

# Do mLabs Still Make a Difference?

## A Second Assessment



Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

# 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](http://www.infodev.org)

Email: [info@infodev.org](mailto:info@infodev.org)

Twitter: [@infoDev](https://twitter.com/infoDev)

Facebook: [/infoDevWBG](https://www.facebook.com/infoDevWBG)

For more resources and information about mLabs, visit:  
<https://www.infodev.org/report/do-mlabs-still-make-difference-second-assessment>

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 Mbodj 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 Elias, Temitayo Oluremi Akingemi, 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.

This assessment was produced by Sonjara, Inc. and commissioned by infoDev, a global partnership program with the World Bank as the second assessment of the holistic effects of mobile application labs (mLabs), which were implemented under the Creating Sustainable Businesses in the Knowledge Economy (CSBKE) program, funded by the government of Finland in partnership with Nokia.

## Assessment Team

The assessment team included Siobhan Green, Kelvin Wong, Michael Lennon, Matthew Dawes, Russell Southwood, Anoush Yedigaryan, Charley Lewis, and Sylvain Béletre. Additional support for this work was performed by Sonjara staff, including Marcy Brown, Andrew Green, Margie Joyce, Silvie Stankova, and Ibrahima Thiam.

## About Sonjara

Sonjara, Inc., is a woman-owned technology business based in the Washington, DC, area that equips the international development community to capture the promise and power of information and communication technologies—particularly the performance improvements emerging from smarter use of data, mobile technologies, and the innovation of business practices.

# Do mLabs Still Make a Difference?

## A Second Assessment

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>I</b>	<b>5 HOW DO MLABS IMPACT THEIR DIGITAL ENTREPRENEURSHIP ECOSYSTEMS?</b>	<b>31</b>
Report Findings	i	The Innovation and Entrepreneurship Enabler Landscape: Rapidly Evolving	31
Summary of Second Assessment		Talent and Human Capital: Expanding and Growing	35
Recommendations	iii	Access to Finance	35
<b>1 INTRODUCTION</b>	<b>1</b>	Summary of Findings	38
The Birth of mLabs (2011-12)	1	<b>6 CONCLUSIONS</b>	<b>39</b>
First mLabs Assessment (2013-14)	2	mLabs Have Evolved in Response to Their Ecosystems	39
Second mLabs Assessment (2016-17)	2	Impact on Start-ups	39
<b>2 TECHNICAL APPROACH</b>	<b>7</b>	Impact on Start-ups' Customers	40
Methodology	7	Impact on the Digital Entrepreneurship Ecosystem	40
<b>3 HOW DO MLABS IMPACT DIGITAL START-UPS?</b>	<b>9</b>	<b>7 RECOMMENDATIONS</b>	<b>41</b>
mLab Start-ups Have Much Higher than Average Survival Rates	9	Strengthen mLab Program Management	42
Why Start-ups Closed and How They Benefited from mLabs	10	<b>REFERENCES &amp; BIBLIOGRAPHY</b>	<b>43</b>
How mLab 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		
<b>4 HOW DO CUSTOMERS BENEFIT FROM MLAB-SUPPORTED START-UPS?</b>	<b>20</b>		
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		

<b>APPENDIX A: MLAB ECA CASE STUDY</b>	<b>47</b>	<b>APPENDIX E: METHODOLOGY</b>	<b>74</b>
Introduction	47	Approach and Rationale	74
mLab ECA and the Ecosystem	50	Research Questions	74
mLab ECA and Start-up Creation and Development	51	Evidence Comparison between the First and Second Assessments	76
mLab ECA and Ranking of Perception of Benefits	52	Sampling	76
mLab ECA and Digital Technology Impacts	53	Limitations	78
<b>APPENDIX B: M:LAB EAST AFRICA CASE STUDY</b>	<b>54</b>	<b>APPENDIX F: QUESTIONNAIRE</b>	<b>79</b>
Introduction	54	<b>APPENDIX G: INTERVIEWED COMPANIES AND INDIVIDUALS</b>	<b>81</b>
m:lab EA and the Ecosystem	57		
m:lab EA and Start-up Creation and Development	58		
m:lab EA and the Ranking of Perception of Benefits	60		
m:lab EA and Digital Technology Impacts	60		
<b>APPENDIX C: CTIC/MLAB WEST AFRICA CASE STUDY</b>	<b>61</b>		
Introduction	61		
CTIC and the Ecosystem	63		
CTIC and Start-up Creation and Development	64		
CTIC and the Ranking of Perception of Benefits	66		
CTIC and DigitalTechnology Impacts	66		
<b>APPENDIX D: MLAB SOUTHERN AFRICA CASE STUDY</b>	<b>67</b>		
Introduction	67		
mLab SA and the Ecosystem	71		
mLab SA and Start-up Creation and Development	72		
mLab SA and the Ranking of Perception of Benefits	73		
mLab SA and Digital Technology Impacts	73		

# Do mLabs Still Make a Difference?

## A Second Assessment

## ACRONYM LIST

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



Photo Credit: mLab South Africa

# Do mLabs Still Make a Difference?

## A Second Assessment



Photo Credit: East Africa iHub

## 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 mLab-supported start-ups are posting an 84 percent survival rate.

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

In addition, evidence indicates mLabs start-ups consistently progress from early stage start-ups into more mature businesses. With respect to mLab-provided services, the most frequently cited benefit by mLab 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 mLab-supported start-ups:

- Over 1.7 million students receive mobile-based academic materials and instruction via digital technology developed by an mLab-supported start-up.
- Farmers monitoring their crops, water usage, and sales with an mLab-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 mLab-incubated app has contributed to a 30 percent national drop in minibus traffic deaths.

*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.”*

- An mLab-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 mLab company's mobile business platform, resulting in increased income-generation opportunities in traditionally underserved areas.

As the above examples show, mLab companies 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 mLab countries.<sup>1</sup> 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.”<sup>2</sup> 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.<sup>3</sup>

1 BoP-targeted beneficiaries fall under an essentially a “social benefit” objective.

2 World Bank 2016, 2.

3 World Bank 2016, 2.

# Do mLabs Still Make a Difference?

## A Second Assessment

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 differs 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.

*We've gone from nothing to Facebook's CEO meeting with our ICT minister and then coming to mLab. He can relate to the minister as Kenya's part of the global economy. We're not a charity case. We're rising up the Innovation Index steadily.*

*- Digital technology entrepreneur, Kenya*

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,<sup>4</sup> 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 mLab companies 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. mLab impact objectives and their strategic focus should be shared directly with investors, participating start-ups, and other mLabs.

### Strengthen mLab 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.



Photo Credit: East Africa iHub

# 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.<sup>5</sup>*

### THE BIRTH OF MLABS (2011-12)

mLabs were launched in Armenia, Kenya, Senegal, and South Africa in 2011 and 2012.<sup>7</sup> 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.<sup>6</sup>

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.<sup>9</sup> In the words of the CEO of mLab Southern Africa:

*[W]hen mLab [was] launched in South Africa in 2012 there wasn't much of a mobile ecosystem.*<sup>7</sup>

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.<sup>8</sup> 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.”<sup>9</sup> 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.<sup>10</sup> 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

7 infoDev 2015.  
8 Du Boucher 2016  
9 Interviewee 2016  
10 Bright 2016.

- Proven to be a viable way to enhance start-up ecosystems<sup>11</sup>

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.<sup>12</sup>

## 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.<sup>13</sup>

As per their design to be “flexible mobile entrepreneurship enablers that would be placed at the heart of mobile innovation and entrepreneurship ecosystems,”<sup>14</sup> 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.

11 infoDev 2014b.  
12 infoDev 2014b.  
13 Adesida, Karuri-Sebina, and Resende-Santos 2016, 77; infoDev 2015.  
14 infoDev 2014b, 10.

# Do mLabs Still Make a Difference?

## A Second Assessment

**TABLE 1. HIGH-LEVEL OVERVIEW OF 2013 BUSINESS MODELS (INITIAL DESIGN)**

	<b>SOUTH AFRICA</b>	<b>KENYA</b>	<b>ARMENIA</b>
<b>Target Audience</b>	Young entrepreneurs and students, application programmers, entrepreneurs with non-programming skills (designers, and others)	Mobile app developers, young entrepreneurs, students for training programs, start-up incubated companies, and experienced entrepreneurs	Students and graduates with no work experience, people interested in improving skills and working on mobile app development
<b>mLab Services</b>	Outreach, community building, and skills setting through a structured program that prepares entrepreneurs for the market or follow-on support from other incubation centers	Incubation and acceleration, networking and partnership building	Skills development, start-up creation and support, incubation, networking
<b>Innovation Approach</b>	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	Identification of innovative solutions and turning them into profitable businesses; a focus on applications with social-development impact and mobile-payment facilities	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

TABLE 2. HIGH-LEVEL OVERVIEW OF 2016 BUSINESS MODELS

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

# Do mLabs Still Make a Difference?

## A Second Assessment

### 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."<sup>1</sup> 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.<sup>2</sup> 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.

<sup>1</sup> m:lab East Africa.

<sup>2</sup> World Wide Web Foundation, "m:lab East Africa," <http://webfoundation.org/projects/mlab-east-africa/>.

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,"<sup>3</sup> 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.<sup>4</sup>*

<sup>3</sup> infoDev 2016.

<sup>4</sup> Hersman 2016.



Photo Credit: East Africa iHub



Photo Credit: East Africa, Kenya iHub

# Do mLabs Still Make a Difference?

## A Second Assessment

## 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

*I would attribute at least half our growth last year (3,600%) to mLabs and to the book of business mLab alumni help us find.*

- Founder, digital agro-entrepreneur-

### 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").<sup>15</sup> 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 mLabs start-ups as part of the desk research and interviewed nearly 60 companies.<sup>16</sup>

<sup>15</sup> 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 mLabs 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.

<sup>16</sup> 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		
<p><b>31 Clients</b></p> <p>Clients are people/companies incubated via services provided by mLabs before 2014.</p>	<p><b>5 Closed</b></p> <p>Closed are clients no longer in the digital technology applications or digital technology market as entrepreneurs.</p> <p><i>This sample group was not part of the first assessment.</i></p>	<p><b>23 Newcomers</b></p> <p>Newcomers are people/ companies incubated via services provided by mLabs since 2014.</p> <p><i>This sample group was not part of the first assessment.</i></p>
NON-MLAB START-UPS, 39 INTERVIEWED		
<p><b>27 Comparables</b></p> <p>Comparables are people/companies receiving digital technology incubation or acceleration services from non-mLab incubators.</p>	<p><b>12 Counterfactuals</b></p> <p>Counterfactuals are entrepreneurs, start-ups, and businesses that have developed digital technology businesses without digital technology incubation or acceleration services.</p>	
ECOSYSTEM, 63 INTERVIEWED		
<p><b>18 Customers</b></p> <p>Customers are individuals and firms benefiting from the use of digital technology or from an improved ecosystem.</p>	<p><b>11 Investors</b></p> <p>Investors are digital enterprise investors.</p> <p><i>This sample group was not part of Assessment 1.</i></p>	<p><b>34 Ecosystem Actors</b></p> <p>Ecosystem Actors are all actors populating the entrepreneurial ecosystem not included in any of the other categories, including mLab staff.</p>

# Do mLabs Still Make a Difference?

## A Second Assessment



Photo Credit: EIF Armenia

## 3 HOW DO MLABS IMPACT DIGITAL START-UPS?

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

**TABLE 4. SURVIVAL RATES SINCE COMPANY INCEPTION BY MLAB**

mLab	Survival Rate
Overall	84%
West Africa (Senegal)	100%
Southern Africa (South Africa)	94%
East Africa (Kenya)	90%
ECA (Armenia)	50%

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

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.

*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.*

**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.*

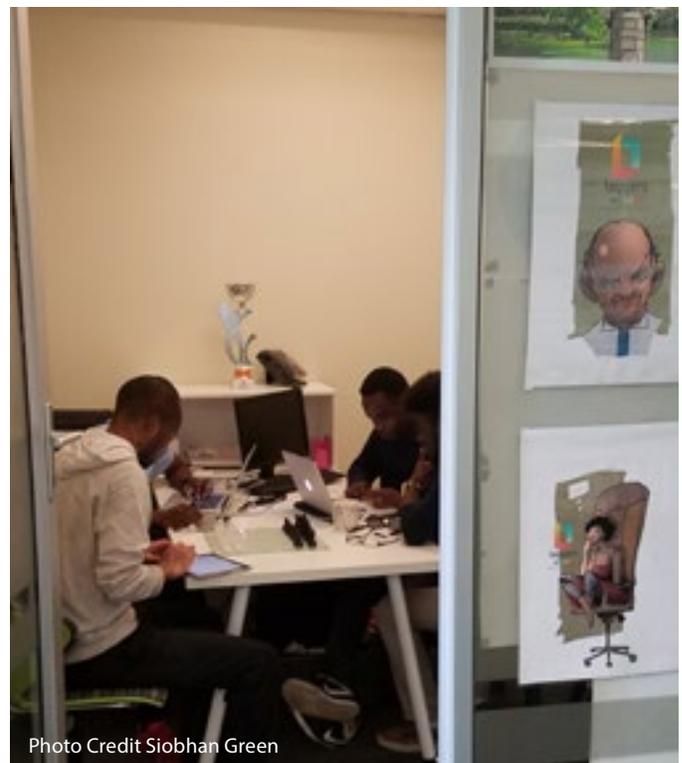
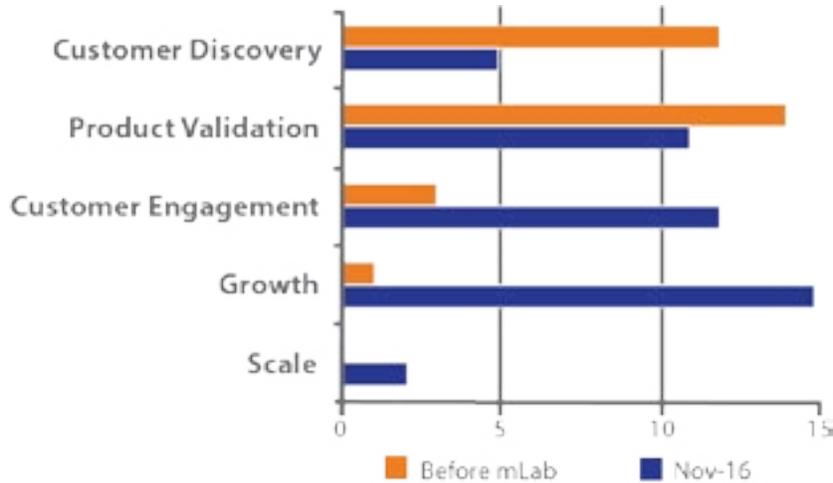


Photo Credit Siobhan Green

# Do mLabs Still Make a Difference?

## A Second Assessment

**CHART 1. NUMBER OF COMPANIES BY START-UP LIFE CYCLE STAGE AT MLABS MATRICULATION AND NOVEMBER 2016**



### 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<sup>17</sup> was applied to mLab-incubated start-ups to analyze how they have matured during this period of time.<sup>18</sup> 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.

