This PDF includes a chapter from the following book:

Digital Entrepreneurship in Africa

How a Continent Is Escaping Silicon Valley's Long Shadow

The title-level DOI for this work is:

doi:10.7551/mitpress/12453.001.0001

1 Hopes and Potentials

Africa, so the saying goes, is rising. From Mark Zuckerberg to Emmanuel Macron to Paul Kagame, presidents, prime ministers, technologists, and policymakers have proposed hopeful narratives, arguing that digital technologies are enabling Africa to leapfrog and experience groundbreaking economic progress. Entrepreneurs and innovators who exploit these opportunities are construed as the driving forces of the "African century." Accordingly, Africa has seen a digital entrepreneurship boom: in just a few years, hundreds of millions and maybe billions of dollars have been invested in tech cities, entrepreneurship trainings, coworking spaces, innovation prizes, and investment funds.

In this book, we unpack aspirations concerning "digital" and "entrepreneurship," contrasting them with empirical research about 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 eleven African cities. It contrasts rich and vast empirical data with popular discourses about digital entrepreneurship in Africa and with literature from management studies. Through this empirical grounding, the book seeks to go beneath and beyond the hype, and explore, document, and analyze the phenomenon of African digital entrepreneurship. It aims to understand both the opportunities and the limits that the rise of the internet has brought to ventures in Africa, painting a richer and more realistic picture than the digital innovation literature, media articles, and policy documents have done.

This book finds that most expectations raised in discourses and management theory do not consider on-the-ground realities and thus miss the essence of digital entrepreneurship in Africa. Our analysis shows that African digital entrepreneurship

- is highly unevenly distributed across the continent;
- is characterized by slow and mostly linear growth;
- creates digital products largely for customers in urban markets at local and regional scales;
- depends on entrepreneurial learning and ecosystem evolution, both processes that extend over long periods of time before producing palpable outcomes;
- consists of strategy innovations like the last-mile platform, which blend digital technologies with analog outreach structures;
- has led to the emergence of new entrepreneurial identities; and
- has triggered cultural and racial tensions as Silicon Valley's ideals have clashed with local realities and reproduced postcolonial dependencies.

Altogether, contrary to expectations conveyed in popular discourses and management scholarship, the average African digital enterprise does not grow exponentially, does not scale internationally, does not produce digital infrastructure, does not attract venture capital (VC), and does not disrupt traditional industries. Instead, we see entrepreneurs who are creatively and productively applying and adapting digital technologies to their local economic, social, and political contexts. This appears to have many of the wished-for positive socioeconomic effects, just not at the rate and scale that the widespread narratives suggest.

Our book thus builds a nuanced review of what the digital revolution means in and to Africa as the world's most marginalized continent. The space-transcending, distance-bridging, fast-scaling, and zero-marginal-cost properties of digital products are sometimes in evidence but can only be brought into being by select actors in certain places. This book shows that the global expansion of digital infrastructure enables local digital enterprises but also their international competitors—the latter often to a greater extent. It examines in detail how exactly the global digital revolution touches down in African cities and nations as it makes possible a host of new activities

but does not untether local digital economies from the continent's structural legacies.

Africa in the Global Economy

Sub-Saharan Africa[1] is the world's poorest, most disadvantaged, and most disconnected region. Although it is a resource-rich continent, gross domestic product (GDP) per capita in Africa is about 6 percent of what it is in Europe and 5 percent of what it is in North America. This is despite Africa's GDP tripling since 2000 (African Union Commission and OECD 2018).

Of the 1.3 billion people in Africa, almost 400 million can be characterized as extremely poor (living on US$1.90 or less) (African Union Commission and OECD 2018). The average African lives for fifteen fewer years than the average North American. One in every three people in sub-Saharan Africa is illiterate, there are still twelve African countries with literacy rates of less than 50 percent, and seventeen out of the forty-six countries in sub-Saharan Africa have female literacy rates of less than 50 percent (UNESCO 2015). Less than half of school-aged children in this region are attending school, and only four percent of children are expected to enter in graduate institutions (Musua 2018).

Despite being extremely rich in energy resources, only 43 percent of sub-Saharan Africa's total population and 25 percent of its rural population have access to electricity (Blimpo and Cosgrove-Davies 2019). Although hundreds of millions of dollars have been spent building submarine fiber-optic cables (Graham, Andersen, and Mann 2015), sub-Saharan Africa remains the planet's least connected region. Only 22 percent of people in the region have internet access, meaning that there are more illiterate people than there are internet users in the region. Even the region's best performers—South Africa, Nigeria, and Kenya—have internet penetration rates of only about 50 percent (Graham 2019). The relatively high cost of internet access is part of the reason for these low rates. As Ojanperä (2018) notes: "A monthly broadband subscription costs around 50 USD in Niger and in Ireland. However, while the Irish internet user earns an average yearly gross income of 53,000 USD, the Nigerien will make 390 USD. So, whereas an Irish person would spend just over half of her weekly salary to cover the subscription for an entire year, the Nigerien would need to allocate over one and a half year's earnings to do the same."

These statistics are presented neither to paint a picture of despair nor to imply that Africa cannot change, but rather as a backdrop for what comes next. Sub-Saharan Africa, in other words, is not necessarily a place in which one might expect a digital revolution to be underway.

New Connectivities, New Beginnings

> 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, former permanent secretary of Kenya's ICT Ministry in 2006 [Bright and Hruby 2015a, 156])

Although just over 5 percent of humanity was connected to the internet at the dawn of the millennium, only twenty years later we are approaching a world in which a majority of the population has access (see figure 1.1; World Bank 2019). The majority of these new connections are in low- and middle-income countries: often places with high levels of un- and underemployment.

Not only are most people in the world now connected, the majority also live where access is physically possible. Ninety-five percent of the world's population live in a place serviced by a mobile-cellular network, and as many as 84 percent of people reside under the shadow of mobile broadband networks (ITU 2017).

The world's remaining gaps in connectivity have been the focus of a range of initiatives by governments, international organizations, and corporations (Friederici, Ojanperä, and Graham 2017). Internet.org (a partnership led by Facebook), for instance, explicitly defined its aim as connecting the planet. It exclaims that this "means the whole world, not just some of us." The partnership aims to achieve this with a combination of zero-rated apps (i.e., helping the poor get online in contexts where access is physically possible, but unaffordable) and unmanned aircraft (in contexts where internet access was previously a physical impossibility). The Alphabet Corporation (Google's parent company) has a similar initiative with its Project Loon. The project utilizes high-altitude balloons that promise to beam internet access down to rural areas. Governments and international organizations have also invested heavily in connectivity projects. The World Bank has allocated over a billion dollars to projects related to broadband infrastructure in Africa, and the African Development Bank claims that $55

