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Digital Entrepreneurship in Africa

How a Continent Is Escaping Silicon Valley's Long Shadow

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8 Ways Forward

This book has shown that African digital enterprises are creatively and productively applying and adapting digital technologies to their local economic, social, and political contexts. They create value in new and unique ways, complementing and diverging from the approaches of their Silicon Valley counterparts. Digital enterprises thus appear to have many hoped-for positive economic effects, such as increasing efficiencies, improving service quality, and creating high-quality jobs in local economies. Homegrown digital products have already become an important complement to the offerings of US and Chinese digital behemoths, and their impact is likely to grow as Africa's digitization progresses and diversifies throughout the twenty-first century.

However, we see that positive local impacts have so far happened at neither the rate nor the scale that widespread narratives about African digital entrepreneurship had suggested. The average African digital enterprise does not grow exponentially, does not scale internationally, does not attract venture capital, and does not disrupt cumbersome analog supply chains. As a result, we see significant waste and misguided efforts in the entrepreneurship support landscape: many advocates and supporters are too removed from the realities of digital entrepreneurs to design helpful and effective interventions. They look for quick wins and silver bullets to break out of imbalanced local and global socioeconomic structures established over decades and centuries. They also impose ideals of digital entrepreneurship that declare Silicon Valley trends as best practice, when in fact many of its premises conflict with local market realities and identities.

Digital entrepreneurship is not a cure-all for Africa's structural economic issues as it is itself shaped and constrained by those issues. The digital

world may in fact offer fewer opportunities for global leveling and catch-up than the analog one because winner-take-all dynamics, distance-bridging potentials, and postcolonial dependencies bolster rather than undermine the superior positions of enterprises and entrepreneurs from high-income countries.

This book may be sobering to some because it has cast aside aspirations and instead tried to capture digital entrepreneurship in Africa as a complex real-world phenomenon. We sought not to omit the many impressive success stories that now exist across the continent, but we also tried to capture African digital entrepreneurship in its breadth and depth. We documented how entrepreneurs learn hard lessons, engage in far from glamorous day-to-day struggles, and face unexpected pitfalls. We have chosen to focus on thorny issues such as digital entrepreneurship's intersection with identities and race, vicious cycles in development processes, and the slower than expected pace of change. By reviewing the ways that African entrepreneurs have so far harnessed digital tools and by contrasting the changes brought about with the transformative hopes shared by so many, this book has built a nuanced review of what the digital revolution realistically means to African cities and nations.

Whether or not the story of African digital entrepreneurship is one of failure or of success is ultimately a matter of perspective. We have used rich empirical data and contrasted it against popular, policy, and management scholarship discourses. Compared to the hopes and assumptions underlying these discourses—namely, that the enormous growth of Silicon Valley and Chinese digital enterprises is replicable within Africa—outcomes have been disappointing.

But the findings of our book also suggest that Silicon Valley was never a reasonable benchmark to begin with. Scholars of economic geography, economic history, science and technology studies, ICT4D, and evolutionary economics will hardly be surprised by our finding that legacies and contexts constrain economic activity, even if it is of the "digital" sort. For them, we hope that our book offers interesting nuance and empirical detail about *how* economic actors (entrepreneurs and enterprises), digital technologies, and economic contexts have interfaced in Africa in the early twenty-first century. Our book also points to new pathways for interdisciplinary inquiry into digital innovation (e.g., on business model innovations like the last-mile platform), which could be more emancipated from

the US-centric perspective that is still so dominant in scholarship (in the management discipline in particular) and in popular narratives (in tech media in particular).

Chapter Summaries and Testing of Analytical Framework

Chapters 2–7 provided a grounded account, drawn from our qualitative empirical analysis, of the defining elements of digital entrepreneurship in Africa. Through this empirical grounding, we were able to put the analytical framework suggested in chapter 1 to the test. Each empirical chapter challenged and nuanced expectations set forth in discourses. We find that some expectations were met, but largely, both popular and academic discourses give inaccurate images of digital entrepreneurship in Africa. Table 8.1 summarizes our findings.

Chapter 2 introduced macro-level proxy data about digital entrepreneurship and showed what African digital enterprises do using interview data. It highlighted that the lion's share of activity on the continent happens in just four countries: South Africa, Kenya, Nigeria, and Egypt. Significant but much lower levels can be found in Ghana, Tanzania, Uganda, Tunisia, Morocco, Mauritius, and Rwanda, and relatively little is happening elsewhere on the continent. Compared to activity in the rest of the world, even the continent's leaders remain far behind, and seem to fall further behind. Already this straightforward look at available datasets called into question expectations that Africa may be leapfrogging or that a kind of global leveling may be underway.