<sup>17</sup> <https://leanstack.com/lean-analytics-the-one-metric-that-matters-and-other-provocations/>. The terms for different stages were edited for clarity with interviewees.

<sup>18</sup> 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**

Firm	Customer Discovery	Product Validation	Customer Engagement	Growth	Scale
Kim/Kimard Studio	2016				
Music of Africa	Closed				
SimpliMantis	2016				
SpaceDecode	2016				
Cube Tech		2016			
Afroes (Kenya)		2016			
Ecole au Senegal		2016			
Genius Family		2016			
Image In		2016			
Inaota		2016			
Nelam Services		2016			
Tagoor		2016			
Cybarc		2016			
Jonga		2016			
Layyers		2016			
Senso		2016			
TechCloud		2016			
Stories Hub			Closed		
My Sales			Closed		
MicroForester			Closed		
LETSEIN			Closed		
CardPlanetSolutions			2016		
Forex.co.ke			2016		
Kidogo			2016		
Leti Arts			2016		
Ma3route			2016		
Linked Partners			2016		
SenTrust			2016		
AftaRobot			2016		
hearScreen			2016		
FamBox				2016	
4 Car				2016	
Illuminum Greenhouses				2016	
Instasave				2016	
MedAfrica				2016	
MFarm				2016	
MobiDev				2016	
Shield Finance				2016	
Sleepout				2016	
TotoHealth				2016	
Uhasibu				2016	
Whive				2016	
Afroes (South Africa)				2016	
Appchemy				2016	
Geekulcha				2016	
GemProject				2016	
M-Factory				2016	
Tour 2.0				2016	
NaKo Games					2016
Eneza Education					2016
Kopo Kopo					2016
mPayer					2016
Sendy					2016
Byfilling					2016
Dariss					2016
ITech Solutions					2016
Niokobok					2016
Seysoo					2016
Soft Solutions					2016
L'africamobile					2016
GoMetro					2016

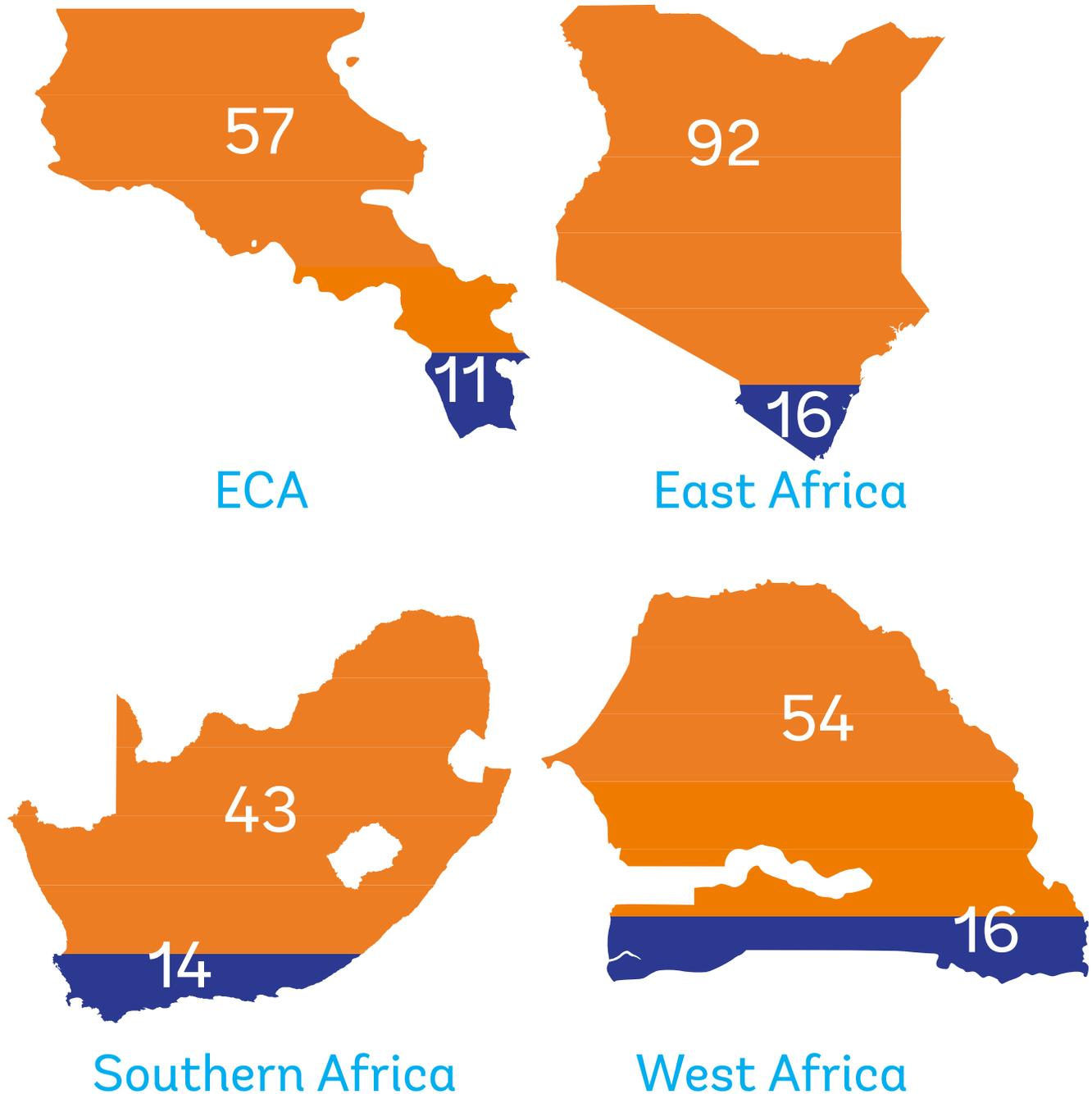
Active: Organization is still active in the ecosystem under its original or new identity.

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



 Employees at Firm Creation  
 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,<sup>19</sup> 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.<sup>20</sup> It reveals a total of 272 direct jobs created from 2014 to 2016, of which 212 jobs were created by m:lab East Africa.

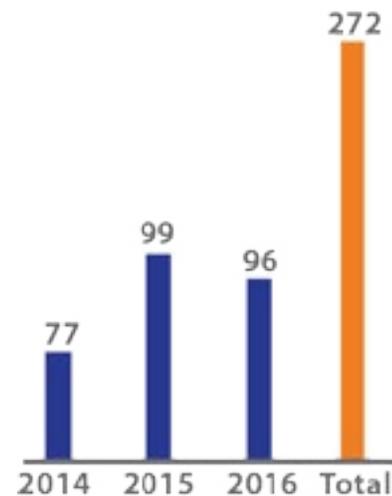
Chart 2's illustration of the total number of employees at a company's launch versus when the company was interviewed in November 2016 is based on interviewed clients and newcomers. They were asked the number of jobs they had at the company launch and in November 2016. They reported 57 employees at creation 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

<sup>19</sup> Direct jobs are defined as "number of additional new direct full-time jobs created by mLab businesses/entrepreneurs as a result of growth. This [number] include[s] full-time direct additional jobs created by the business in other countries as a result of business expansion." infoDev correspondence, December 16, 2016.

<sup>20</sup> mLab Southern Africa did not report jobs created 2014-2015 at the time of the assessment.

mLabs report 75 jobs created during the period 2014-2016, while their start-ups interviewed for the assessment report 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.

**CHART 3. NUMBER OF NEW DIRECT JOBS CREATED BY MLAB SUPPORTED FIRMS, CUMULATIVE 2014-2016 (MLAB DATA).**



## 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?

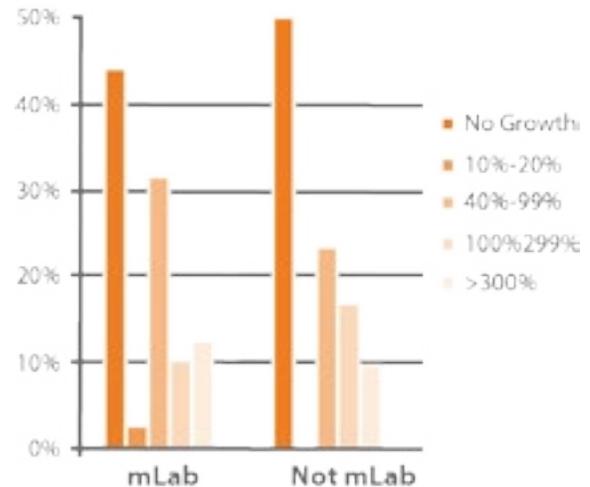
## A Second Assessment

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 mLab-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**



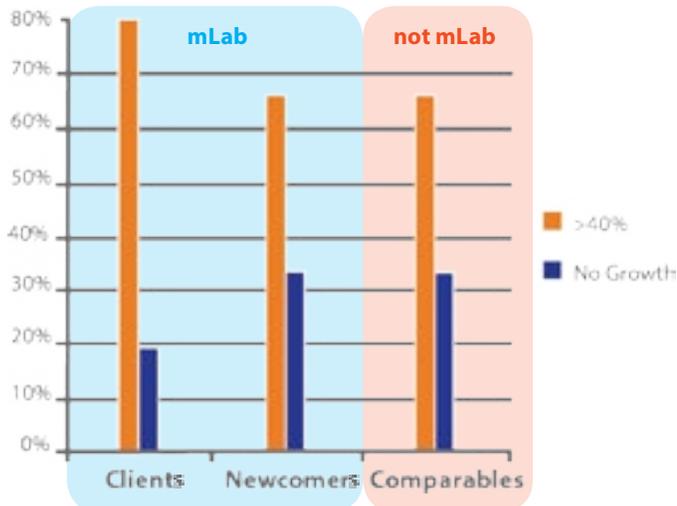
part due to the rising automation even of many white-collar jobs.”<sup>21</sup> This fact is especially true in B2B businesses, where the focus on improved productivity of business processes often results in lower headcounts needed for higher output. However, start-ups that leverage digital technology 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 mLab companies is somewhat better than non-mLab companies (the latter are both comparable companies that have received incubation at non-mLab locations and counterfactual ones that have not received any incubation.

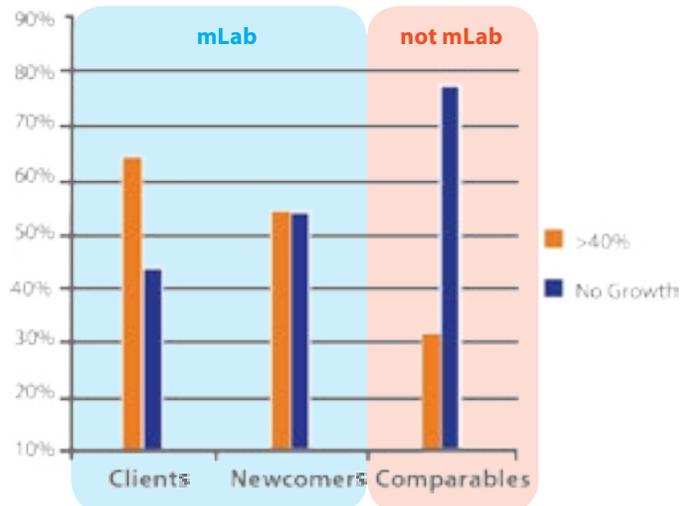
**CHART 5. CLIENTS, NEWCOMERS, AND COMPARABLES' REVENUE GROWTH LAST 3 YEARS**



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

**CHART 6. PERCENT REVENUE GROWTH SINCE JOINING INCUBATOR**



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.