Access to the Internet

Internet penetration 2015, in percent

90–100
80–90
70–80
60–70
50–60
40–50
30–40
20–30
10–20
< 10
n/a
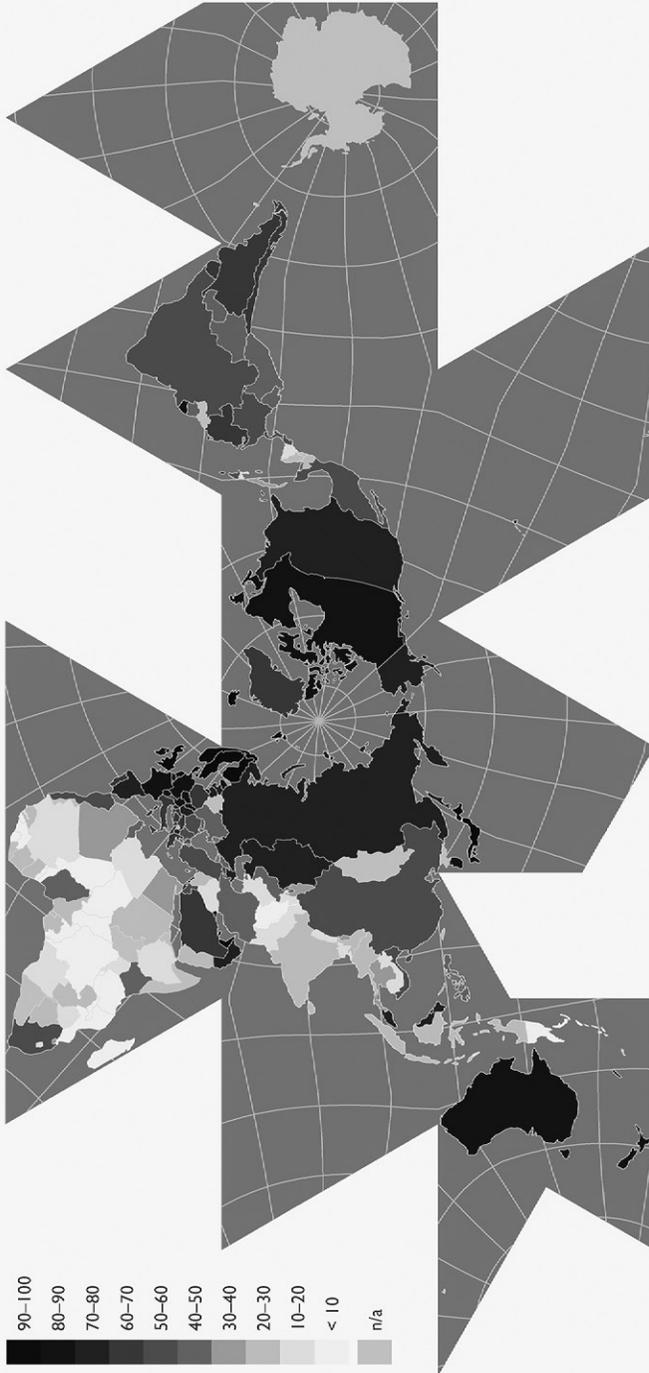
Internet penetration is the proportion of individuals who have used the internet in the last 12 months.

CC-BY-NC Ralph Straumann, @rastrau, & Mark Graham, @geoplace
Oxford Internet Institute, University of Oxford, UK

Data sources: World Bank, Natural Earth
Geonet project: http://geonet.oii.ox.ac.uk

Figure 1.1

Internet penetration in 2015. *Data source:* World Bank, Natural Earth. http://geonet.oii.ox.ac.uk/blog/who-can-access-the-internet/.

billion has been pledged for its Connect Africa initiative (Friederici, Ojan-perä, and Graham 2017).

As the world has become more connected, it has concurrently become more digital. All manner of products, services, and processes are now digital and digitized. This has profound implications for the geography and the organization of work and global supply chains. The move to a more digital and more connected world has enabled the construction of a range of virtual production networks that form complex links and interrelationships between consumers and workers around the planet (Lehdonvirta et al. 2019).

The "world is flat" narrative came and went with the hype of the dot-com boom two decades ago (Zook 2009). But now, almost two decades into the millennium, we have a human planet that is increasingly defined by connectivity. There are few inhabited corners of the planet left in which digital connectivity is impossible. Today, there are no large cities in the world (with the possible exception of Pyongyang) that lack access to the high-speed broadband needed to interface with such services (Graham 2019). Billions of people and organizations are using digital technologies to conduct business and seek prosperity. This by no means has given us a flat world—as evidenced by the fact that the majority of Africans have never used the internet. Yet the creation of planetary-scale markets for digital goods and services has left many people with the impression that a global digital revolution is underway (see box 1.1) and that now, finally, old barriers, constraints, and borders might truly be able to be transcended.

Is African Digital Entrepreneurship on the Rise?

To many, Africa's economic growth combined with these changes in global connectivity heralds a radical moment of change. Digital technologies and the internet have long been framed 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, and Graham 2017). This aspirational component of digital technologies explains why they have been so central to African development discourse: digital technologies offer an imaginary[2] within which there is a pathway for the African continent to overcome and over-turn its historically peripheral global position and its history of colonial

Box 1.1
The Global Digital Revolution

Over the last four decades, enormous scaling economies for several generations of technology corporations have driven the global diffusion of the internet and digital technologies. As microprocessors became more powerful, smaller, and cheaper, they began to be used in many more devices than just the personal computer, generating ever greater possibilities of connectivity and quantities of data. In the early 2000s, smartphones and laptops started to be manufactured and marketed at mass scale in high-income countries, and previously analog tools (such as medical devices, assembly lines, cars, or household items) were "digitized": they were equipped with chips that can process digital signals. In parallel, the internet diffused at a global scale, emerging as the primary technology to interconnect microprocessors and data storage units (e.g., servers and hard drives) at a distance. Increasing internet bandwidth and affordability allowed for near-instantaneous transmissions of larger and larger data volumes. Ultimately, it became possible to run software remotely, enabling browser-based applications, cloud computing, and software as a service (SaaS).

The availability of cheap and powerful data processing and storage facilities in combination with the rise of the internet has resulted in three global phenomena, which together can be referred to as the *digital revolution* (Brynjolfsson and McAfee 2011):

1. Global digital infrastructure consisting of hardware (fiber-optic cables, switching stations, mobile devices, etc.) and software (operating systems, cloud applications, web browsers, app stores, search engines, etc.), which are internationally interconnected and standardized, in principle enabling any internet user to access any digital artifact (software, data) that is physically stored on another internet-connected device (Steinbock 2003; Tilson, Lyytinen, and Sørensen 2010)

2. Pervasive digitization, in which digital technologies augment or transform previously analog processes of value creation, capture, and exchange (e.g., smart electric grids or tracking systems in freight management; Nambisan et al. 2017; Yoo, Henfridsson, and Lyytinen 2010)

3. Growth, convergence, and reconfiguration of information-based industries—that is, those industries that enable or depend on the codification, processing, or transmission of information, including computer and device manufacturing, software and content production, networking infrastructure (fiber cables, data centers, internet exchange points, transmission towers), telecommunications, and media (Malecki and Moriset 2007)

extraction, exploitation, and denigration (Graham, Andersen, and Mann 2015; Jasanoff and Kim 2016).

Now that connectivity has diffused and "democratized," a range of actors are betting that fundamental economic shifts will ensue (Deichmann and Mishra 2016; World Wide Web Foundation 2014). The analog, traditional economic world is deemed to be on the verge of "transformation" and "revolution" (Murphy and Carmody 2015; Ndemo and Weiss 2017a, 2017b). Paul Kagame, the president of Rwanda, perhaps best captures hopes for change with this 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" (quoted in Graham, Andersen, and Mann 2015, 344).

