Do mLabs Still Make a Difference?
A Second Assessment

infoDev
INNOVATION & ENTREPRENEURSHIP

SUPPORTED BY
WORLD BANK GROUP
Do mLabs Still Make a Difference?
A Second Assessment

© 2017 The World Bank Group
1818 H Street NW
Washington, DC 20433
Website: www.infodev.org
Email: info@infodev.org
Twitter: @infoDev
Facebook: /infoDevWBG

For more resources and information about mLabs, visit:

This work is a product of the staff of infoDev/World Bank Group. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the donors of infoDev, the World Bank Group, its Board of Directors, or the governments they represent. The World Bank Group does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of the World Bank Group concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions: This work is available under the Creative Commons Attribution 3.0 Unported license (CC BY 3.0) http://creativecommons.org/licenses/by/3.0. Under the Creative Commons Attribution license, you are free to copy, distribute, transmit, and adapt this work, including for commercial purposes, under the following conditions: Attribution: Please cite the work as follows: "Do mLabs Still Make a Difference? A Second Assessment" 2017. Washington, DC: The World Bank Group. License: Creative Commons Attribution CC BY 3.0

Photo Credits: Cover Photo: Shutterstock 2017
ACKNOWLEDGEMENTS

This assessment would not have been possible without the valuable contribution of all mLab managers, mobile application developers, entrepreneurs, investors, donors, incubators, accelerators, institutional partners, and universities that generously made themselves available for interviews in Armenia, Kenya, Senegal, and South Africa.

Your warm welcome and extensive support during our visits was very much appreciated. To the more than 160 mLab beneficiaries, start-ups, firms, other entrepreneurs, and those vested in digital technology start-ups, the assessment team is grateful to each of you for accommodating an accelerated schedule and responding to last-minute requests for additional information. Your inputs form the core of the assessment.

Special thanks are also due to those who are not part of the mLab program for your time and effort, for sharing your insights, and for helping contribute to this important program.

In particular, the Sonjara team would like to give special thanks to Mariam Davtyan and Armen Melkonyan in Yerevan; Derrick Kotze in Pretoria; Josiah Mugambi, Sheilah Birgen, and Lincoln Njogu in Nairobi; and Regina Mboj and Eva Sow in Dakar for the warm welcome and active support provided during the exercise and for their invaluable help, patience, and guidance.

At infoDev, the Sonjara team is also very grateful for contributions from Ellen Olafsen, Toni Eliasz, Temitayo Oluremi Akinyemi, Zoe Cordelia Lu, Sophia Muradyan, Maja Andjelkovic, Sarah Craig, Mutoni Karasanyi, and Lucas Regner for their intense and committed reviews and insightful feedback. Special thanks go to Yehia Eldogdar, the task team leader for the project, for his leadership.
Do mLabs Still Make a Difference?
A Second Assessment

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1
Report Findings i
Summary of Second Assessment Recommendations iii

1 INTRODUCTION 1
The Birth of mLabs (2011-12) 1
First mLabs Assessment (2013-14) 2
Second mLabs Assessment (2016-17) 2

2 TECHNICAL APPROACH 7
Methodology 7

3 HOW DO MLABS IMPACT DIGITAL START-UPS? 9
mLab Start-ups Have Much Higher than Average Survival Rates 9
Why Start-ups Closed and How They Benefited from mLabs 10
How mLabs Start-ups Have Matured 11
mLab Start-ups Have Created Jobs 14
Beyond Job Creation: Income Generation through Open Markets 14
mLab Start-ups are Healthier than Average 15
Networking Is the Most Valued Service 17
Summary of Findings: mLabs have had a positive impact on incubated start-ups 19

4 HOW DO CUSTOMERS BENEFIT FROM mLAB-SUPPORTED START-UPS? 20
Revenue Stream Map 21
Economic & Social Impact Mapping 22
Revenue Streams vs. Economic and Social Impact Maps 24
Moving Away from Business to Consumer toward Business to Business 29
Pivoting Away from Social Entrepreneurship 29
Summary of Findings 30

5 HOW DO MLABS IMPACT THEIR DIGITAL ENTREPRENEURSHIP ECOSYSTEMS? 31
The Innovation and Entrepreneurship Enabler Landscape: Rapidly Evolving 31
Talent and Human Capital: Expanding and Growing 35
Access to Finance 35
Summary of Findings 38

6 CONCLUSIONS 39
mLabs Have Evolved in Response to Their Ecosystems 39
Impact on Start-ups 39
Impact on Start-ups’ Customers 40
Impact on the Digital Entrepreneurship Ecosystem 40

7 RECOMMENDATIONS 41
Strengthen mLab Program Management 42

REFERENCES & BIBLIOGRAPHY 43
## ACRONYM LIST

<table>
<thead>
<tr>
<th>AKA</th>
<th>Also Known As</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2B</td>
<td>Business to Business</td>
</tr>
<tr>
<td>B2C</td>
<td>Business to Consumer</td>
</tr>
<tr>
<td>BoP</td>
<td>Bottom-of-Pyramid</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>CTIC</td>
<td>Croissance des technologies de l’information et de la communication</td>
</tr>
<tr>
<td>CITI</td>
<td>Cape Information Technology Initiative</td>
</tr>
<tr>
<td>CSIR</td>
<td>Council of Scientific and Industrial Research</td>
</tr>
<tr>
<td>EA</td>
<td>East Africa</td>
</tr>
<tr>
<td>ECA</td>
<td>mLab Eastern Europe, South Caucasus, and Central Asia</td>
</tr>
<tr>
<td>ECDE</td>
<td>Early Childhood Development and Education</td>
</tr>
<tr>
<td>EIF</td>
<td>Enterprise Incubator Foundation</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GSMA</td>
<td>Groupe Speciale Mobile Association</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>IG</td>
<td>Illuminum Greenhouses</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>mLab</td>
<td>Mobile Application Laboratory</td>
</tr>
<tr>
<td>MVP</td>
<td>Minimum Viable Product</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Government Organization</td>
</tr>
<tr>
<td>SA</td>
<td>Southern Africa</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Message Service (aka Text)</td>
</tr>
<tr>
<td>US</td>
<td>United States</td>
</tr>
<tr>
<td>USSD</td>
<td>Unstructured Supplementary Service Data</td>
</tr>
<tr>
<td>UX</td>
<td>User Experience</td>
</tr>
<tr>
<td>VC</td>
<td>Venture Capital</td>
</tr>
<tr>
<td>WA</td>
<td>West Africa</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

The infoDev Mobile Application Laboratory (mLab) program seeks to harness the dynamism of digital technology sectors by equipping the next generation of entrepreneurs to help address development goals. By combining the benefits of digital technology with the strategic benefits of a development-oriented innovative entrepreneurial environment, economic growth and other development objectives can be supported and achieved.

This report is a second assessment of the mLabs program following the 2014 assessment Do mLabs Make a Difference? This second assessment focuses on essentially the same three questions as the first assessment.

In September 2016 the infoDev mLab program engaged Sonjara, Inc. to perform this rapid assessment in Armenia (mLab Eastern Europe, South Caucasus, and Central Asia), Kenya (m:lab East Africa), Senegal (CTIC/mLab West Africa), and South Africa (mLab Southern Africa).

This second assessment is based on an examination and visits to each mLab, with more than 160 field interviews and facilitated focus group discussions. The team analyzed more than 70 mLab-supported companies, conducting in-depth interviews with 59 mLabs start-ups as well as with mLab staff, investors, comparable start-ups, customers, and others in the ecosystem. The team also performed a review of documents, data, and materials provided by the mLabs and companies, as well as collecting leading practices and background research from industry and stakeholder sources.

REPORT FINDINGS

mLabs Have Evolved in Response to Their Ecosystems

Since their launch in 2010 and since the 2014 assessment, mLabs have coevolved with their ecosystems, both influencing and being influenced by rapidly changing environments, marked by increased involvement by the private sector in both incubation and investment, and the rapid changes and improvements in technology infrastructure.

ASSESSMENT FOCAL QUESTIONS

1. What are the effects of the mLabs on start-ups?
2. What are the impacts on customers of start-up products and services?
3. How have the mLabs influenced their local digital entrepreneurial ecosystem?
The successes documented in this report are at least partially attributable to the ability to continuously adapt to the changes in the ecosystem. As the ecosystems likely will continue to evolve rapidly, the future success of mLabs will continue to be linked to their ability to match emerging needs and opportunities.

Impact on Start-ups

The assessment determined that mLabs continue to have positive impacts on supported start-ups, as measured by company survival, maturation, job creation, and income generation. For example, African mLabs-supported start-ups are posting an 84 percent survival rate.

There is also clear evidence of mLabs-generated job growth due to direct hiring by mLabs start-ups and, perhaps more important, income-generation opportunities resulting from mLabs companies’ business models.

In addition, evidence indicates mLabs start-ups consistently progress from early stage start-ups into more mature businesses. With respect to mLabs-provided services, the most frequently cited benefit by mLabs start-ups concentrated on business acumen and networking—the opportunity to connect to other entrepreneurs and other high-quality business resources.

Impact on Start-ups’ Customers

Citizens, businesses, and governments are enjoying a range of benefits as a result of the digital business models, products, and services developed by mLabs-supported start-ups:

- Over 1.7 million students receive mobile-based academic materials and instruction via digital technology developed by an mLabs-supported start-up.
- Farmers monitoring their crops, water usage, and sales with an mLabs-incubated company are experiencing an average increase in income of US$155 per month, adding a US$2.7 million input into the regional economy.
- A national traffic-safety campaign crowdsourcing monitoring of minibus traffic using an mLabs-incubated app has contributed to a 30 percent national drop in minibus traffic deaths.

- An mLabs-supported mobile- and web-based product alerts drivers if they have received a speeding ticket, including the amount, and lets them know the necessary steps toward resolution, such as payment. The web application also lets them check and pay their property tax online.
- Tour guides have broadened their customer base using an mLabs company’s mobile business platform, resulting in increased income-generation opportunities in traditionally underserved areas.

As the above examples show, mLabs have had diverse economic and social impacts on customers, including for bottom of pyramid (BoP) — a group which often makes up the vast majority of the population in the mLabs countries.1 Many customers are benefiting from the growth and diversification of digital products and services being added to the market. Many citizens are enjoying deeper participation and inclusion in more segments of economic and social life. Many customers are also benefiting from extraordinary improvements in the efficiency of services and products, as well as from innovations in business, government, and social affairs.

However, as the World Development Report 2016 points out, the “aggregate impact of digital technologies has fallen short and is unevenly distributed.”2 Benefits to one group of customers cannot necessarily be assumed to have positive impacts on the traditionally disadvantaged. In fact, in many communities, digital technologies can inadvertently exacerbate existing inequality.3

---

mLabs were established as part of the Creating Sustainable Businesses in the Knowledge Economy program, launched in 2010 by the government of Finland and Nokia with the objective “to derive and test new approaches to advancing innovation and entrepreneurship in developing countries.”

---

1  BoP-targeted beneficiaries fall under an essentially a “social benefit” objective.
2  World Bank 2016, 2.
3  World Bank 2016, 2.
While many mLab start-ups express a desire to build companies that provide positive social and/or economic impact, there are significant economic headwinds against these business models succeeding. While specific customer impacts differ by mLab, these headwinds have caused many mLab companies to pivot to more successful revenue sources, which lack clear potential for direct impact for the majority of the population. Along with the overall lack of finance at early stages, increased private sector opportunities in “business to business” (B2B) business models has provided an attractive—and often times essential—alternative to the more challenging BoP and business-to-consumer (B2C) business models.

There is also an increasing level of private sector involvement in both incubators and among investors (angel and venture capital) in the mLab countries and investors have more explicit profit goals and requirements for the companies they work with. While private sector investors often include language on a social and economic benefit aspect, they are measured by their return on investment, and will naturally seek companies that can produce higher yield business models. As such, and as seen in the larger digital ecosystem globally, the economic and social promise of these BoP-targeted business models may be unrealized due to these economic headwinds unless explicitly supported by the donor or government communities.

Impact on the Digital Entrepreneurship Ecosystem

mLabs continue to have positive impacts on their ecosystems. First, being among the earliest incubators in their countries, they provided social proof and led the way for other important partners in the government and private sector to enter the space. In Kenya this growth has translated from an estimated 10-15 digital start-ups created in 2011 to approximately 70-100 new start-ups in 2016. Second, mLabs have provided hands-on training and real-world experience to entrepreneurs as well as helped traditional entrepreneurs and businesses understand the new digital start-up community. Third, mLabs have connected start-ups to financing through a variety of sources. m:lab East Africa start-ups raised nearly US$6 million since the last assessment in 2014. mLab Southern Africa start-ups have generated nearly US$750,000 in external investment in 2016.

As the ecosystem has changed, the influence of the mLabs has changed as well. mLabs are no longer necessarily the most coveted option but rather one of many different types of incubation services available. Other players are offering attractive training and capacity-building support options to compete for top entrepreneurial talent.

While access to finance remains a challenge, new opportunities—such as the estimated US$500 million in venture capital (VC) available to African technology start-ups in 2017—may significantly change the African digital landscape. At the same time, VC investment typically seeks to generate 30 times the investment, and this may reinforce the trend for start-ups to shift away from targeting BoP customer markets, which are usually higher risk and lower return. This underscores the importance of angel and donor investments, which have modest expectations of return.

SUMMARY OF SECOND ASSESSMENT RECOMMENDATIONS

Strengthening mLab Program Impact

Because of the rapidly evolving ecosystems in the mLab countries and differences among mLabs, there should be a formal process for periodic reexamination of mLab strategic focus. This focus should include determining which services generate measurable value for incubated companies, especially access to finance throughout the start-up life cycle. mLabs should continue to strengthen the business acumen of mLab entrepreneurs along with their...
technology skills and to consider deepening the pool of business services support (for example, legal, accounting, human resources, and so on) provided to mLabs so founders can focus on core business activities.

There is also an opportunity for more learning across and among mLabs through formal and informal sharing and networking, such as via strong alumni programs and follow-on support to continually engage past participants. Staging diversified networking activities with industries, prospective partners, mentors, and investors is also recommended as a highly valuable service that could be expanded and measured. mLabs should be shared directly with investors, participating start-ups, and other mLabs.

**Strengthen mLabs Program Management**

In light of the rapid changes in the digital technology ecosystem, building agile management processes into mLabs is recommended, including a full reexamination of performance metrics within and between mLabs and explicit training and support to the mLabs on greater and more effective use of data in decision making.
Do mLabs Still Make a Difference?  
A Second Assessment

Getting the first buyer was critical. The most important thing mLabs gave us was credibility. We became connected to an extraordinary network. Being affiliated with mLabs gave us the credibility to secure the first customers.

- Digital technology entrepreneur, Kenya

1 INTRODUCTION

The infoDev Mobile Application Laboratory (mLab) program seeks to harness the dynamism of digital technology sectors by equipping the next generation of entrepreneurs to help address development goals. By combining the benefits of digital technology with the strategic benefits of a development-oriented innovative entrepreneurial environment, economic growth and other development objectives can be supported and achieved.

As stated in the first assessment:

infoDev took the traditional concept of business incubation and integrated it with elements drawn from areas, such as startup acceleration, app economies, and tech and startup communities. The [mLab] program moved from traditional incubators toward more flexible mobile entrepreneurship enablers that would be placed at the heart of mobile innovation and entrepreneurship ecosystems. 5

THE BIRTH OF MLABS (2011-12)

mLabs were launched in Armenia, Kenya, Senegal, and South Africa in 2011 and 2012.7 Administratively, each mLab was nested within a larger incubator: the Enterprise Incubation Foundation in Armenia, the iHub in Kenya, the Innovation Hub in South Africa, and the Croissance des technologies de l’information et de la communication (CTIC) in Senegal.

Founded in 2012, mLab Eastern Europe, South Caucasus, and Central Asia (ECA) is nested in the Enterprise Incubator Foundation (EIF) along with six other distinct digital technology incubation or innovation initiatives. As part of the EIF, mLab ECA concentrates on digital technology and is a regional “focal point to increase the competitiveness of innovative enterprises working in mobile content and applications of the region.” It “provides a wide range of innovation support services, including organization of trainings, business mentoring, idea generation, and matching grants” to assist entrepreneurs in product development and promotion, connecting them with potential investors, academic experts, and public sector leaders.

At launch, the mLabs were supported by public-private consortia and followed similar program structures. Each mLab was geographically distributed, each had regional coverage, and each had largely similar objectives and activities. For example, the 2012 modifications to the original grant agreements with the Kenyan and Armenian mLabs contain similar if not identical language with respect to activities and very slight variations if any regarding achievement targets. 6

Over their history, the mLabs have seen tremendous change in their ecosystems. In 2011 and 2012 the digital technology start-up ecosystems in Kenya, South Africa, and Senegal were nascent at best.9 In the words of the CEO of mLab Southern Africa:

5 infoDev 2014b, 10
6 World Bank 2012; World Bank 2013
When mLab [was] launched in South Africa in 2012 there wasn’t much of a mobile ecosystem.  

This change is reflected in the growth from a handful of tech hubs and incubators in Sub-Saharan Africa in 2010 to the GSMA estimate of 314 technology hubs and incubators in 2016. In Kenya digital technology start-ups have gone from close to none before 2010 to “10-15 start-ups a year [in 2011 and] now [in 2016] there are 70-100 a year.” In Senegal, the CTIC Dakar launched in 2011 as the first incubator and accelerator in Francophone West Africa for mobile and information and communication technology (ICT) entrepreneurs. Now Senegal is home to seven such incubators.

The proliferation of hubs and incubators has been accompanied by a dramatic expansion of broadband and wireless data infrastructure and services. Driven by increased access to smartphones and other devices as well as dramatic price decreases in devices and data, digital technology has quickly expanded into all sectors.

Concomitant with these developments, private sector investment has become more interested in tech start-ups. In Africa venture capital to tech start-ups will grow from US$40 million in 2012 to an estimated US$608 million by 2018. While start-up investment is still limited compared to the need, important progress has been made with some start-ups able to secure second and subsequent rounds of financing.

FIRST MLABS ASSESSMENT (2013-14)

By mid- to late 2013 the mLabs had made significant progress toward their goals of cultivating the next generation of digital technology entrepreneurs. The 2014 assessment of mLabs in Armenia, South Africa, and Kenya concluded that mLabs had achieved the following:

- Supported and incentivized the creation of close to 70 new start-ups
- Created over 180 high-quality jobs and raised more than US$2.2 million in investments and seed funding
- Developed 292 mobile applications, of which 41 had actual or potential social or economic development impact
- Proven to be a viable way to enhance start-up ecosystems

The first assessment also reported on the mLabs’ target audiences, services, and innovation approaches. Table 1 reports on the results and reveals that the mLabs in 2013 still mostly reflected the initial program priorities.

SECOND MLABS ASSESSMENT (2016-17)

In 2013-2014 the mLabs started to diverge in their programming. By the second assessment, each mLab had significantly modified its services and structure to match local contexts. For example:

- mLab ECA is no longer part of the mLab program, and mLab Southern Africa, while part of the infoDev program, no longer receives grant support as do mLab West Africa and m:lab East Africa.
- mLab West Africa and mLab East Africa have become part of the infoDev Digital Entrepreneur program.
- m:lab East Africa is fully absorbed into an investment-seeking privatized iHub and charges their incubated start-ups fees, while mLabs ECA and Southern Africa fully subsidize their incubated start-ups.
- mLab Southern Africa has a much stronger focus on skills building and much less on incubating entrepreneurs, while mLab West Africa focuses on the incubation of established start-ups with demonstrated revenue greater than US$30,000.

As per their design to be “flexible mobile entrepreneurship enablers that would be placed at the heart of mobile innovation and entrepreneurship ecosystems,” the mLabs are working to be responsive to their specific countries and changing economic contexts. To help illustrate current differences among the mLabs, high-level business model elements are noted in Table 2. The evolution of the mLabs in response to their ecosystems is an important backdrop to understanding the findings of the second assessment.
### TABLE 1. HIGH-LEVEL OVERVIEW OF 2013 BUSINESS MODELS (INITIAL DESIGN)

<table>
<thead>
<tr>
<th>Target Audience</th>
<th>SOUTH AFRICA</th>
<th>KENYA</th>
<th>ARMENIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mLab Services</strong></td>
<td>Young entrepreneurs and students, application programmers, entrepreneurs with non-programming skills (designers, and others)</td>
<td>Mobile app developers, young entrepreneurs, students for training programs, start-up incubated companies, and experienced entrepreneurs</td>
<td>Students and graduates with no work experience, people interested in improving skills and working on mobile app development</td>
</tr>
<tr>
<td><strong>Innovation Approach</strong></td>
<td>Outreach, community building, and skills setting through a structured program that prepares entrepreneurs for the market or follow-on support from other incubation centers</td>
<td>Incubation and acceleration, networking and partnership building</td>
<td>Skills development, start-up creation and support, incubation, networking</td>
</tr>
<tr>
<td></td>
<td>One-on-one mentorship through an entrepreneur in residence; development of a vertical model that allows the mLab to plug into existing incubators and innovation spaces with mobile tech-specific incubation services</td>
<td>Identification of innovative solutions and turning them into profitable businesses; a focus on applications with social-development impact and mobile-payment facilities</td>
<td>Stimulating creative environments for the young and motivating people to develop ideas; “bottom up” attending to young students with little entrepreneurship experience to create a start-up community</td>
</tr>
</tbody>
</table>
### TABLE 2. HIGH-LEVEL OVERVIEW OF 2016 BUSINESS MODELS

<table>
<thead>
<tr>
<th>Start-up Life Cycle Focus</th>
<th>Perceived Unique Value Proposition</th>
<th>Innovation Approach</th>
<th>Institutional Administrative Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early stage entrepreneurial and technical skills-building to launch growth and scale stages</td>
<td>Considered leader in mobile development, multicity reach</td>
<td>Industry vertical focus on exports and outsourcing</td>
<td>EIF (parastatal)</td>
</tr>
<tr>
<td>Early to growth-stage incubation</td>
<td>High-profile name recognition, access to established networks, low rent</td>
<td>Social prosperity prioritization</td>
<td>iHub (private sector)</td>
</tr>
<tr>
<td>Acceleration of early stage entrepreneurs and incubation of mature growth-stage companies</td>
<td>Only ICT incubator that operates with both seed and growth-stage companies</td>
<td>ICT firm acceleration</td>
<td>CTIC (non-profit)</td>
</tr>
<tr>
<td>Early stage tech skills gaps offset</td>
<td>Range/quality of mobile software training, skill-building and engagement of marginalized populations, multicity facilities</td>
<td>Social prosperity prioritization and entrepreneur support</td>
<td>Co-hosted with several parastatal/private sector partnerships</td>
</tr>
</tbody>
</table>
m:lab East Africa (2011-2016)

m:lab East Africa was launched in June 2011. Based in Nairobi, the consortium’s mission was “to facilitate demand-driven innovation by regional entrepreneurs, ensuring that breakthrough low-cost, high-value mobile solutions can be developed and scaled-up into sustainable businesses that address social needs.”\(^1\) m:lab East Africa was housed within the iHub (established in 2010), and resided along with the three principal components of iHub: iHub research, iHub Consulting, and UX Lab.