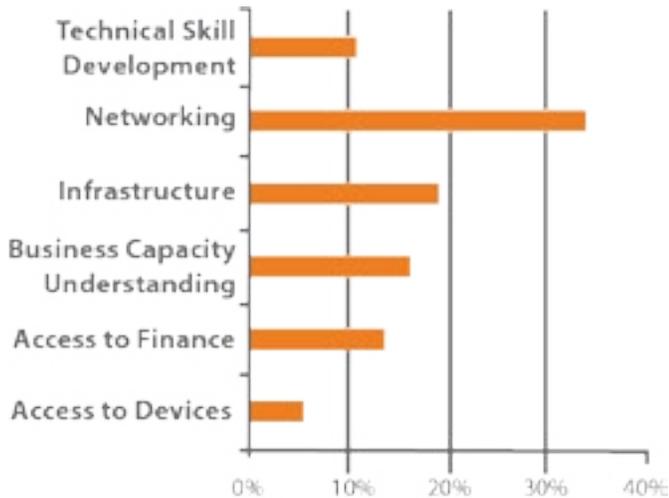
Chart 6 compares revenue growth since joining an incubator among clients, newcomers, and comparables. It indicates that both mLab clients and newcomers perform better than comparables, and that clients do better than newcomers. This result indicates that mLabs may be doing better than other incubators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



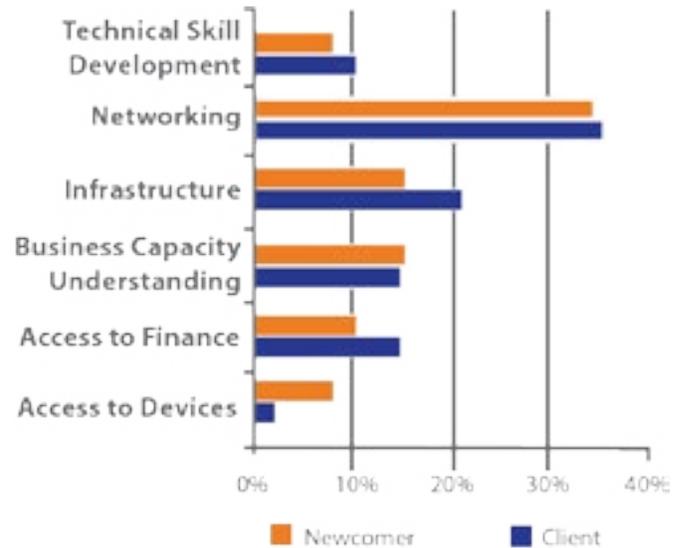
# Do mLabs Still Make a Difference?

## A Second Assessment

**CHART 7. MOST VALUABLE MLAB SERVICE, ALL MLAB INCUBATEES**



**CHART 8. MOST VALUABLE MLAB SERVICE BY MLAB NEWCOMERS AND CLIENTS**



### NETWORKING IS THE MOST VALUED SERVICE

To assess the importance of mLab services, the assessment team asked mLab beneficiaries what mLab services and activities they found most helpful.<sup>22</sup> Three perspectives on service valuation are presented below. The first, reported in Chart 7, is the valuation of services by all mLab beneficiaries. The second, reported in Chart 8, is the valuation of mLab services by clients and newcomers. The third, reported in Chart 9, is the valuation of mLab services by each mLab.

**Finding:** The most valued mLab 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.

<sup>22</sup> The categories are defined as follows: Access to devices at the mLab to test, build, fine-tune, design better user experience, and correct errors. Access to finance and activities that helped start-ups better compete for finance, such as basic information about grants and competitions, preparing product pitches, and actual grant funding. Business capacity is a collection of activities that help build the ability of start-ups to establish and run a digital technology company. Infrastructure is access to work space, access to Internet, and other facilities. Networking is social and professional networking activities and opportunities. Technical skill development is specific to digital technology skills.

Chart 8 compares mLab clients' and newcomers' valuation of mLab services. Networking continues to be the highest-valued mLab 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. mLab also helped a lot with the development of our business model.*

*- mLab entrepreneur*

**CHART 9. BENEFICIARY VALUATION: MOST IMPORTANT MLAB SERVICES FOR ALL MLAB INCUBATEES BY MLAB**

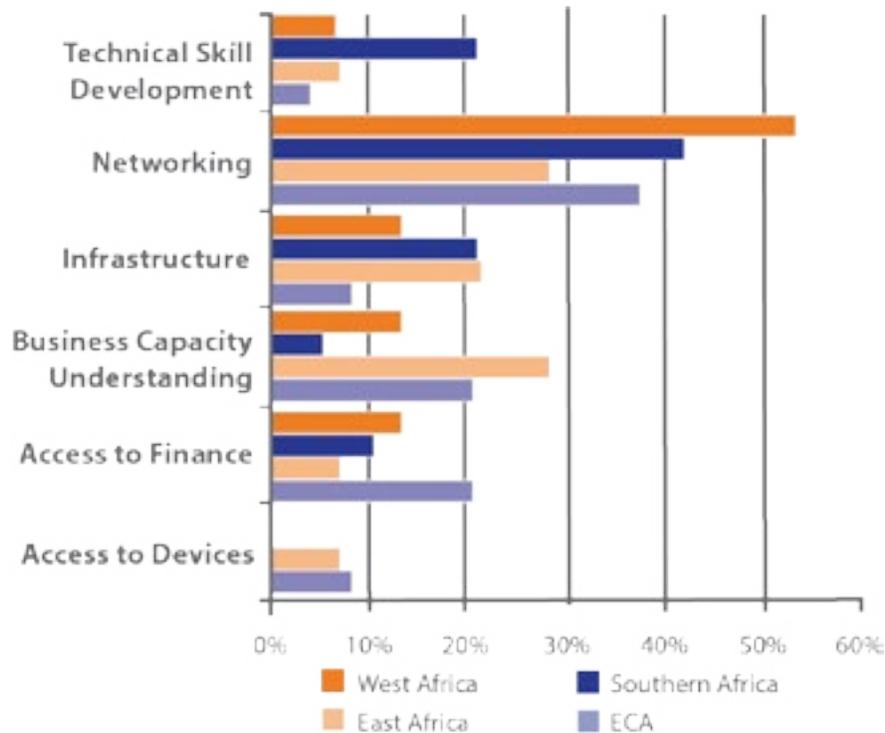


Chart 9 shows each of the four mLabs beneficiaries' valuations of mLab services. While networking remains the most valued mLab service, there is significant variation among mLabs for other services' valuation. The variations are partially based on the differences among mLab service offerings and their 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.



Photo Credits: Above: Jonga

# Do mLabs Still Make a Difference?

## A Second Assessment

### 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.

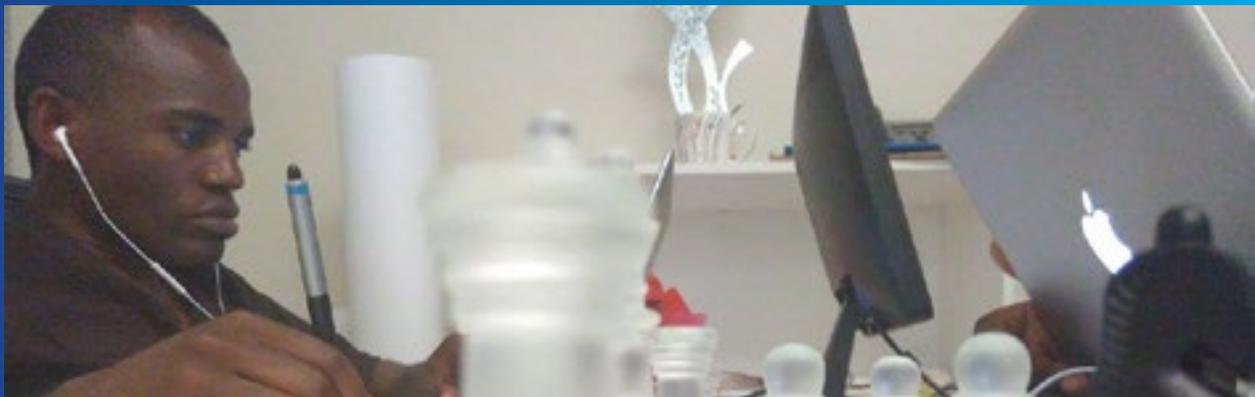


Photo Credits: Above: Jonga, Opposite: Layyers



## 4 HOW DO CUSTOMERS BENEFIT FROM MLAB-SUPPORTED START-UPS?

To assess the impact of applications developed by mLab-supported business and entrepreneurs on customers<sup>23</sup> required 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.<sup>24</sup>

<sup>23</sup> The assessment team interpreted the question “how the customers of applications developed by mLab-supported businesses/entrepreneurs benefit from these applications” (infoDev terms of reference, second assessment) to include both social and economic impacts of company products and services, including BoP, a group that makes up the vast majority of the population in most of these countries. While the mLab program does not have an explicit focus on BoP, the East Africa mLab has the focus “of demand-driven innovation ... scaled-up into sustainable businesses that address social needs” as a founding objective. In addition, as there is a growing awareness by the World Bank and others that digital dividends are not always shared equally throughout a country, the assessment wished to provide more information for future programs on the organic impact of mLab investments, including on BoP customers.

<sup>24</sup> Several factors—including the diversity and breadth of types of customers, their geographic range and sheer numbers, and the differing types of impact to be measured—make measuring impact an interesting challenge. First, reaching a meaningful sample and systematic analysis using interviews would be extremely challenging for a project designed to be rapid and of limited budget. Second, the companies would need to share their customer list and contact information with the assessment team, which is often considered proprietary and may be subject to non-disclosure agreements. Third, some customers are minor teenagers, traditionally disadvantaged, or in some way problematic to interview. With respect to minors and other customers where confidentiality and ability to provide informed consent is questionable, there are legal and ethical issues in each country, and would normally require a human subject

The 73 mLab-supported start-ups reviewed for the customer impact analysis spanned 23 distinct types of businesses in three general categories<sup>25</sup>: 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

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.

<sup>25</sup> The 73 companies include an additional 24 beyond the 59 interviewed.

# Do mLabs Still Make a Difference?

## A Second Assessment

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<sup>26</sup>).

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

<sup>26</sup> While the first assessment mapped company products and services onto different development sectors, the approach used to map the companies was unclear. Therefore, making direct comparisons between companies mapped in the first assessment and those mapped in the second would not be valid. However, as a general pattern, the two assessments show trends in diversification in revenue streams.

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

IMPACT TYPE	IMPACT SECTOR	# FIRMS	%
Digital Technology Sector	Mobile Services Development	17	38%
	Gamification	5	
	Graphic Design	2	
	Multimedia Services	2	
	IT Consulting	1	
	Space Exploration	1	
Development Sector	<b>Finance/Financial Inclusion*</b>	6	34%
	<b>Agriculture*</b>	5	
	<b>Health*</b>	5	
	<b>Grassroots Innovation*</b>	3	
	<b>Education*</b>	2	
	<b>Environment*</b>	2	
	<b>Employment*</b>	1	
	Supply Chain	1	
Service Sector	Media	4	27%
	<b>Mobility*</b>	3	
	Security	3	
	Automotive	2	
	m-Commerce	2	
	m-delivery	2	
	Tourism	2	
	Business Administration	1	
	Childcare	1	

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

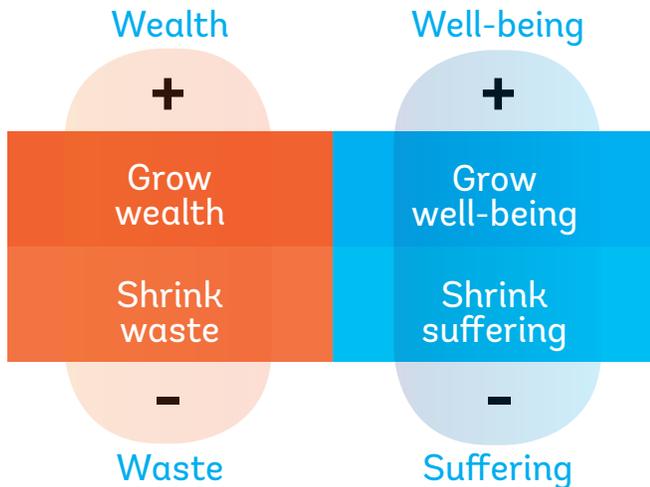
*Mobile apps have greatly impacted logistics, manufacturing, and sales sectors. Firms with very different services need mobile apps, as they help to deliver services and capture customers.*

- Investor, South Africa

# Do mLabs Still Make a Difference?

## A Second Assessment

CHART 10. IMPACT MAPPING FRAMEWORK.



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

CHART 11. ECONOMIC & SOCIAL IMPACT MAP

	Economic Benefit	Social Benefit	
Grow	Wealth	Well-being	73%
	43%	30%	
Shrink	12%	15%	27%
	Waste	Suffering	
	55%	45%	

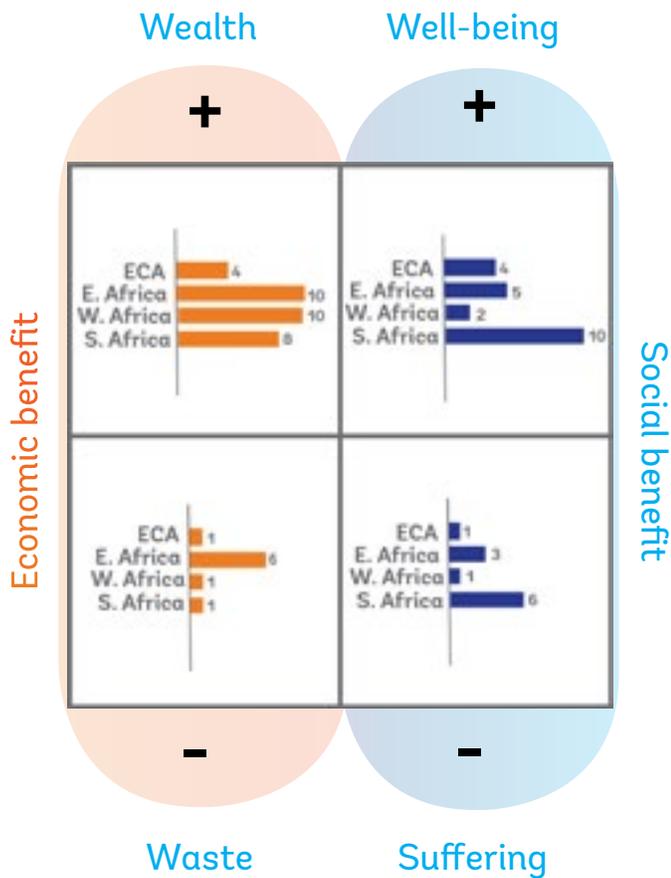
the distribution of its start-ups within the impact mapping framework is closest to the average.