Digital entrepreneurship is widely believed to be a key driver of these changes (Drouillard et al. 2014; Ndemo and Weiss 2017a).[3] According to Ndemo and Weiss (2017a), "The laying of the first fiber-optic cable . . . heralded a new chapter for cheaper telecommunication access. With it, opportunities to mainstream internet access were created, such as . . . startup hubs where entrepreneurs had access to high-speed internet." Policymakers, donors, investors, and media have bought into this narrative. For instance, former 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, stated when visiting Nairobi 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 (see Nothias 2014).

Such far-reaching aspirations have paved the way for concrete actions and interventions: there has been an *African digital entrepreneurship boom*. The number of African incubators and innovation hubs[4] has risen to several

hundred within just a few years (Bayen and Giuliani 2018; Firestone and Kelly 2016), notwithstanding the absence of evidence regarding their effectiveness (Friederici 2019). There are no good figures on the number of smaller-scale initiatives (e.g., 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 four recent and high-profile examples: the GSMA Innovation Fund[5] 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 twenty startups from across the continent and connected them to investors (Kapil, Andjelkovic, and Lu 2018); Google's Nigeria-based accelerator recently funded startups with $3 million, in addition to in-kind support (Jackson 2018a); and the Tony Elumelu Entrepreneurship Programme has committed $100 million in grants for African early-stage entrepreneurs.

Governments and development organizations have also contributed their share. The French Development Agency launched the Digital Africa initiative, committing around $76 million to a startup fund (Olupot 2018). In 2019, the World Bank started a moonshot initiative to boost Africa's digital economy that is said to cost hundreds of millions of dollars, with digital entrepreneurship forming a key pillar (Goldberg 2019). 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 to 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.

Digital Technology and Entrepreneurship: How Two Gospels Have Become One

Why do policymakers, investors, and entrepreneurs devote vast sums of money and attention to fostering digital entrepreneurship in a region characterized by so many structural and maybe more fundamental issues? It certainly is not because there is of a wealth of empirical evidence that

suggests success. Rather, it is in large part because of two unverified discursive belief systems, or *gospels*, about what changing connectivity does to Africa's economic geographies. These are variably deployed, in sometimes overlapping, sometimes contradictory, but always powerful ways (see Avgerou 2003; Birtchnell 2011; Pansera and Owen 2018).

The Internet as a Global Leveler of Opportunity

According to the first gospel, thanks to digital technologies, African entrepreneurs are becoming part of a global landscape of opportunity (Autio et al. 2018; Mavhunga 2017; Nambisan 2017). As alluded to earlier, digital tools and technologies have properties that sometimes allow their users to transcend traditional constraints to economic activity. Here the world is essentially shrunk onto the head of a pin: being located in Africa is no longer of much consequence to an entrepreneur's ability to transact with people and firms anywhere else in world. "Tech-enabled startups . . . can operate on internet scale from day one; propelled by software that makes the fundamental aspects of reaching a broad user-base and going global a lot easier," claims an advisor to the Obama Foundation in an article titled "Why Africa's Youth Should Be Encouraged to Launch Tech Startups" (Jackson 2018b).

The key reason for this change is said to be access to the internet. 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. 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, and 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), entry barriers to digital entrepreneurship are deemed to be relatively low (Dy, Marlow, and Martin 2017; Greengard 2010).

The *Economist* 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, though 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, in the same spirit as his earlier mentioned quote, summed up that "digital innovation means ideas do not have borders and cannot be landlocked" (Tumwebaze 2014).

Entrepreneurs as the New Hope

The second gospel hails the African grassroots entrepreneur as a powerful agent of change. Entrepreneurship complements the aspirational component of digital technologies by offering a more local and bottom-up vision of who will bring about economic development (see Smith et al. 2017). Inside and outside of Africa, the actors who have tried to "develop" the continent in the past are rarely looked at favorably (see 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 nongovernmental 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 (Acemoglu and Robinson 2013).

In contrast, the African grassroots entrepreneur's image is wholly unblemished. Young, smart Africans, often with college degrees from elite universities in the United States and Europe, are easily construed as impatient, driven, and astute change makers (Avle 2014; Bright and Hruby 2015a; Olopade 2014). Digital entrepreneurship offers new hope because the actors who are creating and capturing value are inherently locally driven. This, in turn, makes grassroots participation in the economy much more likely than in older models of development dropped down from afar (see Smith et al. 2017). Entrepreneurship thus suggests that this particular group of Africans may be better positioned than any other 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).

In addition, entrepreneurship is seen as a path toward alleviating youth underemployment (Dolan and Rajak 2016). Africa's demographic and

employment numbers emphasize the discrepancy between job creation and the numbers of youth who will be seeking employment in upcoming years. Entrepreneurship is characterized as a remedy that enables individuals to create their own jobs and jobs for others (Chang 2015; Dolan and Rajak 2016; Farny et al. 2016). Startup "methodologies" (like the lean startup) promise that by following simple templates (like the business model canvas), everyone can be a successful entrepreneur and any city can become a thriving entrepreneurial ecosystem (Feld 2012; Ries 2011). The narrative of Silicon Valley has a proclivity toward highlighting youthfulness as a positive attribute, thus signaling that digital entrepreneurship is an ideal solution to the youth bulge. Actors are thus operating within an environment in which innovation and entrepreneurship are extolled and encouraged at global and national levels.

Leapfrogging: The Time Is Now

In the tradition of modernist development (Rostow 1960), Africa is thus seen to potentially be leapfrogging developmental stages that high-income countries have already gone through. Digital entrepreneurship is now framed as both an indicator of and pathway to modernity, and therefore prosperity. Digital enterprises promise to be transformational, scientific, and high-growth ventures, a departure from the subsistence-, necessity-, and microentrepreneurship that Africa is typically associated with. The narrative thus goes that Africa is catching up with, or even overtaking, richer countries (Bright and Hruby 2015a). Having missed the industrial revolution, so the argument goes, Africa will now be at the forefront of the ongoing digital revolution.

Digital entrepreneurs are cast as visionaries who will bring about leapfrogging with groundbreaking technological products. Young Africans are depicted as the "mobile-first" or "mobile-only" generation, and low-tech "inclusive" or "frugal" innovations (see Birtchnell 2011; Pansera and Martinez 2017), such as Kenya's M-Pesa or the Pan-African Esoko are cited as examples of this progress (Mbiti and Weil 2011; Morawczynski 2009; Omwansa and Sullivan 2012). Africa is deemed capable of developing its own innovations for home-grown problems (Avle and 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 cell phone 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 et al. 2016). The continent is repositioned as the new frontier, as risk is reframed from the potential of losses to the potential of gains (Nyamnjoh 2013). Scarcities are reinterpreted as commercial opportunities (Srinivas and Sutz 2008), as bottom-of-the-pyramid customers (Prahalad 2009) are construed as an underserved market segment eagerly awaiting service provision, preferably through mobile phones. The continent is seen as a unique opportunity for financial investors, given that a number of African nations (including Ghana, Ethiopia, and Côte d'Ivoire) continue to be among the fastest-growing countries globally (Bright and Hruby 2015a; Signé 2018). As a result of these factors, the *Economist* (2011) coined another catchy slogan: "Africa rising." Meanwhile, politicians across the continent have proclaimed the "African century."

What Does Digital Entrepreneurship Theory Suggest?