Still in chapter 2, we examined our sample of African digital enterprises. We saw that even though the rise of digital entrepreneurship in Africa has been enabled by the global digital revolution, local contexts significantly shape market opportunities and realities. Consumers' spending power is low and digital infrastructures remain incomplete. This gives rise to an abundance of innovative solutions to local constraints, and technological adaptations are commonplace. A different kind of digital entrepreneurship emerges than the one we know from academic literature and tech media: few enterprises manage to reach distant markets, stimulate significant user-driven value creation, automate information processing, or develop their own digital infrastructure that becomes the foundation for generative innovation. The absence of integrated digital payment systems is a key

Table 8.1
Evidence in favor of and against expectations for digital entrepreneurship in Africa

Expectation	Popular discourses	Academic discourses	Chapters presenting evidence	Evidence in favor	Evidence against
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	3, 5, 6, 7	Many sustainable enterprises; creative innovations adapting technology and business models to local conditions; investments and supports multiplied (initially low levels)	Entrepreneurial learning takes time; resources complementary to connectivity missing (specialized knowledge, investment capital); entrepreneurs from privileged backgrounds; products for urban populations; only a few ecosystems show signs of specializations and innovations
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	2, 3, 4, 5	Some digital platforms scale fast (e.g., payments and ecommerce), often coupled with analog outreach structure (last-mile platforms)	Enterprise growth slow, linear, and/or locally confined; local markets small and fragmented; innovations consist of technological adaptations, not technological products and components; no big data analysis; no production of digital infrastructure; ecosystem evolution bottlenecks; dependency on local economies creates threshold for growth
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	2, 5, 7	Software outsourcing makes use of labor cost advantages; foreign-educated Africans act as bridges	In most scalable product categories and for international expansion, digital enterprises face competition from Silicon Valley; African actors structurally disadvantaged; postcolonial dependencies persist

barrier to digital enterprises' ability to charge users and develop low-margin business models. Rather than creating complex and scalable analytical technologies and techniques, African enterprises focus on short-term revenue and conduct the digitization of information in direct exchanges with local actors.

Chapter 3 asked why it is that African digital enterprises rarely scale. We highlighted that digital enterprises are always embodied: they are run by real people embedded in physical and social contexts. They necessarily exist in, are governed by, and are enabled and constrained by the economic, social, political, and environmental geographies around them. This means that African digital enterprises, just like their Silicon Valley counterparts, identify opportunities in their environments, which they pursue in an iterative experimental process until their resources run out or until they reach product-market fit. Yet African enterprises do not usually find large addressable homogenous markets in their vicinity, as both infrastructures and demand for digital products are limited. They also depend on immediate revenue generation and cannot invest unlimited funds for uncertain gains over many unprofitable years.

This is where the entrepreneurial journey continues on a very different path compared to what the Silicon Valley playbook would prescribe: not African digital enterprises' immediately accessible demand nor their own initial resources nor the resources in their environments allow them to expand internationally in anything but a slow and piecemeal fashion. Accordingly, we find that exponential user base growth that has inspired management scholars and commentators seems to be possible only for enterprises located in a region where a number of conditions are in place that are not given in African cities. Only in niches where market knowledge is a competitive advantage and difficult to imitate can African enterprises sustain competitive challenges from large digital platforms. Ultimately, 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.

Chapter 4 analyzed how African digital enterprises can still sustain themselves and grow under these competitive conditions. From among the countless small innovations and business model adaptations that entrepreneurs reported to us in interviews, four common strategies emerged. The first was to scale using good relationships to customers and partners. This linear and local scaling strategy works mostly with business customers

needing specific software. The second was to become a local information platform, which digitizes, curates, and mediates local content for local consumers. Network effects and user base growth were possible here; however, margins are tiny in this business model given the limited revenue potential of online advertisements to African consumers. Charging small commission fees to one side of a platform market interested in relaying information to the consumers of the other side was a more viable approach. The third strategy was to invest in local assets that have value for corporate customers in high-income countries, such as labor, market knowledge, or a unique cultural artifact (like an online game with African characters). Outsourcing companies were dominant in this category. Scaling happens at a distance but is relationship driven and thus linear and often ad hoc. The final and maybe most promising strategy was the last-mile platform. Here, enterprises blend a digital platform backend with an analog structure to reach end users with limited digital infrastructure access.

The growth of even successful African digital enterprises thus rarely resembles a hockey stick. Most enterprises in our sample grew instead according to slower, linear scaling patterns, not dissimilar to analog enterprises. Some exploited network effects and scaled exponentially, but only up to the threshold that the size of the local market allowed it.

Chapter 5 more closely examined the entrepreneurial ecosystems within which African digital entrepreneurs are operating. It showed that ecosystems of digital entrepreneurship have appeared in many major African cities. Yet ecosystems differed. We categorized them into three tiers: maturing (1), incipient (2), learning (3). The chapter then discussed five different types of entrepreneurial resources, highlighting typical bottlenecks for each ecosystem tier.

Vicious cycles due to bottlenecks were particularly pressing in tier 3 ecosystems like Maputo or Addis Ababa. Ecosystem evolution can lead to lower-tier systems being stuck at relatively nascent levels. Efforts of governments and international development organizations can be futile here, not only because they lead to unwanted side effects, but also because their interventions are powerless in the face of overwhelming bottlenecks like the slow pace of entrepreneurial learning or lacking access to large enough markets.

Chapter 6 focused on the entrepreneurs themselves—recounting some of the identities and aspirations that they conveyed. Although a number of diverse identities emerged, African digital entrepreneurs generally tended

to be inspired by rationales of Silicon Valley, such as fast technology-driven growth and transformation. Silicon Valley norms and aspirations are rarely adopted wholesale; rather, they are merged with local ideals, goals, and realizations. The practice of digital entrepreneurship thus becomes much more than just economic activity; it also becomes a set of aspirations for changing old ways. Yet most who can afford to participate in this African avant-garde are themselves affluent elites. It remains an open question to what extent they can consider and embrace African identities and livelihoods that for now seem excluded from the digital entrepreneurship arena, like the majority of Africans who, living outside of cities, are still unable to use digital infrastructure in any form.