**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.

**CHART 12. MAPPING THE MLABS' INTENDED END-USER IMPACTS**



### EXAMPLE OF INTENTION TO REDUCE SUFFERING

*Zusha! a road safety project, partnered with mLab alumni Ma3Route to test if access to a digital reporting platform would lead to a reduction in accident rates. After the intervention, the number of total accidents dropped by 30%. ... Zusha! is now expanding pilot studies into Tanzania, Uganda and Rwanda.*

- [ma3routeblog.wordpress.com](http://ma3routeblog.wordpress.com)

### REVENUE STREAMS VS. ECONOMIC AND SOCIAL IMPACT MAPS

**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.**

		ECONOMIC AND SOCIAL IMPACT			
Revenue stream		Grow wealth	Shrink waste	Grow well-being	Reduce suffering
Digital Technology Sector	Mobile Services Development	15	1	1	
	Gamification			5	
	Graphic Design	1		1	
	Multimedia Services	2			
	IT Consulting	1			
	Space Exploration			1	
	Sub Total	19	1	8	0
Development Sector	Finance	1	5		
	Agriculture	5			
	Health	1			4
	Grassroots Innovation			3	
	Education			2	
	Environment		1	1	
	Employment			1	
Sub Total	7	6	8	4	
Service Sector	Media	1		3	
	m-Commerce	1	1		1
	Mobility			1	2
	Security				3
	m-Delivery	2			
	Tourism			2	
	Automotive	1			
	Business Administration				1
	Childcare				1
	Sub Total	5	1	6	8
<b>Total</b>	<b>31</b>	<b>8</b>	<b>22</b>	<b>12</b>	

## 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.

# Do mLabs Still Make a Difference?

## A Second Assessment

### 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 provided GoMetro with facilities and industry exposure (network and networking opportunities) as its founder wasn't a techie. mLab also really helped the company to produce its initial app when the start-up was under a time constraint to get it ready for the Gauteng Innovation Competition, which was one of the stepping-stones to its success.

### 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."

# Do mLabs Still Make a Difference?

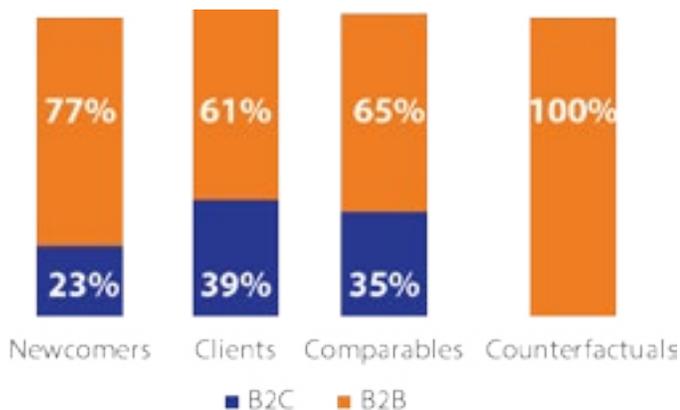
## A Second Assessment

### 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.

#### CHART 13. CUSTOMER ORIENTATION OF SURVEYED FIRMS.



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”

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

*- Kenyan investor*

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.

*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.*

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.*

## 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.



# Do mLabs Still Make a Difference?

## A Second Assessment

# 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<sup>27</sup>

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.

<sup>27</sup> The four other factors are (1) the current market size and available monetization channels for mobile app start-ups; (2) the state of the ICT sector; (3) the overall regulatory, policy, and business environment; and (4) the overall ICT infrastructure. They are important but are not part of the core mLab program mission or objective. Furthermore, they are macro-national-level factors well beyond the capability of mLabs to impact. For further discussion, see infoDev (2014a, 53).

*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.*

*- Digital technology entrepreneur, Armenia*

*[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 policies<sup>28</sup> and South African government policies on entrepreneurship.<sup>29</sup>

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.*

<sup>28</sup> KPMG in Armenia 2013.

<sup>29</sup> RSA 2012.

*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*

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.<sup>30</sup>

**CHART 14. PERCEPTIONS OF SIGNIFICANT ECOSYSTEM CHANGE SINCE 2013**



<sup>30</sup> These categories are based on content analysis of interview

# Do mLabs Still Make a Difference?

## A Second Assessment

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.<sup>31</sup>

### Demonstrating Local Digital Start-ups' Incubation Viability

mLabs contributed to these changes by demonstrating viability of local digital start-ups and the incubation model. Starting from close to zero in 2011, ECA, Southern Africa, and East Africa mLabs developed more than 1,300 mobile apps, of which nearly half were brought to market. mLabs created nearly 100 start-ups, raised US\$4 million in external start-up investment, and reached or trained over 8,000 individuals and entrepreneurs.<sup>32</sup> mLabs were pioneers<sup>33</sup> and the World Bank was the first major donor to launch formal processes, activities, and on-the-ground organizations dedicated to incubating digital start-ups for social and economic impact.<sup>34</sup> Through their successes, the mLabs demonstrated viability of incubating digital technology and entrepreneurship to a point where there are more than 300 such efforts under way in Africa,<sup>35</sup> and a recent estimate by AngelList notes more than 1,100 technology start-ups in South Africa compared with 85 in Armenia, 528 in Kenya, and 31 in Senegal over the last three to four years.<sup>36</sup>

### 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.”<sup>37</sup> 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.<sup>38</sup>

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

35 GSMA 2016.

36 AngelList 2016.

37 Jovanovic and Rousseau 2005.

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.

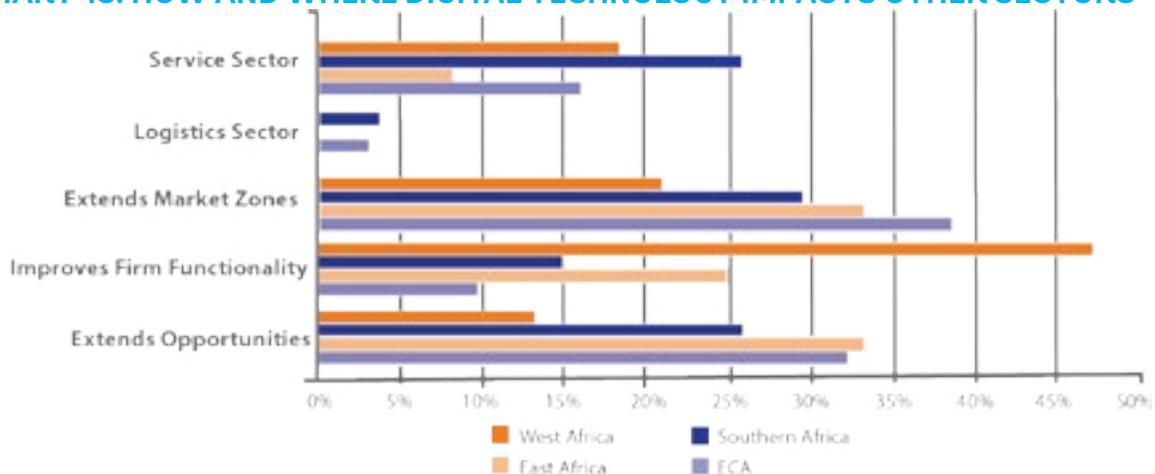
### Improves Firm Functionality & Extends Opportunities

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.

**CHART 15. HOW AND WHERE DIGITAL TECHNOLOGY IMPACTS OTHER SECTORS**



# Do mLabs Still Make a Difference?

## A Second Assessment

### 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.

*There's now a more seasoned experience who understand the importance of the business. Talent is 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 [it] used to be [start-ups were] full of expat coders, no longer.*

*[In the] initial years of the ecosystem, everybody was looking for coding talent. Need is still there but ... [the] problem at the base level: how do I build a cool solution? Not much business expertise. Lots more people need to focus on “this is a business.”*

Given the high survivability of African mLab start-ups compared with equivalent African and U.S. start-ups, mLabs have clearly been successful supporting a more mature ecosystem, one with companies further along in their start-up life cycle journey.

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.<sup>39</sup>*

### 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.

*m:lab East African startups have raised US\$5.9 million in external investment from 2014 to 2016.*

- *m:lab East Africa Performance Report (2017)*

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.*

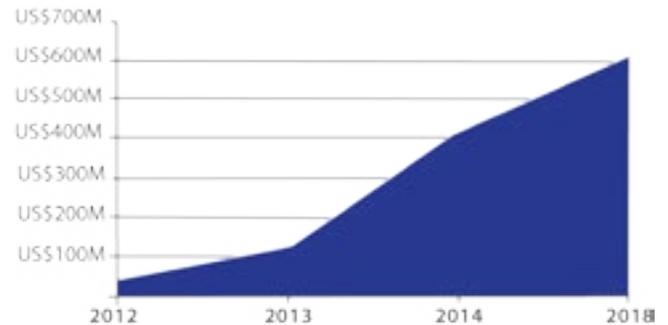
To assess potential impacts of mLabs on the A2F part of the ecosystem landscape, this section will provide three perspectives of the landscape in the four mLab countries: (1) a view of the private sector, (2) where mLabs receive their first funding, and (3) angel investment interest.

### Growth in Private Investment Since 2012

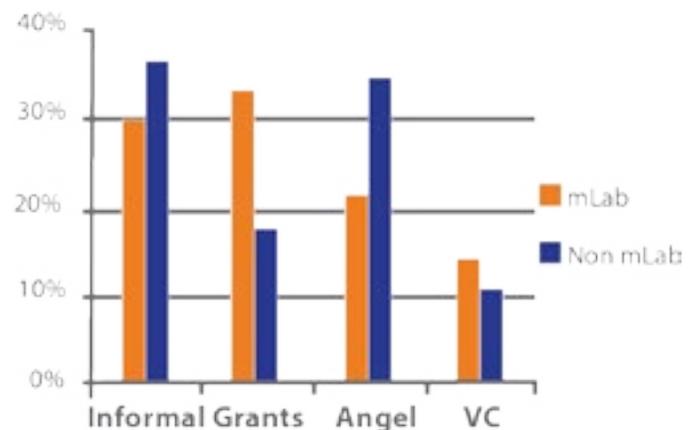
As indicated in Chart 16, estimates for venture capital funding available to African technology start-ups have increased dramatically since 2012.<sup>40</sup>

While this trend is good for start-ups that can compete for VC funding—that is, start-ups with established products in

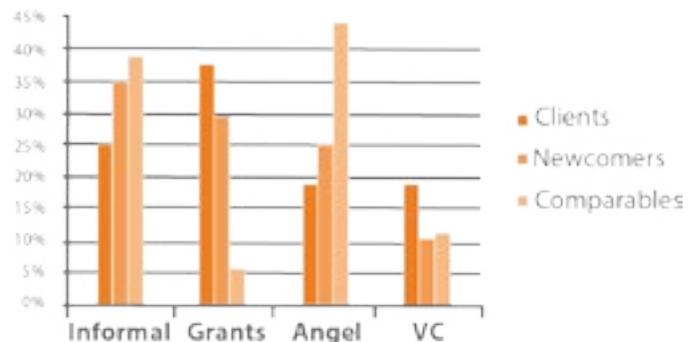
**CHART 16. VENTURE CAPITAL FUNDING ESTIMATES FOR AFRICAN TECHNOLOGY FIRMS**



**CHART 17. FIRST INVESTMENT SOURCE MLAB AND NON MLAB STARTUPS**



**CHART 18. FIRST INVESTMENT SOURCE CLIENTS, NEWCOMERS AND COMPARABLES**



# Do mLabs Still Make a Difference?

## A Second Assessment

viable markets, with paying customers, and the capability of generating 30 times the investment they receive<sup>50</sup>—most mLab start-up firms cannot meet these criteria. As one investor put it, the mLab 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 mLab 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 mLab 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.<sup>41</sup>

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. mLab 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, mLab—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.*

<sup>41</sup> See Primary Success Factors section in the Case Studies, Appendixes A-D for further detail.