Not just popular narratives but also management research tends to downplay the role of distance for digital entrepreneurship. In fact, Satish Nambisan, in his foundational and widely noted paper (Nambisan 2017), highlights less boundedness of entrepreneurial agency and entrepreneurial opportunity as the defining feature of digital entrepreneurship compared to traditional or analog entrepreneurship. A burgeoning management literature has become infatuated with the idea that digital entrepreneurship and digital business models hold particular potential for transcending analog geographical constraints (see Aldrich 2014; Autio et al. 2018; Sussan and Acs 2017). In the following sections, we briefly review foundational concepts from this literature to show why it comes to rather similar (albeit less explicit and sweeping) affirmations as those from the policy gospels we reviewed in the previous section.

Digital Infrastructure, Affordances, and Generativity

All entrepreneurship consists of economic actors (individuals, firms, or other organizations) pursuing an uncertain market opportunity, creating and capturing value in the process (Alvarez and Barney 2005; Alvarez, Barney, and Anderson 2012; Davidsson 2005). Technology entrepreneurship is distinct in that the affordances of a given technological innovation constrain and enable potential pathways for the pursuit of opportunity.[6] This is because particular technologies lend themselves to particular ways of creating and capturing value, which makes some entrepreneurial strategies viable and others less so. Consider telephony as an example. Telephony is an end-to-end individual communication technology. Users derive value by being able to hear an audio signal (voice) in real time, emitted by a person located in a distant place. Strong network and critical mass effects apply (Katz and Shapiro 1985; Markus 1987): the more users there are, the higher the value of having a phone line for any given user. Telephone operators can make money by charging users fees for the phone line or for its usage. For operators, typical strategies are thus investing in telephony infrastructure, owning customer relationships, partnering with value-added service providers (e.g., telephone marketing or hotlines), standardizing technology through associations and regulators, reaching interconnection agreements with large competitors, and crowding out smaller competitors. All of these strategies allow for maximizing value creation while creating opportunities for value capture. On the market level, without regulation, oligopolies or monopolies will ensue, because small, localized phone providers cannot achieve the necessary minimum efficient scale. Ultimately, telephony's technological affordances shape (but do not wholly predetermine) both business strategies and market structures.

By extension, digital entrepreneurship is about economic actors pursuing market opportunities that exist by virtue of *digital* technologies' affordances (Nambisan 2017). Most people intuitively understand contemporary technologies like the internet, mobile applications, social media, cloud computing, or artificial intelligence (AI) as digital. Yet to comprehend why digital technologies are often celebrated as offering the fastest and widest scaling opportunities, we will briefly clarify what distinguishes digital from analog.

In *digital technologies*, information is represented and transmitted by means of binary signals (e.g., high vs. low voltage), whereas *analog*

technologies use continuous signals (e.g., continuous amounts of voltage). Binary signals are easier to transfer and interpret compared to signals on a continuum because they are less susceptible to noise and disturbances (Null and Lobur 2006). The first commercial technology to exploit digital signaling as a more efficient way of information processing and transmission was the personal computer—or more specifically, the microprocessors that computers run on (Campbell-Kelly et al. 2013). Hardware (computers using microprocessors) can interpret and process software and data. Data and software are digital artifacts: they adhere to standardized information structures (e.g., programming languages or operating systems), which can be represented as binary electronic transmission signals that microprocessors can interpret.

By virtue of adhering to standardized information structures, digital artifacts become *reprogrammable*, *editable*, *interactive*, and *open* (Kallinikos, Aaltonen, and Marton 2010; Yoo, Henfridsson, and Lyytinen 2010). Furthermore, any computer can efficiently process any information once it has been "digitized" (i.e., it has been brought into a format that can be represented as zeros and ones). This enables what Bruno Latour (1986) refers to as the *immutable mobile*, the *separation of form and function*, and the ability to transport information without significantly altering its characteristics of meaning (Yoo et al. 2012; Yoo, Henfridsson, and Lyytinen 2010). For instance, though a physical book can only ever represent the text and images that were initially printed in it, a smartphone can process any digital information, and the same phone can be reprogrammed for different uses at different points in time.

Together, separation of form and function and the attributes of digital artifacts enable *combinatorial innovation*: new generations of digital technologies can integrate with and build on previous generations (Benkler 2006; Gao and Iyer 2006; Yoo et al. 2012). The ease of combinatorial innovation is a key affordance of digital technologies. As a result of this affordance, digital innovation (i.e., the creation of new digital technologies) has advanced through a *generative* process: many digital technologies have enabled further innovations to build on them, without the need for the creators of the original technologies to stay involved (Zittrain 2009).

Ultimately, the separation of form and function together with the stacking of technological layers upon layers has brought about a rich *digital infrastructure* (Henfridsson and Bygstad 2013; Tilson, Lyytinen, and Sørensen

2010), consisting of a broad set of interoperable and modular digital tools, platforms, and standards. Digital infrastructure represents an external enabler of opportunity for entrepreneurs (Briel, Davidsson, and Recker 2018; Nambisan 2017).

Unconstrained generativity and combinatorial innovation are thus the key affordances of digital versus other technologies. Yet this does not mean that they are entirely technology driven. In fact, a number of organizations and other social and institutional arrangements (standards, programming languages, open-source communities, internet commissions, regulations, protocols, programming interfaces, etc.) are safeguarding and maintaining the integrative and combinatorial potential of digital technologies.

Exploiting Digital Technology for Value Creation and Capture

To survive and grow, digital enterprises engage in value creation and value capture (Amit and Zott 2001; Zott, Amit, and Massa 2011). Economic value creation using digital technologies (which we will refer to as *digital value creation*) can be categorized into four types (see table 1.1). The most pervasive and basic type is *digital production*: the creation of a digital artifact such as code, online content, a website, a mobile application, or software (Ojanperä et al. 2017; Schradie 2011). Digital production typically differs from analog production (e.g., traditional manufacturing) because marginal costs are reduced for production and distribution. Software, applications, and content can be replicated at almost no cost; where broadband is available, it is cheap and fast to distribute to faraway users; and customers can search easily even for niche items (Brynjolfsson, Hu, and Simester 2011; Shapiro and Varian 1998). The cost-benefit ratio of production and innovation is particularly low in software development, as existing layers of software can be stacked on top of each other to create new products (Gao and Iyer 2006).

Table 1.1
Four types of value creation using digital technologies

Type	Summary
Digital production	Creation of a digital artifact
Information processing	Editing, integrating, and analyzing existing information
User interconnection	Allowing users to share and collaborate
Market intermediation	Connecting buyers and suppliers

All digital entrepreneurship involves digital production. In contrast, most digital production itself is not entrepreneurial (i.e., market-opportunity oriented). Types of nonentrepreneurial digital production that we will discuss in this chapter and elsewhere in the book include some types of digital labor, commits to GitHub (the world's largest collaborative software development platform), and posts on Stack Overflow (a global software developer knowledge platform).

A second and similarly common type is *information processing*. In a digital world, meaningful (new) information can be created at low cost by editing, transferring, integrating, and analyzing existing information (Amit and Zott 2001; Shapiro and Varian 1998; Yoo, Henfridsson, and Lyytinen 2010; Zook and Grote 2017). Activities such as big data analytics, data science, machine learning, automation, algorithmic computing, and artificial intelligence are all facets of information processing.