Finally, chapter 7 discussed the continuity between Africa's historical and current place in the world and how this global positioning might impact the continent's technological aspirations. We have shown that some of the most successful entrepreneurs and those best able to signal legitimacy are those steeped in Silicon Valley modalities, which are themselves biased toward Westerners. We point, for instance, to pattern matching, a heuristic process used by investors, reproducing their biases and expectations about startups and thus leading to white, male entrepreneurs securing financing at higher rates and valuations than their nonwhite, female counterparts. To compensate, local actors develop strategies like white fronting as a means of recouping their agency. Similarly, entrepreneurs adopt the language of social entrepreneurship and impact to access resources of international development organizations.

This is not to make the argument that these performances are not important. Just because there is a disconnect between winning awards and understanding a market, that does not mean that this sort of performativity is not always an important part of being a digital entrepreneur. Some successful entrepreneurs have been able to, for instance, talk the talk about the "bottom of the pyramid" while walking a more realistic walk. These actors harness a nuanced understanding of symbols and myths.

Still, the metanarrative of pervasive marginalization and a view of Africa as nonmodern impedes the allocation of capital to the highest potential companies, instead directing it to those able to mimic developmentalist archetypes. Silicon Valley is held up as an exemplar, and success for African entrepreneurs is often judged against that benchmark, despite ample evidence that African digital markets are simply not amenable to a pure version

of Silicon Valley–style high-growth startups. If investors are more willing to adapt their expectations to African settings, rather than have Africa adapt to their expectations, they may find that there are investment-worthy enterprises on the continent that require much lower funding outlays than in other locales. Building mechanisms for trust in unfamiliar territories is a new area of learning for them.

Digital Expectations

This book has shown that although beliefs about the transformative potentials of digital entrepreneurship are widespread and are articulated everywhere from World Bank reports to ICT ministries to innovation hubs, realities are far more diverse and sobering. Why do we see such a disconnect? Why are enormous resources deployed to support such untested strategies, especially in a world of scarce resources?

One part of the answer is the persistence of the idea that because digital technologies allow many digital products and services to be reproduced and transmitted at close to zero cost, spatial barriers matter less than ever. For enterprises based in Africa, far from some of the world's largest markets, this fundamental change in positionalities, if true, would have enormous implications. The issue here rests on two competing visions of what the internet is and what it can do. In one vision, the internet brings into being virtual, ubiquitous, and aspatial counterforces to space-bound mechanisms such as agglomeration (see Autio et al. 2018). In the other vision, the internet does none of those things. It is simply a network of networks that allows information to be quickly transmitted from place to place and—despite our best efforts—is something more akin to the Victorian telegraph system than to a virtual reality world.

These discourses about digital transformations do not just *reflect* Africa, they also *transform* it. What we should therefore be focusing on is not just why expectations do not match reality, but rather what realities those expectations help to bring about. As misguided as Silicon Valley comparisons may be, people and enterprises across Africa are forced to engage with them.

The digital entrepreneurs we interviewed often framed their visions, expectations, and conduct through this lens. Harvey's (1989) concept of time-space compression predicts that places that are digitally connected

grow in cultural proximity with one another. It is difficult to imagine an entrepreneur anywhere in the world, who is designing and building digital technologies, who would be unfamiliar with the startup and Silicon Valley imaginaries.

We have shown that an important part of the work of the digital entrepreneur is not just bringing a product to market and the operational side of running a business, it is also helping to reproduce a core set of narratives about what digital entrepreneurship is. These frames can often be useful, as is seen when entrepreneurs seek to attract investment from international development agencies. Entrepreneurs are able to straddle skillfully the contradictions between hyperbolic framings of potential and actual nuanced business strategy (Graham 2015). But they can also serve as a distraction and, at worst, can begin to undermine effective operational strategies and investment decisions.

On the one hand, there is likely still utility in moving discussion away from creating the next Google and building services for a global market so that the next generation of entrepreneurs has a more grounded and nuanced sense of what is possible and practical. On the other, it is that excitement about potentials, rather than sober assessments about actual possibilities, that got many digital entrepreneurs interested in their work, got governments to offer supportive environments, and got investors to support much of the activity going on today.[1]

Global Ambitions

A key part of those digital expectations has been a strong set of global ambitions. Yet as we have shown, African digital enterprises will not play a significant role in commodified global digital markets any time soon. Africans will continue to use apps, software, and devices designed and made in high-income countries, but the reverse will not be true—barring a few potential exceptions. Here it is important to remember that digital products are much more than just software. Digital solutions always sit on top of layers upon layers of analog infrastructures, as well as locally contingent social, economic, political, and even environmental preconditions, affordances, and constraints. Meanwhile, the world's digital giants quickly gobble up the few opportunities that have true transnational resonance and are exploitable in an asset-light fashion.

If we look away from desires to create the "next Google" or "next Amazon," there are endless local problems awaiting local solutions. The biggest opportunities for African digital entrepreneurs therefore lie in locally and regionally oriented business models, integrating digital and analog value creation. Such integration requires deep local knowledge and experiential skill: something that will give a lot of African digital entrepreneurs an important competitive advantage against foreign competitors.

Down a Notch: Contextualizing the United States' and China's Digital Success

We should thus refrain from transferring policy and strategy lessons from Silicon Valley or elsewhere from high-income countries to Africa (see Rodrigues et al. 2018). Instead, we have to historically and geographically contextualize Silicon Valley's success to correctly assess its symbolic and practical relevance for African digital entrepreneurship now and in the future.