**TABLE 8. ANGEL LIST INVESTORS MONITORING STARTUPS**

	INTERESTED INVESTORS	INVESTORS WITH 50+ INVESTMENTS
Cape Town	1,233	60
Gauteng	1,199	22
Yerevan	7,685	45
Nairobi	1,182	23
Dakar	1,140	23

## 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.

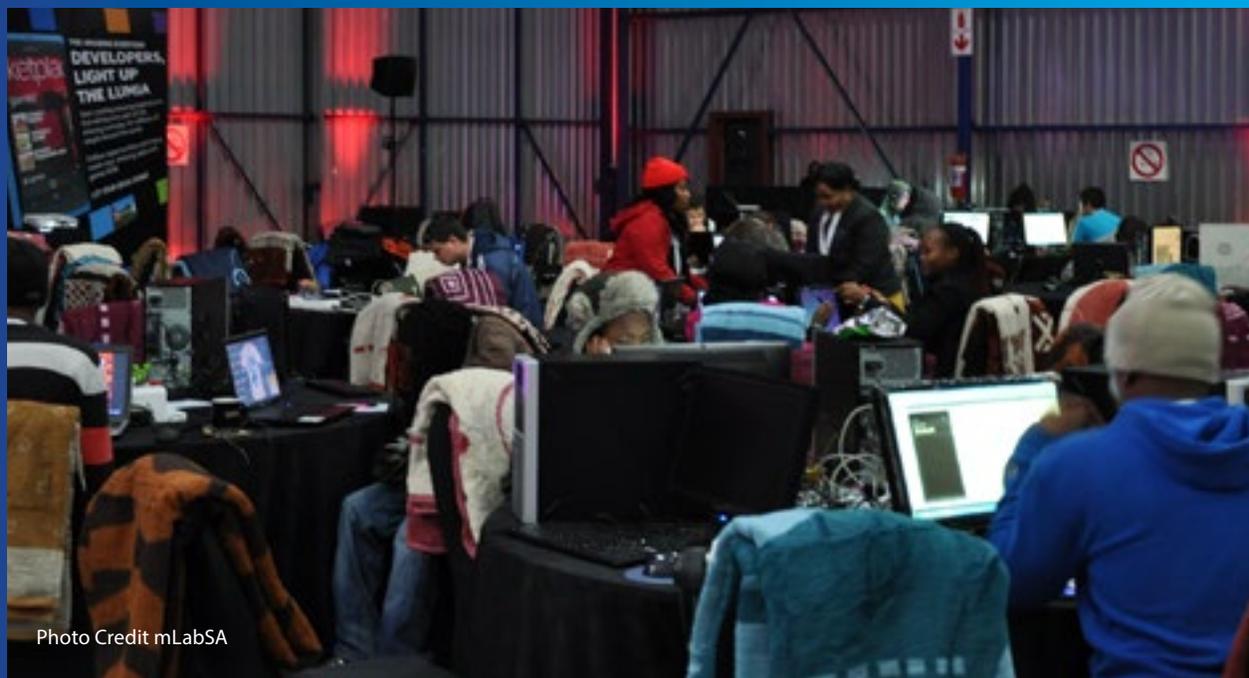


Photo Credit mLabSA

# Do mLabs Still Make a Difference?

## A Second Assessment

*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*

## 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.

*What changes can enable digital technology developers to boost national development?*

*I wish there was an easy response. Government asks this question every day. Focus on co-working and incubation. There's no silver bullet. I used to be very skeptical of tech hubs. But I can now see when the hype has died down, there's interesting stuff left in the market.*

*- Investor, Senegal*

*mLab set up my business. Ericsson went to mLab looking for interesting projects and found us. Incubators are places of refuge, since start-ups need a lot of stuff: physical spaces, networking with like-minded people, etc.*

*- mLab entrepreneur*

## 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.

# Do mLabs Still Make a Difference?

## A Second Assessment

## 7 RECOMMENDATIONS

### 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).

## 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, fundraising workshops, customer-pipeline development, or technical training), can help cement alumni commitment to promoting and further engaging with mLab.

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.

# Do mLabs Still Make a Difference?

## A Second Assessment

## REFERENCES & BIBLIOGRAPHY

Adesida, Olugbenga, Geci Karuri-Sebina, and João Resende-Santos. 2016. *Innovation Africa: Emerging Hubs of Excellence*. Bingley, UK: Emerald Publishing.

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

AngelList. 2016. Locations, AngelList. <https://angel.co/locations>. December 2016.

Arzumanyan. T. 2008. "ICT industry in Armenia: current state and development patterns." VI Globelics Conference, Mexico City, September 22, 2008. [https://smartech.gatech.edu/bitstream/handle/1853/40262/Tigran\\_Arzumanyan\\_ICT\\_Industry.pdf](https://smartech.gatech.edu/bitstream/handle/1853/40262/Tigran_Arzumanyan_ICT_Industry.pdf)

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.

Brookings Institution. 2013. . "Forum on Mobile Entrepreneurship around the World." Video. 25 May 2013. <https://www.youtube.com/watch?v=g9Gl2NYuCps>.

Enterprise Incubation Foundation. Various Years. *Armenian ICT Sector State of Industry Reports*. <http://www.eif.am/eng/researches/report-on-the-state-of-the-industry/>.

Basil, Peters. 2014. "Venture Capital Funds - How the Math Works." Angel Blog. [http://www.angelblog.net/Venture\\_Capital\\_Funds\\_How\\_the\\_Math\\_Works.html](http://www.angelblog.net/Venture_Capital_Funds_How_the_Math_Works.html).

Bright, Jake. 2016. "A brief overview of Africa's tech industry – and 7 predictions for its future." Wb Posting. World Economic Forum. <https://www.weforum.org/agenda/2016/05/a-brief-history-of-africa-s-tech-industry-and-7-predictions-for-its-future/>. 5 May 2016.

Bright, Jake, and Aubrey Hruby. 2015. *The Next Africa: an emerging continent becomes a global powerhouse*. New York: Thomas Dunne Books/St. Martin's Press.

Jovanovic, Boyan and Peter L. Rousseau. 2005. "General Purpose Technologies." Working Paper 11093. NBER Working Paper Series, National Bureau of Economic Research, Cambridge, MA .January 2005. <http://www.nber.org/papers/w11093>

Comins, Neville Raymond and Erika Kraemer-Mbula. 2016. "Innovation Hubs in Southern Africa" in *Mobile Innovation Africa: Emerging Hubs of Excellence*, Eds. Olugbenga Adesida, Geci Karuri-Sebina, and João Resende-Santos. Emerald Group, Bingley, U.K.

Du Boucher, Victor. 2016. "A few things we learned about tech hubs in Africa and Asia," GSMA Wb Posting. August 05, 2016. <http://www.gsma.com/mobilefordevelopment/programme/ecosystem-accelerator/things-learned-tech-hubs-africa-asia>

Deloitte & Touche. 2014. *The Future of Telecoms in Africa: the blueprint for the brave*. Deloitte & Touche. [http://www2.deloitte.com/content/dam/Deloitte/fpc/Documents/secteurs/technologies-medias-et-telecommunications/deloitte\\_the-future-of-telecoms-in-africa\\_2014.pdf](http://www2.deloitte.com/content/dam/Deloitte/fpc/Documents/secteurs/technologies-medias-et-telecommunications/deloitte_the-future-of-telecoms-in-africa_2014.pdf).

Desai, Adarsh. 2016. "What's your strategy for innovation labs?" Voices Blog. World Bank. 02/25/2016.

<http://blogs.worldbank.org/voices/what-s-your-strategy-innovation-labs>.

Department of Telecommunications and Postal Services. 2015 National Integrated ICT Policy Review Report. 2015. Department of Telecommunications and Postal Services, Pretoria, March 2015. <https://www.activateleadership.co.za/hive/original/561f341c3a3f0.pdf>.

Department of Science and Technology, Republic of South Africa. 2013. ICT RDI Roadmap. Department of Science and Technology, Pretoria. [http://www.dst.gov.za/images/ict\\_rdi\\_roadmap.pdf](http://www.dst.gov.za/images/ict_rdi_roadmap.pdf)

Esselaar, S, Gillwald, A, Moyo, M & Naidoo, K. 2010. "South African ICT Sector Performance Review 2009/2010." Towards Evidence-based ICT Policy and Regulation, Vol. 2 , Policy Paper 6, Research ICT Africa, Cape Town.

Fetsch, Emily. 2015. "Are Incubators Beneficial to Emerging Businesses." Ewing Marion Kauffman Foundation. <http://www.kauffman.org/blogs/growthology/2015/03/are-incubators-beneficial-to-emerging-businesses>

Gauteng Growth and Development Agency. 2014. Annual Report 2013/2014. Gauteng Growth and Development Agency. 124 Main Street, Marshalltown, Johannesburg. <http://www.theinnovationhub.com/files/documents/5551e9389e494.pdf>

George, Alexander L. and Timothy J. McKeown. 1985. "Case Studies and Theories of Organizational Decision Making," in Robert F. Coulam and Richard A. Smith, Eds., Advances in Information Processing in Organizations, Vol. 2. Greenwich, Conn., JAI Press, 1985.

Gharabegian, Areg. 2016. "Computer-Related Education in Armenia." The Armenia Week. January 14, 2016. <http://armenianweekly.com/2016/01/14/computer-related-education-in-armenia>.

Government of South Africa. 2012 The National Development Plan 2030. <http://www.gov.za/issues/national-development-plan-2030>

GSMA. 2016. The Mobile Economy 2016. GSMA Association. <https://www.gsmaintelligence.com/research/?file=97928efe09cdba2864cdcf1ad1a2f58c&download>

Handjiski, Borko. 2015. "Mobile connectivity in Africa has already arrived." Future Development Blog, The Brookings Institution, March 18, 2015. <https://www.brookings.edu/blog/future-development/2015/03/18/mobile-connectivity-in-africa-has-already-arrived/>.

Independent Entrepreneurship Group. 2013. "South African Government Policies Since 1994." Web Posting. July 14, 2013. <http://ineng.co.za/south-african-government-policies-since-1994/>

infoDev. 2011. "Request for Expressions of Interest, Creating Sustainable Businesses in the Knowledge Economy in Europe and Central Asia: Host Organization for a Capacity-building Initiative in ICT Policy and Regulation for Eastern Europe and Central Asia (ECA)." 12 April 2011. <https://www.devex.com/funding/r?report=grant-1525-1525>

infoDev. 2014a. Do mLabs Make a Difference? A Holistic Outcome Assessment of infoDev's Mobile Entrepreneurship Enablers. Washington, DC: The World Bank. 2014. <http://documents.worldbank.org/curated/en/477261468182328452/pdf/915610WP0Box370020140last0version01.pdf>

infoDev. 2014b. The Business Models of mLabs and mHubs—An Evaluation of infoDev's Mobile Innovation Support Pilot. Washington, DC: International Bank for Reconstruction and Development/ The World Bank. 2014. [http://www.infodev.org/infodev-files/mlab\\_and\\_mhub\\_publication\\_0.pdf](http://www.infodev.org/infodev-files/mlab_and_mhub_publication_0.pdf)

infoDev. 2014c. Mobile at the Base of the Pyramid: Ghana, Mozambique, Nigeria, Zambia: Summary Report. International Bank for Reconstruction and Development / The World Bank: Washington D.C.,

# Do mLabs Still Make a Difference?

## A Second Assessment

USA. [https://www.infodev.org/infodev-files/mobile\\_apps\\_at\\_the\\_base\\_of\\_the\\_pyramid\\_summary\\_report.pdf](https://www.infodev.org/infodev-files/mobile_apps_at_the_base_of_the_pyramid_summary_report.pdf)

infoDev, 2015. "Derrick Kotze Interview." Web Posting. May 22, 2015. <http://www.infodev.org/articles/interview-derrick-kotze-mlab-southern-africa-ceo>

infoDev. 2016. "Sheilah Birgen Interview." Web Posting. 28 January 2016. <http://www.infodev.org/interview/sheilah-birgen-mlab-east-africa>.

infoDev-Sonjara. 2016. Terms of Reference, Do mLabs still make a difference? A Second Rapid, September 05, 2016.

Innovation Hub. 2016. "The Innovation Hub And Mlab Bring Codetribes to Soweto." Press Release. [http://www.theinnovationhub.com/press-room-media/news\\_and\\_current\\_affairs/the-innovation-hub-and-mlab-bring-codetribes-to-soweto-nws445](http://www.theinnovationhub.com/press-room-media/news_and_current_affairs/the-innovation-hub-and-mlab-bring-codetribes-to-soweto-nws445)

T. James, S., Esselaar P, Mosebi, J, Bowmaker-Falconer, A, Sibthorpe, C & Quansah, Y. 2000. "SAITIS Baseline Studies: A Survey of the IT Industry in South Africa." South African Information Technology Industry Strategy, Pretoria, ZA. <https://idl-bnc.idrc.ca/dspace/handle/10625/35761>

Hersman, Erik. 2016. "iHub the Next Chapter." Web Posting. 11 March 2016. <http://ihub.co.ke/blogs/26994>.

International Bank for Reconstruction and Development / The World Bank. 2016. World Development Report 2016: Digital Dividends. International Bank for Reconstruction and Development / The World Bank. 1818 H Street NW, Washington DC 20433. <http://documents.worldbank.org/curated/en/896971468194972881/pdf/102725-PUB-Replacement-PUBLIC.pdf>.

Interviewee, 2016. Anonymous 2016 Assessment 2 Interviewee.

Juliet. 2016. "Eneza adds MORE than 600,000 users in less than 3 Months." Web Posting. Eneza Education. November 29, 2016. <http://enezaeducation.com/eneza-adds-more-than-600000-users-in-less-than-3-months/>

Kawasaki, Guys. 2009. "Guidance to Entrepreneurs." Entrepreneur. May 2009 <https://www.entrepreneur.com/article/201102>

Kelly, Timothy John Charles and Rachel Sohn Firestone. 2016. "How tech hubs are helping to drive economic growth in Africa". World Development Report background papers. Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/626981468195850883/How-tech-hubs-are-helping-to-drive-economic-growth-in-Africa> .

Mitra, Aumya and Douglas Andrew, Gohar Gyulumyan, Paul Holden, Bart Kaminski, Yevgeny Kuznetsov, and Ekaterine Vashakmadze. 2007. The Caucasian Tiger Sustaining Economic Growth in Armenia. The International Bank for Reconstruction and Development / The World Bank 1818 H Street, NW. 2007. <http://documents.worldbank.org/curated/en/725081468217776036/pdf/392500AM0Cauca101OFFICIAL0USE0ONLY1.pdf>.