The third type is *user interconnection*, which lets users interact or develop content collaboratively, thereby leveraging network effects. The internet and mass-produced consumer devices, such as laptops and smartphones, have allowed users to interact with each other in ever more diverse and elaborate ways (e.g., sharing images and videos), thus increasing the potential value of interconnection compared to telephony. Social networks and crowdsourcing platforms are key examples of such user-driven, collective value creation.

Fourth, *market intermediation* exploits digital technologies to alleviate information asymmetries and reduce transaction costs in two-sided markets (Amit and Zott 2001; Eisenmann, Parker, and Van Alstyne 2006). More than just connecting buyers and suppliers, intermediaries also create market institutions—typically by guaranteeing transactions and safeguarding norms, thereby generating trust (Lehdonvirta et al. 2019). As with user interconnection, the value for a given user increases with others' adoption; however, for market intermediation, it is adoption on the other side of the market that benefits them (Amit and Zott 2001; Shapiro and Varian 1998). Digital platforms (Gawer 2011; Parker, Van Alstyne, and Choudary 2016; Srnicek 2016) are sophisticated forms of market intermediaries.

Whereas information processing, user interconnection, and market intermediation all depend on regular internet-enabled interactions between enterprises and customers (Amit and Han 2017; Arakji and Lang 2007), for digital production, customers can obtain a copy of the digital artifact and derive value from usage even when disconnected from the supplier.

Accordingly, digital production predates the rise of the internet by several decades. Moreover, the four types of digital value creation are not mutually exclusive. For instance, a software-as-a-service (SaaS) provider may leverage cloud servers and allow users to develop and share customizations through APIs, thus combining digital production, user interconnection, and information processing.

Most digital enterprises (with the exception of some not-for-profits like open-source software providers) seek not only to create but also to capture economic value. Value capture consists of transforming a share of overall created economic value into monetary value that is owned or controlled by the enterprise and can be traded with others, such as cash, assets, current and projected revenues, or a company's valuation.

Again, the affordances of digital technologies partially predetermine possible value-capture strategies, often leading to vastly different approaches compared to, say, manufacturers of physical goods. For example, to make money, digital enterprises may artificially reduce the quality and quantity of software, making it exclusive to paying users (e.g., through license keys or freemium models). For value creation based on user interconnection, enterprises may avoid charging users directly and instead monetize their attention from third parties like online advertisers. For market intermediation, enterprises may charge one side of a dual-sided market for access to the other or analyze data about one side and sell it to the other (Eisenmann, Parker, and Van Alstyne 2006; Wu 2016).

Ultimately, the "many-to-many" nature of internet-enabled technologies means that the lion's share of value-creating activity (e.g., content production and data generation) is done by users and not by the enterprise itself (Amit and Han 2017; Enders et al. 2008; Teece 2018). In a digital world, many users move from being consumers to indispensable coproducers of value (Baldwin and von Hippel 2011; Ramírez 1999). Instead of creating a finished product and selling it to a passive recipient, digital enterprises become facilitators or orchestrators of users' collective and often unintentional value creation (Amit and Han 2017; Amit and Zott 2015; Eisenmann, Parker, and Van Alstyne 2006).

Spatial Decoupling of Value Creation and Capture
The distance-bridging potential of the internet and the global diffusion of digital infrastructure results in far wider geographical decoupling of value

creation and capture compared to analog entrepreneurship. For physical goods (cars, furniture, food, etc.), users consume value after making a one-off purchase, and the infrastructure for disseminating or producing and using the products (power grids, roads, airports, ports, mass transport, etc.) tends to be nationally or locally owned, controlled or regulated by public agencies. In analog economies, producers assemble resources and assets in a particular location, creating value embodied in a physical output, the value of which is then split into use value and monetary value when sold. For illustration, a German car manufacturer may create value embodied in cars produced in a plant in, say, China to service the Chinese market. The German headquarters may skim off most of the value that is captured when the car is sold, but the Chinese plant, Chinese distributors, and other supply chain partners in China are bound to capture some of the value simply by virtue of the fact that the car is a physical object that has to be distributed to a customer.

In the digital economy, on the other hand, a transnational producer provides a virtual setting for user-driven value cocreation while continuously skimming off a share of the value created by users around the world. The value of a digital platform can be continuously created by billions of users around the world (by uploading content, providing personal information, creating usage data patterns, etc.), while value capture happens almost exclusively in the digital platform's headquarters (e.g., in San Francisco) as this company's main physical site of operation (Teece 2018; Zuboff 2019). In fact, users and user innovators develop locally relevant content, introducing economics of scale and scope for the platform without it needing to invest in local product knowledge. Through the global harmonization of digital infrastructure, market-leading digital products can thus spread to any place where the internet and all other necessary infrastructures are in place (e.g., logistics and transport infrastructure for Amazon). Especially for digital products that depend on limited analog infrastructures, value creation can thus happen in any interconnected place, while value capture happens only in the select locations of company headquarters or subsidiaries (Friederici and Graham 2018; UNCTAD 2019).

It is this potential to harness value that has been cocreated across a vast geographical expanse that has led management scholarship into arguing that market opportunities are generally less bounded for digital compared to analog enterprises. Leading business model theorists Raphael Amit and

Christoph Zott (2001, 495) believe that "virtual markets have unprecedented reach because they are characterized by a near lack of geographical boundaries." They say that preexisting analog barriers (like cultural or language differences) "appear to be vastly reduced relative to the traditional 'bricks-and-mortar' world." Entrepreneurship researcher Erkko Autio and his colleagues (2018) argue that digital affordances "do not operate spatially" (77) because digital infrastructure is a "location nonspecific element" (81), such that the "Internet's architectural trust mechanisms can potentially offer a near full substitute for social and relational trust that is non-localized and does not depend on geographical proximity" (76). Satish Nambisan (2017), in his earlier-mentioned foundational paper on digital entrepreneurship, suggests that it is an intriguing research puzzle that "the same" digital infrastructure leads to different entrepreneurial outcomes in different places (1046).

These arguments assume that digital infrastructure and digital technologies are globally homogeneous, ubiquitous, openly accessible, and inclusive (Aldrich 2014; Greengard 2010; Sussan and Acs 2017; Tilson, Lyytinen, and Sørensen 2010). Any enterprise with an internet connection should thus have equal access to the same vast global market opportunities.

Global Digital Platforms as Idols of Exponential Growth

Beyond the abstract potential of vast global market opportunities, the management literature has also been inspired by a very concrete set of enterprises: the "big five" global technology corporations (Google, Apple, Facebook, Amazon, and Microsoft) and other fast-scaling US digital companies (Airbnb, Uber, Salesforce, etc.). Many academic papers mention these organizations to illustrate their ideas (e.g., Amit and Han 2017; Amit and Zott 2001; Huang et al. 2017; Sussan and Acs 2017; Yoo, Henfridsson, and Lyytinen 2010). The fact that these companies have achieved the world's highest market valuations over a very short period of time, making their founders among the richest and most influential people on the planet, has triggered thousands of pages of academic writing, which we will attempt to condense in the next few pages (see table 1.2 for a summary of key concepts).