The global digital economy has grown quickly and widely, creating wealth, access to information, and opportunities for innovation. It has been underpinned by the unprecedented growth of select American digital platforms (as well as Asian and European digital infrastructure providers). These organizations have not only become large corporations in their own right, they have also created facilitative infrastructures for digital entrepreneurs and innovators in practically any internet-connected location.

Our findings do not deny that US digital platforms have had an enabling effect for digital entrepreneurship in Africa. The global diffusion of the internet and digital infrastructure has indeed been an external enabler of entrepreneurial opportunity at a global scale, including in Africa (Aldrich 2014; Briel, Davidsson, and Recker 2018; Nambisan 2017). However, transnational digital platform corporations have strategically monopolized precisely the most scalable digital product categories, outcompeting upstarts from other locations based on financial advantages, multipronged scaling economies, and lock-in effects. In the early 2000s, at the time that the diffusion and increasing capacity of the internet began to open up global market opportunities, only the US West Coast boasted the entrepreneurial knowledge, the organizational networks, the human capital, and the financial resources required to take on a software platform market leader

approach (Bresnahan, Gambardella, and Saxenian 2001; Saxenian 1994; Schiller 2000; Storper et al. 2015; Zook 2002). These corporations built on the legacy of computer firms from the same region and complemented their offerings, but they differed from hardware providers as they were light on physical assets and "scaled without mass" (OECD 2017, 218; see also Parker, Van Alstyne, and Choudary 2016).

Especially for digital products that depend on a large user base, like that of Facebook, it was also essential that the United States represented a large, homogenous, and keen domestic consumer market, making it easier to reach a self-sustaining critical mass and ultimately user numbers that eclipsed those of all similar competitors abroad. The same was true for many companies founded in the first decade of the century, like Airbnb, Netflix, Twitter, Pinterest, Instagram, WhatsApp, Uber, Priceline, Upwork (or oDesk/Elance), and many other end user-facing transaction platforms. Only Silicon Valley offered the access to human and financial capital necessary to conquer a user base quickly enough to reach self-sustaining market leader positions:

> If you see how Facebook started, Facebook also started as a very simple app. It grew, in my view because there's a lot more people with big pockets in Silicon Valley, in America, than here. . . . I think the money aspect is a big deal. I think, as much as we say, "the internet is an equalizer," the fact that an app that's a clever app will start here and then as soon as they've got enough money, they'll move to Silicon Valley to try. . . . With that money, you get the best developers, you get and all that complexity built-in, and all those value chains and the big expansion. (Entrepreneur in Johannesburg)

A different pattern with a similar result applies to leading innovation platforms and companies combining transaction and innovation platform products—so-called integrated platforms (Evans and Gawer 2016). The competitive strategies involved in building innovation ecosystems like those of Google, Microsoft, or Apple are highly complex and resource intensive. Key levers are competitive trade-offs of openness that need to be incorporated into application programming interfaces and decisions about whether to offer one's own products at the risk of cannibalizing the innovation ecosystem (Boudreau 2010; Gawer 2014; Teece 2018). Later, merger and acquisition strategies formed another key element in securing innovation platform leadership (Chen, Werle, and Moser 2018; Henningsson, Yetton, and Wynne 2018). Such strategies only become possible for well-financed

corporations with control over "unavoidable" infrastructural products (like Google Search and Gmail, Microsoft Windows, or Apple's iOS; see Thun and Sturgeon 2017).

Note also that today's incumbent digital platform companies have rarely competed head-on. Mostly, they have complemented each other and benefited from each other's rise and the global diffusion and standardization of hardware digital infrastructure. They sometimes forayed into each other's markets (Google Plus for Facebook or Apple Maps for Google Maps), but they often had to abandon attempts at challenging market leadership positions and resorted to dividing up quasi-monopolist positions for different product categories.

This explains why Chinese companies have largely been the only ones able to keep up and catch up with US digital behemoths. China's "Great Firewall" gave rise to US-incumbent equivalents (Tencent's WeChat for WhatsApp, WeChat Pay and Alipay for PayPal, Baidu for various Google products, Alibaba for Amazon, etc.), thriving in a vast domestic market that demanded those same products with a few years delay (Huang et al. 2017; Thun and Sturgeon 2017). Yet China's technology industry had long built up significant innovation capabilities and momentum (Fan 2006; Meng and Li 2002; Mu and Lee 2005), suggesting that protectionism and the domestic market alone would not have resulted in the same growth. Recently, some Chinese companies (especially Alibaba and Tencent) have begun international expansion and acquired foreign technology companies, but the scale and scope of this endeavor remains small compared to their American counterparts (Chen, Werle, and Moser 2018; Jia, Kenney, and Zysman 2018).