Minges, Michael, Doug Court, and Jose Maria Diaz Batanero. 2016. A Review of Micro, Small and Medium Enterprises in the ICT Sector. ITU. [https://www.itu.int/dms\\_pub/itu-s/oth/06/36/S06360000013301PDFE.pdf](https://www.itu.int/dms_pub/itu-s/oth/06/36/S06360000013301PDFE.pdf).

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

OAfrica (27 April 2011) "Listing the African Tech Hubs." Web Posting. OAfrica. <http://www.oafrica.com/business/african-tech-hubs/>

- Ojala, Arto Ojala. 2016. "Business models and opportunity creation: How IT entrepreneurs create and develop business models under uncertainty." Special Issue: Digitization in Business Models and Entrepreneurship Information Systems Journal. Volume 26, Issue 5, September 2016.
- Omwansa, Tonny K. 2015. "mLab: Increasing Awareness of Internet Measurement in Kenya." University of Nairobi, Nairobi, Kenya, November 2015.
- Shaban, A. 2016. "South Africa leads adult smartphone use on the continent." Web Posting. Africa News. Com. 1 June 2016. <http://www.africanews.com/2016/06/01/south-africa-leads-adult-smartphone-use-on-the-continent/>
- Skok, David. 2010. "Startup Killer: The Cost of Customer Acquisition." For Entrepreneurs. Web Posting. <http://www.forentrepreneurs.com/startup-killer/>.
- Suh, Yongyoon and Hakyoon Lee. 2017. "Developing ecological index for identifying roles of ICT industries in mobile ecosystems: The inter-industry analysis approach." Telematics and Informatics. Volume 34 Issue 1, February 2017.
- Thevathasan, Vanessa, with Sonja Ruetzel. 2016. AIDF Mobile for Development 2: Transforming Global Healthcare Through Mobile Technology. Aid and International Development Forum. Two America Square. London EC3N 2LU. United Kingdom. <http://www.aidforum.org/mobile-for-development/mobile-for-development-report>
- USAID. 2013. ICT Country Profile Armenia 2013. [http://www.rciproject.com/itprofiles\\_files/ICT\\_Country\\_Profile\\_Armenia\\_2013\\_1.0.pdf](http://www.rciproject.com/itprofiles_files/ICT_Country_Profile_Armenia_2013_1.0.pdf).
- Wong, Kelvin, Brian King, Russell Southwood, and Isabelle Gross. 2013. "Cheap and plentiful broadband in sub-Saharan Africa: Clearing the last blockages." Telematics for Development Working Paper Series. Center for International Development and Conflict Management, University of Maryland College Park, College Park USA. 29 September 2013.
- Wong, Kelvin. 2015. "Health Systems, Mobile Payments, and Broadband Telecommunications Sector Assessments: Methodology and Implementation Approaches for Liberia, Guinea, and Sierra Leone." 2015.
- World Bank/International Bank for Reconstruction and Development. 2012. "Regional Mobile Applications Lab in East Africa Grant, TF097925 Amendment to the Grant Agreement." September 4, 2012. <http://documents.worldbank.org/curated/en/332951468248077572/pdf/RAD2010912951.pdf>.
- World Wide Web Foundation, Web Posting <http://webfoundation.org/projects/mlab-east-africa/>.
- World Bank/International Bank for Reconstruction and Development. 2013. "Regional Mobile Applications Lab in Armenia Grant, TF099367 Amendment to the Grant Agreement." February 14, 2013. <http://documents.worldbank.org/curated/en/242891468249305330/pdf/RAD726643700.pdf>
- Zenn, Jacqueline. 2013. "10 Differences Between B2C and B2B Marketing." HubSpot (web log), November 27, 2013. <https://blog.hubspot.com/agency/differences-b2c-b2b-marketing#sm.000012iahp4ozoeertlth0cq5kcg1>.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

# 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.<sup>1</sup> 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.<sup>2</sup>

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.<sup>3</sup> 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.<sup>4</sup> 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.

1 The license provides for 10 percent fixed-income tax and 0 percent profit tax rates for technology start-ups.

2 World Bank 2013.

3 Applicants for the start-up teams are assessed on a variety of

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.

4 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.

TABLE A.1. SELECT MLAB ECA RESULTS, PROVIDED BY MLAB ECA

INDICATOR	2011	2012	2013	2014	2015	2016
Start-ups created with mLab support	0	0	5	3	3	3
Revenue generated by start-ups US\$	0	0	55,100	2,000	3,000	2,000
External investment raised by start-ups US\$	15,000	32,700	128,700	0	110,000	0
Number of new direct jobs created	15	25	37	9	11	5
Consumer app users reached	0	0	1,700,000	25,000	74,000	70,000
Apps reaching underserved communities (bop, rural, & social dev apps)	0	6	6	0	0	0
New mobile apps brought to market	0	110	117	8	5	4
Number of app prototypes created	12	117	131	8	5	4
Number of teams applying for in-depth mLab support	0	25	216	10	10	7
Teams receiving in-depth one-on-one support	8	15	57	9	9	5
Number of people trained	24	180	260	40	60	47
Number of developers and entrepreneurs reached	0	0	1,000	102	86	78

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.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

### 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.<sup>5</sup> Since then there have been dramatic changes. Armenian digital technology exports have grown dramatically.

Software exports were US\$20 million in 2000,<sup>6</sup> roughly the same as the US\$21 million generated by mobile application development in 2015,<sup>7</sup> and the ICT sector as a whole has seen exports grow from US\$58 million in 2010 to US\$214 million in 2015.<sup>8</sup> 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.<sup>9</sup> This transformation started in 2000 with the government's emphasis on information technology,<sup>10</sup> followed by the formation of the Information Technologies Development Support Council in 2001<sup>11</sup> 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.<sup>12</sup> 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.

7 EIF 2015. Armenian ICT Sector State of Industry Report, 42.

8 Ibid., 40.

9 Ibid., 40.

10 See ICT Master Strategy for Republic of Armenia, <http://www.unapcict.org/ecohub/resources/ict-master-strategy-for-republic-of-armenia>.

11 Arzumanyan 2008.

12 Interviewee 2016.

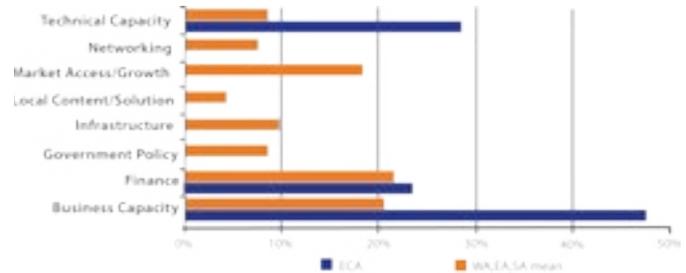
## MLAB ECA AND THE ECOSYSTEM

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.<sup>13</sup>

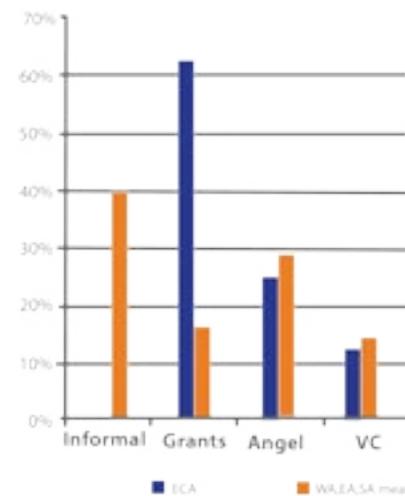
**CHART A.1. PRIMARY SUCCESS FACTORS FOR SUSTAINED GROWTH OF MOBILE TECHNOLOGY SECTOR**



### 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.

**CHART A.2. START-UP FIRST FUNDING SOURCE**

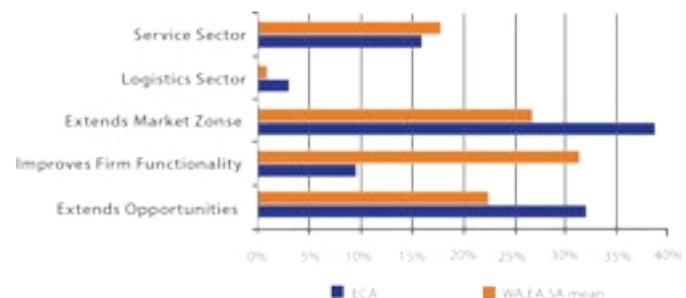


In Armenia 60 percent of interviewed digital technology start-ups receive grants, about four times the rate of start-ups in the other three cases. Angel and venture capital funding rates are about the same, and informal funding was much lower in Armenia. While some sampling bias may be introduced, the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

**CHART A.3. HOW AND WHERE DIGITAL TECHNOLOGY IMPACTS OTHER ENTREPRENEURS**

### 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.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

### 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**

CURRENT NAME	CUSTOMER DISCOVERY	PRODUCT VALIDATION	CUSTOMER ENGAGEMENT	GROWTH	SCALE
Stories Hub			Closed		
NaKo Games					2016
My Sales			Closed		
Micro-Forester			Closed		
LETSEIN			Closed		
FamBox				2016	
4 Car				2016	
Cube, Tech		2016			

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

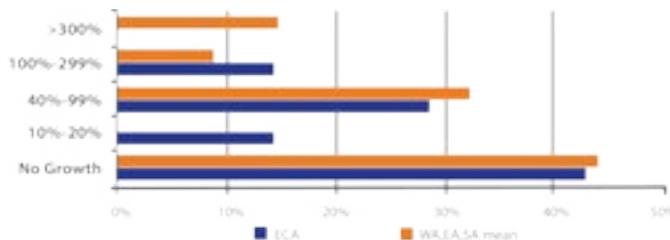
Closed: Organization is no longer active in the ecosystem.

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.

**CHART A.4. PERCENT CHANGE IN REVENUE OVER LAST 3 YEARS**



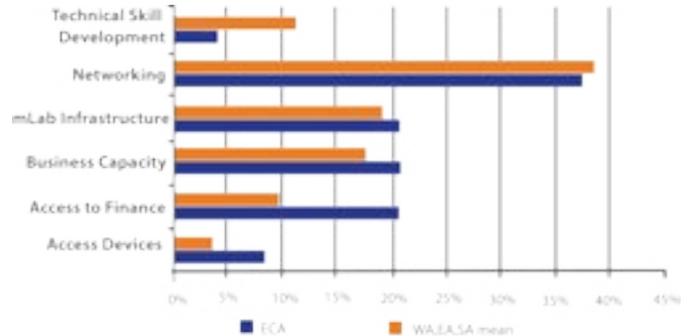
## MLAB ECA AND RANKING OF PERCEPTION OF BENEFITS

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

**CHART A.5. MOST VALUABLE MLAB SERVICE**



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.*

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

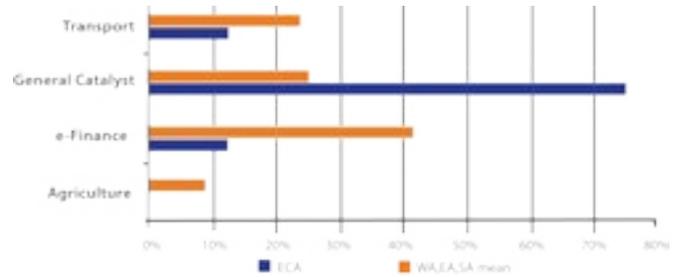
### MLAB ECA AND DIGITAL TECHNOLOGY IMPACTS

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?

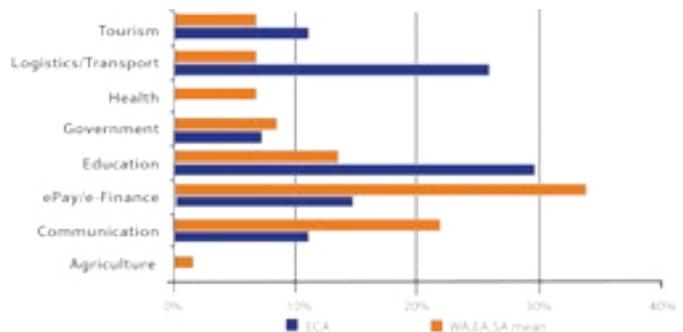
The Armenian digital technology market has largely focused on export markets and internally on service sectors. A number of applications under development that serve development and marginalized populations, with a focus on education and agriculture, have potential impacts in this area. Broadly, Chart 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.<sup>14</sup>

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.

**CHART A.6. SECTOR AREAS DIGITAL TECHNOLOGY HAS IMPACTED**



**CHART A.7. WHERE DIGITAL TECHNOLOGY HAS IMPACTED NATIONAL DEVELOPMENT**



<sup>14</sup> 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."<sup>15</sup> 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.<sup>16</sup> The mLab has the capacity to incubate six to seven start-ups concurrently, and offers beneficiaries work space and access to office infrastructure, internships,<sup>17</sup> 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.<sup>18</sup> The mLab also ceased training activities (which had largely been supported via corporate sponsorship) to concentrate on incubation and Pivot East.<sup>19</sup>

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."<sup>20</sup> 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.<sup>21</sup>*

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

15 <http://mlab.ke.co>.

16 <http://webfoundation.org/projects/mlab-east-africa/>.

17 Current mLab head (former CEO before the reorganization) Sheila Birgen started at mLab as an intern in 2012 (infoDev 2016).

18 mLab interview.

19 mLab interview.

20 infoDev 2016.

