and Pitfalls
6. Local Talent and Skill
7. Entrepreneurship Support Organizations
8. Finance and Resources
9. Government and Universities

Each factsheet will also provide a list of further information resources. Factsheets will thus make context-specific information easily accessible, making them particularly useful for practitioner and policy audiences with an interest in a particular city.

Appendix B: Methodology and Primary Data

For scholarly audiences and interested others, we provide in-depth methodological detail. In particular, we describe the nature of our data, listing which stakeholder groups were interviewed in which city, when interviews were conducted, and how we analyzed the data.

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