Aside from US West Coast and Chinese platforms, other companies for which the global diffusion of digital technologies opened global markets have been mass producers of hardware (such as smartphones, chips and processors, and sensors) and code (such as outsourcing providers; Gregory, Nollen, and Tenev 2009; Malecki and Moriset 2007; Steinbock 2003). For hardware (especially processors and smartphones), infrastructure makers in East Asia (mainly China and Taiwan) exploited specialization economies, cheap labor, and physical mass production scaling economies (Chen 2004; Gregory, Nollen, and Tenev 2009; Zhou et al. 2011). Similarly, the outsourcing industries of India and some nations in Southeast Asia benefited from good timing and entrepreneurial learning, competitive advantages in the

cost of human capital, and sometimes from favorable policy regimes (Arora et al. 2001; Athreye 2005; Gregory, Nollen, and Tenev 2009; Heeks 2006). Overall, Asian companies thus benefitted from some scaling economies, but not from the same network effect and big data–driven scaling economies and lock-in dynamics underlying user base scaling. They grew into billion-dollar industries, yet they continue to face rather different scaling thresholds and profit margins.

Local Realities

It is likely that every African nation will develop a sustainable but small domestic digital enterprise sector. Those local opportunities are necessarily more bounded than the expectations they arrive in the wake of. With local problems and local solutions come upper thresholds for enterprise size. In other words, the local market size at urban or national levels sets a limit on the scalability of solutions and thus necessarily limits the growth potential for enterprises in small cities or nations. This implies a key difference from digital enterprises in high-income nations: even if they are also unable to scale abroad, their domestic market opportunities of differentiation and localization are vastly bigger than those of their African counterparts. Ultimately, both the average African and the average European digital enterprise may be confined to local markets, but *local markets* means something rather different on the two continents. Because there are few sizable African markets for most of the solutions offered by digital entrepreneurs, we are unlikely to see a significant number of large African digital enterprises (many hundreds of employees, billion-dollar valuations, etc.) emerge any time soon.

However, in the goldilocks zone between globalized and local infrastructures and global and local solutions (Quinones, Heeks, and Nicholson 2017), it is likely that African digital enterprise ecosystems will sustain themselves by occupying market niches that are unattractive for global competitors and by innovating unique and new products. Unique local instantiations of digital entrepreneurship emerge out of attempts at both reproduction and emancipation from Silicon Valley. Our analysis suggests that ideally, such efforts will take advantage of an ability to scale regionally, focusing on problems and opportunities that are both common across Africa and foreign enough to the digital giants to prevent a barrier to entry. These likely

clusters in South Africa, Kenya, Nigeria, and Ghana will still need years to develop, but as they grow they will progressively benefit from economies of scale and specialization.

The core point here is that the geography of digital economies remains double-edged (Malecki and Moriset 2007). Paradoxically, in the digital age, the potential of a given place to establish a local digital economy thus depends on its ability to nurture and retain what cannot be digitized and distributed. Digital entrepreneurship therefore is anything but footloose. Digital entrepreneurship is deeply embedded in local economies, which means that its success and development impact fundamentally depends on preexisting local conditions such as the availability of skilled labor, tacit knowledge exchange, collaboration and cospecialization, and trust-based networks. Crucially, such localized productive activities and resources interdepend, which leads to virtuous circles for the development of locales that are already successful and vicious circles for those that are not.

Uneven Development

What do the realities of digital entrepreneurship mean for economic development in Africa? We should be cautious about its potentials as a wide-reaching tool for development for two reasons. First, most of our findings show that successes are exceptional. Every chapter highlighted limitations and pitfalls, sometimes significant ones. Almost all startups and almost all support organizations realize quickly that progress is slow and painstaking, rather than swift and easily enabled by ubiquitous technology. Digital entrepreneurship therefore will not be transforming Africa any time soon. The average African digital enterprise is not a disruptor; it is not growing exponentially; it is not exporting internationally; and it is not able to attract risk capital. That is not to say that these enterprises are not making valuable contributions to local economies. They are. But the African digital enterprise is far from the disruptive and transformative organization many want, hope, and expect it to be. The selective perceptions offered, for instance, in works like *The Next Africa* (Bright and Hruby 2015a) tend to lead to misguided conclusions about overall trends.

The preceding discussion has shown that digital entrepreneurship is far from footloose. We therefore cannot simply expect digital-entrepreneurship-led development to happen just anywhere. Digital entrepreneurship is a

fundamentally skills- and knowledge-based economic activity. Entrepreneurs require access to both specialized technical knowledge and the sort of entrepreneurial knowledge that involves running and scaling a digital startup under local conditions. This is not knowledge that can simply be imported, and it is hard to codify (it would be hard to teach much of it in a class, for instance). Rather, it is learned over time through iterative and tacit processes. In every one of the African centers of activity, there were cases of pioneer entrepreneurs who started many years ago. Over the first two to four years of their journeys, entrepreneurs mature and get a fundamentally different outlook; while doing so, they shift the trajectory of the entire ecosystem.

This, in tandem with the other centrifugal clustering forces mentioned earlier, leads to the conclusion that digital entrepreneurship is unlikely to fundamentally unsettle already existing economic cores and peripheries (see Birtchnell 2011). Large cities that have traditionally been hubs of transport, trade, mobility, culture, and education are also at the forefront of the digital economy. The importance of legacy economic structures and local markets therefore cannot be overstated. Digital entrepreneurship, in other words, does not represent an unexplored new industry that can be tapped into in order to foster economic development. It may, in fact, do little to address uneven development if the myriad infrastructures and the human, social, and economic capital that shapes and nurtures digital economies are not also present.

The digital revolution seems to have enabled the emergence of African digital entrepreneurship, but meanwhile it has benefited Silicon Valley and other locations where digital infrastructure is produced to a much greater extent. Today, the US West Coast, Asian technology clusters, and select urban hot spots in high-income countries have established thriving local digital economies. Africa has seen a drastic increase in the consumption and usage of digital products, while productive activity has remained limited when compared to other world regions.