21 Hersman 2016.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

TABLE B.1. SELECT M:LAB EAST AFRICA RESULTS, PROVIDED BY M:LAB EAST AFRICA\*

INDICATOR	2011	2012	2013	2014	2015	2016
Start-ups created with mLab support	6	12	50	67	80	65
Revenue generated by start-ups US\$	141,7270	0	627,000	535,000	936,000	660,000
External investment raised by start-ups US\$	0	1,000,000	1,500,000	1,865,000	2,120,000	1,870,000
Number of new direct jobs created	0	56	100	140	194	176
Consumer app users reached	0	0	263,000	387,110	1,853,200	2,560,780
Apps reaching underserved communities (bop, rural, & social dev apps)	38	0	78	111	134	278
New mobile apps brought to market	115	0	196	234	168	278
Number of app prototypes created	60	70	301	67	80	278
Number of teams applying for in-depth mLab support	0	338	460	219	315	281
Teams receiving in-depth one-on-one support	7	0	119	63	40	79
Number of people trained	0	0	462	126	122	288
Number of developers and entrepreneurs reached	0	0	5,000	193	202	293

\*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 Mwingu 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

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

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.

*A great deal of early agriculture-focused start-ups were providing farmers with information on prices that it was hoped would help them get better prices and in some cases might even claim they could therefore eliminate the “middle man.”*

Twiga Foods (not an mLab company), “a mobile-based supply platform for Africa’s retail outlets, kiosks, and market stalls,” turned this proposition on its head by seeking to supply small-scale retailers (currently 2,000 of them a week) with a limited range of physical goods: bananas (of which it has supplied 27 million), tomatoes, onions and potatoes. It buys from farmers and runs its own warehouses, freezer units, and transport. In other words, it seeks to make more money for the shop outlet and the farmer by making the middle of the value chain more efficient and faster. It offers better prices than the wholesale market and delivers to the shop door. On this basis it has gone from 3 staff in November 2013 to 146 full-time employees and 50-60 part-time employees. It has plans to expand into neighboring countries in 2017.

## 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, (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.

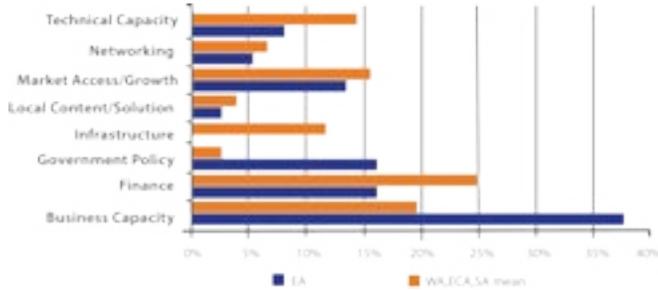
### The Access to Finance Landscape

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 on average, and a much lower frequency from informal funding.

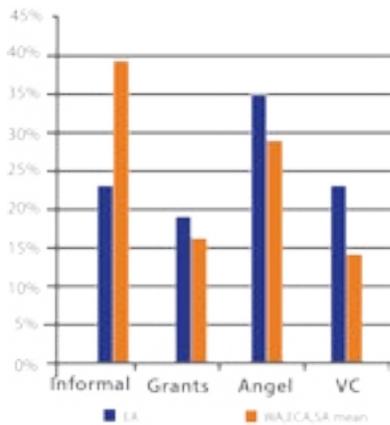
### Impact of Digital Technology on Other Sectors

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.

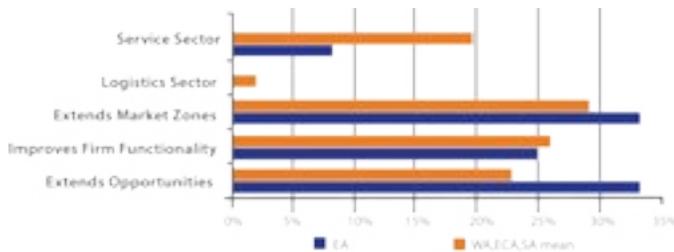
**CHART B.1. PRIMARY SUCCESS FACTORS FOR SUSTAINED GROWTH OF MOBILE TECHNOLOGY SECTOR**



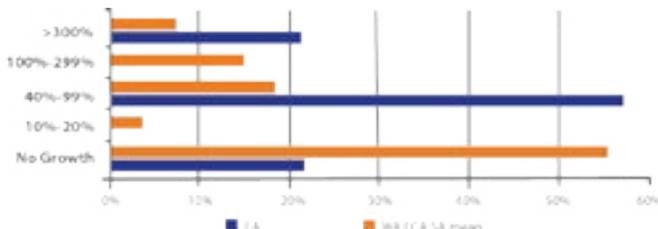
**CHART B.2. START-UP FIRST FUNDING SOURCE**



**CHART B.3. HOW AND WHERE DIGITAL TECHNOLOGY IMPACTS OTHER ENTREPRENEURS**



**CHART B.4. PERCENT CHANGE IN REVENUE OVER LAST 3 YEARS**



## 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.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

**TABLE B.2. MATURATION AND SURVIVAL STATUS FOR SELECT INCUBATED START-UPS, NOVEMBER 2016**

NAME	CUSTOMER DISCOVERY	PRODUCT VALIDATION	CUSTOMER ENGAGEMENT	GROWTH	SCALE
Afroes		2016			
CardPlanetSolutions			2016		
Eneza Education					2016
Forex.co.ke			2016		
Illuminum Greenhouses				2016	
Instasave				2016	
Kidogo			2016		
Kopo Kopo					2016
Leti Arts			2016		
Ma3route			2016		
MedAfrica				2016	
mFarm				2016	
MobiDev				2016	
mPayer					2016
Sendy					2016
Shield Finance				2016	
Sleepout				2016	
TotoHealth				2016	
Uhasibu				2016	
Whive				Closed	

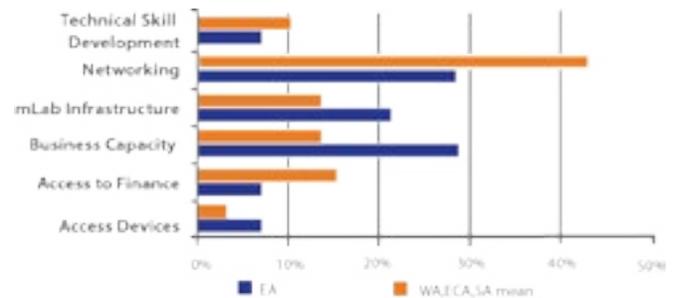
Active: Organization is still active in the ecosystem under its original or new identity.

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.

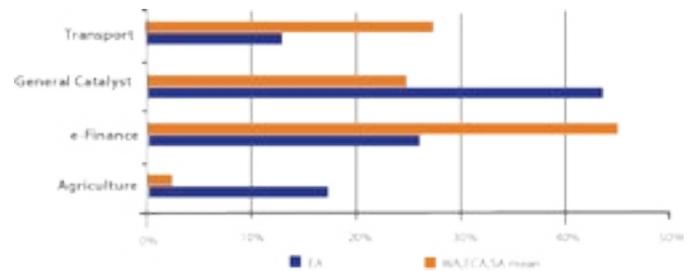
CHART B.5. MOST VALUABLE MLAB SERVICE



## M:LAB EA AND DIGITAL TECHNOLOGY IMPACTS

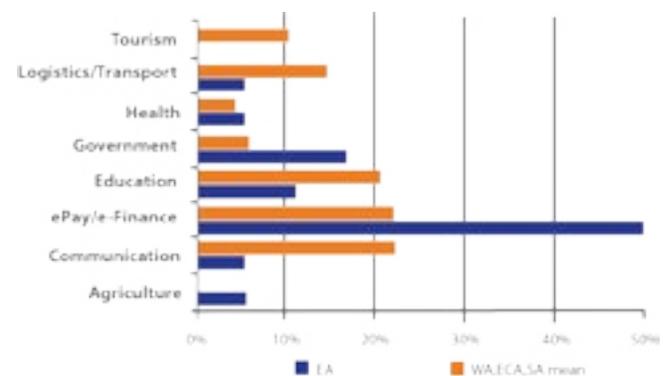
This section reports on where respondents think digital technology has had the most significant impact.<sup>22</sup> The question was addressed in two ways. The first is which sectors have the highest impact on digital technology. The second is where digital technology has the highest impact on national 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.

CHART B.6. SECTOR AREAS DIGITAL TECHNOLOGY HAS IMPACTED



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.

CHART B.7. WHERE DIGITAL TECHNOLOGY HAS IMPACTED NATIONAL DEVELOPMENT



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.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

# 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.<sup>23</sup> 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 Jambar 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.<sup>24</sup> 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.<sup>25</sup>

## 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

<sup>23</sup> 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.

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

<sup>25</sup> The CTIC was not included in the first assessment that covered 2011-2013.

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

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

\*CTIC was not included in the first assessment.

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, mLab 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

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

on digital services—like People Input, which continues to thrive—or on outsourcing. But as in Kenya, there was neither a young start-up community nor a very large digital ecosystem at that point in time.

Senegal now has five other incubators and co-working spaces: virtual incubator Concree (run by Baobab Entrepreneurship), Jjiguene, Jokkolabs, Fab Labs (Orange), and Synapse Centre (a generalist incubator). Three of these incubators—Jjiguene (aimed specifically at women), Jokkolabs, and the Synapse Centre (a non-tech incubator)—are all in the Sacre Coeur district of Dakar.

Thus the mLab is part of a larger system encouraging entrepreneurship. The CTIC has described the structure as follows: training and idea generation occur at universities and within digital technology communities; then acceleration (prototype, product, and business development) and longer-term start-up incubation take place at the CTIC/mLab, and growth and scale happen in the market.

Although the start-up scene is lively and energetic, it has yet to attract the range of investment sources found elsewhere. The only source specifically targeted at tech start-ups is Teranga Capital, set up by the former head of the CTIC. A significant number of start-ups have been created by returning diaspora. Government support includes the opening of the CTIC, but there are no programs aimed specifically at tech start-ups. From the private sector two of the mobile operators—Millicom (with a competition) and Orange (with a Fab Lab)—have provided support. The community network Mobile Monday flourished for a number of years but is currently not active.

Starting from a much lower base, Senegal's digital start-up ecosystem has never had a hype wave in quite the same way as Kenya. As a francophone market, it was much less well known globally than Kenya. However, there has been a growth in start-ups, and undoubtedly there is now a higher level of skill and expertise. A significant number of start-ups have been created by diaspora Senegalese returning to their home country. The volume and quality of digital skills in the country has grown as the ICT sector itself has grown, and there has been a steady trickle of people returning from the diaspora with high-quality skills.

Senegalese industry verticals are beginning to apply digital technology to change work processes, but an overall absence of competition means the process is not fast-moving. The government has adopted digital technology in various areas (including customs), but adoption seems to depend on individual champions rather than an overarching government plan.

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. Charts C.1, C.2, and C.3 compare the CTIC/mLab WA to the mean value of the other three mLabs.

#### 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.

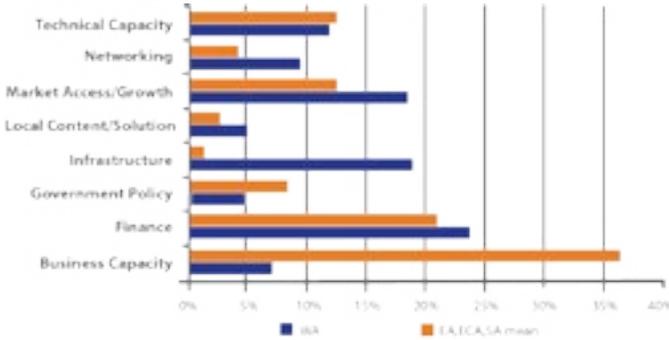
#### The Access to Finance Landscape

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.

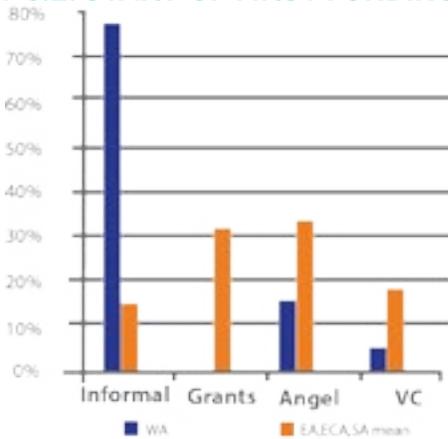
#### Impact of Digital Technology on Other Sectors

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.

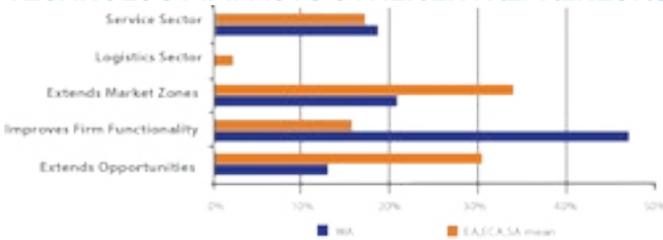
**CHART C.1. PRIMARY SUCCESS FACTORS FOR SUSTAINED GROWTH OF MOBILE TECHNOLOGY SECTOR**



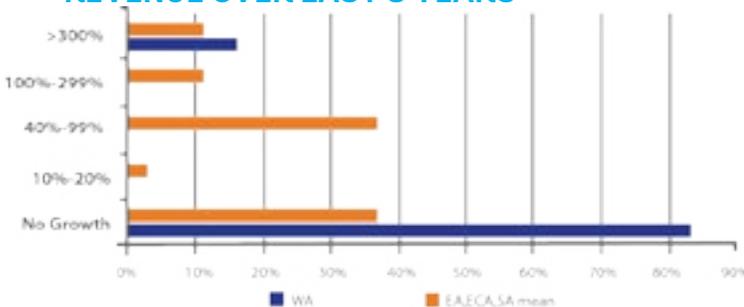
**CHART C.2. START-UP FIRST FUNDING SOURCE**



**CHART C.3. HOW AND WHERE DIGITAL TECHNOLOGY IMPACTS OTHER ENTREPRENEURS**



**CHART C.4. PERCENT CHANGE IN REVENUE OVER LAST 3 YEARS**



## CTIC AND START-UP CREATION AND DEVELOPMENT

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 C.2. MATURATION AND SURVIVAL STATUS FOR SELECT INCUBATED START-UPS, NOVEMBER 2016**

CURRENT NAME	CUSTOMER DISCOVERY	PRODUCT VALIDATION	CUSTOMER ENGAGEMENT	GROWTH	SCALE
Byfilling				2016	
Dariss				2016	
Ecole au Senegal		2016			
Genius Family		2016			
Image In		2016			
Inaota		2016			
ITech Solutions				2016	
Nelam Services		2016			
Niokobok				2016	
Seysoo				2016	
Soft Solutions			2016		
Tagoor		2016			
Cybarc		2016			
L'africamobile				2016	
Linked Partners			2016		
Sentrust			2016		

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.