Initial m:lab activities centered on training, creation of an active digital start-up community, and development of new business opportunities.\(^2\) With a capacity to incubate six to seven start-ups concurrently, the m:lab offers work space and access to office infrastructure, internships, training sponsored by corporates, coaching, and access to grants. A flagship component of the m:lab activities is Pivot East, an annual regional start-up competition that yields 25 finalists. These finalists participate in a month long training and skills-development program that serves as a talent-identification and recruiting basis for longer-term m:lab incubation. The best ideas among the semifinalists are potential incubatee recruits.

2013 brought significant change with the replacement of grant funding with finance development support and an end to training activities so the m:lab could concentrate on incubation and Pivot East.

In 2015 m:lab activities shifted again to focus on “1) market-driven training on different platforms, 2) business incubation, and 3) a testing lab for apps,”\(^3\) and in 2016, m:lab East Africa was formally absorbed and integrated into the iHub corporate structure and the new for-profit iHub business model with new services offerings. As co-founder Erik Hersman and then iHub CEO wrote in March 2016:

> Today we’re excited to announce some fairly significant changes at the iHub. A group of people are investing in the iHub in order to help us grow, to tighten up our service offerings and make them more profitable, and to help us figure out how not to just find startups but to grow the ones that are getting traction.

> First and foremost we recognize the need to make sure that we are 100% self-funded, which means running a productive and more efficient set of consulting services. Many of the current staff will be the same, though we will also add more talent to the team (so, we are hiring), however we’ll likely need to reorganize the services to more efficiently work together. We will ramp up our software, user experience, research, data science and design consultancy offering and position iHub as a preferred global provider for these services.\(^4\)

---

1. m:lab East Africa.
3. infoDev 2016.
2 TECHNICAL APPROACH

METHODOLOGY

The methodological approach developed to provide further evidence on the influence and effect of mLabs was based on the terms of reference parameters and included interviews, focus group discussions, site visits, and desk review of mLab progress reports and other documents. The approach was designed to be backward compatible with the first assessment where possible, and to facilitate the backward compatibility of any future assessments and monitoring and evaluation efforts. The approach established a way in which narrative and categorical information could be gathered, stored, and analyzed. The methodology was then applied to sample group types and sizes following the first assessment and the terms of reference. Sample types and sizes are reported in Chart 1.

As with the first assessment, the methodology does not provide a means to establish a direct causal link between the mLabs and the impacts on their companies, customers, and ecosystems. Instead, it exposes and examines trends and root causes, stakeholders’ perceptions, macroeconomic factors impacting the incubator/accelerator sector, and the larger social impact of mLabs.

A full discussion of the methodology is provided in the accompanying appendixes.

mLab is widely seen as a source of potential entrepreneurs. We need to identify people and build support around them.

- Investor, Armenia

Groups: Definitions and Sizes

The second assessment used the original sample categories from the first assessment and added three new categories to account for new mLab entrepreneurs, investors, and failed companies (labeled “closed start-ups”).15 The assessment team interviewed more than 160 unique organizations and individuals in four countries across eight sample groups. Interview data was supplemented with desk research and information from the mLabs themselves.

In selecting mLab beneficiaries to interview, the team focused on those directly incubated by the mLabs, dubbed “high touch” because of the intense support they received. The team reviewed 73 mLab start-ups as part of the desk research and interviewed nearly 60 companies.16

---

15 The three new categories are closed, newcomers, and investors. Only a small number of closed firms were interviewed because of the high survival rate of mLab start-ups; very few individuals or companies met the criteria of “closed.” The team defined entrepreneurs or companies who pivoted to new products, companies, or services but did not leave the field as being clients or newcomers. Please see the discussion in the section on closed start-ups.

16 Each mLab has provided a range of services, from “high touch” incubation to “low touch” workshops, trainings, and hackathons. Roughly thousands of individual participants and start-up companies have benefited from “lighter” mLab services, activities, and community events. However, given the core assessment research questions, this assessment concentrates on the “high touch” beneficiaries. Additional research on “light touch” impact is recommended.
### TABLE 3. SAMPLE GROUPS AND NUMBERS

#### MLAB START-UPS, 59 INTERVIEWED

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 Clients</td>
<td>Clients are people/companies incubated via services provided by mLabs before 2014.</td>
<td></td>
</tr>
<tr>
<td>5 Closed</td>
<td>Closed are clients no longer in the digital technology applications or digital technology market as entrepreneurs.</td>
<td>This sample group was not part of the first assessment.</td>
</tr>
<tr>
<td>23 Newcomers</td>
<td>Newcomers are people/companies incubated via services provided by mLabs since 2014.</td>
<td>This sample group was not part of the first assessment.</td>
</tr>
</tbody>
</table>

#### NON-MLAB START-UPS, 39 INTERVIEWED

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 Comparables</td>
<td>Comparables are people/companies receiving digital technology incubation or acceleration services from non-mLab incubators.</td>
</tr>
<tr>
<td>12 Counterfactuals</td>
<td>Counterfactuals are entrepreneurs, start-ups, and businesses that have developed digital technology businesses without digital technology incubation or acceleration services.</td>
</tr>
</tbody>
</table>

#### ECOSYSTEM, 63 INTERVIEWED

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Customers</td>
<td>Customers are individuals and firms benefiting from the use of digital technology or from an improved ecosystem.</td>
</tr>
<tr>
<td>11 Investors</td>
<td>Investors are digital enterprise investors.</td>
</tr>
<tr>
<td>34 Ecosystem Actors</td>
<td>Ecosystem Actors are all actors populating the entrepreneurial ecosystem not included in any of the other categories, including mLab staff.</td>
</tr>
</tbody>
</table>
Do mLabs Still Make a Difference?
A Second Assessment

The assessment team examined the influence of mLabs on company outcomes based on four elements of start-up creation and development:

1. Survival rates and why companies closed
2. The difference between the mLab company maturity landscapes from when the incubated company joined the mLab, and the time of this assessment
3. Financial health of the mLab companies
4. The numbers of jobs created

The team also provided a ranking of value services by mLab-incubated start-ups.

MLAB START-UPS HAVE MUCH HIGHER THAN AVERAGE SURVIVAL RATES

Finding: As shown in Table 4, mLab companies enjoy a very high survival rate. West Africa survival rate is 100 percent, and East and Southern African survival rates are better than 90 percent. mLab ECA was an outlier among the mLabs with a company survival rate of 50 percent.

mLab ECA’s lower company survival rate may be attributable to their program design. The program has the twin goals of first providing a training ground for young entrepreneurs and second promoting internationally viable start-ups. Struggling companies are encouraged to “fail fast” and learn from the experience to build on at another company in the ecosystem or to create a new start-up.

The international commercial viability focus means the criteria for company success is higher and more difficult to achieve in an export-oriented and more developed ecosystem than in a purely domestic market. In other words, success is harder to achieve and companies and entrepreneurs are encouraged to close and move on to their next endeavor when they start to struggle.

mLab West Africa’s impressive survival rate is likely due to the fact that the program has a higher barrier to entry for companies than that of the other mLabs. Applicants are

<table>
<thead>
<tr>
<th>mLab</th>
<th>Survival Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>84%</td>
</tr>
<tr>
<td>West Africa (Senegal)</td>
<td>100%</td>
</tr>
<tr>
<td>Southern Africa (South Africa)</td>
<td>94%</td>
</tr>
<tr>
<td>East Africa (Kenya)</td>
<td>90%</td>
</tr>
<tr>
<td>ECA (Armenia)</td>
<td>50%</td>
</tr>
</tbody>
</table>

TABLE 4. SURVIVAL RATES SINCE COMPANY INCEPTION BY mLAB
required to be farther along the start-up maturation life cycle and to have existing revenue. Maturity, especially with existing customer base and revenue, leads to lower risk of closure. The mLab is also heavily invested in companies that offer information technology (IT) products and services, a current growth area across the world.

The East and Southern African mLabs largely focus on identifying top entrepreneurial talent and supporting their capacity to achieve success in a domestic context, with a potential for internationalization down the road. The team discovered that these mLabs focus on supporting entrepreneurs, who are given many opportunities to pivot, change their customer base, and try new approaches without having to close the company.

Finding 3: Several start-ups in Kenya and South Africa noted they were able to avoid closing as a result of consulting work they secured via their mLab network. They mentioned this revenue stream as a key factor that allowed them to remain in business, especially when their product idea hit a snag or when sales were slower than needed. Others mentioned cheap or free mLab infrastructure services as factors in avoiding closure since it kept their costs low while they pivoted. One entrepreneur of a closed start-up who did not have this opportunity noted that:

[A] lot of effort went into start-ups and product innovation and we lacked the bandwidth to address another sector. We should have looked at contract work and freelancing and outsourcing for government and big organizations.

mLab provided us a necessary space to keep the lights on. I slept there many nights despite the no sleeping policy. It provided us with networking, exposure, courses, training. mLab is a beacon: people come there to discover talent.

- mLab entrepreneur, Kenya

WHY START-UPS CLOSED AND HOW THEY BENEFITED FROM MLABS

A relatively small number of mLab incubated start-ups did not survive between the first and second assessment, so the team relied on qualitative data from the entrepreneurs of the closed companies as well as discussions with all respondents on why they saw companies close.

Finding 1: Several interviewed companies closed primarily because of a lack of revenue. Reasons given include inadequate focus on revenue (versus the product) and failure to secure sufficient funding to finish the product. One entrepreneur closed his company because he relocated to a country with a more favorable business, tax, and legal climate for start-ups.

Finding 2: Two entrepreneurs attributed their close to inadequate business acumen and issues with the product business model. In their words:

[We did not] go on with our idea, which was the first mistake and second one was not pushing each other. We thought there was no sense and need to continue, and were only thinking in the frameworks of Hackathon. There was also lack of experience and knowledge. And it is very upsetting to see that our idea is already in use by others. [I had] no project plan … [and] was unable to fund the development of the app, just a badly-done “wireframe” to demonstrate the look and feel. My app went nowhere.
How mLab Start-Ups Have Matured

While the entrepreneurial journey is never truly linear, there are several common stages entrepreneurs go through to become successful. This start-up life cycle stages model\(^{17}\) was applied to mLab-incubated start-ups to analyze how they have matured during this period of time.\(^{18}\) The common stages are the following:

- Customer discovery (identifying the product or service and potential target market)
- Product validation (building the app or infrastructure to deliver the product or service and validating that there is a market)
- Customer engagement (marketing and sales to first round of customers, with polishing of the product or service)
- Growth (growing customer base to be profitable and scale)
- Scale (that is, expanding to a new market, sector, or country)

- Market exit (selling the business via IPO or private sales) is a common end point spoken of by investors, though very few companies get to that stage, and none of the mLabs we interviewed did. Please note that closed in this assessment means companies that closed and are no longer part of the ecosystem.

There is no standard length of time between stages due to many factors, including the following:

- Maturity of product or service sectors and markets
- Complexity of the product or service to deliver
- Experience and skills of founders and key staff
- Partnerships, support, or competition with existing companies
- Level of investment and resources available at each stage

To provide a holistic view, the assessment traced the start-up life cycle path of each mLab company interviewed and compared the life cycle stage when the company joined mLab to their status in November 2016 to provide a panorama of firm maturation and survivability. However, as many start-ups reported, their entrepreneurial journeys often involved significant pivots requiring them to move to earlier stages in the life cycle.

\(^{17}\) https://leanstack.com/lean-analytics-the-one-metric-that-matters-and-other-provocations/. The terms for different stages were edited for clarity with interviewees.

\(^{18}\) Given that mLab incubation start-up entered at different times, the actual difference between then and November 2016 also varies.
TABLE 5. INDIVIDUAL FIRMS BY STARTUP LIFECYCLE STAGE AT MLAB MATRICULATION AND IN NOVEMBER 2016

<table>
<thead>
<tr>
<th>Firm</th>
<th>Customer Discovery</th>
<th>Product Validation</th>
<th>Customer Engagement</th>
<th>Growth</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kim/Kimard Studio</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music of Africa</td>
<td>Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SimpliMantis</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SpaceDecode</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cube Tech</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afros (Kenya)</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecole au Senegal</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genius Family</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Image In</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inaota</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nelam Services</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tagoor</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cybarc</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jonga</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laiyers</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senso</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TechCloud</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stories Hub</td>
<td>Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My Sales</td>
<td>Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MicroForester</td>
<td>Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LETSEIN</td>
<td>Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Card/PlanetSolutions</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forex.co.ke</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidogo</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leti Arts</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ma3route</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linked Partners</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sentrust</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AftaRobot</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hearScreen</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FamBox</td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Car</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illuminum Greenhouses</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intaseq</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MedAfrica</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MFarm</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MobiDev</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shield Finance</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleepout</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TotoHealth</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uhasibu</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whive</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afros (South Africa)</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appchemy</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geekulcha</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GemProject</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MFactory</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tour 2Go</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NaKo Games</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eneza Education</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kopo Kopp</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mPayer</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sendy</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Byfilling</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dariss</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iTech Solutions</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niokobok</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ssyspo</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft Solutions</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lefricamobile</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GoMetro</td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Active: Organization is still active in the ecosystem under its original or new identity.  Closed: Organization is no longer active in the ecosystem.
Do mLabs Still Make a Difference?
A Second Assessment

CHART 2. TOTAL NUMBER OF EMPLOYEES AT FIRM CREATION VS. WHEN INTERVIEWED IN NOVEMBER 2016

- **ECA (East Africa):**
  - Employees at Firm Creation: 11
  - Employees as of November 2016: 16

- **Southern Africa:**
  - Employees at Firm Creation: 43
  - Employees as of November 2016: 14

- **East Africa:**
  - Employees at Firm Creation: 57
  - Employees as of November 2016: 92

- **West Africa:**
  - Employees at Firm Creation: 16
  - Employees as of November 2016: 54

*Legend:
- Blue: Employees at Firm Creation
- Orange: Employees as of November 2016*
Table 5 provides a panoramic illustration of company survivability and maturation of mLab-supported companies. mLab companies have a remarkable survivability; they also have experienced consistent progression from one life cycle stage to the next, despite the pivots and other challenges reported by many start-ups.

**Finding:** Across all mLabs, start-up stage maturation has progressed significantly during the companies’ experience with the mLabs, as shown in Chart 1. Most companies, when they joined an mLab, were in the early life cycle stages (26 of 30), while in November 2016 the preponderance of companies were at middle or higher levels of maturity (29 of 45). The creation of 26 companies in the intervening period is also a positive finding for mLab impact on company maturation. This finding suggests greater company maturity and better financial health of mLab companies (since in general, greater maturity both leads to and requires better financial health).

**MLAB START-UPS HAVE CREATED JOBS**

**Finding:** mLabs have a positive impact on direct job creation; however, data sourced directly from the mLabs may underestimate the number of jobs created by mLab companies and the ways they help create jobs.

mLabs help create jobs in at least two ways: (1) direct jobs created by mLab firms as they are established and grow, and (2) through developing and expanding markets.

Chart 3 shows direct jobs created by mLabs as reported by the ECA, East Africa, and West Africa mLabs. It reveals a total of 272 direct jobs created from 2014 to 2016, of which 212 jobs were created by m:lab East Africa.

Chart 2’s illustration of the total number of employees at a company’s launch versus when the company was interviewed in November 2016 is based on interviewed clients and newcomers. They were asked the number of jobs they had at the company launch and in November 2016. They reported 57 employees at creation and 246 in November 2016. This longitudinal perspective of more than 400 percent job growth seems uncaptured in mLab data with the exception of m:lab East Africa and its spectacular 98 jobs created in 2016. Furthermore, ECA and West Africa

mLabs report 75 jobs created during the period 2014-2016, while their start-ups interviewed for the assessment reported 102 total employees, a full third more than mLab-reported job creation results. This rate of underestimation may be even higher given that the sample of interviewed start-ups in this assessment is smaller than the sample mLabs use to report job creation.

**BEYOND JOB CREATION: INCOME GENERATION THROUGH OPEN MARKETS**

**Finding:** Focusing on direct job creation as a key metric of mLabs’ impact misses or does not account for income generating activity supported directly by mLab-incubated start-ups. Dubbed the “sharing economy,” this model of opening up new markets to potential sellers of services and products is the core business model of several mLab start-ups. In addition, existing and new sellers have seen improvements in the quality and reliability of income-generation opportunities by increasing the remuneration and stability of work in the informal sector.

A challenge of job creation as a metric of success is that with the digitization of business, many technology investments allow companies to be more productive with fewer staff. As the World Bank’s World Development Report 2016 points out: “The shift of income from labor to capital and the fall in the share of mid-level jobs in many countries is at least in
Do mLabs Still Make a Difference?
A Second Assessment

Tour2.0, a South African cultural tourism firm, built an app to sell and broker tours between local South African tour guides, artists, restaurateurs, and other service providers, and American and European tourists looking for novel tourism experiences. Tour2.0 technically only has seven employees; however, they have provided work directly to 43 tour guides and indirectly to four jobs on average per tourism experience through additional customers to local businesses normally outside of the tourism market. The company is now looking to expand to Uganda, Tanzania, and Kenya using the same model.

Previously, motorcycle drivers in Kenya might have only offered delivery or transport services to those they knew personally. Now with the mLabs-supported SENDY app (“Uber for motorcycles”), these drivers are able to offer their services to a broader range of digitally connected customers, resulting in an increased number of engagements and stability of income. Estimates note SENDY has more than 1,000 corporate customers in Nairobi and over 100 drivers registered in Kisumu; it received an investment estimated to be over US$200,000.

Kenya’s Illuminum Greenhouses equips smallholder farmers with affordable modern agricultural technologies that improve their productivity and incomes. The company reports that each of the nearly 1,500 farmers they work with generates an additional average revenue of US$1,800 per year, which translates into an additional US$2.7 million input into the economy. The revenue earned by these farmers is not counted as “jobs.” However, this revenue has gone directly toward retaining, and potentially increasing, on-farm employment, as some farmers have likely hired additional support as a result of their involvement in Illuminum.

CHART 4. CHANGE IN REVENUE GROWTH OVER THE LAST 3 YEARS

part due to the rising automation even of many white-collar jobs. This fact is especially true in B2B businesses, where the focus on improved productivity of business processes often results in lower headcounts needed for higher output. However, start-ups that leverage digital technology to expand essentially non-digital business activities—such as Go Metro, a transportation mapping firm, and Twiga Foods, a mobile-based agricultural supply platform—may not be subject to this dynamic, as they bring previously excluded portions of the population into the digital economy.

MLAB START-UPS ARE HEALTHIER THAN AVERAGE

Assessing the financial health of start-ups without access to financial documents or audits is difficult, especially because of the proprietary nature of the information and reluctance of most companies to share such details. To overcome this challenge and create a sketch of financial health, interviewed start-ups were asked their percentage change in revenue growth over the last three years and revenue increase since joining an incubator. In Charts 4 through 6, the financial health of the start-ups is analyzed to triangulate the findings and determine potential causes.

Finding: Results indicate that the financial health of mLabs companies is somewhat better than non-mLabs companies (the latter are both comparable companies that have received incubation at non-mLab locations and counterfactual ones that have not received any incubation.

As Chart 4 shows, there was not a significant difference between mLab and non-mLab companies in their percentage change in revenue over the last three years. While there was a slightly higher level of reports of “no growth” from non-mLab firms, these firms also reported higher levels of over 100 percent growth. Chart 4 results reveal a data break at growth less than 40 percent.

In order to compare across incubated start-ups, Chart 5 collapses percentage change in revenue into two groups: those with growth greater than 40 percent and those with no growth. By comparing results among these incubated firms—clients, newcomers, and comparables—it is clear that companies with longer histories with mLabs have higher percentages of growth than those with no growth. This finding is more understandable for newcomers as they generally are less mature in the start-up life cycle. Comparables were made up of a range of companies with different maturity levels; mLab-supported companies are clearly performing at the same level or possibly slightly better as the comparables.