Expectations that Africa's development progress should be reflected in its convergence with Western structures and practices is likely to lead to further disappointment for everyone. Attempts to enact a specific model of digital entrepreneurship in different African cities have resulted in challenges. It appears that neither African markets nor funding environments are designed to cater to the Silicon Valley model of high-growth startups.

Although foreign investors and foreign entrepreneurs have the funds and independence to persist in enacting this particular form of digital entrepreneurship, African-born entrepreneurs often distance themselves from it.

The question of markets is a particularly dark shadow that hangs over African digital entrepreneurs' ambitions. Many are inspired by pursuing opportunities that have been touted in tech and development discourses, such as supposed riches at the base of the pyramid or Africa's growing middle class, but entrepreneurs regularly experience disappointment when realizing that markets are actually smaller and harder to penetrate (see chapters 2 and 3).

Also, the demographic makeup of the digital entrepreneurship sector may mean that digital inequality is increased rather than decreased through it. The culture and immediate geographical environment that most digital entrepreneurs are steeped in is urban (Strachan Matranga, Bhattacharyya, and Baird 2017), which means that the rural customer is often not well understood or entirely neglected (Wyche and Steinfield 2016). In turn, if urban entrepreneurs exclusively use their localized knowledge and cater to urban segments, this necessarily further reinforces digital divides. Entrepreneurs might also do this inadvertently because of their lack of knowledge of the affordances of users who are distant from them (see chapters 2, 3, and 6). Whenever we found effective products for rural customers, they had been designed by exceptional entrepreneurs who had both extensively familiarized themselves with those contexts and were able to mobilize the significant resources necessary to achieve critical mass.

Local entrepreneurship may thus compound existing imbalances of digitization and availabilities of digital infrastructure. Infrastructure development is a primary means through which governments have tried to widen the opportunity for digital entrepreneurship geographically (Ngoasong 2018). Our findings show that extending digital infrastructures to rural areas is not enough, as infrastructure needs to be supplemented by resources, competencies, and knowledge for digital products to emerge that are better suited to rural contexts. This was one of the lessons of Kenya's Digital Villages project. Dr. Bitange Ndemo, the former permanent secretary of the country's Ministry for ICT, reflected on the outcomes of the project:

> We should have given proper consideration to, and sought to gain, an adequate understanding of the prevailing cultural orientation towards business processes in the rural areas. Many years of handouts (grants) had eroded any understanding

of other forms of financing, such as loans, in this case to the extent that majority of recipients had no intention of repaying the loan. With such intentions, some recruits diverted the loan into other uses depleting their operational expenditure. Unfortunately, these were areas where the business would have been sustainable if they had had financial discipline. However, this did not deter the team from pushing other projects that they felt could help the country succeed in becoming the regional ICT hub. There was still promise because many youths who could code were now moving to Nairobi to try their luck. (Ndemo 2015)

This is not to say that Silicon Valley's learnings are completely inconsistent with the needs of African locales. In fact, our analysis shows that some Silicon Valley principles, in particular the lean startup (Ries 2011), resonate in situations in which resources are scarce. Then again, it requires an entity with institutional heft and capacities to provide services to low-income customers and surmount infrastructural deficiencies.

A Long-Term, International Game

Together these findings reveal that though there are impressive individual success stories of digital entrepreneurship across Africa, we do not know yet how important for Africa's economic development it will be because it builds momentum only at the regional scale and only through long-term processes. There is no short-term fix or shortcut that will allow the next Silicon Savannah, Silicon Cape, Silicon Lagoon, or Silicon Mountain to emerge in Africa and to emulate Silicon Valley.

Developing African clusters of digital entrepreneurship will take time because experiential, localized, and interactive learning and adaptation have only just begun. It is noteworthy that most digital entrepreneurs themselves—and their investors—recognize this long-term trajectory.

This does *not* mean that the situation is futile for entrepreneurs, governments, and anyone else concerned with economic development. It is worth looking to Rwanda and Kenya as countries that are building entire supporting ecosystems for their country's entrepreneurs. When compared to peers in terms of GDP per capita or the Human Development Index, the momentum of digital entrepreneurship is indeed impressive in those countries. This book has described why there will be upper thresholds for entrepreneurial opportunities and why the next Google probably will not come from Kigali, but that does not have to stop Kigali from investing in its

digital economy. And as clusters in places like Kigali mature, it is possible that some of them will begin to evolve specialization economies—perhaps last-mile platforms (see chapter 4) around smallholder agriculture, bottom of the pyramid services, entertainment, local government services, or transport.

Digital tools and technologies do have space-bridging, scale-free, and zero-marginal-cost properties, but that does not mean that they can allow anyone to transcend underlying and surrounding economic, social, and political geographies. Those properties can necessarily only be brought into being by select actors in certain places at specific times. Yes, a file can be instantly transmitted to the other side of the planet for little cost—but no, that does not mean that the many other individual and structural advantages and disadvantages that shape economic development can be circumvented.

In turn, these observations point to where African digital entrepreneurship is currently having its most significant impacts and where it could be even more impactful. As shown in this book, African digital enterprises have excelled at adapting digital technologies to economic structures and processes that they find in the world around them. They have built *new sociotechnological infrastructures for others' economic activity*, usually blending analog and digital technologies in new ways that make sense in local contexts. This is a domain of entrepreneurship to which international competitors make no claim, as they have neither a financial interest nor the innovative capabilities to do so.