In a nutshell, management scholarship has explained the rise of these companies by highlighting that they have pursued *digital platform business models* (Gawer 2011; Parker, Van Alstyne, and Choudary 2016; Teece 2018). Digital platform companies exploit the opportunity to capture value that

Table 1.2
Key terms for the scaling of digital platforms

Concept	Description
Digital platform business models	Business models that rely on extracting rent from creating virtual environments for mediated or hosted interactions.
Transaction platforms	Platforms that enable direct exchange between users.
Innovation platforms	Platforms that establish environments for software developers or other digital innovators to create applications and software.
Integrated platforms	Providers that offer both innovation and transaction platform products.
Cost-related scaling economies	Scaling economies through near-zero cost to copy digital artifacts.
Demand-side scaling economies	Network effects accelerate growth once a critical mass of users has been surpassed.
Big data analysis (as scaling economy)	Disproportionately better and more information can be derived from analyzing large quantities of user data than for smaller ones.
User base scaling	A platform's user base becomes its key asset, letting investors attribute value to these platforms based not on immediate revenue potential, but on user numbers.
Generativity scaling	Digital platforms become digital infrastructure in their own right, ultimately scaling together with the diffusion of the internet and increasing digitization.

is cocreated, enabling others around the world to build onto and enhance the digital environments they are offering while setting up minimal to no physical operations in the vicinity of their customers (Evans and Gawer 2016; Parker, Van Alstyne, and Choudary 2016).

An important distinction can be drawn between transaction and innovation platforms. *Transaction platforms* enable direct exchange between users (e.g., Facebook), often intermediating between two sides of a market (e.g., Airbnb). Innovation platforms, on the other hand, establish environments for software developers or other digital innovators to create applications and software, which are then offered to end users through the platform. They do this by setting up application programming interfaces (APIs), thereby setting standards and frameworks for what developers do. *Integrated platforms* are providers that offer both innovation and transaction platform

products. For instance, Google has several transaction platform products (Gmail, Google Hangouts, Google Play, YouTube) but also innovation platforms (Android, Google APIs). Integrated platform companies tend to be the largest by market capitalization (e.g., Google, Apple, Alibaba, Facebook, and Amazon; Evans and Gawer 2016).

Importantly, transaction and innovation platforms scale differently. As mentioned earlier, the creation and distribution of digital software and applications is subject to substantial *cost-related* scaling economies (e.g., near-zero cost of the second copy). Yet, for transaction platforms, *demand-side* scaling economies are most important: network effects accelerate growth once a critical mass has been surpassed. Network effects are common for many-to-many communication technologies like telephony, but they can be enhanced for internet-based digital products due to richer interactivity and the importance of user-generated content, ultimately allowing end users to cocreate a significant share of the overall product value (Amit and Han 2017; Arakji and Lang 2007; Aral, Dellarocas, and Godes 2013). *Big data analysis* can represent a third scaling economy for these platforms: disproportionately better and more information can be derived from analyzing large quantities of user data than for smaller ones (Brynjolfsson, Hitt, and Kim 2011; Huang et al. 2017; Zuboff 2019). Machine learning and algorithmic computing allows this data processing to be automated (thus decreasing cost) while yielding more relevant results.

For many transaction platforms, all three scaling economies apply at the same time. This leads them to employ a *user base scaling* approach. Investors may attribute enormous economic value to these platforms, based not on financial but on user numbers (consider Facebook's acquisition of WhatsApp for $19 billion). Ultimately, the user base of such a digital enterprise becomes its key asset and sets in motion a self-sustaining growth process. Transaction platforms attempt to reap benefits from a first-mover advantage, which turns into monetization potential once they attain a monopolistic position, ideally at global scale. Using and enrolling into these platforms is usually extremely cheap (or free), simple, and convenient. Through this strategy, Google Search became the market leader for online search, Amazon for e-commerce, Airbnb for room sharing, Uber for hailing taxis, Facebook for social networking, WhatsApp for instant messaging, and so on.

The pattern that applies to innovation platforms is *generativity scaling*: some digital products become digital infrastructure in their own right,

ultimately scaling together with the diffusion of the internet and increasing digitization (Henfridsson and Bygstad 2013; Teece 2018). Such products are sometimes visible to end users (e.g., operating systems, online payment providers, browsers, app stores), whereas others may be taken for granted or run in the background (e.g., content management systems, encryption services, APIs, plug-ins, servers, cloud storage). Consumers do not typically choose these products; rather, they are built into or underlie the brands they are actively choosing. For instance, customers may pick a hardware-software bundle (e.g., a Samsung smartphone running on Android, or a Dell laptop running Windows, Internet Explorer, Adobe Flash, Oracle's Java), in effect purchasing an integrated piece of digital infrastructure that gives them access to the services they seek to actively use. Accordingly, not all generatively scaling products are known brands. Generativity scaling applies to nonplatform digital infrastructure products (Intel processors, Akamai, Amazon Web Services, Qualcomm, Ericsson, Oracle, Adobe, etc.), but innovation platforms are at its core because they represent the very enablers of combinatorial digital innovation (Gawer and Cusumano 2014; Teece 2018). For maximum scaling, innovation platforms thus aim to achieve a standard character and selectively and strategically seek interoperability with other products through (application programming) interfaces.

True to its disciplinary frame, the rather extensive strategy and information systems literature sees the few globally leading transaction and innovation digital platforms as *astute role model strategists*. It implies that exponential business growth and "disruption" of old business models is a desirable outcome, thus seeking to identify strategy patterns that others can imitate. Specific incumbent platforms are used to illustrate platform business models (e.g., Gawer 2014), but platform strategies are ultimately presented as models and thus as action templates (see, e.g., chapters 3 and 5 in Parker, Van Alstyne, and Choudary 2016). Particular historical and geographical positionalities (who, when, where) of existing platforms are downplayed or completely ignored in this literature (see Srnicek 2016).

The Why and How of This Book: A Grounded Empirical Inquiry

Ultimately, both popular understandings and management theory suggest an optimistic and aspirational vision of digital enterprises' growth potential and thus for any location's potential for economic development in the

internet age. If digital technologies are globally leveling the economic playing field, if anyone with an internet connection can be a digital entrepreneur, if larger and larger markets are becoming available, if enterprise scaling is quicker and easier through digital technologies, and if generativity affords endless potential for innovation, then why would the twenty-first century not be the time when Africa is finally reaping growth and catching up with the rest of the world?

Our book probes into this ambition, offering insights into what is actually happening on the ground. A legitimate worry is that such enthusiasm is based on overhyped expectations (Rodrigues et al. 2018). Channeling resources into supporting entrepreneurs is a trade-off that shifts the burden of development away from building public institutions and tackling structural issues (Birtchnell 2011; Honig 2017): what Ory Okolloh, a pioneer in the Kenyan digital technology scene, describes as the "fetishization of entrepreneurship" (Kuo 2015). Proponents of digital entrepreneurship can appear to proselytize a gospel of prosperity in which the subjects of development are encouraged to keep the faith in the face of failure and difficulty. Viewed critically, digital entrepreneurship may at best be a fad that will run the course of its hype cycle before disappearing from debates and at worst deceive us and make structural issues like inequality worse rather than better.

Discourses have always not just reflected the world, but also helped to produce it. However, because of the paucity of available evidence on this topic, we would argue that framings of and visions about African digital entrepreneurship have, thus far, been especially impactful on a range of related policy and practice. Our book thus seeks to discern if digital entrepreneurship is more than a current buzzword in international development, media, and policy circles. We will explore whether any of the related high-flying ambitions are translating into palpable growth and expansion among digital enterprises (and thus to local economic development), or if they simply risk distracting from real potentials and opportunities.