Chart 6 compares revenue growth since joining an incubator among clients, newcomers, and comparables. It indicates that both mLab clients and newcomers perform better than comparables, and that clients do better than newcomers. This result indicates that mLabs may be doing better than other incubators at promoting revenue growth in their supported companies.
Do mLabs Still Make a Difference? A Second Assessment

NETWORKING IS THE MOST VALUED SERVICE

To assess the importance of mLabs services, the assessment team asked mLabs beneficiaries what mLabs services and activities they found most helpful. Three perspectives on service valuation are presented below. The first, reported in Chart 7, is the valuation of services by all mLabs beneficiaries. The second, reported in Chart 8, is the valuation of mLabs services by clients and newcomers. The third, reported in Chart 9, is the valuation of mLabs services by each mLabs.

Finding: The most valued mLabs service is networking, followed by technical skill development. Access to devices valued the least.

Chart 7 indicates that networking is the most highly valued service, followed by access to infrastructure such as office space, Internet, and computers. This finding was also reinforced when discussing key factors in start-up survival, as discussed previously. Technical skills development and access to specialized devices and test equipment are ranked least valuable.

Chart 8 compares mLabs clients’ and newcomers’ valuation of mLabs services. Networking continues to be the highest-valued mLabs service, with infrastructure and business capacity understanding following close behind; the three garner nearly 70 percent of the votes. Clients valued access to finance more than newcomers, who valued access to devices and technical skills. This result may be due to financial maturity of clients, who are more likely able to afford the devices or training they want but who have a greater need for financing as they require larger amounts of capital to grow or scale.

mLabs has provided us with a bridge to the domestic ecosystem and which has in turn slowly opened up international avenues. mLabs also helped a lot with the development of our business model.
- mLabs entrepreneur

CHART 7. MOST VALUABLE MLABS SERVICE, ALL MLABS INCUBATEES

CHART 8. MOST VALUABLE MLABS SERVICE BY MLABS NEWCOMERS AND CLIENTS
Chart 9 shows each of the four mLabs beneficiaries’ valuations of mLab services. While networking remains the most valued mLab service, there is significant variation among mLabs for other services’ valuation. The variations are partially based on the differences among mLab service offerings and their evolution. The results reflect what respondents’ value but also what services mLabs prioritize and the ecosystem in which mLab exists. There is an element of self-selection by incubated start-ups—they gravitate to incubators that offer the services and activities they are looking for.

For example, mLab Southern Africa pivoted in 2013 to emphasize training and skill capacity development rather than start-up incubation, and many of the incubated companies matriculated into the mLab via the training programs. This may explain why a higher percentage of Southern African respondents valued technical skills development over other services. In addition, several South African respondents mentioned that the devices that were available were not that new and that there were not enough of them to go around. They liked the idea of getting access to different handhelds and tablets for testing, but the reality as they experienced it fell short; none ranked access to devices as high value to them.
MLABS HAVE HAD A POSITIVE IMPACT ON INCUBATED START-UPS

Survival
mLab start-ups enjoy a very high survival rate, especially in Africa. Survival rates varied among the mLabs based on their applicant requirements, program design, and broader ecosystem. mLab ECA had the lowest survival rate but encouraged entrepreneurs to “fail fast.” In contrast, mLab West Africa had the highest survival rate but only admitted more mature start-ups.

Maturity
Start-ups that have gone through an mLab program have significantly matured relative to comparable start-ups. As start-up incubators, the mLabs’ primary objective is to enable start-ups to refine their business model and progress through the start-up life cycle stages. Each of the mLabs has successfully taken their start-ups from early to later stages.

Jobs Created
mLabs have created jobs in at least two ways. mLab start-ups directly created more than 270 jobs between 2014 and 2016. Additionally, the mLabs contributed to growing markets for digital skills and talent in their local ecosystem.

Financial Health
mLab start-ups are financially healthier than comparable start-ups. Based on survey responses regarding income growth, 80 percent of mLab respondents experienced revenue growth of 40 percent or more over the last three years.

Recommendation
Across the board, mLab start-ups value networking more than any other service provided. mLab managers should continue to invest in networking activities and broaden their scope of knowledge sharing across infoDev’s global network.

Photo Credits: Above: Jonga, Opposite: Layyers
The 73 mLab-supported start-ups reviewed for the customer impact analysis spanned 23 distinct types of businesses in three general categories: Digital technology companies (38 percent), development sector companies (34 percent), and other service companies (27 percent).

The team then used four different analytical approaches to gauge intended customer impact via data collected from both interviews and information provided by the firms themselves.

- **Revenue stream map**: Following the approach of the first assessment, the team identified each firm’s principal revenue stream, based on their products and services and mapped them by sector, grouped by digital technology, service companies, and development sector.

- **Economic and social impact map**: To provide a comparative perspective, the team created a framework for a more holistic method than the interview approach used to assess customers and the ecosystem because of the breadth and complexity of the customer markets.

Institutional Review Board authorization per country, adding cost and time. Finally, a formal impact assessment would need to be focused on one company or industry per country in order to provide the necessary structure and rigor. The team instead focused on intentions of impact, as identified by the companies themselves, to see if there were any patterns of potential impact that additional research could look at in depth. One of our recommendations is for infoDev to use mLabs as sources for potential subjects for in-depth customer impact assessments.

The 73 mLab-supported start-ups include an additional 24 beyond the 59 interviewed.
to map these products and services to their intended impact on customers. Impacts were measured across two axes: economic and social, and growth and shrinkage (more details can be found below). The team mapped each company into one of four categories (grow wealth, grow well-being, shrink waste, reduce suffering), based on their published metrics, mission, or market offerings.

- **Comparison map:** The team then integrated the two maps to hone a more precise picture of where and how impacts are distributed. Six illustrative examples are described to provide a real-world context for the aggregate findings.

- **Client basis:** The team analyzed historical trends in target clients and life cycle journeys to see if these revenue streams and economic and social impact intentions had changed over time.

---

**REVENUE STREAM MAP**

**Finding 1:** mLab product and services customers are experiencing an increasing diversification of benefits, as indicated by the diversification of the companies’ revenue streams. mLab companies have a broad cross-section of revenue streams, grouped into digital technology, development, and service sectors (see Table 6; the bolded entries with an asterisk indicate first assessment Firm Area of Impact).

**Finding 2:** Thirty-eight percent of companies have their revenue streams in the digital technology sector, which will have multiplier impacts across the economy.

---

**TABLE 6. MAP OF MLAB FIRMS’ REVENUE STREAMS.**

<table>
<thead>
<tr>
<th>IMPACT TYPE</th>
<th>IMPACT SECTOR</th>
<th># FIRMS</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Technology Sector</td>
<td>Mobile Services Development</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gamification</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graphic Design</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multimedia Services</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT Consulting</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Space Exploration</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Development Sector</td>
<td>Finance/Financial Inclusion*</td>
<td>6</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>Agriculture*</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health*</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grassroots Innovation*</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education*</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environment*</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employment*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supply Chain</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Service Sector</td>
<td>Media</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobility*</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Automotive</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>m-Commerce</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>m-delivery</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tourism</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business Administration</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Childcare</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
This result is good sign of the viability of the digital technology industry in the four economies. World Bank research suggests digital technologies, such as those at the core of each new mLab-supported start-up, tend to

- Boost participation by new and existing actors in economic activity;
- Improve the efficiency of the services in those industries;
- Bring innovation to the practices and business models in those industries.

There are indications in some markets that critical scale and viability thresholds are occurring in select industries, such as the finance sectors in Kenya and South Africa, which are improving productivity in a sustainable and scalable manner. Successful e-market platforms in South Africa, Kenya, and Senegal hint at the longer-term viability of broader customer benefits from these platforms.

At the same time, growth in digital technology companies does not necessarily lead to direct impact on BoP customers, as IT companies are typically B2B and do not focus on individual consumers. As pointed out previously, since the digital technologies are not always equally diffused in a population, it cannot be assumed that improvement in the digital infrastructure will necessarily mean equal benefits to BoP.

**ECONOMIC & SOCIAL IMPACT MAPPING**

The assessment team developed an analytic framework to distinguish if the intention of a product or services is to provide economic or social benefit to the customer, and if the customer experiences a growth (more) of a positive or shrinks (less) of a negative. This growth-shrinkage of economic and social impact served as a structure to map an mLab’s companies based on their published metrics, mission, or market offerings. This process captures the macro-level indication of where m-Lab companies are impacting customers. The framework is illustrated in Chart 10.

The next step was to map each mLab start-up to the framework. Using each company’s published metrics, mission, or market offering to determine their intended customer impact, the team categorized the companies into one of the quadrants. For example, a digital technology services company intends to shrink waste of their clients by digitalizing currently analog processes. An agro-business company intends to grow wealth by improving the prices farmers get for their products. Products that are intended to improve health provision services are trying to reduce

---

*What changes can enable digital technology developers to boost national development? This is universal, not just limited to Armenia—apps like city cleanliness help with municipal governance. Such apps can bring social revolutions, they are new tools.*

~ Investor, Armenia

*We have grown an extra 600,000 unique users (with 33% month on month growth) … 70% of our growth is being driven by the rural population—users accessing the most basic of phones … This is what we mean by revolutionizing African education.*

~ Education start-up, Kenya

*Mobile apps have greatly impacted logistics, manufacturing, and sales sectors. Firms with very different services need mobile apps, as they help to deliver services and capture customers.*

~ Investor, South Africa
suffering due to illness. Services that are offering new social services to underserved populations are growing well-being.

Finding 1: Growing wealth is the primary customer impact.

Chart 11 reports on results of the mapping of revenue streams. There are significant differences among mLabs in the number and types of intended customer impacts generated by mLab companies. Unsurprisingly, across all four countries, economic benefit via grow wealth constitutes the primary customer impact, with 43 percent of mLab-supported start-ups. Social impact via grow well-being is the second most frequently occurring impact area for mLab start-ups, with 30 percent of mLab companies targeting this benefit.

Companies focusing on shrink waste (12 percent) and shrink suffering (15 percent) constitute less than 30 percent of the portfolio of all mLab start-ups. A more focused look at each mLab will provide a clearer picture of each.

Finding 2: Customer economic and social impact varies by mLab, as illustrated in Chart 12.

mLab ECA: ECA mLab start-ups are evenly balanced between grow wealth and grow well-being, and overall the distribution of its start-ups within the impact mapping framework is closest to the average.

m:lab East Africa: m:lab EA–supported companies were the most evenly distributed across all four impact type quadrants, with start-ups in each category. m:lab East Africa’s distribution of start-ups (along with Southern Africa’s) also contains an above-average proportion of companies oriented toward impacting customer social prosperity and well-being.

In the shrink waste quadrant, East Africa is the leader among its peer labs. The balance of start-ups in Kenya’s shrink waste quadrant is a reflection of the many m-financial services companies that have emerged with the dramatic success of mPesa. mLab Southern Africa: mLab Southern Africa was the only case where grow wealth was not the most frequently cited objective. mLab Southern Africa has the greatest number of companies focused on impacting customer social prosperity and well-being, with 16 out of 25 companies mapped to customers’ well-being as foremost in their mission.

mLab West Africa/CTIC: The mLab West Africa portfolio’s distribution of start-ups is almost entirely focused on grow wealth, with 10 of 14 companies mapped to this quadrant as their primary focus.
Finding: When the team compared the results of these two maps (see Table 7), more diversity of economic and social impact was found in the development and service companies than the digital technology companies. Most digital technology companies are focused on growing wealth for their customers, which in most cases are businesses.

Examples: Revenue Streams and Economic and Social Impact

Six start-ups were selected as illustrative examples of businesses that have potential to provide economic and social impact to underserved groups, via improving infrastructure that directly touches the BoP, connecting underserved sellers to new markets; and providing new or improved services to underserved communities.
Do mLabs Still Make a Difference?
A Second Assessment

TABLE 7. NUMBER AND DISTRIBUTION OF FIRM REVENUE STREAMS AND TYPES OF ECONOMIC-SOCIAL IMPACT.

<table>
<thead>
<tr>
<th>Revenue stream</th>
<th>Grow wealth</th>
<th>Shrink waste</th>
<th>Grow well-being</th>
<th>Reduce suffering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Technology Sector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Services Development</td>
<td>15</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Gamification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphic Design</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Multimedia Services</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT Consulting</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space Exploration</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sub Total</td>
<td>19</td>
<td>1</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Finance</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>1</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Grassroots Innovation</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Environment</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Supply Chain</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Sub Total</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Service Sector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media</td>
<td>1</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>m-Commerce</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Mobility</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>m-Delivery</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourism</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Automotive</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Administration</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Childcare</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Sub Total</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>8</td>
<td>22</td>
<td>12</td>
</tr>
</tbody>
</table>
ENEZA EDUCATION: M:LAB EA
Revenue and Impact Map: education, reduce suffering
What?
Eneza offers SMS-based virtual tutor and teacher’s assistant content as a way for both students and teachers to access valuable courses and assessments while interacting with live instructors—all through low-cost mobile phones. SMS-based products such as Shupavu 291 enable primary and secondary students to access Kenya National Curriculum-aligned lessons, assessments, ASK a Teacher, and Wikipedia. Teachers can access teacher-development courses and parents can access a basic business course. There are versions for Tanzania and Ghana as well.

Evidence of impact
As of November 2016, 1,700,000 users in Ghana, Kenya, and Tanzania. In 2017 Eneza is expanding to Lesotho, Nigeria, South Africa, Uganda, Zambia, and Zimbabwe. The company is targeting 50 million users, and as of November 2016, Eneza has experienced a 33 percent per month growth rate.

Thirty percent of users are outside the formal school setting. Super users include youth in conflict areas of Kenya, including Garissa and the Dadaab Refugee Camp. An impact assessment was performed in 2014: student results improved 23 percent compared with the control group (full results pending).

How are they providing services to underserved communities?
By using SMS-based education services, Eneza has built the most widely used mobile education platform in Africa with local content. “Having SMS-based content (now also Android / html- text only/ and web-based) has been a key element for reaching the BoP, according to the Interviewee (2016).

Top benefit from mLab
Networking with other mLabs members and alumni, training services.

FAMBOX: MLAB ECA
Revenue and Impact Map: media, grow well-being
What?
Fambox is the first Armenian online TV portal and mobile application with legal video content. On a daily basis, high-quality video material, including new releases and premieres from the Armenian film industry, are available on Fambox.

Evidence of impact
Fambox serves and expands the worldwide market for Armenian-language films and TV. This service supports the local culture and arts community and serves the diaspora with Armenian language and cultural content.

How are they connecting underserved sellers to new markets?
Currently the maximum number of viewers of a movie (screened) is 200,000; however, there are 1-2 million potential viewers of a streamed service in Armenia and 4-5 million worldwide, proving a wider market for films. In addition, Fambox offers an easy channel to access the Armenian diaspora.

Top benefits from mLab
Work space, participation in grants, networking, access to investment, and access to recruitable staff.
GOMETRO: MLAB SA
Revenue and Impact Map: transportation, shrink waste
What?
GoMetro is a South African transportation mapping company that provides service to commuters, transport operators and planners, and advertisers. As of November 2016 they had 22 full-time staff and 52 part-time staff. In October 2016 they had a 20 percent equity stake investment by Tritech Media.

Evidence of impact
GoMetro simplifies transport operations on public and semipublic transport services within South Africa. Through strong working relationships with city governments across South Africa, GoMetro modernizes and digitizes public transport networks and brings minibus taxis (used primarily by BoP) into the formal transport market.

GoMetro’s mobile transport information and ticketing technology has been used by consumers in more than 200,000 trips across South Africa. MTN, Burger King, Lunch Bar, African Bank, Shoprite, and FNB have experienced up to a fourfold increase in campaign performance when using GoMetro’s location and movement-aware advertising engine.

How are they improving Infrastructure that directly touches the BoP?
GoMetro’s data tools let municipalities fight congestion by having navigation, traffic alerts, train timetables, bus stop locations, and ride-hailing, ride-sharing, and cycling options all in one app. By partnering with local businesses and brands, the app further provides relevant and valuable offers to commuters on their way to work or home.

Top benefit from mLab
mLab helped get attention from the market and identify strong business partners.

ILLUMINUM GREENHOUSES: M:LAB EA
Revenue and Impact Map: agriculture, growth wealth
What?
Illuminum Greenhouses is a Kenyan company that equips smallholder farmers with access to affordable modern farming technologies to improve their productivity and incomes using digital technologies. They are looking to expand into other countries in Sub-Saharan Africa.

Evidence of impact
Illuminum’s vision is to equip smallholder farmers in Sub-Saharan Africa with access to affordable modern farming technologies and improve their productivity and incomes. As of November 2016 the company had constructed more than 300 greenhouses and served nearly 1,500 farmers, boosting their incomes by an average of US$155 per month (US$2.7 million per year).

How are they improving infrastructure that directly touches the BoP?
Working with smallholder farmers to improve production and increase efficiency through the use of new modern technologies.

Top benefit from mLab
mLab helped get attention from the market and identify strong business partners.
KIDOGO: M:LAB EA

Revenue and Impact Map: childcare, improve well-being

What?
Kidogo is a social enterprise that improves access to high-quality, affordable early childhood care and education in East Africa’s low-income communities. Kidogo seek to unlock the potential of young children and transform the trajectories of their families through the provision of high-quality childcare, along with sustainable business models for women to provide for their families.

Evidence of impact
As of November 2016 Kidogo had two centers, five “Mamapreneurs,” 250 children, and 1,000 family members benefiting from services. They also have received funding from Grand Challenges Canada, government of Canada. Recent assessments found a 20 percent average increase in the quality of the caregiving environment (within 12 months), and 500,000-plus hours of high-quality care provided.

How are they providing services to underserved communities?
Using “hub” centers as a model, Kidogo has launched a social-franchising program to support local women (Mamapreneurs) with training, resources, and ongoing mentorship to start or grow their own quality childcare micro-business (or “spoke”).

Top benefit from mLab
Kidogo was not interviewed. Kidogo was incubated by mLab and assessed in the first round, but it had left the mLab before the second assessment began.

TOUR2.0: MLAB SA

Revenue and Impact Map: tourism, grow wealth

What?
Tour2.0, a South African cultural tourism company, built an app to sell and broker tours between local South African tour guides, artists, restaurateurs, and other service providers and American and European tourists looking for novel tourism experiences. The company is expanding into Kenya, Tanzania, and Uganda.

Evidence of impact
Tour2.0 brings tourists with money to new areas where they learn about South African culture through the direct hiring (via the Tour2.0 website) of tour guides who offer customized tours to tourists as well as through the opportunity to buy goods and services from these underserved communities. Tour2.0 also finds and trains potential tour guides and identifies cultural experiences with local partners.

As of November 2016 Tour2.0 had seven employees, 43 tour guides, and an average of four indirect jobs per tourism experience in underserved communities. They are performing a full-impact assessment that will be available in mid-2017.

How are they connecting underserved sellers to new markets?
By making tourism more equitable, Tour2.0 becomes a vehicle to make communities more viable while providing wealthy tourists with access to experiences and communities normally unavailable to them.

Top benefit from mLab
Hackathons, which allowed the company to bounce ideas off others and seek a solution. IP and finance workshops and investor-ready workshops, which gave Tour2.0 a lead to the Startup Support Program. “Let’s not forget the small big things—the venue and facilities, the use of devices on which to test their products.”
MOVING AWAY FROM BUSINESS TO CONSUMER TOWARD BUSINESS TO BUSINESS

Finding: Companies are pivoting toward more sustainable B2B sources of revenue and away from B2C. This fact means that the customers of mLab companies’ products and services primarily are other businesses (local and international), not consumers.

As illustrated in Chart 13, the team discovered that 39 percent of clients have B2C as their primary customers, while 23 percent of newcomers have B2C as their primary customers and 100 percent of the counterfactual companies have B2B as primary customers.

An explanation for this pivot toward B2B may be related to the differences in the sales and marketing resources needed for the different types of customers: B2B market development relies much more on reputation, networks, and skills and less on large marketing budgets. Average revenue per sale is significantly higher for B2B, and cost per sale is lower. B2B repeat sales tend to be more stable, reducing cost per sale. Additionally, the scale required for company sustainability is very different—one large B2B sale can sustain a company for years.

The high cost of customer acquisition in the B2C market is often referred to as a “start-up killer,” as the need for capital is beyond the capacity of most start-ups. This fact may be the reason why only incubated start-ups had any B2C market focus.

Lack of access to finance is a common complaint across the start-up ecosystem, necessitating a “bootstrapping” approach to building their businesses, especially in the early stages. As a result, many companies start with a B2B or consulting-services model while they gather the financial resources to build and market a B2C product.

PIVOTING AWAY FROM SOCIAL ENTREPRENEURSHIP

Finding: Social entrepreneurial-oriented companies, especially those who primarily focus on BoP or traditionally disadvantaged communities, are pivoting to more sustainable business models.

Several interviewed start-ups indicated that they have moved or are moving away from targeting marginalized populations. They noted they struggled to find economically viable markets for their low-income- or BoP-oriented products or services. There is also increasing demand from the private sector for their digital technology skills.

In addition—even when there are viable markets—because of the need to self-fund development and growth, many entrepreneurs have been forced to pivot toward more lucrative B2B markets, which have more sustainable revenue streams that can be accessed on a short time scale. As one interviewee stated:

Investors are only interested once the start-up is profitable, and that’s too late.

The folks doing well are doing B2B or B2G, rather than BoP.