The catch, so far, has been that such localized infrastructures are hard to scale beyond the context for which they were designed in the first place. Furthermore, combinatorial innovation is not as easy for analog-digital blends as it is for software (see chapter 1).

Therefore, we argue that African digital entrepreneurship can only supersede the economic legacies and market thresholds of its environments if it embraces either or both of two strategies. First, African digital enterprises ought to find ways to develop and disseminate unique products that Silicon Valley is unable to offer but that are useful and widely applicable in contexts outside of enterprises' home contexts, especially in other low- and middle-income countries. Second, African digital entrepreneurship needs regionally specific but integrated digital infrastructures to accelerate the potential of combinatorial innovation. African digital innovations

in areas like digital payments, hacks to deal with mobile operator APIs, low-bandwidth apps and software, offline functionalities, blockchain, and others are abundant, but also scattered. They need a common open forum, allowing innovators to build on what others have done before them. The absence of African innovation platforms and Africa's dependence on Chinese and US platforms (like Android, Alibaba, etc.; Evans and Gawer 2016) is testament to this book's finding that African digital entrepreneurship is in large part unable to reverse the power imbalance of the global digital economy because it is always using but almost never creating digital infrastructures. It could begin by creating digital infrastructure for its own unique purposes and conditions (especially for digital payments), potentially unlocking some of the generative potential of digital innovation and becoming exporters rather than consumers of digital products. Both of these strategies require continent-wide and multistakeholder collaboration and openness.

Implications for Policy and Practice

After conducting fieldwork in eleven African cities and speaking to entrepreneurs, governments, development agencies, workers, and researchers, we have encountered an enormous breadth of plans, projects, businesses, and ideas. The innovations being designed and built from Dakar to Dar es Salaam are all shaped by the places that they are made in. These are not solutions that could have come from San Francisco or London. And they will play a role in turn in fundamentally shaping sectors as diverse as transport, retail, agriculture, and education in their home locales. Digital entrepreneurship thus undoubtedly is shaping and being shaped by the African cities that it takes root in.

Digital entrepreneurship in Africa thus is anything but a failed project. It is, however, a project that has failed to live up to the aspirations that many have tacked onto it. We hope that this book has given an account of not just successes and failures, but also the typical activities of Africa's digital entrepreneurs. In doing so, we hope to have moved beyond naïve hope and hype and instead helped focus attention on possible and probable futures for African digital economies.

In closing this book, we therefore wish to bring together the implications of a grounded, nuanced study of African digital entrepreneurship—implications that are sober but hopeful, realistic but wide-reaching. In the following

section, we begin with a set of broad implications and from there move to discussing specific implications for entrepreneurs, hub and incubator managers, investors, local governments, donors, and researchers.

Cross-Cutting Implications

Silicon Valley cannot, and should not, be copied. Quite the opposite. African digital entrepreneurs need to focus on their unique offerings (in part to not have to compete with Silicon Valley firms). Local resources can be created and nurtured in ways that are in tune with local conditions.

Those local specializations should allow entrepreneurs to create digital products and product component modules that are widely needed, including outside of their locales. This requires regional or city-level coordination. Associations (or similar groups) can be used to coordinate within ecosystems and across to other ecosystems, in Africa and beyond.

Any investments of money, effort, and time need to be converted into entrepreneurial resources that are *locally sticky*. This means that the resource predominantly and sustainably benefits local entrepreneurs. Tacit, experience-based, and locally specific entrepreneurial knowledge may be the most important locally sticky entrepreneurial resource. It cannot be imported. The lean startup and other strategies may be useful templates, but entrepreneurs need to conduct deep and sophisticated local adaptations.

According to Storper et al. (2015), locally sticky entrepreneurial resources include lead and networking organizations, institutionalized organizational practices, and both dense and wide cospecialized networks. It should be noted that infrastructures of connectivity, such as affordable broadband, and physical infrastructure (roads, hub buildings, offices, tech parks, etc.) are only necessary preconditions for these resources to exist; they do not themselves represent the resource for the entrepreneur. Infrastructure only generates value when it is in (collective) use, which itself depends on entrepreneurial actions. It is also noteworthy that resources that are more locally sticky are also more intangible and long-term oriented. None of the resources mentioned is easy to generate, and none of them is commodified or easily commodifiable. In other words, resources/inputs are inimitable and ultimately provide local competitive advantage.

For scaling at distance, what have been called *smart specialization* strategies may offer clues. Digital entrepreneurs should not enter already commodified and already competitive sectors. If they do, they should be

prepared for cost pressure and again small scale growth. The key questions are: What can be locally produced (a) that cannot or can only hardly be replicated elsewhere, (b) that will be needed elsewhere, and (c) that can be transported or duplicated there at relatively low cost? The answers to these questions could result in a specialization that can be locally nurtured. This does not have to be a product. It could be a product component, a business, a value-creation model, a cultural practice, or even a particular sector of the digital economy (e.g., marketing). Significant local competitive advantage and economic development may thus come from giving entrepreneurs resources, but they have to be invested with care and strategic discernment, and entrepreneurs cannot be expected to turn these into economic development over a short time frame.