To probe into expectations, this book seeks to document and analyze the phenomenon of African digital entrepreneurship as it has become observable in recent years. It aims to understand both the opportunities and the 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 empirically ground the conversation that scholars, practitioners, and policymakers have begun,

without getting lost in the descriptive detail of any particular success story or aspect.

No book could perfectly capture the diversity of African cities while also discussing the continent as a whole (Cheeseman and de Gramont 2017; Noorloos and Kloosterboer 2018; Phillips 2014; Watson 2015). We attempt to do justice to local contexts without losing sight of continent-wide themes that have emerged from our analysis. Namely, we 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 explicitly discuss variations in dimensions of digital entrepreneurship that vary starkly across the continent, such as the size of domestic and urban digital markets (chapter 2) and the strength of the local digital entrepreneurship ecosystem (chapter 5). We also include factsheets for brief outlines of local digital entrepreneurship scenes and data points on local digital markets for each of our case studies in appendix B. North African nations are excluded from the analysis for two reasons: first, sub-Saharan Africa has traditionally been 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 (Graham, Andersen, and Mann 2015).[7] We thereby extend and augment emerging work on technology entrepreneurship in Africa that has been limited to illustrative maps and case studies of sectors and companies (Rodrigues et al. 2018).

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. Ultimately, our book is a departure from the few other books in this domain that have made sweeping statements that falsely generalize from exceptional success stories (see Bright and Hruby 2015a; Ndemo and Weiss 2017a; and to a lesser extent, Taura, Bolat, and Madichie 2019). Given our ambition to provide grounding and nuance, we also feel strongly that we should not "dumb down" and simplify the content of this book, as we steer clear of hyperbolic talk both of revolution and of failure (Gillwald 2019).

This may sound like a dry academic exercise, but from hundreds of interactions in recent years, we feel that there is a real hunger for

well-reasoned, detailed, and rigorous analysis among policymakers, development organizations, investors, and also entrepreneurs themselves. This is because—as has been the case for so many technology and development fads—thorny issues can be ignored for some time, but disillusionment with overblown hype from the people on the ground is bound to set in sooner or later. We therefore hope that these audiences will find the evidence in this book useful and timely, and we have done our best to make our insights accessible to them.

As we also challenge and contextualize strategy literature on digital entrepreneurship, management scholars are another audience for whom this book should be useful. We want to add geographical sensitivity to the firm-level perspective espoused in this literature. We also want to move this discipline away from their focus on unique and nonrepresentative Silicon Valley success stories like Google or Amazon, and instead point to more inquiry into digital innovations that happen outside of the United States and China. Economic geography, economic history, science and technology studies, information and communication technologies for development (ICT4D), and evolutionary economics will hopefully find the nuance we provide to be useful. This book offers rich and multilayered empirical detail about how economic agency intersects with digital technologies and Africa's socioeconomic legacy in the early twenty-first century.

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 five-year Geonet research project at the Oxford Internet Institute, which all three authors were involved in. Our guiding research questions throughout the project were these: (1) Who are Africa's digital entrepreneurs (i.e., their backgrounds, motivations and mindsets)? (2) How are they and their enterprises pursuing market opportunities through digital technologies? (3) What markets (nature, size, scope) are they able to address? (4) How do their ecosystems and social environments support them (or not)?

We wanted to study digital entrepreneurship, a new phenomenon, across "Africa" as a whole, while also capturing local differences and diversity. Balancing ambitions of breadth and depth, and of generalizability and truthfulness to local differences, we opted for a multisited case study approach, with semistructured interviews as the primary means of data collection (see

appendix A for details on methodology). We used a "least-similar" rationale to select city case studies: if we could detect patterns across all or most of a set of highly diverse cases, we would be more confident that those patterns also apply to cities that we did not examine empirically (i.e., other major African cities). We thus identified cases across Anglophone, Francophone, and Lusophone Africa, with varied sociopolitical, cultural, and economic environments. We ultimately conducted theory development based on case studies in Nairobi, Lagos, and Kigali, and later tested and extended preliminary theories through case studies of Abidjan, Accra, Addis Ababa, Dakar, Johannesburg/Pretoria, Kampala, Maputo, and Yaoundé. Between January 2017 and March 2018, we conducted 202 in-depth research interviews in these cities, including interviews with 143 digital entrepreneurs. In almost three hundred pages of field diary notes, we captured firsthand impressions gathered from meeting participants at startup offices and coffee shops, visiting dozens of innovations hubs, and attending policy events (see appendix B for summaries of our impressions for each case study).

Further, we draw from access to Geonet's quantitative mapping and digital outsourcing work (Braesemann, Stoehr, and Graham 2019; Ojanperä et al. 2017), as well as a previous project on the business process outsourcing sector in Kenya and Rwanda (Mann, Graham, and Friederici 2014), providing us with a wide-lens view of Africa's emerging digital economies. Two of the authors (Friederici and Wahome) completed doctoral theses on digital entrepreneurship in Africa. They investigated digital entrepreneurship organizations in Nairobi, Kigali, Accra, and Harare, conducting strategic ethnographies and sociologies of digital spaces, including 166 interviews.

Together, we have conducted many months of fieldwork across the continent, and this book captures the essence of what we have learned during this process. It attempts to codify what we find to be an accurate, realistic, and insightful account of African digital entrepreneurship in the early twenty-first century.

Analytical Framework

We use the domains of discourse outlined in this chapter to construct an analytical framework that our book can probe into and nuance (see table 1.3). We identify two bodies of discourses. *Popular discourses* are prevalent in media, documents and statements by policymakers, and reports and other

Table 1.3
Analytical framework based on popular and academic discourses

Expectation	Popular discourses	Academic discourses
Greater inclusiveness and acceleration of entrepreneurial activity	Cambrian moment; Silicon Savannah; youthful continent; lean startup; "mobile-first" generation	Democratization of entrepreneurship; less bounded entrepreneurial agency; "same" digital infrastructure as ubiquitous enabler
Fast-paced and transformative growth	Leapfrogging; Africa rising; digital entrepreneurship revolution; startup nation; M-Pesa and Andela	Growth on steroids; generativity; digital transformation; network effects and user-based growth; digital platform business models
Africa catching up due to global leveling of opportunities	Flat world; digital innovation knows no borders; leapfrogging	Democratization of entrepreneurship; less bounded entrepreneurial outcomes; reduced role of clusters; value capture at distance

contributions by international development organizations. *Academic discourses* derive from various strands of management scholarship, especially information systems, strategy, and entrepreneurship journals and books.

We do not employ a single overarching theory, for two reasons. First, we are in large part interested in verifying and challenging common beliefs among practitioners and policymakers. Second, it is hard to think of one established body of theory that captures digital entrepreneurship in Africa in a satisfying way. Digital entrepreneurship is an interdisciplinary construct, and academic debate on it is only just beginning—if by rather famous entrepreneurship scholars like Aldrich, Davidsson, Autio, and Acs. Theory building has begun in this new scholarly domain, but empirical studies have been confined to the United States, Europe, and Asia (Amit and Zott 2001; Briel, Davidsson, and Recker 2018; Huang et al. 2017).