- Kenyan investor

MobiDev is a Kenyan application development firm (SMS/USSD/mobile/web apps developer) that pivoted. While moving to growth stage, MobiDev pivoted from its original Youth IT capacity-building priority (employment) to IT/business administration services for well-funded customers. MobiDev’s pivot is illustrative of a widespread trend among mLab start-ups rich in IT skills: They enjoy a competitive advantage in the market and can profit more in the IT sector than from their original social benefit idea.
SUMMARY OF FINDINGS

mLab start-ups’ customers gained benefits from more diverse products and services in local markets.

For example:

• More than 1.7 million students receive mobile-based academic materials and instruction via a digital platform developed by an mLab start-up.

• Farmers monitoring their crops, water usage, and sales on a digital platform are experiencing an average increase in income of US$155 per month, totaling US$2.7 million in a year.

• An mLab start-up’s app has contributed to a 30 percent national drop in minibus traffic deaths.

However, both mLabs and the start-ups they support have realized a need to pivot to higher-revenue-generating activities in order to maintain economic viability. As a result:

• Many mLab start-ups have pivoted from B2C models to B2B models.

• Social enterprises that were unable to find a path to economic viability have pivoted away from BoP markets to serve more profitable consumers.

Recommendation: Create a process to regularly reexamine the mLab strategic focus.

The mLab business model has proven its value in developing income-generating and economically viable start-ups, which sometimes include social enterprises. If mLab managers aim to tackle social development challenges, they should reconsider their program design and optimize its support for social entrepreneurs.
5 HOW DO MLABS IMPACT THEIR DIGITAL ENTREPRENEURSHIP ECOSYSTEMS?

The assessment team used three entrepreneurial ecosystem factors to map the contributions made by the mLabs to their local ecosystems. The three are among the seven identified by infoDev in the 2014 Business Models of mLabs and mHubs—An Evaluation of infoDev’s Mobile Innovation Support Pilots:

- The innovation and entrepreneurship enabler landscape (including incubators, technology innovation hubs, accelerators, government-funded programs, and tech-community organizations and networks)
- The availability of talent and human capital
- The access to finance landscape

To assess mLabs’ impact on the innovation and entrepreneurial and human capital landscapes, the assessment relied on interview results, the first assessment, and desk research.

[Mobile technology] ... can be quite revolutionary, as with Uber and the taxi sector in Kenya … No company can do without a mobile strategy or using social media. They also need to use the analytics side. Plus, mobile payment strategies are essential for nearly all companies.

- Investor, Kenya

THE INNOVATION AND ENTREPRENEURSHIP ENABLER LANDSCAPE: RAPIDLY EVOLVING

Significant Ecosystem Changes

In 2011 the mobile ecosystem was largely based on 2.5G infrastructure and devices. Mobile coverage was extremely limited and expensive compared to today. Mobile technical solutions were based on SMS and USSD, and smartphones were only held by the most affluent. The ecosystem had far fewer start-ups across all sectors and many used technology to facilitate a business component such as call centers and medical transcription services. There were few incubators and minimal private sector investment in start-ups in Africa.

By 2016 the innovation entrepreneurship landscape had changed dramatically. The mLabs have contributed to a more mature ecosystem, measured by the number and diversity of incubators and the number of start-ups they support, as noted in the customer impact discussion. mLab start-ups were among those that broke ground building important relations between digital start-ups and existing market companies.
There is now increased involvement of the private sector and government in digital technology as a whole and especially with start-ups. Existing companies are more likely to view start-ups as potential competitors whose actions must be countered through competition or partnership; many larger companies are starting to cultivate formal relationships with incubators to develop talent pipelines and ideas for their own innovation with digital technology. Private sector partners who are seeking new ideas to adapt to their own needs are increasingly sponsoring competitions and accelerator programs.

In addition, many governments have embraced entrepreneurship as a way to address income inequality and prosperity goals. Most have formal policies to support entrepreneurs, including the reduction of existing government processes and easing of regulations imposed on start-up growth, such as Armenian tax policies28 and South African government policies on entrepreneurship.29

There is also an evolution in how the opportunities in digital technology are discussed. They have moved from general aspirational visions of technological impact to focused analysis on specific market opportunities, overcoming technology challenges, and sustainable business models.

For example, here is what two entrepreneurs have said:

Five years ago there was a boom. Everybody wanted to make start-ups. Two years ago it all fell down. Call it “entrepreneurship entertainment” hackathons with no follow up. Now you can see serious people emerge. Everybody wants to have a position in the ecosystem.

The mindset has changed. Now there is more of a belief that “one can create.” The ability to know the basics, know the experience, see the problem. This is the basis of innovation and a successful entrepreneur.

Another change is the access to experienced mentors and investors because there are more veteran entrepreneurs who can coach and mentor new start-ups. These relationships have greater potential to lead to angel investment. Positive stories of investing success plus increasing relationships between entrepreneurs and investors are creating more local appetite for angel investing in the tech start-up space. One interviewee noted:

there’s now a more seasoned experience that understands the importance of the business [not just technology]. … The ecosystem is more mature about financial terms.

Because of the increased interest in the digital technology sector, both local and foreign non-traditional entrepreneurs have been starting or joining tech start-ups, which improves the business and tech experience for these new companies. This intersection of diverse technology entrepreneurs has created large-scale opportunities to build webs of relationships for mentoring, fund-raising, or partnering with local and global players.

When asked about the most significant change in the ecosystem, interviewees identified a larger and more mature market and did so more than three times as often as the next most frequently mentioned change. Results are reported in Chart 14.30

**Chart 14. Perceptions of Significant Ecosystem Change Since 2013**

<table>
<thead>
<tr>
<th>Change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger, more mature markets</td>
<td>62%</td>
</tr>
<tr>
<td>Higher access penetration</td>
<td>19%</td>
</tr>
<tr>
<td>No change</td>
<td>12%</td>
</tr>
<tr>
<td>New mindset</td>
<td>8%</td>
</tr>
</tbody>
</table>

What will improve the digital technology start-up ecosystem most in your opinion?

I might be biased, but I think more investing. One of the challenges is that the start-ups lack certain skills. There are lots of tech skills but they lack business skills.

~ Investor, Senegal

---

28  KPMG in Armenia 2013.
29  RSA 2012.
30  These categories are based on content analysis of interview
The growth of venture capital available to African technology companies (discussed in greater detail below) is another sign of the increasing maturity of the digital technology ecosystem, as is the diversity of services that the companies offer. Without seed, grant, prizes, and other early stage finance, many successful mLab start-ups—such as NaKo Games and GoMetro—may not have been successful with later-stage funding. As a result of this dynamic, there are many ICT-enabled, knowledge-intensive services offered today that did not exist in 2011. Improvements to digital infrastructure such as connectivity access and cost, start-up monetization channels, and smartphone penetration rates have helped to expand the customer bases.

Diversifying and Deepening the Homegrown Digital Services

In addition to pioneering and offering social proof of successful digital incubation, mLabs have made contributions to the diversification of company types and the services they offer, as demonstrated in the section on mLab impact on customers. This diversification is indicative of the growing sophistication of the ecosystem and reflects a maturing market. More services and more kinds of services combined with declines in telecommunication access prices have lowered business-operating costs, enabling new businesses to emerge and existing ones to grow, and expanding access to digital service to increasingly lower income customers. This virtuous economic cycle of enabling more efficient business, at lower costs for more people, is a potential driver of improved social and economic impact via the ICT sector. This cycle has had two important results: The first is the spillover of digital technology to other sectors; the second is an increase in the type and number of digital technology services.

Spillover Benefits of Digital Technology to Other Ecosystems

As a general purpose technology, information technology affects the full range of sectors to “transform both household life and the ways in which firms conduct business.”

To assess how mLabs as producers of digital technology have impacted other ecosystems, the assessment team asked interviewees to identify how and where the digital technology ecosystem affected other entrepreneurial ecosystems—that is, where spillover effects occurred. Chart 15 shows the responses, clustered into five categories: (1) extends opportunities, (2) extends market zones, (3) improves company functionality, (4) services sector, and (5) logistics sector. The level of impact of each category among the four mLabs did differ, likely reflecting the ecosystems in which they exist. For example, Armenian interviewees rated improving company functionality the lowest and the extension of market zones the highest, which reflects the Armenian focus on international markets, whereas Senegalese interviewees ranked improving company functionality the highest and extending opportunities the lowest, reflecting CTIC’s predominance of digital technology companies.

results.

31 Deloitte 2014a.
32 infoDev 2014, Select Annexes.
33 The possible exception is the Armenian ecosystem, where start-up functions were ongoing with existing corporate structures and where the Enterprise Incubator Foundation was established in 2002 and was 10 years into its mission. Innovation Ventures (DIV) and Grand Challenges, was launched in 2014; UNICEF’s Social Innovation Lab was launched in 2015.
34 USAID’s U.S. Global Development Lab, with its Development Enterprise Initiative (DIV) and Grand Challenges was launched in 2014; GSMA’s Social Innovation Lab was launched in 2015.
35 GSMA 2016.
36 AngelList 2016.
38 These categories are based on content analysis of interview results.
ILLUSTRATIVE EXAMPLES: DIGITIZED MARKETS

With respect to the growth in number and types of digital technology serves available, the following examples illustrate mLab-incubated company products that have “digitized” a traditionally analog market.

Improves Firm Functionality & Extends Market Zones

Genius Family offers N’Diarte, a web and mobile e-commerce tool to help Senegalese businesses manage invoices, cash flow, inventory, and their expenses in real time. The tool has a mobile app to allow staff access to digital receipts and sales information away from the office, so they can market in more than one city. N’Diarte’s customers include e-commerce, hotel, and poultry-management companies. Tools such as N’Diarte are very helpful for business owners as they help improve decision making and visibility into inventory, cash flow, and profitability.

Logistics & Services Sector

4Car offers a mobile and web-based product for Armenian drivers with a variety of services. One service alerts drivers if they have received a speeding ticket, including the amount, and lets them know the necessary steps toward resolution, such as payment. The web application also lets them check and pay their property tax online. Another popular service has been dubbed the “Craigslist of cars in Armenia”—an online marketplace to find spare parts and auto dealers and to publish classified ads in the auto market across the country.

Improves Firm Functionality & Extends Opportunities

Card Planet Solutions is a Kenyan company that offers smart-card services to the recipients of donor and government services in order to increase efficiency, convenience, and security and to save costs. Card Planet leverages on smart cards and related technologies integrated to the Internet and hence creates robust “chip-to-cloud” solutions for an array of sectors such as health and digital identity, payments and loyalty cards. Card Planet reports that mLabs helped them get the attention of investors so they could build their business.

Logistics Sector & Extends Market Zones

Twiga Foods (not an mLab start-up) improves the supply chain of household foods and goods between small-scale retailers (currently 2,000 of them a week) and farmers. Using technology and improved logistics management, Twiga Foods runs its own warehouses, freezer units, and transport, allowing the company to offer lower prices and better delivery services to small-scale retailers. Twiga Foods is planning on expanding to other countries in 2017 to broaden their regional presence.
TALENT AND HUMAN CAPITAL: EXPANDING AND GROWING

mLabs have enriched and contributed to talent and human-capital development in several ways. First, they have helped entrepreneurs gain valuable experience while also setting expectations about entrepreneurship. Second, mLabs added high-quality jobs (formal and informal) to the field, as discussed above in the section on job creation. Third, mLabs have offered training and professional-development support to the current and next generations of technology professionals.

One clear evidence of impact on the ecosystem is that many larger companies in each of the economies are cultivating relationships with mLabs both to develop an external talent pipeline to feed organizational innovation and to equip staff to be intrapreneurs—staff who work within an organization to apply entrepreneurial ideas and innovation principles to drive company improvement.

mLabs have explicitly focused on two sets of skills and capacities that successful digital technology start-ups require: (1) the ability to design, build, and maintain effective digital technology products and services, such as coding, project management, and UX design; and (2) business management, including financial management, human resource management, market research, and getting products to market. mLabs have positively impacted the ecosystem by increasing the number of individuals who have both technology experience and the experience of building a business. By focusing on building both the technology and business talents of entrepreneurs, the mLabs support a “pipeline” of real-world experience in building a business from scratch and moving it along the start-up life cycle.

Consider the following interviewee comment:

The approach has changed from 2015 when [the mLabs] would take applicants just with strong ideas … [now] they are focusing in on more established products/teams.

In Armenia, in particular, the ability of the mLabs and other entrepreneurs to promote a business mind-set was vital to the transformation of the country from its former Soviet past. One investor noted the following:

The development of these business skills is also held back by the overall mindset of the Armenian population. Just 25 years ago in the Soviet era everyone was a public-sector worker. This has a huge effect on the mindset of working people. This is still all that the older generation remembers through their education as well as their experience.

Across the board, all mLabs reported more technology talent, more support for technology start-ups, and more technology being applied to industry verticals.

The flow of qualified job candidates is higher. There’s more training and the talent pool is bigger.

As the ecosystem matures, both domestically and internationally, and as companies move beyond mobile apps to cyber security, cloud-based computing, and the Internet of things, new and perhaps more technically sophisticated skills may be required. Repeating the successes of the 2010s, as described below, may be more challenging:

Since 2010, iHub has produced 152 companies and grown a membership base of nearly 20,000 techies. iHub influenced Africa’s incubator movement, inspiring the upsurge in tech hubs across the continent.

ACCESS TO FINANCE

Measuring the impact of mLabs on access to finance (A2F) in the ecosystem is difficult to establish. The mLabs have actively promoted A2F by providing seed funding and connecting their entrepreneurs to angel and venture capital investors, and the mLabs have built and enhanced fund-raising capacity and attractiveness among their beneficiaries. Still a causal link is difficult to make, not only because of the complexity of raising finance and who should be credited, but also because the digital technical finance landscape in Africa is largely still nascent. Also, A2F beyond initial seed funding has not been a priority mLab objective.
Individually, all reviewed mLabs have provided grants and critical start-up seed funding, and all regularly refer their start-ups to prize-contests and grant programs; this has helped several companies build their portfolios and reputations.

In Armenia an mLab company’s first investment was a seed grant, which then led to a larger one; today the company is at scale and competing successfully in the international app market. Several other mLab ECA start-ups have developed along the life cycle stages with mLab ECA or EIF funding.

In Kenya an mLab company recently received an estimated US$200,000 of Series B funding. In Senegal the mLab has played a vital role as the first incubator, and its start-ups’ vertical concentration must augment their access to finance. And in Kenya and Senegal dominant telecommunications operators have institutionalized start-up support.

These examples of mLabs activities and results have contributed to this changing landscape. Across Africa and in Armenia a sizable number of competitive private market-driven incubators have followed the path that mLabs and a handful of other early incubation efforts started on in 2010. These activities and results reflect a change in the ecosystem: a start-up’s access to finance. Consider a comment from an African entrepreneur:

What’s coming out now is real. More solid businesses are coming out of it. Lot more money trying to find opportunities and it’s harder to find opportunities.

To assess potential impacts of mLabs on the A2F part of the ecosystem landscape, this section will provide three perspectives of the landscape in the four mLab countries: (1) a view of the private sector, (2) where mLabs receive their first funding, and (3) angel investment interest.

**Growth in Private Investment Since 2012**

As indicated in Chart 16, estimates for venture capital funding available to African technology start-ups have increased dramatically since 2012.  

While this trend is good for start-ups that can compete for VC funding—that is, start-ups with established products in...
viable markets, with paying customers, and the capability of generating 30 times the investment they receive—most mLabs start-up firms cannot meet these criteria. As one investor put it, the mLabs could help with:

expectation management around growth and funding. Firms often expect easy social or financial returns but if they were more modest in their expectations, they would have better businesses. But VCs are not interested in modest expectations.

mLab Start-ups’ First Funding

Chart 17 compares first sources of investment for mLabs entrepreneurs to non-mLab entrepreneurs (comparable and counterfactual). Non-mLab entrepreneurs are more successful with informal investors and much more successful with angel investors. mLab entrepreneurs are much more successful with grant-based funding and slightly more successful with VC investors than non-mLab entrepreneurs.

Chart 18 reveals mLabs entrepreneurs doing significantly better with grants than comparable incubated firms, while comparable incubated firms do much better with angel investors. The chart also suggests that newcomers are becoming less reliant on grants, and that clients are doing nearly twice as well as the newcomers with VC investors, as one might expect with more established firms.

Angel Investment

Angel investments make up about 20 percent of mLabs start-ups’ first investments and may be underused by mLab companies, especially in Southern Africa and ECA. Table 8 shows the number of AngelList interested investors following start-up companies in each of the mLab locations (mLab Southern Africa has two locations, one in Gauteng and the other in Cape Town), and it lists the number of investors who have made more than 50 investments. The table provides an estimation of investor interest in each of the ecosystems. There is a much higher level of investor interest in the ECA and SA Mlabs ecosystems, with more than 7,000 interested in Yerevan start-ups and more than 80 investors with more than 50 investments in South Africa.

Lack of Funding Is Hurting Growth

As mentioned in the previous section on firm survival, many of the entrepreneurs interviewed identified lack of access to finances as a constraint, and it was identified, by nearly one in five respondents, as a primary success factor for sustained economic growth.41

Specific views included the following:

Attitudes of local investors toward start-ups are still skeptical and international investment is primarily in other internationally managed organizations, not local organizations.

We need to link start-up companies better to government, corporates, funders—to get access to capital. mLabs need to provide capital / funding. Add funding, but don’t be reckless—if they meet the criteria, put your money where your mouth is. I plan to invest in start-ups when I have the money. Don’t stop, mLabs—just make the funding happen!

These results indicate a challenging situation for start-ups, reflected in the following comment:

Access to finance is a bottleneck. Funders need to be better educated, to understand that the start-up field is risky and slow to pay.

<table>
<thead>
<tr>
<th>TABLE 8. ANGEL LIST INVESTORS MONITORING STARTUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTERESTED INVESTORS</strong></td>
</tr>
<tr>
<td><strong>Cape Town</strong></td>
</tr>
<tr>
<td><strong>Gauteng</strong></td>
</tr>
<tr>
<td><strong>Yerevan</strong></td>
</tr>
<tr>
<td><strong>Nairobi</strong></td>
</tr>
<tr>
<td><strong>Dakar</strong></td>
</tr>
</tbody>
</table>

41 See Primary Success Factors section in the Case Studies, Appendixes A-D for further detail.
SUMMARY OF FINDINGS

mLabs have had numerous positive impacts on their entrepreneurial ecosystems:

• Proving the incubation model: mLabs were among the first incubators in their countries and did pioneering work that helped set the stage for the more than 300 African tech hubs and incubators that followed.

• Accelerating digitization of the economy: mLabs have extended market participation to new sellers and customers, regions, and types of beneficiaries. They have improved the efficiency of market services and introduced innovative approaches and business models in non-ICT sectors.

• Enriching technical capacity and entrepreneurship skills: mLabs have promoted improved technology skills (coding, technology project management, UX design) and enabled entrepreneurs to gain professional experience in building start-ups.

• Access to finance: mLabs have actively promoted access to finance by supporting links between entrepreneurs and sources of funding, including grants and seed funding, enabling their start-ups to secure more than US$16 million in investment capital.

Recommendation: Increase the focus on A2F throughout the mLab incubation program.

To the extent possible, mLabs should seek out partnerships with angel investors, fund managers, and venture capitalists to work with their entrepreneurs from the earliest stages of the start-up life cycle. Their guidance would enable the start-ups to build more scalable business models, and better present to potential investors.
Do mLabs Still Make a Difference?
A Second Assessment

6 CONCLUSIONS

MLABS HAVE EVOLVED IN RESPONSE TO THEIR ECOSYSTEMS
mLabs have coevolved with their ecosystems, both influencing and being influenced by rapidly changing environments (including such factors as new entrants to the incubator space, new and cheaper technology, and increasing levels of investment capital available). The mLabs of 2016 are significantly different than the mLabs of 2011 or 2013. The successes documented in this report are at least partially attributable to their ability to evolve within the specific context of the ecosystem. As ecosystems will continue to evolve rapidly, future success of mLabs will continue to be linked to their ability to evolve to match the emerging needs and opportunities.

IMPACT ON START-UPS
The mLabs have had a solid impact on helping start-ups improve survivability and achieve maturity, as well as grow jobs and income generation opportunities in their communities. mLab clients cited networking as the most highly valued aspect of being affiliated with mLabs, yet it was not an explicit service of any mLab nor measured by standard indicators. For example, mLab alumni entrepreneurs were not used as mentors to existing entrepreneurs.

Firms face an ongoing challenge around access to finance at key stages in the life cycle. They also need to bolster both their business acumen as well as the technology skills in order to face the challenges of each start-up stage.

One of the challenges for entrepreneurialism is many underestimate risk. In education and business, there is a well-articulated path for growth and success. But for entrepreneurs, there is not a predictable path for success. The popular narrative suggests success is due solely to hard work and genius, but we forget about luck. Markets are unpredictable and hostile to small businesses. Early success attracts attacks from larger businesses—and small businesses are often unequipped to deal with their attacks. While good people bounce and adapt, we all need to understand this risk factor in entrepreneurialism.

- Investor, South Africa
IMPACT ON START-UPS’ CUSTOMERS

mLabs have had noticeable economic and social impact on customers through the firms they have nurtured, measured by the expansion of products and services into a range of new sectors. In addition to broader positive impact on their economies, many mLab-supported firms have interesting business models that may also have real measurable impact on the BoP and underserved communities, especially through informal income generation and improvement of quality services.