Implications for Entrepreneurs

Be realistic, be prepared, be patient. The odds are stacked against you. Some of your challenges are surmountable, but some simply are not. Learning and adaptation will be time-consuming and sometimes frustrating. Depending on your location, your sector, and your network, you may have to revenue-fund for a long time and accept slow growth.

Know the possibilities and limitations of digital technology value creation in African markets. Identify niches and try to find opportunities to tap into generativity. You want to become the platform that others build on, while simultaneously you need to build a strong value-capture (monetization) mechanism into your business model.

Evaluate the trade-offs between perfecting your product for a local market versus scaling opportunities. Alternatively, look into work-arounds. Investigate cross-country partnerships, franchise models, and mergers and acquisitions strategies to combine local adaptation and international scaling.

Implications for Hub and Incubator Managers

Be ambitious, but also be clear to yourself and to others about who your stakeholders are and where the boundaries of your operations are. In doing so, it is worth paying attention to the parts of the ecosystem that don't care for you or are skeptical about what you're doing. Your role should be to be creative and to do things that are difficult to measure (e.g., community building). But that does not mean that you don't need to develop some form of measurement or accountability mechanism.

Implications for Investors

Be prepared for a long-term game. Most digital business models enter unchartered territory, so you will have to learn together with your entrepreneurs. The problem is that good data is hard to come by. Smartphone and internet penetration rates are not reliable indicators, and most widely available statistics are unsuitable to make realistic assessments of market size.

For foreign investors, be aware that entrepreneurs may not match your expectations and standards in terms of polish and experience. However, they often know local market conditions much better than you ever will. Listen to them and keep lines of conversation open.

Implications for Local Governments

Many of your officials will not understand much about how digital entrepreneurship works. There is much to be gained from listening to people in the sector and thinking carefully about how gaps in knowledge can be filled in.

It rarely makes sense to pour resources into physical infrastructure, such as incubators and tech parks. Such infrastructure is usually useless if it is not complemented by a number of soft factors, especially participation by key entrepreneurs. Government-run interventions will be seen skeptically by entrepreneurs in almost any country, so you cannot take participation for granted. If you build it, they will not come.

Avoid simple gap or needs analyses and surveys, as well as pillar- or component-based ecosystem or innovation system assessments. Entrepreneurship is not a box-ticking exercise. You cannot just "fill gaps"; instead, you will need to understand the dynamic and complex nature of digital entrepreneurship to design effective interventions, or limit yourself to "enabling environment" work.

Although the local job market cannot accommodate everyone, not everyone can, or should, be an entrepreneur. Moreover, importantly, the gains from digital entrepreneurship concentrate in just a few hands. Extreme care thus needs to be taken in allocating the scarce resources entrusted to government.

Implications for Donors

Resist the temptation to fund photo opportunities. African technology is appealing from a development PR standpoint—but, as noted, digital

entrepreneurship is not an activity that spreads its gains widely. From a development perspective, resources are likely much better spent on lasting and sustainable investments in communities and infrastructures. And, finally, ensure that you invest in monitoring and evaluation. We still do not know enough about what works and what does not.

Future Directions

Ultimately, Africa needs to mix and match business models from elsewhere, developing its own unique adaptations. Successful strategies will be about compiling and combining local and international elements of value creation and local economic development. What we end up seeing may appear to be neither radically new nor different at face value, while significant change may be underway underneath the surface. Last-mile platforms (see chapter 4) are an example of a genuine digital business model innovation that is worth exploring more for researchers and practitioners alike.

This book has shown that the key to operating in a globalized digital economy is to establish or occupy strategic points of value extraction. It is an open and exciting question where these may be for African enterprises. Local economic development will happen if models are able to both create and capture value locally or when they allow cocreation of value abroad and capture value locally (like Silicon Valley platforms are doing).

We set out on our multiyear research project to better understand how digitization at a planetary scale affects economic opportunities in some of the world's most economically marginal places, and to ask whether digital entrepreneurship might be a promising new pathway for Africa's economic development. This book has shown that contrary to many hopes and aspirations for the sector, digital entrepreneurship is unlikely to foster broad-based economic development across Africa.

Businesses by their nature funnel profit upward rather than outward and benefit capital at the expense of labor. However, that integral feature of capitalism is often overlooked as it is deployed in the service of development because of the creative destruction that it can bring about. People in the world of international development recognize that capitalism concentrates wealth and resources at the top, but many accept that trade-off because the other side of the trade involves positive change: new jobs, new value chains, new industries, new services, and new ways of living.

Our research showed that African digital entrepreneurship has few broad impacts, and it is relatively exclusionary. We also showed that this is not just a feature of the *entrepreneurship* part of digital entrepreneurship, but also the *digital* part. Economic networks that are mediated by digital tools and technologies democratize access and participation, while creating bottlenecks that are captured, controlled, and managed by those with the resources and capabilities to do so.

It is important for African countries that as much as possible of the created value is *captured locally* as well. It is about not just building businesses, but also coming up with local solutions to local problems, and this book has shown myriad examples of the creative ways in which Africa's entrepreneurs are doing that. Africa's digital entrepreneurs are ultimately shaping lives, societies, and economies across the continent. They are not creating the next Google or Facebook, but they are hard at work ensuring that the communities that they work in are not subject to the next round of foreign digital extractivism made possible by ever-more connectivity and ever-more digital legibility of key social and economic activities. In an increasingly unequal global digital economy, this endeavor alone may make digital entrepreneurship a key part of Africa's twenty-first-century journey toward greater independence and economic empowerment.