Accordingly, neither popular nor academic discourses propose clear predictions or prescriptions. Still, both express and define expectations for observers and stakeholders of digital entrepreneurship in Africa (policymakers, scholars, investors, development organizations, etc.). The headline expectation set by popular discourses is this: "Following the arrival of broadband internet, digital entrepreneurship can become Africa's driver of rapid and inclusive socioeconomic development, and help the continent to catch up with the rest of the world." The headline expectation set by

academic discourses is this: "Digital infrastructure has enabled relatively unbounded entrepreneurial opportunity and reduced the role of enterprise location and geography." Academic discourses do not speak about Africa directly, but imply that African digital enterprises should be able to pursue strategies and attain successes that are similar to their high-income country counterparts.

By proposing a condensed analytical framework, we are necessarily making simplifications and omissions as to what has been said about the phenomenon we are interested in. For instance, several media articles and reports deviate from the aforementioned popular discourses (Asemota 2018; Essien 2015; Ndiomewese 2017; Rodrigues et al. 2018). However, the discourses we seek to challenge and nuance represent dominant meso- and macro-level discourses, mostly put forward by powerful entities, thus shaping other actors' behavior (Alvesson and Kärreman 2000; Rose 2012). Actors and entities we encounter time and again as proponents of these discourses include policymakers (Kagame, Kenyatta, Macron), global media (BBC, CNN, Al Jazeera, CNBC, *National Geographic*), international technology media (TechCrunch, *Wired*, *MIT Technology Review*), African technology media (Disrupt Africa, Quartz Africa), local media (*Daily Nation* in Kenya, *New Times* in Rwanda), some international foundations (Rockefeller and Tony Elumelu Foundation), technology corporations and their surrogates (GSMA, Internet.org), development organizations (World Bank, UN organizations), and consultancies (McKinsey Global Institute, Accenture Development Partners).[8] It is an important scholarly exercise to put the claims and expectations that these powerful actors determine to the (empirical) test.

Likewise, emerging digital entrepreneurship theory does not explicitly claim to explain digital entrepreneurship in all its instantiations, everywhere in the world. Yet it seeks to advance theory that is generalizable to organizations of a certain kind (digital enterprises), irrespective of their location. Here, it is an important scholarly exercise to examine whether and how such theory indeed applies in a context that is radically different from the contexts that the theory developers had in mind, and to develop new contextualized theories to address any oversights (Barnard, Cuervo-Cazurra, and Manning 2017; Nkomo 2017; Walsh 2015).

Of course, this does not mean that other literatures have nothing to say about digital entrepreneurship in Africa, and indeed several related contributions are emerging (e.g., Avle and Lindtner 2016; Friederici 2018;

Jiménez and Zheng 2018; Marchant 2018; Ndemo and Weiss 2017b; Pijnaker and Spronk 2017; Wentrup, Ström, and Nakamura 2016). Management is only just "discovering" Africa (George et al. 2016; Nkomo 2017; Zoogah and Peng 2019), and other disciplines have established much deeper bodies of knowledge on the continent. Still, our analytical framework engages with management scholarship because this discipline has discussed digital entrepreneurship most explicitly and actively, thus staking a claim on interpreting and defining it. It is therefore here that we believe our work can lead to the greatest productive tension. For other academic disciplines, our book still makes valuable contributions, even if it does not challenge their theories head-on. Namely, we provide rich empirical detail on an economic process and practice that represents a new and unique constellation of long-standing areas of interest like economic development, technology, power, social structures, and African studies.

In sum, this book will verify and extend an analytical framework that condenses common expectations about digital entrepreneurship in Africa. The framework consists of two pillars: popular discourses about digital entrepreneurship in Africa and scholarly discourses on digital entrepreneurship in general. The book will test in what ways popular aspirations are accurate or only amount to hope and hype, and it will test the applicability of digital entrepreneurship theory to Africa as a context that differs from the implied contexts of this theory.

Book Outline

Following this introductory chapter, the book is divided into seven chapters. The red thread throughout the book is an empirical grounding and testing of the analytical framework outlined in the previous section. To this end, chapter 2 describes what we observed about digital entrepreneurship in Africa, while chapters 3–7 explain and dig deeper into our observations, especially those that challenge the analytical framework. Those chapters focus on answering "why" and "how" questions. The following is a brief outline of the key points made by each chapter:

• Chapter 2 provides a descriptive, broad-strokes overview, drawing on available indicators and first-level analysis of interview data. It shows that digital entrepreneurship is unevenly spread across Africa and that

African digital enterprises mostly focus on revenue generation in small, fragmented local markets.

- Chapter 3 analyzes why African digital enterprises have so far stayed local. Our findings suggest that African enterprises iteratively learn from local customers, creatively adapting to local conditions, for as long as their resources allow it. Mostly, product-market fit means a sustainable but not an expansive business. More scalable digital product categories (e.g., social network sites) are occupied by Silicon Valley competition.

- Chapter 4 analyzes how African digital enterprises can still succeed and grow. It outlines four strategies that often have led to sustainability: (1) scaling based on customer and partner relationships, (2) local information platforms, (3) investing in local assets with value for customers in high-income countries, and (4) blending digital platforms with an analog outreach structure (what we call *last-mile platforms*).

- Chapter 5 uses the entrepreneurial ecosystem as a conceptual lens to discuss African enterprises' access to resources. Based on analysis of resource shortages and bottlenecks, it distinguishes three tiers of African ecosystems: learning, incipient, and maturing. The chapter highlights that, due to vicious cycles in ecosystem development, lower-tier systems can be stuck at nascent levels. In such cases, supports like hubs and innovation competitions are not advancing ecosystems as much as many hope because they themselves depend on other resources.

- Chapter 6 discusses what it means to be an African digital entrepreneur. It shows that Africans are reconciling decontextualized ideals of digital entrepreneurship with the social world around them. They are breaking new ground and have begun to form a new professional class. However, they are for the most part a relatively exclusive cultural and economic urban avant-garde. This implies that preexisting social positionalities in African nations have changed in style but mostly been reproduced.

- Chapter 7 engages with the (dis)continuities of Africa's place in the world that digital entrepreneurship has brought about. It shows that developmentalist ideas of Silicon Valley as a gold standard of digital entrepreneurship are ubiquitous in Africa, forcing actors to wield its mythologies and expectations. Thereby, global asymmetries of privilege, capital, and capability are replicated in local microcosms, leading to significant tensions. Despite indignation, local entrepreneurs find

pragmatic answers, like "white fronting" (i.e., partnering with white Westerners to attract investment capital).

- Chapter 8 explicitly contrasts the findings of chapters 2–7 with the expectations expressed in popular and management discourses. It highlights broader implications and summarizes what policymakers and others may do differently and better.

The consequence of our findings is *not* that digital entrepreneurship in Africa is economically futile. Entrepreneurs, investors, policymakers, and development organizations should not give up on digital entrepreneurship as a path toward local development. However, our book is a cautionary tale suggesting that effects will not be fast-paced and revolutionary. Rather, we see evolutions in the factors underlying sustainable digital entrepreneurship (entrepreneurial knowledge, networks, product and business model innovations, support interventions, etc.). And we also see waste of resources, time, and attention, spent on pipe dreams, ineffective action, and ephemeral successes with no lasting relevance for development (vanity enterprises, tech cities, investments based on racial stereotypes, hackathons as photo ops for development organizations, etc.). To maximize the positive work that digital entrepreneurship can do for Africa's development, all involved will have to play a long-term game that focuses on locally sticky assets and strategies while cutting out as much of the waste and misguided actionism as possible. If this is achieved, digital entrepreneurship will play not the most important, but a significant role for Africa's twenty-first-century economic history.