However, there is strong economic pressure in the ecosystem moving start-ups away from products and services that have direct economic or social impact on customers to those that are more indirect, especially for underserved or BoP communities. This economic pressure, combined with the A2F challenges, may exacerbate digital divide issues by making social entrepreneurship a greater challenge.

IMPACT ON THE DIGITAL ENTREPRENEURSHIP ECOSYSTEM

mLabs have had a positive impact on their ecosystems in several regards. First, by being some of the first incubators in this space, mLabs provided social proof and led the way for other partners (governmental and private sector) to enter the space. Second, mLabs have provided hands-on training and real-world experience to entrepreneurs and helped mature the understanding of the digital start-up community by traditional and non-traditional entrepreneurs. Finally, they connected start-ups to financing, mainly through grants and some VC funding.

However, as the ecosystem has changed, the influence of the mLabs has changed as well. mLabs are no longer the first and only incubator but rather one of many different incubators in the marketplace. Other players are offering training and capacity-building support to start-ups. There are also new finance opportunities, such as growth in the angel ecosystem (within and outside of Africa), that offer possible opportunities for the mLabs to explore for mentors, partnerships, and additional investment.
STRENGTHEN THE MLAB PROGRAM IMPACT

Create a Process for Regular Reexamination of mLab Strategic Focus

The mLabs and their start-ups evolved in response to their ecosystems. As such, mLabs should create a process for periodic examination of their strategic focus. The process should include reexamining optimal types of incubatees for each mLab (that is, early stage vs. growth-stage start-ups, health vs. education verticals) and a consideration of incubatees’ likely economic and social consequences or objectives. This process should enable each mLab to optimize support for incubatees, recruitment of strong mentors, business relationships, and investors, with the result being better performing incubatees. The World Bank can also help facilitate this strategic planning process to help mLabs determine the next steps in their evolution.

Increase Focus on mLab Services that Generate Measurable Value

There are numerous ways mLabs create tangible, measurable value for start-ups and investors. These include increased access to business networks and financing as well as establishing (and/or increasing) customer pipeline volume. mLabs should increase their focus upon these highest-value services, and improve their capacity to deliver and monetize these services.

Continue Focus on Improving Business Acumen

A learning need expressed by many entrepreneurs was knowledge and experiences tailored to grow the business through the various stages of the start-up life cycle. mLabs can augment this capacity through expanding both mentor resources and the alumni network, discussed below as a separate recommendation. This could include building a knowledge base of specialized insights about digital enterprise growth in developing economies generated from results of action-oriented research. Different stages of growth have different needs. For example, seed-stage companies need to grow and scale beyond the prototype stage in order to demonstrate to investors the financial soundness of their business model. Further formalizing the training and technical support around financial management practices (that is, creating accounting books, reading a profit and loss statement or balance sheet, and learning how to project and optimize cash flow as well as how to “pitch” investors and banks) should be considered.

Increase Focus on Access to Finance throughout the Start-up Life Cycle

Access to finance was identified by interviewees as critical for firm maturation. In the early seed stage, grants and angel investment are important to develop prototypes. Once a prototype and its related business model have demonstrated traction in the market, access to angel investors, venture capital, specialized market resources, and potential partners are critical to growth and scaling. mLabs have been instrumental in generating funding/investor partnerships, but more is needed.

Establishing formal relationships with financial institutions and potential investors should be further augmented and considered as an integral part the incubation program.

Link mLab Firms with Business- focused Connections and Specialist Support

Many mLab companies are founded by tech-savvy individuals with innovative ideas. Solving the engineering aspect of product development is often not the greatest challenge. Understanding the value drivers, costs of customer acquisition, and the administrative components of mobilizing an organization are often the more significant obstacles. mLab support in this area might include discounted services for consultation on legal (contracts, patents/IP, tax law, equity deals, and so on), human resources (employment contracts, administrative support, recruitment, and so on), financial management (financing, access to loans or credit, bookkeeping and accounting services, and so on), and marketing expertise (access to market research, how to perform focus groups, branding, and so on).

7 RECOMMENDATIONS
Increase Knowledge Management and Networking Activities

More structured and purposeful knowledge management (KM) and networking activities would provide benefits to the entrepreneurial ecosystem, to individual firms, and to Bank practitioners. The scope of KM activities to consider could include between companies within an individual mLab, between and among mLabs, and among mLabs, the mLab program, and international development professionals. KM activities between and among mLabs could include an annual mLabs practitioners’ workshop to share best practices and lessons learned.

mLabs could also support the transfer of knowledge between mLabs and other local incubation allies with formal networking activities, infrastructure, and dedicated resources. Metrics such as referral requests or connections made could be identified and used.

infoDev can facilitate opportunities for inter-mLab KM and rapid action learning sprints to deepen understanding of emerging issues, priorities, and trends faced by mLabs firms, digital technology incubators, and/or industry verticals or sectors targeted for greater ICT-penetration.

Finally, mLabs and infoDev should identify and use indicators to measure networking and knowledge-sharing activities to determine the best returns on investment.

Alumni Program and Follow-on Support to Engage Past Participants

Some mLab alumni expressed desire for greater follow-on support once the formal program came to an end. They suggested ideas such as an online platform that would allow program alumni to connect, share experiences, and access mentors they had met during the program. An ongoing alumni network can also serve as a source of start-up mentors, and for engaging “graduated” start-ups in continued involvement to help strengthen the start-up community. Ad hoc get-togethers in the form of a Tech Tuesday on selected topics (for example, fund-raising workshops, customer-pipeline development, or technical training), can help cement alumni commitment to promoting and further engaging with mLabs.

It also increases the opportunity to build pipelines of future angel investors for current start-up participants.

STRENGTHEN MLAB PROGRAM MANAGEMENT

Build Agile Management Processes

In the rapidly evolving technology field, traditional annual strategic planning is seldom responsive enough to adapt readily to the pace of change, the speed of technology changes, shifting market competition, and the contexts of economic and social change. Most technology companies have adopted their direction-setting and product-development processes to allow for nimbler, continuous adaptation to change. mLabs have an opportunity to model agile management practices and germinate these market-leading practices with the start-ups they incubate.

Reexamine Performance Metrics

Due to the responsive and evolving nature of the mLabs, performance metrics may have extremely short shelf lives and may not be appropriate across all programs. Metrics need to reflect the strategic approach of the mLabs as well as be relevant to the firms being incubated. Some considerations should be to co-generate with the mLabs the next wave of improvements to the current performance scorecard. Metrics generation and data collection should be optimized to enable better prediction, local decision support, and collaborative action research rather than be used strictly for performance reporting and accountability. In addition, developing indicators individualized to an mLab’s specific case and its strategic focus could provide a new dimension for evaluation.

Explicitly Build Data for Decision-Making Capacity

As part of their involvement in mLabs program, each mLab needs a level of data management proficiency that supports tracking, measuring, and evaluating operational and programmatic performance. Some mLabs will need support in capacity building for these skills. The model should include common incubation indicators familiar across the industry (for example, lean start-up or similar agile “metrics that matter” approaches) where key performance indicators are consistently tracked, reviewed, and benchmarked.
REFERENCES & BIBLIOGRAPHY


Alliance for Affordable Internet. 2016. 2015-16 A4AI Affordability Report. Alliance for Affordable Internet: Washington, DC, USA.


Association for Progressive Communications. 2016. Ending digital exclusion: Why the access divide persists and how to close it. APC policy paper on access to the internet. Association for Progressive Communications: Melville, South Africa.


Do mLabs Still Make a Difference?
A Second Assessment


mLab East Africa http://mlab.co.ke/about/


APPENDIX A: MLAB ECA CASE STUDY

INTRODUCTION

Founded in 2012, mLab Eastern Europe, South Caucasus, and Central Asia (ECA) is nested in the Enterprise Incubator Foundation (EIF) along with other digital technology incubation and innovation initiatives. The EIF serves as a key policy think tank for the architecture of Armenia’s digital economy. Together with existing technology firms, sometimes in partnership and sometimes in competition, the EIF and the private sector each promote champions for Armenia’s tremendous growth. The government has continued to play a leading role, most recently through legislation that provides for a three-year, tax-free license for digital technology.

As part of the EIF, mLab ECA concentrates on digital technology and is a regional “focal point to increase the competitiveness of innovative enterprises working in mobile content and applications of the region.” It “provides a wide range of innovation support services, including organization of trainings, business mentoring, idea generation, and matching grants implemented by the EIF” to assist entrepreneurs in product development and promotion, connecting them with potential investors, academic experts, and public sector leaders.

mLabs Program

mLab ECA supports early stage innovation, development, and commercialization of digital technology content and services. Services include mentorship, formal and individual training in software development, user experience (UX), productivity enhancement, quality management capacity and other business skills that increase the competitiveness of mLab beneficiaries.2

In this capacity, mLab ECA essentially provides services to three different types of entities: individual trainees who benefit from both ad hoc and course-length training; interns who work with mLab projects; and start-up teams who receive substantial long-term support in the development of their mobile applications.3 Trainees participate in various software-development and business/project management courses, which range from Java for Android, UNIX, and Python programming to iOS apps development.4 Some training courses are designed for longer-term, high-skill capacity building, while others reach a more broad-based population of mobile web-application developers. Since 2011 mLab ECA has reached or trained more than 2,000 individuals. mLab-sponsored hackathons and other competitions extend the mLab’s reach into the region and to a much larger number of beneficiaries.

Internships are accomplished through a long-term program lasting up to a year. Interns are able to take courses and work in support of incubation teams. Interns develop technical software-development expertise as well as know-how to help them become digital technology entrepreneurs. They are also mentored in a vibrant technological and entrepreneurial environment. A number of interns continue on to join mLab incubation teams or develop their own ideas to pursue as entrepreneurs. mLab ECA has supported 150 interns since 2011.

mLab ECA incubation is designed for individuals to develop ideas into prototypes and teams to produce commercially viable products. mLab ECA can support four to five teams at a time; mLab ECA has supported an average of three and a half teams a year, or just under 90 percent of its capacity. Teams are provided with work space, equipment, software expertise, business expertise, and a start-up-friendly environment for up to one year. During this period, teams evolve and in most cases are able to sustain themselves as they move out of the incubator and look for their own premises. The free and casual environment, space and equipment, and hands-on expertise, matched with inter-team dynamics, a creative and productive environment, and the independence to determine their own work pace, were reported as important elements by start-ups.

criteria, including an assessment of their idea or application as well as their commitment to seeing their project through to the point where they can enter the market.

These short-term courses are offered either as daylong courses or up to 15 session courses with 30 contact hours. Costs range from no cost to 25,000 drams (US$50) for a 30-hour course.
Coaching and mentoring are provided on topics such as commercializing products, software-development skills, and entrepreneurial capacity. Teams also receive support and coaching on strategy development, formulation of a business model, team creation through defining roles and responsibilities among team members, understanding the chain of business development to the extent of marketing and selling products, and revitalizing revenue. Incubatees work with the mLab and EIF to help them secure financing, reach investors, and secure non-financial partners, such as content partners. In the case of 4Car, an automotive platform, launching their service, which notifies drivers of tickets issued by the police, access to police data was made possible by the EIF’s good offices. Table A.1 shows select results since mLab ECA launched.

### Table A.1. Select mLab ECA Results, Provided by mLab ECA

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-ups created with mLab support</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Revenue generated by start-ups US$</td>
<td>0</td>
<td>0</td>
<td>55,100</td>
<td>2,000</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td>External investment raised by start-ups US$</td>
<td>15,000</td>
<td>32,700</td>
<td>128,700</td>
<td>0</td>
<td>110,000</td>
<td>0</td>
</tr>
<tr>
<td>Number of new direct jobs created</td>
<td>15</td>
<td>25</td>
<td>37</td>
<td>9</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Consumer app users reached</td>
<td>0</td>
<td>0</td>
<td>1,700,000</td>
<td>25,000</td>
<td>74,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Apps reaching underserved communities (bop, rural, &amp; social dev apps)</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>New mobile apps brought to market</td>
<td>0</td>
<td>110</td>
<td>117</td>
<td>8</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Number of app prototypes created</td>
<td>12</td>
<td>117</td>
<td>131</td>
<td>8</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Number of teams applying for in-depth mLab support</td>
<td>0</td>
<td>25</td>
<td>216</td>
<td>10</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Teams receiving in-depth one-on-one support</td>
<td>8</td>
<td>15</td>
<td>57</td>
<td>9</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Number of people trained</td>
<td>24</td>
<td>180</td>
<td>260</td>
<td>40</td>
<td>60</td>
<td>47</td>
</tr>
<tr>
<td>Number of developers and entrepreneurs reached</td>
<td>0</td>
<td>0</td>
<td>1,000</td>
<td>102</td>
<td>86</td>
<td>78</td>
</tr>
</tbody>
</table>
Armenian Digital Technology Ecosystem

This section provides an overview of the digital technology ecosystem in Armenia and then a more focused view of research and development. After Armenian independence, the ecosystem declined and in the early 2000s was described in a World Bank publication as shockingly underdeveloped. Not only is Armenia squarely among laggards (the worst category, occupied by Sub-Saharan Africa, Albania, and the Central Asian republics of the former Soviet Union); its relative position has actually worsened significantly since 1995. Since then there have been dramatic changes. Armenian digital technology exports have grown dramatically.

Software exports were US$20 million in 2000, roughly the same as the US$21 million generated by mobile application development in 2015, and the ICT sector as a whole has seen exports grow from US$58 million in 2010 to US$214 million in 2015. In the same period the number of Armenian digital technology firms has grown from 197 in 2010, the year before mLab ECA was launched, to 450 in 2015. This transformation started in 2000 with the government’s emphasis on information technology, followed by the formation of the Information Technologies Development Support Council in 2001 and the establishment of the Enterprise Incubator Foundation in 2002. It is within this context that mLab ECA became operational in 2012.

Digital Start-up Ecosystem

The Armenian digital start-up ecosystem is vibrant and has experienced tremendous growth over the past few years, partially related to preferential tax incentives; in 2016 an estimated 120 start-ups were granted tax-free start-up status. The ecosystem, which started with the outsourcing sector, has evolved to produce new digital products, but it still maintains a focus on the international market. This ecosystem benefits from low data costs, high penetration rates, good infrastructure, and low taxes.

The mLab ECA and other digital technology entrepreneurs in Armenia benefit from the ecosystem in several ways. First, the market is small, as several interviewees noted, which is an advantage to start-ups. A small market not only enables nimble and quick reaction, but also may serve as a natural market-protection barrier; large international actors are less likely to enter the domestic Armenian market and compete with local digital technology firms. Second, many interviewed start-ups see the Armenian market as an attractive place to develop applications and conduct initial product testing before moving on to growth and scale in Iranian and former Soviet markets, the latter particularly attractive given Armenia’s 2015 accession to the Eurasian Economic Union.

Established companies also pursue start-up activities within existing corporate structures. For example, one company, which began with technical training and then moved on to outsourcing, recruits talented trainees to develop their ideas into prototypes; promising prototypes are taken to market via spin-off companies that remain within the corporate structure. This company now has nearly a dozen spin-off subsidiaries.

Internet accessibility has rapidly increased with a simultaneous lowering of access prices. This has resulted in an increased number of users. One interviewee noted that retail access costs may be approaching a level so low that service providers cannot make a return on investment. Demand is high in a variety of areas, ranging from basic communications to services, entertainment, business and finance.

The growth of the sector is partially driven by local acceptance and success in international markets. This growth has resulted in technology-related talent becoming more business- and customer-oriented, and an increasing interest of Armenians in digital technology professions.

Academic programs and informal education in coding have become popular among youth and young adults. Their profiles vary, but the majority of those observed tend to be younger to middle-aged people who increasingly teach themselves to use technology solutions. Also interesting has been the development of an urban culture accepting the routine use of digital technology as well as market players becoming more trusting in internet-based applications.

---

5 Mitra et al. 2007.
6 Ibid., Box 7.3.
8 Ibid., 40.
9 Ibid., 40.
12 Interviewee 2016.
MLAB ECA AND THE ECOSYSTEM

The following three results provide additional detail about the ecosystem: What the interviewed ecosystem members think are the primary success factors for sustained growth in the mobile technology sector, start-ups’ first source of investment, and where and how digital technology entrepreneurship impacts other entrepreneurs. Each of the three charts compares mLab ECA with the mean value of the other three mLabs.

Primary Success Factors

Chart A.1 shows what interviewees see as the primary success factors for achieving sustained growth. The chart shows the percentage each critical success factor was given by the mLab ECA ecosystem interviewees and the mean for the other three mLabs. Key differences between mLab ECA and the other three mLabs are the higher emphasis on business capacity and technical capacity and the relatively low valuations given to infrastructure and market access by ECA respondents.

The Access to Finance Landscape

Access to finance is a critical factor for the survival and success of start-ups within the digital ecosystem. Without funding it is not possible to support a group of young ambitious individuals who want to transform a bright idea into a successful business or to take a minimum viable product (MVP) on to the next stage of growth. Chart A.2 shows the source of first investment that firms receive in Armenia and in the other three cases.

In Armenia 60 percent of interviewed digital technology start-ups receive grants, about four times the rate of start-ups in the other three cases. Angel and venture capital funding rates are about the same, and informal funding was much lower in Armenia. While some sampling bias may be introduced, the bias may be equally due to the different populations each mLab seeks to prioritize.

Impact of Digital Technology on Other Sectors

Chart A.3 features areas where respondents thought digital technology entrepreneurs had impacted other sectors. A preponderance of respondents identified the extension of market zones and opportunities, and these responses were given at higher rates than at the other three mLabs. Also, improving firm functionality was quite a bit lower in Armenia than in the other three mLabs.

13 These values were generated via a content analysis.
MLAB ECA AND START-UP CREATION AND DEVELOPMENT

This section examines the impact of mLab ECA on incubated start-up development, maturation, and survival. First, using the start-up development life cycle, the period from which each mLab company joined the mLab up to their current life cycle stage is mapped. This provides a critical view of how each mLab firm is surviving and maturing. Next, the financial health of mLab ECA firms in terms of revenue growth over the last three years is compared with the other three mLabs.

Start-up Survival and Firm Maturation

Table A.2 shows start-up maturation and survival. It identifies the life cycle stage of when a start-up joined the mLab and its status in November 2016. There are five life cycle stages:

- Customer discovery (identifying the product or service and potential target market)
- Product validation (building the app or infrastructure to deliver the product or service and validating that there is a market)
- Customer engagement (marketing and sales to first round of customers, with polishing of the product or service)
- Growth (growing customer base to be profitable and stable)
- Scale (expanding to a new market, sector, or country)

As Table A.2 shows, mLab ECA has consistently brought its incubated start-ups to maturity, with two at growth and one at scale. One key start-up ecosystem characteristic is how long start-ups survive and when they close. The table reveals that most companies start at the customer-discovery stage and make it to customer engagement, where a little more than half exit the ecosystem. Two companies, My Sales and MicroForester, closed; however their founding entrepreneurs have started new ventures in the digital technology ecosystem.

### Table A.2. Maturation and Survival Status for Select Incubated Start-Ups, November 2016

<table>
<thead>
<tr>
<th>CURRENT NAME</th>
<th>CUSTOMER DISCOVERY</th>
<th>PRODUCT VALIDATION</th>
<th>CUSTOMER ENGAGEMENT</th>
<th>GROWTH</th>
<th>SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stories Hub</td>
<td></td>
<td></td>
<td>Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NaKo Games</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>My Sales</td>
<td></td>
<td></td>
<td>Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Micro-Forester</td>
<td></td>
<td></td>
<td>Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LETSEIN</td>
<td></td>
<td></td>
<td>Closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FamBox</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>4 Car</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Cube, Tech</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
</tbody>
</table>

Active: Organization is still active in the ecosystem under its original or new identity. Closed: Organization is no longer active in the ecosystem.
This pattern is quite different from EA and SA, where more than 80 percent of firms survive, and from West Africa, where they have a 100 percent survival rate. This fact may be due to different pressures from the mLabs to close out start-ups with limited opportunities for success (such as EA and SA, which often incubate entrepreneurs through several “pivots”), and/or different entrance criteria (as in West Africa, where firms need to be at the customer-engagement stage with revenue in order to enter the mLab).

Financial Status

Chart A.4 shows the percentage change in revenue over the last three years. It indicates that mLab ECA companies are similar in comparison with the other mLab companies, with the exception of the very high revenue growth (greater than 300 percent) companies, where there are no mLab ECA companies.

MLAB ECA AND RANKING OF PERCEPTION OF BENEFITS

This section examines how mLab beneficiaries value mLab services. The results are from interviews. Interviewees could identify several services they found to be valuable.

Chart A.5 shows the proportion of mLab ECA services that were identified as important by respondents in comparison to in the other three mLabs. These results mirror key success factors, with an emphasis on business activities related to access to financing, business capacity, and networking.

The mLab ECA beneficiaries stated that they valued more highly the non-digital technology skills of networking, developing business capacity, and access to finance. Since many of the start-up entrepreneurs that come to mLab ECA are young people recently out of school, the opportunity to network both with professionals and technical experts in the field as well as potential clients and investors is invaluable. Through a variety of different competitions, hackathons, guest-speaker series, and participation in Digitech forums and fairs, start-up teams interact with prominent experts, potential investors, and seek advice and find answers to the questions encountered in the course of starting up and developing a new idea.

Interviewees also mentioned mentoring as highly valuable. Mentoring provides individualized attention—such as pointing entrepreneurs and interns in the direction of competitions and potential funding sources—as well as links to diaspora in external digital technology ecosystems. For example, one start-up entrepreneur noted that the mLab GooglePlay Publisher account allowed him to publish his app. Another interviewee noted that the mLab and EIF facilitated access to key market data that drove his subscription and advertising revenue-generation model.

With regard to obtaining early stage finance, many mLab start-ups noted the importance of the mLab ECA host, the EIF, as they developed their businesses. Access to finance, especially when developing an idea, was bolstered by an EIF matching grant program that funded several start-ups, which subsequently received non-mLab funding. Equally important was mLab ECA and EIF encouragement to enter competitions and seek funding. Lastly, one start-up noted that they would not have been able to enter the ecosystem if not for the intern stipend.

While technical skills development and access to devices were among the undervalued mLab contributions, two respondents noted value in key mLab services such as UX design and access to multiple handheld devices for testing.

Lastly, not reflected in the table is opportunity for quick-turnaround consultations with experts in the diaspora on issues ranging from prototype development to market potential. One respondent noted:

[I] started with the idea that the first step was to define and develop the product. mLab helped me understand that one first needs to identify user needs and then do the product.
MLAB ECA AND DIGITAL TECHNOLOGY IMPACTS

This section reports on where respondents thought digital technology has had the most significant impact in Armenia. The question was asked in two ways: The first is, Which sectors have had the highest impact from digital technology? The second is, Where has digital technology had the highest impact on national development goals?

The Armenian digital technology market has largely focused on export markets and internally on service sectors. A number of applications under development that serve development and marginalized populations, with a focus on education and agriculture, have potential impacts in this area. Broadly, Chart A.6 reflects these priorities, with 70 percent of the responses attributing an effect as a general-purpose technological catalyst for business, social development, and economic growth.  

When asked where digital technology has impacted national development, education and logistics lead, with responses in Armenia exceeding responses in the other mLabs by factors of two to three times, as reported in Chart A.7. Direct impacts of mLab-supported applications on development and marginalized populations have been relatively modest as a result of focusing on higher-revenue applications and external markets. The dynamic is that entrepreneurs are there to make money and the money is to be made with customers who have it.

---

14 This insight was generated through a content analysis of respondent replies of where they thought non-digital technology ecosystems had been most impacted by digital technology.
APPENDIX B: M:LAB EAST AFRICA CASE STUDY

INTRODUCTION
mLabs Program
m:lab East Africa (EA) was launched in June 2011 by a consortium that included eMobilis, the World Wide Web Foundation, the University of Nairobi, and the iHub, with support from InfoDev, Nokia, the Kenyan ICT Board, and the Kenyan Ministry of ICT. Based in Nairobi, the consortium’s mission was “to facilitate demand-driven innovation by regional entrepreneurs, ensuring that breakthrough low-cost, high-value mobile solutions can be developed and scaled-up into sustainable businesses that address social needs.”15 The mLab was housed within the iHub (established in 2010), and resided along with the three principal components of iHub: iHub research, iHub Consulting, and UX Lab.

To help achieve consortium objectives, initial mLab activities centered on three areas: (1) technical training, (2) creation of an active digital start-up community, and (3) development of new business opportunities.16 The mLab has the capacity to incubate six to seven start-ups concurrently, and offers beneficiaries work space and access to office infrastructure, internships,17 training sponsored by corporates, coaching, and access to grants.

A flagship component of the mLab activities is Pivot East, an annual regional start-up competition that yields 25 finalists. The finalists participate in a monthlong training and skills development program that serves as a talent-identification and recruiting basis for longer-term mLab incubation. The best ideas among the semifinalists are potential incubatee recruits. In addition to Pivot East and start-up incubation, other mLab activities range from ad hoc training in areas such as Android, SMS, USSD, and Windows, to regularly scheduled community-building events such as Wireless Wednesdays and TechTrend Thursday. m:lab EA has also focused on sectoral/vertical areas, such as the Mobile Impact Ventures Program, an acceleration program that concentrates on the agriculture, health and water, and education sectors funded by the Rockefeller and Tony Elumelu Foundations.

The period since 2013 has brought significant change in several areas for m:lab East Africa. In 2013 the mLab changed its practice of providing grant funding to incubated firms.

Instead, m:lab EA began connecting start-ups to prospective financiers and other funding organizations.18 The mLab also ceased training activities (which had largely been supported via corporate sponsorship) to concentrate on incubation and Pivot East.19

In 2015 mLab activities shifted again to focus on “1) market-driven training on different platforms, 2) business incubation, and 3) a testing lab for apps.”20 In 2016 m:lab EA was formally absorbed and integrated into the iHub corporate structure. In addition, the iHub business model shifted. It is essentially now following a for-profit model and is moving to new services. As co-founder Erik Hersman wrote in March 2016:

Today we’re excited to announce some fairly significant changes at the iHub. A group of people are investing in the iHub in order to help us grow, to tighten up our service offerings and make them more profitable, and to help us figure out how not to just find startups but to grow the ones that are getting traction. … First and foremost we recognize the need to make sure that we are 100% self-funded, which means running a productive and more efficient set of consulting services. Many of the current staff will be the same, though we will also add more talent to the team (so, we are hiring), however we’ll likely need to reorganize the services to more efficiently work together. We will ramp up our software, user experience, research, data science and design consultancy offering and position iHub as a preferred global provider for these services.21

Table B.1 shows select results since m:lab East Africa launched.

15 http://mlab.ke.co.
17 Current mLab head (former CEO before the reorganization)
Sheilah Birgen started at mLab as an intern in 2012 (infoDev 2016).
18 mLab interview.
19 mLab interview.
20 infoDev 2016.
21 Hersman 2016.
### Table B.1. Select m:Lab East Africa Results, Provided by m:Lab East Africa*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-ups created with mLab support</td>
<td>6</td>
<td>12</td>
<td>50</td>
<td>67</td>
<td>80</td>
<td>65</td>
</tr>
<tr>
<td>Revenue generated by start-ups US$</td>
<td>141,727</td>
<td>0</td>
<td>627,000</td>
<td>535,000</td>
<td>936,000</td>
<td>660,000</td>
</tr>
<tr>
<td>External investment raised by start-ups US$</td>
<td>0</td>
<td>1,000,000</td>
<td>1,500,000</td>
<td>1,865,000</td>
<td>2,120,000</td>
<td>1,870,000</td>
</tr>
<tr>
<td>Number of new direct jobs created</td>
<td>0</td>
<td>56</td>
<td>100</td>
<td>140</td>
<td>194</td>
<td>176</td>
</tr>
<tr>
<td>Consumer app users reached</td>
<td>0</td>
<td>0</td>
<td>263,000</td>
<td>387,110</td>
<td>1,853,200</td>
<td>2,560,780</td>
</tr>
<tr>
<td>Apps reaching underserved communities (bop, rural, &amp; social dev apps)</td>
<td>38</td>
<td>0</td>
<td>78</td>
<td>111</td>
<td>134</td>
<td>278</td>
</tr>
<tr>
<td>New mobile apps brought to market</td>
<td>115</td>
<td>0</td>
<td>196</td>
<td>234</td>
<td>168</td>
<td>278</td>
</tr>
<tr>
<td>Number of app prototypes created</td>
<td>60</td>
<td>70</td>
<td>301</td>
<td>67</td>
<td>80</td>
<td>278</td>
</tr>
<tr>
<td>Number of teams applying for in-depth mLab support</td>
<td>0</td>
<td>338</td>
<td>460</td>
<td>219</td>
<td>315</td>
<td>281</td>
</tr>
<tr>
<td>Teams receiving in-depth one-on-one support</td>
<td>7</td>
<td>0</td>
<td>119</td>
<td>63</td>
<td>40</td>
<td>79</td>
</tr>
<tr>
<td>Number of people trained</td>
<td>0</td>
<td>0</td>
<td>462</td>
<td>126</td>
<td>122</td>
<td>288</td>
</tr>
<tr>
<td>Number of developers and entrepreneurs reached</td>
<td>0</td>
<td>0</td>
<td>5,000</td>
<td>193</td>
<td>202</td>
<td>293</td>
</tr>
</tbody>
</table>

*This data was provided to the assessment team by the m:Lab East Africa. Some indicators for m:Lab East Africa seem to be based on different criteria than the other mLabs. Thus comparison should be done with care.
Kenyan Digital Technology Ecosystem

This section provides an overview of the digital technology ecosystem in Kenya and then a more focused view of the digital start-up ecosystem. Following these discussions, the ecosystem will be described in more detail by looking at three areas: the primary success factors for sustained growth in the mobile technology sector, access to finance, and the degree to which the digital technology sector has served as a key vector for other sectors.

Kenya has one of the more liberalized ICT sectors on the continent and has had a good track record with innovation in the digital technology sector, such as the Mawingu TV White Spaces pilot. In the ecosystem, Safaricom remains a dominant service provider and player, and with the government as the main shareholder, there appears to be little appetite to mitigate its market dominance. For start-ups this fact is both a positive and a negative factor. On the positive side, Safaricom has its own start-up investment fund, Safaricom Spark, and if a start-up is seen to promote a good potential service for Safaricom’s market, it will have a ready audience. Total funds are about US$1 million for minority equity stakes or as convertible debt, ranging from about US$65,000 to US$240,000 per investment. On the negative side, one interviewee noted that the ecosystem is: *just much bigger but there are very real threats as Safaricom entrenches itself and the internationals Uber, WhatsApp, Facebook, etc get better at accessing the market.*

Kenya has had several connections to international fiber networks since the early 2010s. This resulted in a dramatic increase in capacity and a drop in access prices. The main urban centers are connected with fiber and the country has among the lowest broadband access costs in Sub-Saharan Africa.

However, there remain areas where voice and data coverage is spotty and large remote areas (like the North) where coverage is largely restricted to stretches along the main roads. While cell phone penetration rates are estimated to be in the 90 percent range, smartphone penetration is much lower (estimated in the 20 percent range).

Since liberalization, the ICT sector has grown rapidly as different vertical areas of activity have begun to digitize. The most heavily affected vertical has been banking, through competition with m-money services, most notably mPesa. Alongside the private sector, the government has also introduced a number of e-services (for example, visas) and is planning to bring in more. However, although there are companies that are innovating (for example, Equity Bank with Equitel and other services), the majority of companies remain fairly conservative in their approach to changing business processes.

The Kenyan ecosystem is a leader in e-financial services, with 26.3 million m-money subscribers carrying out 227.3 million transactions in Q4 2015. A significant ecosystem of (largely) start-up companies has grown up around the dominant m-money service mPesa, providing different financial services based upon it. By contrast, in 2014 the country was reported as having only 12 million credit card users, with use stagnating.

As ICT has become more widely adopted by a wide range of business sectors, the number of people obtaining ICT skills has increased, with mLabs playing a part. Most people asked said that they could find the ICT skills and talents they required but that both wages and demand for these skills remained high. One interviewee noted that among technology incubators,

*talent is [now] much, much better and is no longer a problem but there’s an inflation in salaries. None of us is hiring expat developers any more. Nairobi Garage used to be full of expat coders, no longer. The ecosystem is more mature about financial terms. We learned a lot about market size from the companies 88mph put money into. However, all its exits have been on a breakeven basis.*

Still for young, underfunded start-ups, lack of affordable skills and technical talent remains a significant barrier.

Digital Start-up Ecosystem

Nairobi has a rich start-up ecosystem of incubators and co-working spaces, including iHub, Nailab, Nest, Nairobi Garage (with two premises), and the iLab at Strathmore University. Accelerators include Spring and the Merck accelerator.

Outside of Nairobi, incubators in Mombasa and Kisumu are anticipated to come online soon. The government has funded a local content program that includes e-government services and is specifically open to start-ups. These developments are reflected in an increase in start-ups, more coding talent, available funding, and more working spaces. There used to be 10 to 24 new start-ups a year; now there are 70 to 100.

Nairobi has a range of investors, including institutional investors, VC players, impact-fund investors and more recently business angels. As elsewhere, there is an investment gap between “friends, family and fools” and
those who will invest in a business that has proven revenue. Almost all start-ups spoken to pointed to this investment gap. However, a number of start-ups (for example, Twiga Foods and Branch) have demonstrated that with the right team and idea, investment is available. Some investors noted there are not enough investible and “investment-ready” start-ups, but that this is starting to change.

One challenge for start-ups and investors is that an estimated 70 percent of digital advertising revenues go through the locally owned Scanad Group. As with the dominant position of Safaricom, this market near monopoly provides a significant hurdle for start-ups basing their business model on advertising.

As the ecosystem has grown there are two changes that were most frequently noted by respondents: First, the considerable hype generated by Kenyans about their ecosystem (dubbed Silicon Savannah at one point) has died down and there are now second-generation entrepreneurs and more solid business opportunities. Second, it is now a bigger ecosystem in every sense. One respondent warned that it was now in danger of becoming “saturated,” and another respondent emphasized that in these circumstances new start-ups need to be differentiated.

M:LAB EA AND THE ECOSYSTEM

The results below provide additional detail on the ecosystem in three areas: (1) What interviewed ecosystem members think are the primary success factors for sustained growth in the mobile technology sector, (2) the start-ups’ first source of investment, and (3) and where and how digital technology entrepreneurship impacts other entrepreneurs. Charts B.1 through B.3 compare m:lab EA to the mean value of the other three mLabs.

Primary Success Factors

Chart B.1 outlines what the interviewees identified as the key success factors for digital technology entrepreneurs in the Kenyan ecosystem, showing the percentage for each critical success factor and comparing it with the mean of the other three mLabs.

The most important success factor in Kenya was business capacity, with twice as many responses than the next two leading success factors. Government policy (tied with finance) was listed as the next most important success factor and was cited more than five times as often than in the other three mLabs.

The Access to Finance Landscape

Access to finance is a critical factor in the survival and success of start-ups within the digital ecosystem. Without funding, it is not possible to support a group of young ambitious individuals who want to transform a bright idea into a successful business or to take a minimum viable product on to the next stage of growth. Chart B.2 shows the first source of funding for interviewed Kenyan firms. Interestingly, Kenyan firms report higher rates of initial funding from angel and VC investors than the other three mLabs. Government policy (tied with finance) was listed as the next most important success factor and was cited more than five times as often than in the other three mLabs.

Impact of Digital Technology on Other Sectors

Chart B.3 shows areas where respondents thought digital technology entrepreneurs’ activities had spilled over and impacted other sectors. Overwhelmingly, respondents identified the business areas of extending opportunities and market zones, as well as improving firm functionality.
M:LAB EA AND START-UP CREATION AND DEVELOPMENT

This section examines m:lab East Africa’s start-up creation and maturation. First, using the start-up development life cycle, the period from which mLab companies join the mLab up to their current life cycle stage is mapped. This provides a critical view of how lab firms are surviving and maturing. Next, the financial health of mLab companies in terms of the percentage change in revenue over the last three years is considered in comparison with the other three mLabs.

Start-up Survival and Firm Maturation

Table B.2 shows start-up maturation and survivability. It identifies the life cycle stage of when a start-up joined the mLab and its status in November 2016. There are five life cycle stages:

- Customer discovery (identifying the product or service and potential target market)
- Product validation (building the app or infrastructure to deliver the product or service and validating that there is a market)
- Customer engagement (marketing and sales to first round of customers, with polishing of the product or service)
- Growth (growing customer base to be profitable and stable)
- Scale (expanding to a new market, sector, or country)

Table B.2 shows most m:lab East Africa client firms reported being at the “early stage” before they joined m:lab EA. Typically, these firms were grappling with issues of customer discovery and product validation. As evidenced in the table by their current status (2016), m:lab EA–supported firms report being in a more advanced state, working on challenges of sustaining customers, and optimizing their business models for sustainability and profitability.

Financial Status

Chart B.4 shows the start-ups’ percentage change in revenue over the last three years. It indicates that m:lab East Africa start-ups do much better overall than those from the other three mLabs, and especially better among firms with revenue of 40-99 percent and more than 300 percent. These differences may in part result from the type of start-ups that m:lab EA recruits, and that they must pay for services.
# TABLE B.2. MATURATION AND SURVIVAL STATUS FOR SELECT INCUBATED START-UPS, NOVEMBER 2016

<table>
<thead>
<tr>
<th>NAME</th>
<th>CUSTOMER DISCOVERY</th>
<th>PRODUCT VALIDATION</th>
<th>CUSTOMER ENGAGEMENT</th>
<th>GROWTH</th>
<th>SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afroes</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CardPlanetSolutions</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eneña Education</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Forex.co.ke</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illuminum Greenhouses</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instasave</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidogo</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kopo Kopo</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Leti Arts</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ma3route</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MedAfrica</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mFarm</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MobiDev</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mPayer</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sendy</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shield Finance</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleepout</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TotoHealth</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uhasibu</td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whive</td>
<td></td>
<td></td>
<td>Closed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Active: Organization is still active in the ecosystem under its original or new identity.

Closed: Organization is no longer active in the ecosystem.
M:LAB EA AND THE RANKING OF PERCEPTION OF BENEFITS

Chart B.5 shows the proportion of mLab EA services that were identified as important by respondents in comparison to the other three mLabs. It shows the percentage by which the activity or services was identified as important. While networking is a top valued service, along with business capacity, m:lab East Africa start-ups valued it considerably less than those of the other three mLabs, while they valued business capacity much more than in the other three mLabs.

M:LAB EA AND DIGITAL TECHNOLOGY IMPACTS

This section reports on where respondents think digital technology has had the most significant impact.22 The question was addressed in two ways. The first is which sectors have the highest impact on digital technology. The second is where digital technology has the highest impact on national development goals. Chart B.6 shows the areas where respondents thought digital technology has had the greatest impact. Interviewed respondents think that digital technology is primarily recognized for its role as a general-purpose technological catalyst for business, social development, and economic growth. Interestingly, despite mPesa’s success, or perhaps as a result, e-finance is rated below that of respondents from the mean of the other three mLabs.

When asked where digital technology had most affected national development, Chart B.7 shows different results, countering the previously noted low valuation of e-finance and placing it as the most important area of impact on national development. The government is the second most impacted area of digital technology, cited by respondents nearly three times as often as other cases.

---

22 This insight was generated through a content analysis of respondent replies of where they thought non-digital technology ecosystems had been most impacted by digital technology.
APPENDIX C: CTIC/MLAB WEST AFRICA CASE STUDY

INTRODUCTION

mLabs Program

mLab West Africa was launched in April 2011 and was the first digital technology incubator in West Africa. With the mLab nested in the CTIC, also launched in April 2011, many if not all mLab activities are subsumed under CTIC branding.\(^{23}\) The CTIC was supported by a consortium including infoDev and the IFC, the Orange mobile phone company, the European Union, the German Agency for International Cooperation (GIZ), local government agencies ADIE (an IT agency) and ARTP (a telecommunications regulator), and PACC–PME/PMF. The operating structure for the CTIC is a not-for-profit foundation; it employs nine staff.

In this context, the CTIC has been a pioneer in developing the Senegalese start-up ecosystem and has worked closely with a wide range of organizations to grow both opportunities and an understanding of what it means to be an entrepreneur. It has opened up the potential for entrepreneurship in a country where the height of parental ambition remains that a son or daughter get a job in government or a large multinational. It also lobbies the government for funding and a better business climate for start-ups.

The CTIC offers three distinct programs. One is a later-stage incubation stream for established firms that have revenue of more than US$30,000. This program has a maximum three-year incubation program. Competition for places is intense, with 150-300 start-ups applying each year.

The second program is a six-month early stage acceleration program, BuntuTEKI, aimed at entrepreneurs with prototypes in need of accelerated development. mLab services include offices and associated resources (like Internet access), access to markets and finance, coaching, training (for example, in sales and marketing and local law), networking, and events and business development.

A third program is a series of about 20 outreach events a year. These range from daylong seminars on how to attract investment to partnerships with mobile operators Orange and Tigo, start-up competitions, and the Jambal Tech Festival, a 1,000-people-plus multiday event.

The incubation capacity at the CTIC is 18 start-ups a year and seven early stage entrepreneurs a year. The total revenue of CTIC-incubated start-ups is just under US$6 million, with mLab start-ups accounting for an estimated 90 percent of this.\(^{24}\) The CTIC plans to be financially self-sustaining. Its earned income has grown from 44 percent in 2012 to 80 percent self-sustainability in 2015.

Table C.1 shows select results for mLab West Africa since 2014.\(^{25}\)

Senegalese Digital Technology Ecosystem

The Senegalese digital technology ecosystem was born of the overall growth of mobile phones and smartphones, the drop in wholesale and retail bandwidth prices, the impact of Orange Money as a financial platform, and the launch of the CTIC as a support mechanism for start-ups.

The number of mobile phones in Senegal nearly quadrupled from 4 million in 2007 to 15 million in March 2016. There is now a penetration rate of 114 percent, indicating multiple phone ownership by individuals. A Pew Research Center survey in 2015 found there was a 15 percent smartphone ownership level.

Senegal was one of the first Sub-Saharan countries with international cable connectivity. Sat3 was operational in 2001, nearly 10 years before most other Sub-Saharan countries. The incumbent operator Sonatel was “price

23  The precise delineation between the CTIC and the mLab is not clear. Many interviewees, including infoDev and CTIC staff, have said that the mLab is called CTIC; some had not heard of the name “mLab.” However, the team discovered areas of difference; for example, the mLab reported to the World Bank two start-ups created in 2014, while the CTIC website lists four for the same period. As it became very challenging to differentiate between the CTIC and mLab West Africa, for the purposes of this report, all activities funded via infoDev as mLab West Africa are ascribed to the CTIC, unless a differentiation was able to be made.

24  The CTIC reports a total of US$6 million, while reports from infoDev estimate US$5.5 million or less.

25  The CTIC was not included in the first assessment that covered 2011-2013.
progressive” in both retail and wholesale prices. At the same time, Orange-owned Sonatel (in which the government retains a shareholding) has a dominant position in the market and there is an absence of the kind of competition found in other more liberalized African countries.

Sonatel has the majority of voice and data revenues and few independent ISPs have survived; furthermore, there appears to be no political will to tackle the issue of its de facto monopoly position. At the same time, Sonatel is positively disposed toward start-ups and has opened Fab Labs both in Abidjan and Dakar and also opened an incubator with four start-ups under the Orange Fab Lab brand. Still, the dominance of Sonatel is likely responsible for the limited range of digital technology companies and suppliers.

One element of the Senegalese digital technology ecosystem is the relative lack of effective e-payment mechanisms. Part of this is due to the relatively recent launching of Orange Money in 2013, many years after this occurred in other African countries. While there is now a more competitive market, some nascent e-commerce start-ups (like Tong Tong) operate in a hybrid fashion, with users ordering online but paying in cash on delivery.

**Digital Start-up Ecosystem**

In this context, mLabs and its host the CTIC were launched in 2011 and have become a key support mechanism for the digital technology start-up scene. The CTIC is in many ways more important as a local resource than the other mLabs, as there are fewer other incubators or co-working spaces in Senegal, and Senegal started from a much lower base than the others.

The CTIC joined an ecosystem that started in the early 2000s when Jokko Labs was launched (unrelated to the currently operational Jokkolabs). The earlier Jokko Labs failed for a number of reasons. There were also a number of other start-ups launched in the 2000s, but these were more focused

---

**TABLE C.1. SELECT CTIC RESULTS, PROVIDED BY CTIC**

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>2014*</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-ups created with mLabs support</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Revenue generated by start-ups US$</td>
<td>1,629,702</td>
<td>967,856</td>
<td>263,691</td>
</tr>
<tr>
<td>External investment raised by start-ups US$</td>
<td>156,000</td>
<td>114,000</td>
<td>71,000</td>
</tr>
<tr>
<td>Number of new direct jobs created</td>
<td>10</td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td>Consumer app users reached</td>
<td>13,850</td>
<td>27,700</td>
<td>43,428</td>
</tr>
<tr>
<td>Apps reaching underserved communities (bop, rural, &amp; social dev apps)</td>
<td>8</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>New mobile apps brought to market</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Number of app prototypes created</td>
<td>14</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Number of teams applying for in-depth mLabs support</td>
<td>48</td>
<td>60</td>
<td>65</td>
</tr>
<tr>
<td>Teams receiving in-depth one-on-one support</td>
<td>37</td>
<td>40</td>
<td>58</td>
</tr>
<tr>
<td>Number of people trained</td>
<td>450</td>
<td>935</td>
<td>231</td>
</tr>
<tr>
<td>Number of developers and entrepreneurs reached</td>
<td>1,900</td>
<td>2,700</td>
<td>3,200</td>
</tr>
</tbody>
</table>

*CTIC was not included in the first assessment.
Two challenges exist for the Senegalese digital start-up ecosystem, and both are acute. First, there are doubts as to whether Senegal has a large enough market to sustain B2C start-up models. Nevertheless, this fact has had a positive impact in that it has forced several start-ups of this kind to scale across francophone Africa. Second, there are challenges working with the dominant operator Sonatel, which is the main market entry platform for Senegalese start-ups. Additionally, being a francophone market may provide both disadvantages as well as advantages.

CTIC AND THE ECOSYSTEM

The results below provide additional detail on the ecosystem in three areas: (1) What interviewed ecosystem members think are the primary success factors for sustained growth in the mobile technology sector, (2) the start-ups’ first source of investment, and (3) where and how digital technology entrepreneurship impacts other entrepreneurs.

Primary Success Factors

Chart C.1 outlines interviewees’ identification of key success factors for digital technology entrepreneurs in the Senegalese ecosystem. It shows the critical success factors identified by mLab ecosystem interviewees and the mean of the other three mLabs. Key differences between CTIC/mLab WA and the other three cases are a dramatic undervaluation of the role of business capacity as a success factor and a dramatically higher valuation of infrastructure.

The Access to Finance Landscape

Chart C.2 shows the first source of funding of mLab firms. It indicates that the CTIC relies heavily on informal funding and is less able to generate VC funding than the other three mLabs. Given that the Senegalese start-ups are at later-life cycle stages, they should be in a position to attract later-stage funding; it is therefore a surprise that it does not exist in greater quantity. At the same time, as noted above, Senegal’s market and finance sources are quite a bit smaller than Kenya’s or South Africa’s.

Impact of Digital Technology on Other Sectors

Chart C.3 shows areas where respondents thought digital technology entrepreneurs’ activities spilled over and impacted other ecosystems. The impact on firm functionality is much higher and extending opportunities and market zones is much lower in West Africa than the other three mLabs.
This section examines the CTIC’s start-up creation and maturation. First, using the start-up development life cycle, the period from which mLab companies join the mLab up to their current life cycle stage is mapped. This provides a critical view of how mLab start-ups are surviving and maturing. Next, the financial health of mLab start-ups in terms of their revenue growth over the last three years is considered in comparison with the other three mLabs. Finally, job creation at each mLab is considered.

Start-up Survival and Firm Maturation

Table C.2 shows start-up maturation and survivability. It identifies the life cycle stage of when a start-up joined the mLab and its status in November 2016. There are five stages:

- Customer discovery (identifying the product or service and potential target market)
- Product validation (building the app or infrastructure to deliver the product or service and validating that there is a market)
- Customer engagement (marketing and sales to first round of customers, with polishing of the product or service)
- Growth (growing customer base to be profitable and stable)
- Scale (expanding to a new market, sector, or country)

In the case of the CTIC, the effect on start-up creation and development is quite different from that in other three cases, given that incubated firms are required to have revenue. Thus while the role in start-up creation is minimal, the role of the mLab in developing a product or service thru the life cycle stages is not. Because most of the CTIC-incubated companies are technology firms with some established products, customers, and markets, the start-up development is likely to be much more focused than in the other three mLabs, where start-ups are at a much earlier life cycle stage.

Financial Status

Chart C.4 shows revenue growth of the CTIC and the mean value of the other three mLabs. It reveals that just over 80 percent of the respondents report no revenue growth over the last three years, a much higher level than in the other three, which report about 35 percent of companies with
Do mLabs Still Make a Difference?
A Second Assessment | Appendices

<table>
<thead>
<tr>
<th>CURRENT NAME</th>
<th>CUSTOMER DISCOVERY</th>
<th>PRODUCT VALIDATION</th>
<th>CUSTOMER ENGAGEMENT</th>
<th>GROWTH</th>
<th>SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byfilling</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Dariss</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Ecole au Senegal</td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genius Family</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Image In</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Inaota</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>iTech Solutions</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Nelam Services</td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niokobok</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Seysoo</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Soft Solutions</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Tagoor</td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cybarc</td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L’africamobile</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Linked Partners</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Sentrust</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
</tr>
</tbody>
</table>

Active: Organization is still active in the ecosystem under its original or new identity.
Closed: Organization is no longer active in the ecosystem.
no growth. At the same time, the CTIC has a slightly higher number of companies reporting more than 300 percent growth. This bi-modal distribution may be the result of the differences in the types of companies that participate, with established later-life cycle companies in West Africa and much earlier life cycle companies in the other three mLabs.

**CTIC AND THE RANKING OF PERCEPTION OF BENEFITS**

This section examines how mLab WA/CTIC beneficiaries valued mLab services. Results are from interviews, where interviewees could identify several services they found to be most valuable. Chart C.5 shows the proportion of mLab WA services that were identified as important by respondents in comparison to the other three mLabs. These results mirror key success factors, with an emphasis on business activities related to access to financing, business capacity, and networking.

In the case of the CTIC, as in the other three cases, networking was the most valued service, and even more so than in the other three cases. Given the relative maturing of the CTIC, the relative undervaluation of the other services is not unexpected.

**CTIC AND DIGITAL TECHNOLOGY IMPACTS**

This section reports on where respondents think digital technology has had the most significant impact. The question was addressed in two ways. The first is which sectors have the highest impact on digital technology. The second is where digital technology has the highest impact on national development goals.

Chart C.6 shows where respondents see the most significant impact of digital technology. The chart indicates the e-finance and transportation sectors as those most often noted as having been impacted. In comparison with respondents in the other three cases, Senegalese respondents identify e-finance more than three times as often, and transport nearly twice as often.

When asked where digital technology has had the most effect on national development, results reinforce previously noted ones, with e-finance/e-payments in the lead. General communications had twice as many respondents as in the other the cases. Notably, agriculture, government, health, and logistics and transport were not reported as having been impacted. These results are reported in Chart C.7.
APPENDIX D: MLAB SOUTHERN AFRICA CASE STUDY

INTRODUCTION

mLabs Program

mLab Southern Africa was launched in 2012 by a consortium,26 with the aim to support mobile application developers from concept development to the prototype stage. Three functions were envisioned:

1. An acceleration function to develop projects “through training, insourcing of skills and outsourcing certain [other] parts”

2. A launch function to commercialize products by “providing support with media, investor and partner exposure. The program supported 32 entrepreneurs during the year under review, with 26 mobile apps.”

3. An early stage start-up function to help start-ups further define their concepts, validate processes, develop investor pitching, and gain grant or other seed funding.

In 2013 mLab Southern Africa refocused its strategy, activities, and target clients. It now concentrates on the individual as opposed to the company—it wants to back “the jockey and not the horse.” This then leads to the formation of both teams and very early stage start-ups from the individuals being supported. In this sense, mLabs SA has become more of an academy, with a focus on implementing, facilitating, and developing technical capacity. The other key function of the mLab is to provide support for other programs in the ecosystem, such as the International DEMOLA network, Project codeX, and DreamGirls International.

In 2015 the mLab CEO, Derrick Kotze, stated that “the biggest challenge by far is skills availability.” Pivoting from earlier objectives, mLab SA now sees itself as more of a vertical accelerator. It now focuses more on training, and especially coding, and more on youth from university students, unemployed graduates, and aspiring developers.

As such, mLab SA does not overly emphasize the basics of forming, servicing, and running a company and the full cycle of product management. Nor does it have a strong focus on mentorship, which is apparent in a number of other similar bodies, which are regarded as having a “heavy touch” with the companies that they are working with. The decision to spin off these mid-to-late incubation activities was taken and guided by the fact that the Innovation Hub in Pretoria, where the mLab is also based, is itself an incubator. mLab SA feels, therefore, that they should be complementing the Innovation Hub and not competing with it. An example of this complementarity is the coordination of the two organizations in the launch of the eKasi Lab Soweto, which will include mLab SA’s CodeTribe Academy, a full bursary program that trains youth on how to develop for Android, backend and cloud, using SCRUM Agile methodologies as well as native software development kits.28

When mLab launched in South Africa in 2012 there wasn’t much of a mobile ecosystem; we had to wear many hats to help stimulate and pull together a very fragmented ecosystem. Today, almost three years later, we are able to focus on specific areas where we can bring the most value and deliver on other important elements like student outreach, training, Hackathons etc.

- Derrick Kotze, 2015, mLab Southern Africa CEO

---

26 TIHMC, CSIR/Meraka, Infodev Worldbank, uNgana Africa, Innovation Lab, and Nokia.
mLab Southern Africa is part of a structure that includes the Innovation Hub and the Maxum Business Incubator. This is by design and, as articulated in the first assessment of mLab Southern Africa and described by Neville Raymond Comins and Erika Kraemer-Mbula:

[mLab Southern Africa] overlaps with other programmes offered, and the Innovation Hub, serving as a feeder programme into the Maxum business incubator pipeline. Successful developers at the mLab then enter the Maxum business incubator for support in the commercialization of their product and development of their business.29

Derrick Kotze, mLab Southern Africa’s CEO, describes the process as follows:

Once these products, services or businesses reach a viable stage, they can move into the larger ecosystem and to a next stage of support through other programs like business incubators or secure longer-term investment. Or if they fail, teams can reuse and restructure them to develop a new opportunity.30

The recently opened Cape Town office is superbly located and has excellent facilities. This has allowed the formation of key partnerships in the creative hub of Cape Town, and alongside the newly opened eKasi Lab Soweto, which houses the CodeTribe Academy, represents an important development. Likewise, partnerships with the likes of Project codeX, the CSIR, and the International DEMOLA network can all be seen as excellent ways to support the maturation of the technology ecosystem and to assist the next generation. By opening training facilities in a township, providing coding skills and illustrating the potential of the mobile device to individuals who live their lives at the bottom of the pyramid, the chances of creating solutions that serve the largest section of South African society can only be boosted.

Overall, mLab Southern Africa has had a transformational three years but has been hamstrung by a lack of human resources. However, the opening of the Cape Town satellite office and the CodeTribe Academy in Soweto highlight the wider impressive ambitions of the organization. In interviews with the mLab CEO and the head of the Cape Town office, it is interesting to note that exactly the same phrase was used: “we bet on the jockey and not the horse.” That very much summarizes the overarching objective: To discover, train, open the eyes of individuals to the potential of the mobile device and its associated applications, and then to help facilitate those individuals’ growth and exposure into the wider technology innovation ecosystem. Table D.1 shows select results since mLab digital technology innovation ecosystem launched.

The South African Digital Technology Ecosystem

Although South Africa’s economy was historically rooted in the primary sectors of mining and agriculture, the country nonetheless emerged from apartheid with a small but highly developed ICT sector, partly due to the years of apartheid. In 1994 the sector’s contribution to GDP was estimated at just below 2 percent, rising to nearly 4 percent 10 years later. Following the advent of democracy, a number of initiatives were launched to further build and develop the sector. These included a National Research and Technology Foresight Project undertaken by the Department of Arts, Culture, Science and Technology between 1998 and 2000, within which ICT was one of 12 focus areas; and a Canadian-funded South African IT Industry Strategy (SAITIS) project under the Department of Trade and Industry between 1999 and 2002.

Digital Start-up Ecosystem

The South African digital start-up ecosystem is arguably the most well developed on the continent. One recent GSMA estimate counts 54 active tech hubs in the country, compared to 27 in Kenya and 10 in Senegal. This marks a dramatic increase from five tech hubs in 2011, and it is substantially more than the 24 listed recently by Kelly and Firestone. While some differences in numbers are attributable to definitions, the digital start-up ecosystem in South Africa is undoubtedly burgeoning, and it remains the most vibrant and active tech environment on the continent.

The incubation landscape is becoming a lot more professional, adopting much more of an organizational approach

- Long-time digital technology observer

30 infoDev 2015.
### TABLE D.1. SELECT MLAB SOUTHERN AFRICA RESULTS, PROVIDED BY MLAB SA

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-ups created with mLab support</td>
<td>0</td>
<td>8</td>
<td>12</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Revenue generated by start-ups US$</td>
<td>0</td>
<td>283,000</td>
<td>345,110</td>
<td>–</td>
<td>–</td>
<td>732,482</td>
</tr>
<tr>
<td>External investment raised by start-ups US$</td>
<td>0</td>
<td>625,293</td>
<td>652,205</td>
<td>–</td>
<td>–</td>
<td>732,000</td>
</tr>
<tr>
<td>Number of new direct jobs created</td>
<td>0</td>
<td>39</td>
<td>51</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Consumer app users reached</td>
<td>0</td>
<td>0</td>
<td>598,000</td>
<td>–</td>
<td>–</td>
<td>14,527</td>
</tr>
<tr>
<td>Apps reaching underserved communities (bop, rural, &amp; social dev apps)</td>
<td>2</td>
<td>6</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>New mobile apps brought to market</td>
<td>0</td>
<td>14</td>
<td>64</td>
<td>4</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Number of app prototypes created</td>
<td>10</td>
<td>22</td>
<td>74</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Number of teams applying for in-depth mLab support</td>
<td>2</td>
<td>32</td>
<td>78</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Teams receiving in-depth one-on-one support</td>
<td>0</td>
<td>12</td>
<td>21</td>
<td>3</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Number of people trained</td>
<td>108</td>
<td>0</td>
<td>223</td>
<td>17</td>
<td>370</td>
<td>267</td>
</tr>
<tr>
<td>Number of developers and entrepreneurs reached</td>
<td>0</td>
<td>1,122</td>
<td>1,578</td>
<td>92</td>
<td>52</td>
<td>30</td>
</tr>
<tr>
<td>CURRENT NAME</td>
<td>CUSTOMER DISCOVERY</td>
<td>PRODUCT VALIDATION</td>
<td>CUSTOMER ENGAGEMENT</td>
<td>GROWTH</td>
<td>SCALE</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------</td>
<td>--------------------</td>
<td>---------------------</td>
<td>--------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Afroes</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afta Robot</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appchemy</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geekulcha</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GemProject</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GoMetro</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hearScreen</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jonga</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kim/Kimard Studio</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layyers</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m-Factory</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music of Africa</td>
<td>Closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senso</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SimpliMantis</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SpaceDecode</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TechCloud</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toonserve</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tour 2.0</td>
<td></td>
<td></td>
<td></td>
<td>2016</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Active: Organization is still active in the ecosystem under its original or new identity.
Closed: Organization is no longer active in the ecosystem.
The ecosystem is geographically dispersed, with start-ups split between the “creatives” in Cape Town and the more “business”-focused Johannesburg-Pretoria nexus, and a smattering in the Eastern Cape.

The establishment of technology hubs and incubators was a slow process. Deriving from the government’s 1996 “Science and Technology White Paper,” in 1997 a National Innovation Fund (then worth upward of US$2 million annually) was established to fund and support, via a competitive bidding process, “novel products, processes or services” with commercialization as a key objective. The country’s first true incubator was launched in the same year—the Cape Information Technology Initiative (CITI)—which aimed to “grow the IT industry through business incubation, provision of venture capital, IT education, industry research and marketing, and networking of individuals and organisations.”

South Africa has continued to prioritize ICT innovation, developing an ICT RDI Strategy in 2007 and an RDI Roadmap in 2013, which explicitly recognized the “growing list of incubators and entrepreneurial development programs contributing to small-scale innovation.” In 2015 the national ICT Policy Review panel recommended improved “coordination of national, provincial, NGO and private sector-led research facilities, incubators and accelerators.”

Today the ICT sector is seen as a key enabler to increasing GDP.

The South African digital start-up ecosystem is complex. The multifaceted web of inter-relationships and inter-dependencies can best be understood in the context of the complex of key interconnected features defining the landscape as set out below. It is also an ecosystem that is dominated by white South Africans, as attendees at the many technology conferences and exhibitions illustrate; the racial diversity of the country is not reflected in the technology sector.

Start-ups looking to the internal South African market to gain initial traction face a range of challenges. These include the cost of access to infrastructure: It is too expensive, and this severely limits customers’ ability to access digital technology benefits. Adult smartphone penetration is estimated at 37 percent, meaning that 63 percent of the adult population can only use USSD, SMS, and other very basic products.

The start-up ecosystem is also weakened by the lure of jobs and corporate careers, and a culture that drives educated individuals, particularly black South Africans, toward a more traditional career focus. IP and patent restrictions and protections, constraints on international money transfers, and a lack of government understanding around technology were reported as disincentives for potential start-ups.

**MLAB SA AND THE ECOSYSTEM**

The results below provide additional detail on the ecosystem: (1) What interviewed ecosystem members think are the primary success factors for sustained growth in the mobile technology sector, (2) start-ups’ first source of investment, and (3) where and how digital technology entrepreneurship impacts other entrepreneurs. Charts D.1 through D.3 compare the results of mLab Southern Africa with the mean values of the other three mLabs.

**Primary Success Factors**

Chart D.1 shows what interviewees see as the primary success factors for achieving sustained growth. South African interviewees place far less emphasis on business capacity and far more emphasis on access to markets. Interestingly, no South African interviewees mentioned technical capacity or government policy as primary success factors.

**The Access to Finance Landscape**

Access to finance is a critical factor for the survival and success of start-ups within the digital ecosystem. Without funding, it is not possible to support a group of young ambitious individuals who want to transform a bright idea into a successful business or to take a minimum viable product on to the next stage of growth. Chart D.2 provides a breakdown of where start-ups in South Africa received their first source of funding. The chart reflects grants and angel investors providing the lion’s share of financing.

**Impact of Digital Technology on Other Sectors**

Chart D.3 reveals that South African respondents were significantly more likely to identify the service sector as the primary utility of digital technologies for other entrepreneurs and businesses and far less likely to identify firm functionality as important.

---

31 James et al. 2000, 37.
32 Ibid., 42.
33 RSA DST 2013, 12.
34 RSA DTPS 2015, 129
35 Shaban, 2016.
MLAB SA AND START-UP CREATION AND DEVELOPMENT

This section examines mLab Southern Africa’s start-up creation and maturation. First, using the start-up development life cycle, the period from which mLab start-ups joined the mLab up to their current life cycle stage is mapped. This provides a critical view of how mLab start-ups are surviving and maturing. Next, the financial health of mLab companies in terms of revenue growth over the last three years is considered in comparison with the other three mLabs. Finally, job creation at each mLab is considered.

Start-up Survival and Firm Maturation

Table D.2 shows start-up maturation and survivability. It identifies the life cycle stage of when a start-up joined the mLab and its status in November 2016. There are five stages:

- **Customer discovery** (identifying the product or service and potential target market)
- **Product validation** (building the app or infrastructure to deliver the product or service and validating that there is a market)
- **Customer engagement** (marketing and sales to first round of customers, with polishing of the product or service)
- **Growth** (growing customer base to be profitable and stable)
- **Scale** (expanding to a new market, sector, or country)

Table D.2 shows mLab-incubated firms’ survival according to start-up stage. It reveals a very slow development and evolution of the mLab start-ups. Many of them have taken several years from the time of they joined the mLab to even reach the stage of “customer discovery.” The other trend, likely associated with the first, is a very low exit rate.

GoMetro is probably regarded as the most successful company to come out of the mLab Southern Africa stable. It is interesting to note that the start-up began as a “mobile application company” but has in fact transformed into a geographic information system (GIS) company, which offers its solutions through the mobile web, SMS, USSD, and mobile applications.

Financial Status

Chart D.4 compares the percentage change in revenue of mLab firms in SA against those in the rest of the sample over three years. Half of the South African firms report no change in revenue, slightly more than the others. Detailed feedback
from interviewees on their revenue status ranged from the gloomy and the grateful to the bullishly optimistic. One interviewee describes himself as “operating at a loss,” while another recounts doing design work for other mLab startups just “to keep the lights on.”

**MLAB SA AND THE RANKING OF PERCEPTION OF BENEFITS**

This section examines how mLab beneficiaries value mLab services. Results are from interviews. Interviewees could identify several services they found most valuable. Along with their counterparts in other mLab countries, a substantial number of South African start-ups rate networking as the most highly valued of all the services offered by mLab. Most of the remaining interviewees were split between access to infrastructure and technical skills development. Interestingly, services enhancing business capacity were valued significantly less in South Africa than in the other three cases.

In Chart D.5 the picture that emerges of mLab Southern Africa is of a place that offers the necessary infrastructure and training, along with all-important exposure to networking opportunities with other industry stakeholders and experts, for the development of digital applications.

**MLAB SA AND DIGITAL TECHNOLOGY IMPACTS**

This section reports on where respondents thought digital technology has had the most significant impact. The question was addressed in two ways. The first is which sectors have the highest impact from digital technology. The second is where digital technology has the highest impact on national development goals. Chart D.6 shows the areas where respondents thought digital technology has had the greatest impact.

In South Africa digital technology is primarily recognized for its role as a general-purpose technological catalyst for business, social development, and economic growth. Transportation was also seen as relatively more impacted by digital technology than in the remainder of the sample. Interestingly, e-finance was not identified at all in South Africa, perhaps because of the country’s already highly developed financial sector and the recent failure of m-money solutions.

When asked where digital technology has impacted national development in South Africa, respondents placed little value on the impact on e-payments and e-financial issues compared with other mLab countries. Chart D.7 indicates health was significantly more often identified, 16 times more than in the other mLabs, on average, while transportation and logistics and tourism were also identified more often.
APPENDIX E: METHODOLOGY

The terms of reference specified the following methodology: field visit interviews, focus groups, and surveys to collect quantitative and qualitative data on the sample groups from the first assessment, from firms that no longer exist, and from mLab incubatees since 2013. Based on these parameters the following approach was implemented.

RESEARCH QUESTIONS

Research questions, which were derived from the first assessment and the terms of reference, are formalized as follows:

1. mLabs’ Effects on Start-up Creation and Development
   • What is the influence and effect of mLabs on their start-ups’ survival, financial status, and job creation outcomes?
   • What is the financial status of mLab supported firms?
   • What is the importance ranking of mLab provided services?
   • Why have exited (closed) firms exited and how did they benefit from mLabs?

2. mLabs’ Effect on Entrepreneurial Ecosystems
   • What is the influence and effect of mLabs on the entrepreneurial ecosystem in which mLabs operate?

3. Development Impact through the Usage of Mobile Applications
   • How have customers benefited from mLab applications?

APPROACH AND RATIONALE

The methodology is largely based on qualitative surveys, focus group discussions, document reviews of mLab progress reports, and other research and evaluations.

The methodology follows a form of structured focused comparison—a method that prescribes that the same questions are asked in the same cases and different questions be asked in different cases. Developed for decision-making analysis, the approach is modified to accommodate narrative data (long answer survey responses) with results from document review and categorical data.

The method is especially useful to structure foci on different samples and with small n-interviews, where n-size precludes sophisticated statistical significance and analysis. This method was implemented in three previous evaluations with narrative surveys, quantitative, and qualitative data in 2011, 2013, and 2015 by proposed key personnel.

36 George and McKeown 1985.
37 The modifications have been developed through the application of several rapid assessments in the ICT sector, such as Cross Border Network Rapid Assessments (2011-2012); Web and Mobile Applications for International Development–Working Group Survey Results (2013); and Health Systems, Mobile Payments, and Broadband Telecommunications Sector Assessments: Methodology and Implementation Approaches for Liberia, Guinea, and Sierra Leone (2015).
### TABLE E.1. 2013 AND 2016 ASSESSMENT EVIDENCE CATEGORIES

<table>
<thead>
<tr>
<th>ASSESSMENT</th>
<th>2013 STUDY</th>
<th>2016 STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up Creation and Development</td>
<td>• Creation*</td>
<td>• Creation†</td>
</tr>
<tr>
<td></td>
<td>• Revenue generation*</td>
<td>• Survival†</td>
</tr>
<tr>
<td></td>
<td>• Jobs created*</td>
<td>• Life cycle maturation stage†‡</td>
</tr>
<tr>
<td></td>
<td>• Investment*</td>
<td>• Jobs created*†</td>
</tr>
<tr>
<td></td>
<td>• Processes for mobile application with development impact†‡</td>
<td>• Macro employment climate†‡</td>
</tr>
<tr>
<td></td>
<td>• Companies’ development sector impact (n=8)†‡</td>
<td>• Revenue growth over last 3 years†</td>
</tr>
<tr>
<td></td>
<td>• Talent pool*†</td>
<td>• Revenue growth since joining mLab†</td>
</tr>
<tr>
<td></td>
<td>• Inspiring and stimulating ecosystem*</td>
<td>• Ranking of mLab services †</td>
</tr>
<tr>
<td></td>
<td>• Connecting local, regional, and international ecosystems†‡</td>
<td></td>
</tr>
<tr>
<td>Customer Impact</td>
<td>• Economic and social impact mapping†‡</td>
<td>• Sector (3) and revenue stream (23)†‡</td>
</tr>
<tr>
<td></td>
<td>• Impact mapping by revenue stream†‡</td>
<td>• Ecosystem member perceptions about impact of digital technology on national development†‡</td>
</tr>
<tr>
<td>Ecosystem Influence</td>
<td>• Ecosystem 3 years ago and now†‡</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Talent and human capital*†‡</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• mLab ecosystem spillover benefits†‡</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Access to finance*†‡</td>
<td></td>
</tr>
</tbody>
</table>

Note: The 2016 study was largely unable to make use of mLab provided data (noted with the *) due to uneven access to data and incomparability of data among mLabs. The team recommendations in the main report reflect this experience.

* Aggregated mLab provided data; † Interview; ‡ Desk study.
EVIDENCE COMPARISON BETWEEN THE FIRST AND SECOND ASSESSMENTS

Based on the terms of reference and discussions with the World Bank team, the Sonjara team leveraged evidence from the first assessment and updated it where possible, and collected additional evidence to support new types of analyses and generate new insights. Table E.1 highlights the evidence used in both assessments. Data collection for this assessment includes three components: stakeholder interviews, document reviews, and focus group discussions. It includes evidence both collected via interviews as well as reported by mLab staff.

Interviews

Based on the research questions, an interview process was designed to serve as a common framework to gather information. The objective was to establish a means by which narrative and categorical information could be gathered, stored, and analyzed against common criteria. The interview process was anchored in the research questions, based on a subset of subsidiary expository questions to explore each research question. These built upon the data collected in the first assessment. Additional questions were designed to explore focal issues not originally part of that assessment. The interview process also included questions identifying the context of the respondent in the ecosystem, such as start-up size, business model, and respondent perceptions about local entrepreneurship. Additional questions about mLab services as well as how digital technology has supported national development were also included.

This process generated a questionnaire of about 80 questions—too many to conduct with a single respondent.38 Following the structured focused comparison subsets, questions were assigned to specific sample groups. For example, incubated start-ups of the mLab and other incubators were asked one set of questions, and mLab start-ups that no longer exist another set. This process allowed for a maximum number of questions while making efficient use of valuable interview time. An enumerator administered the questionnaire and transcribed the results to a storage and analytical tool.

Desk Study and Document Review

Desk study and document review were conducted prior to, in parallel, and after the interviewing process. Various documents were reviewed, including available mLab progress reports, annual reports, and other analyses pertinent to mLabs.39 Additional industry and sector reports, news reportage, and select raw data reports from the first assessment were also reviewed. mLab and company websites were also reviewed. A full list of sources can be found in the References of the main document.

Focus Groups

Focus group discussions were conducted at mLab. The objective of the focus was to further push the “how” and “why” questions and to capture the dynamics of group discussions. Focus group discussions concentrated on teasing out the relevance of trends noted in the interviews as well as conclusions from the first assessment. They are an important vehicle to ground-test preliminary results from the interviews.

Sampling

Based on the terms of reference, the original samples in the first assessment were required:

1. Clients: People and companies directly benefiting from mLabs’ services and activities, such as entrepreneurs, start-ups, trainees, and event participants prior to 2014
2. Comparables: Non-mLab start-ups engaged in similar activities as clients who have received support from other programs similar to mLabs
3. Counterfactuals: People or firms engaged in activities similar to those of mLab start-ups who have not received any support from mLab-type programs
4. Customers: Individuals and businesses benefiting from the use of digital technology
5. Ecosystems: Other people or organizations not included in the above groups such as universities, mobile operators, investors, training organizations, government agencies, and so on

In addition to these sample groups, the terms of reference specified that mLab clients incubated from 2014 on as well as incubatees no longer in the digital technology market be included. Based on our analysis, investors in the digital technology sector were also included. This resulted in the addition of the following sample groups:

6. Closed firms: Clients no longer in the mobile applications or digital technology market as entrepreneurs
7. Investors: Digital technology investors
8. Newcomers: New mLab clients since 2014

38 One of the lessons from the first assessment (as is common with many assessments) is participation fatigue.

39 infoDev 2014a; Omwansa 2015.
### TABLE E.2. SAMPLE GROUPS, DEFINITIONS AND SIZE

<table>
<thead>
<tr>
<th>SAMPLE GROUP</th>
<th>DEFINITION</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>mLab Beneficiaries</td>
<td>People/firms incubated via services provided by mLabs before 2014.</td>
<td>59</td>
</tr>
<tr>
<td>Client</td>
<td>People/firms incubated via services provided by mLabs before 2014.</td>
<td>31</td>
</tr>
<tr>
<td>Closed (new)</td>
<td>Clients no longer in the digital technology applications or digital technology market as entrepreneurs. This sample group was not part of Assessment 1.</td>
<td>5</td>
</tr>
<tr>
<td>Newcomer (new)</td>
<td>People/firms incubated via services provided by mLabs since 2014. This sample group was not part of Assessment 1.</td>
<td>23</td>
</tr>
<tr>
<td>Non-mLab Startups</td>
<td>People/firms receiving digital technology incubation or acceleration services from non-mLab incubators</td>
<td>39</td>
</tr>
<tr>
<td>Comparable</td>
<td>People/firms receiving digital technology incubation or acceleration services from non-mLab incubators</td>
<td>27</td>
</tr>
<tr>
<td>Counterfactual</td>
<td>Entrepreneurs, startups and businesses that have developed digital technology businesses without digital technology incubation or acceleration services.</td>
<td>12</td>
</tr>
<tr>
<td>End User</td>
<td>Individuals and businesses benefiting from the use of digital technology or from an improved ecosystem such as digital technology users and their communities, enterprise customers using the applications developed, and others.</td>
<td>18</td>
</tr>
<tr>
<td>Investor (new)</td>
<td>Mobile enterprise investors. This sample group was not part of Assessment 1.</td>
<td>11</td>
</tr>
<tr>
<td>Ecosystem Actor</td>
<td>All actors populating the entrepreneurial ecosystem not included in any of the other categories, including Lab staff</td>
<td>34</td>
</tr>
</tbody>
</table>
Groups: Definitions and Sizes

Using the original sample categories in the first assessment and adding categories to account for new mLab client start-ups and investors and start-ups no longer in existence (labeled “closed firms” in Table E.2), the team interviewed 162 individuals from 160 unique organizations in four countries across the eight sample groups listed in Table E.2.

In selecting mLab clients to interview, the team focused on start-ups directly incubated by the mLabs; these companies are dubbed “high touch” because of the intense support they received. The team interviewed 59 mLab “high touch” beneficia ries.40

Interview data were supplemented with desk research and information from the mLabs themselves. Findings and data about the effects of mLabs on direct client firms are covered in the survey sample category “mLab Beneficiaries” which is made up of clients, newcomers, and closed firms. A full list of interviewee companies and organizations can be found in Appendix G.

LIMITATIONS

The core focus of this study is to assess the impact of the four mLabs as digital technology incubators along three prescribed dimensions: on (1) the start-ups themselves, (2) their ecosystem, and (3) their products. This assessment is difficult for a variety of reasons. Below we outline some limitations and our mitigation approach. Overall, as with the first assessment, this study is unable to provide a clear and concrete link between cause and effect for the following reasons:

• A rapid assessment is by design quick and aggressive but not comprehensive.

• Given the complexity of the start-up environment and unique circumstances each entrepreneur brings to his/her company, teasing out the impact of the mLabs on their success or failure is challenging.

• Three of the four mLabs assessed are hosted in a larger incubator that has multiple simultaneous projects. In one, the mLab brand was all but invisible. Untangling a direct causal effect of an mLab from the host incubator as well as other incubation or acceleration efforts is often not possible.

• Some of the mLabs are administratively linked to other incubators that implement activities with the World Bank and other donor funding (USAID, the government of Finland, and other World Bank programs) in support of mLab beneficiaries. Given this interwoven and overlapping mutually supportive structure, teasing out the impact of a single strand is not feasible within the confines of this rapid assessment.

• Incubators and entrepreneurs do not track comprehensive or consistent data. As a result, we often relied on perceived or estimated value responses as indicators of true value.

To mitigate these limitations, we use more of a “how to understand” framework rather than take a “what is the proof?” approach.

As such, our approach has been to generate knowledge about how to understand the impact of the mLabs and, in particular, how mLabs and other digital technology incubators, accelerators, and promoters can use the study to increase their own effectiveness.

40 Each mLab and its host organization also had thousands of additional individual participants and start-ups who benefited from “light touch” mLab services and activities such as community events, workshops, trainings, and hackathons. Given the core assessment research questions, these “light touch” beneficiaries were not interviewed.
APPENDIX F: QUESTIONNAIRE

Interview Questions. O = open-ended questions; C = close-ended questions

C 1 - Are you an individual entrepreneur or a firm? (if C1=individual go to O25)
C 2 - When was your organization founded?
C 3 - Number of employees at founding? FT PT
C 4 - Current number of employees? FT PT
C 5 - How many partners at founding?
C 6 - Current number of partners?
C 7 - When did you join an incubator?
C 8 - In your business or business planning, who pays or will pay for the service?
C 9 - Are your clients primarily C B2C, B B2B or other?
C 10 - At what stage in the start-up life cycle is your business at now?
C 11 - At what stage of the start-up life cycle was your business when you joined an incubator?
C 12 - What are your firm’s top 3 competitive advantages or strengths?
O 13 - How does your firm make or plan to make money? (What is your business’ revenue model?)
C 14 - What proportion or anticipated proportion of your business is going to be domestically and internationally focused?
O 15 - Why did you not join an incubator?
C 16 - What is your % change in US$ turnover (revenue) over last 3 years?
C 17 - Have you seen an increase in revenue since you joined an incubator?
C 18 - When did (or will) your business be cash flow positive?
C 19 - Do you have a partnership with financial service provider?
C 20 - At what stage of firm development did you first receive external investment?
C 21 - From what kind of lender?
C 22 - How much was the investment (local or US$ currency)?
C 23 - At what stage of firm development do you think investment is most/least important? O 24 - Why?
O 25 - What have incubators done to help accelerate your growth and success?
O 26 - What specific types of incubator activities have been most helpful for your growth and success?
O 27 - What activity or input was most helpful to make you more economically viable?
O 28 - What, if any, errors in strategy or planning were corrected or improved with incubators support?
C 29 - Have you participated in an accelerator?
O 30 - What do you think are the primary success factors for achieving sustained growth in mobile technology sectors?
O 31 - At what stages or phases of firm development do these success factors occur? O 32 - Why?
O 33 - What are likely new challenges for mobile enterprise entities over the next 2-3 years?
O 34 - How does entrepreneurship in the mobile application and digital technology sectors help work by entrepreneurs in other sectors?
O 35 - What will improve the digital technology start-up ecosystem most in your opinion?
C 36 - What are the most/least important services you and your firm received from mLabs?

C 37 - When you seek assistance, who or what are your top sources of assistance? If more than 1, note top 3

C 38 - What kind of help did they provide?

O 39 - What has been the greatest benefit of being part of the incubator?

O 40 - Among these exited (closed) firms, did some individuals from the firm reenter the mobile development ecosystem? How many? Where in the market?

O 41 - How did the mLab experience influence what you are currently doing?

O 42 - Are there benefits from the mLabs-supported experience that are ongoing, that you are applying going forward? Such as new ventures, reuse of intellectual capital, experiences, or diffusion through other channels (academia)?

C 43 - What applications have the greatest impact on end users? O 44 - How?

C 45 - What applications have the greatest impact on national development? O 46 - How?

C 47 - Are there particular sectors where mobile applications and digital technology are more likely to help national development than others?

O 48 - Why?

O 49 - Do you have demographic and geographic data on end users? - Describe or provide examples.

C 50 - What mobile applications have had the greatest impact on national development?

C 51 - What are the primary sectors where mobile applications have been deployed and had the most impact? Digital technologies?

O 52 - What are common challenges to expanding the utility of mobile apps for national development? Digital technologies?

O 53 - What changes can enable mobile apps and digital technology developers to boost national development?

O 54 - Are there areas where mLabs and other incubators can increase the impact of their contribution to national development?

O 55 - How has the mobile application and digital technology entrepreneurial ecosystem changed over the past few years? O 56 - The general entrepreneurial ecosystem?

O 57 - Have non-digital technology sectors benefited from entrepreneurship in digital technology? How, and where?

*Note, some numbers are not consecutive due to dropping some questions when the questionnaire was field-tested.
APPENDIX G: INTERVIEWED COMPANIES AND INDIVIDUALS

4 Car
Aarki
Abacus
Able Wireless
Ad Dynamo
Administrative assistant
AND
Anonymous (4)
Afrikan Dust Media Group
Afroes
Afroinnovator
Afta Robot
AkiraChix
Android developer intern
Appchemy
ARLOOPA
ArmDataLab
ArmNews TV
Assitant
AUA/IT School
AZERTY
Bitcircuit
Brave Venture Labs
BRCK

By Filling
Card Planet Solutions
Cheikh Anta Diop University
Clean H2O
coders4africa.org/Gebeya/Anwani/Buymore
CoinAfrique
Comparez
Concree
CTIC Dakar
Cube Technologies
Dasaran.am
DatalIntegrated
Dev Academie
Devcorp
Digitata
DreamGirls International
Echo Mobile
Eduz
Emerging Markets Capital
Eneza Education
Enterprise Innovation Center
Eyone
Fambox
Forex
EntrepreneurEnAction.com

Looma

Former iHub employee

Ma3Route

Former mLab employees (2)

MahalaMobile

Freelance journalist

M-Changa

Futureneers

Mdundo

FX Studios

Medi

Geekulcha

m-Factory

GemProject

Microsoft Innovation Center

GoMetro

Mission East

Google

mLAB ECA

Gyumri Technology Center

mLab SA Pretoria

Hair Dresser

mLab SA Cape Town

hearScreen

mLab start-ups, current (5)

htxt

MobiDev

IBM Research Lab/House4Hack

Mobile Monday

Illuminum Greenhouses

Mobile4Senegal

Individual entrepreneur

Mobitainment

Instigate Mobile

Monniz

InTouch

Mugambi

Investor

My Sales

JEN MEDIA

Nailab

Jokkolabs

NaKo Games

Jonga

Ndiaye

L'AFRICAMOBILE

Nest

Lafrique

Nextdream

L'AFRICAMOBILE

Nioskobok

Ligueye.com

Olive Tree

EntrepreneurEnAction.com

Omidyar Foundation

Former mLab employees (2)

Freelance journalist

Futureneers

FX Studios

Geekulcha

GemProject

GoMetro

Google

Gyumri Technology Center

Hair Dresser

hearScreen

htxt

IBM Research Lab/House4Hack

Illuminum Greenhouses

Individual entrepreneur

Instigate Mobile

InTouch

Investor

JEN MEDIA

Jokkolabs

Jonga

L'AFRICAMOBILE

Lawyer

Layyers

Leti Arts

Ligueye.com
PaintIn
Partech Ventures
People Input
PicsArt
Police Tool
Prestadak
Prestadak/Ligueye.com
Project codeX/codeX Academy
Senso
Shield Finance
Shopmeaway
Simlimantis
SMART Project COAF
Space Decode
Start-up entrepreneurs (2)
StoriesHub
Students
TechCloud
TechStars
Teranga Capital
The Mobi Hunter
Tong Tong
Toonserve
TotoHealth
Tour2.0
Twiga Foods
Tyabu
Uber
Union of Information Technology Enterprises
Useful and Beautiful
Volkeno
WeDoApps
WISS
World Bank
World Wide Worx
Yerevan State University students (3)
Yux
Zege Tech