CHART C.5. MOST VALUABLE MLAB SERVICE

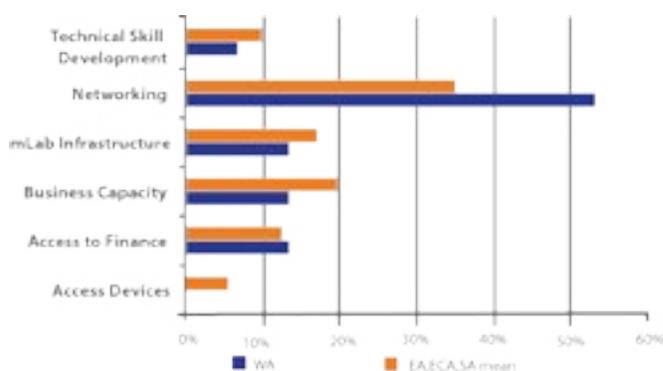


CHART C.6. SECTOR AREAS DIGITAL TECHNOLOGY HAS IMPACTED

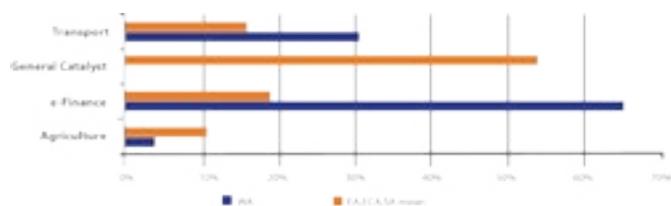
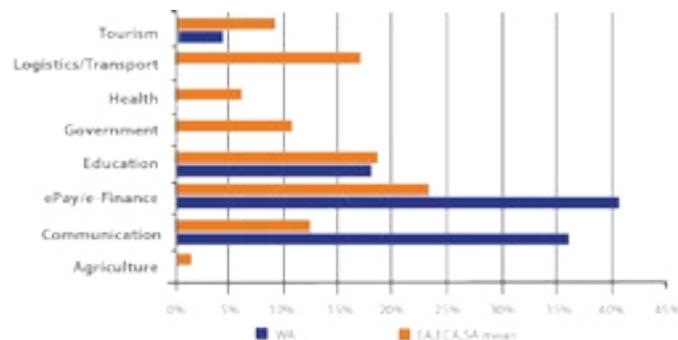


CHART C.7. WHERE DIGITAL TECHNOLOGY HAS IMPACTED NATIONAL DEVELOPMENT



# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

# APPENDIX D: MLAB SOUTHERN AFRICA CASE STUDY

## INTRODUCTION

### mLabs Program

mLab Southern Africa was launched in 2012 by a consortium,<sup>26</sup> 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.”<sup>27</sup>
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.<sup>28</sup>

*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*

<sup>26</sup> TIHMC, CSIR/Meraka, Infodev Worldbank, uNgana Africa, Innovation Lab, and Nokia.

<sup>27</sup> Gauteng Growth and Development Agency 2014, 39-40.

<sup>28</sup> Innovation Hub 2106.

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.<sup>29</sup>*

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.<sup>30</sup>*

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 Southern Africa launched.

<sup>29</sup> Comins and Kraemer-Mbula 2016, 77.

<sup>30</sup> infoDev 2015.

## 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 South African start-up ecosystem exists in a software industry with sales estimated at US\$1.25 billion in 2016, up from about US\$1 billion in 2013. A recent estimate by AngelList notes more than 1,100 technology start-ups in South Africa over the last three to four years, compared with 85 in Armenia, 528 in Kenya, and 31 in Senegal.

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

*- Long-time digital technology observer*

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

TABLE D.1. SELECT MLAB SOUTHERN AFRICA RESULTS, PROVIDED BY MLAB SA

INDICATOR	2011	2012	2013	2014	2015	2016
Start-ups created with mLab support	0	8	12	4	7	10
Revenue generated by start-ups US\$	0	283,000	345,110	–	–	732,482
External investment raised by start-ups US\$	0	625,293	652,205	–	–	732,000
Number of new direct jobs created	0	39	51	–	–	–
Consumer app users reached	0	0	598,000	–	–	14,527
Apps reaching underserved communities (bop, rural, & social dev apps)	2	6	8	2	4	4
New mobile apps brought to market	0	14	64	4	7	10
Number of app prototypes created	10	22	74	–	–	–
Number of teams applying for in-depth mLab support	2	32	78	–	–	–
Teams receiving in-depth one-on-one support	0	12	21	3	7	11
Number of people trained	108	0	223	17	370	267
Number of developers and entrepreneurs reached	0	1,122	1,578	92	52	30

**TABLE D.2. MATURATION AND SURVIVAL STATUS FOR SELECT INCUBATED START-UPS, NOVEMBER 2016**

CURRENT NAME	CUSTOMER DISCOVERY	PRODUCT VALIDATION	CUSTOMER ENGAGEMENT	GROWTH	SCALE
Afroes				2016	
Afta Robot				2016	
Appchemy				2016	
Geekulcha				2016	
GemProject				2016	
GoMetro					2016
hearScreen					2016
Jonga		2016			
Kim/Kimard Studio	2016				
Layyers		2016			
m-Factory				2016	
Music of Africa	Closed				
Senso		2016			
SimpliMantis	2016				
SpaceDecode	2016				
TechCloud		2016			
Toonserve	2016				
Tour 2.0				2016	

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 | Appendices

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.<sup>31</sup> 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.”<sup>32</sup>

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.”<sup>33</sup> In 2015 the national ICT Policy Review panel recommended improved “coordination of national, provincial, NGO and private sector-led research facilities, incubators and accelerators.”<sup>34</sup> 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,<sup>35</sup> meaning that 63 percent of the adult population can only use USSD, SMS, and other very basic products.

31 James et al. 2000, 37.

32 Ibid., 42.

33 RSA DST 2013, 12.

34 RSA DTPS 2015, 129

35 Shaban, 2016.

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.

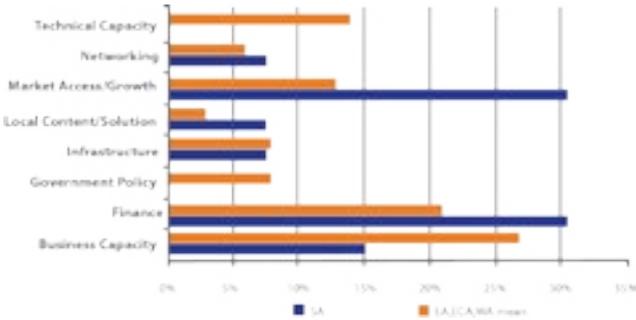
#### The Access to Finance Landscape

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.

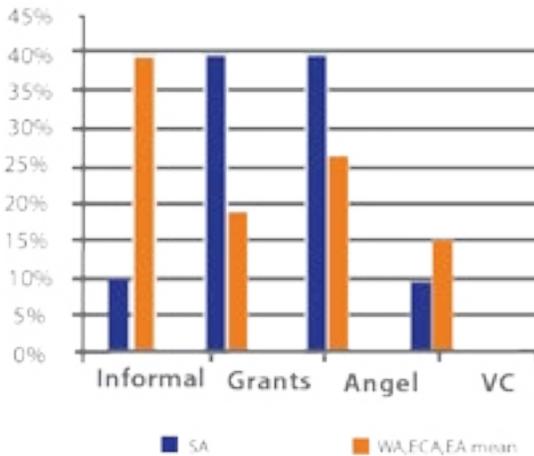
**CHART D.1. PRIMARY SUCCESS FACTORS FOR SUSTAINED GROWTH OF MOBILE TECHNOLOGY SECTOR**



**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.

**CHART D.2. START-UP FIRST FUNDING SOURCE**



**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)

**CHART D.3. HOW AND WHERE DIGITAL TECHNOLOGY IMPACTS OTHER ENTREPRENEURS**

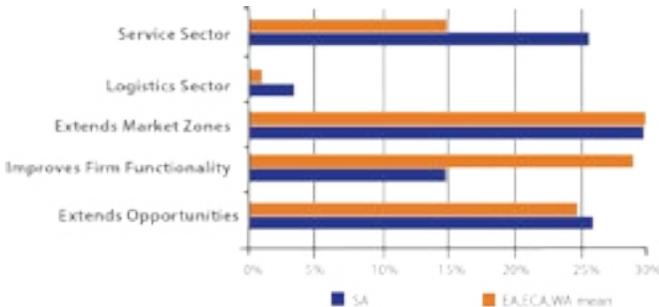
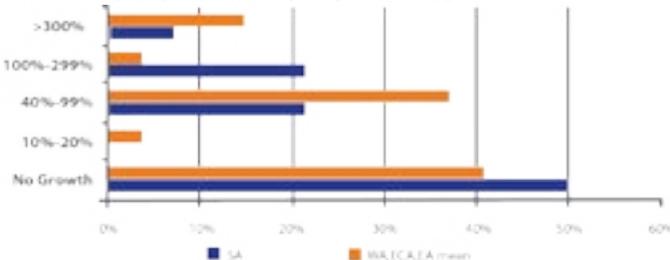


Table D.2 shows mLab-incubated firms’ survival according to start-up stage. It reveals a very slow development and evolution of the mLab start-ups. Many of them have taken several years from the time of they joined the mLab to even reach the stage of “customer discovery.” The other trend, likely associated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

**CHART D.4. PERCENT CHANGE IN REVENUE OVER LAST 3 YEARS**



**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

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

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 start-ups 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.

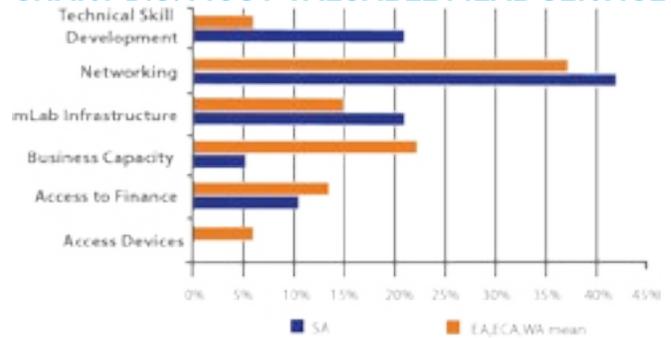
### MLAB SA AND DIGITAL TECHNOLOGY IMPACTS

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.

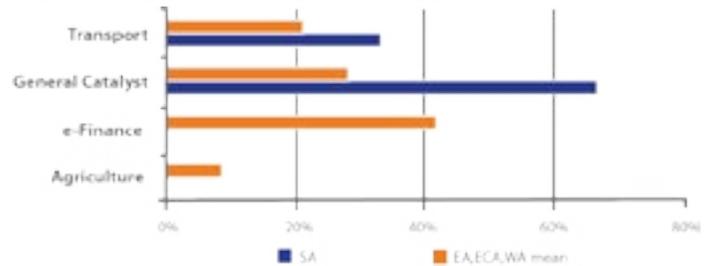
In South Africa digital technology is primarily recognized for its role as a general-purpose technological catalyst for business, social development, and economic growth. Transportation was also seen as relatively more impacted by digital technology than in the remainder of the sample. Interestingly, 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.

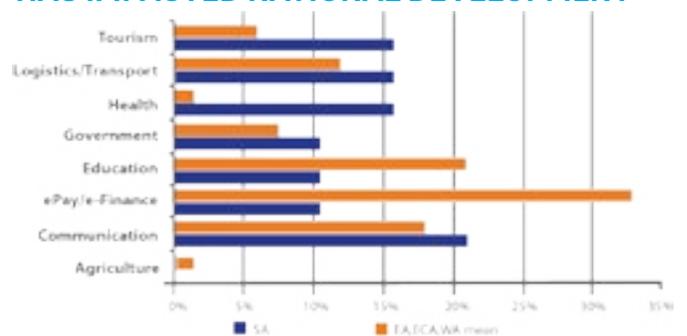
**CHART D.5. MOST VALUABLE MLAB SERVICE**



**CHART D.6. SECTOR AREAS DIGITAL TECHNOLOGY HAS IMPACTED**



**CHART D.7. WHERE DIGITAL TECHNOLOGY HAS IMPACTED NATIONAL DEVELOPMENT**



# 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.

## 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<sup>36</sup>—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.<sup>37</sup>

## 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?

<sup>36</sup> George and McKeown 1985.

<sup>37</sup> 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).

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

TABLE E.1. 2013 AND 2016 ASSESSMENT EVIDENCE CATEGORIES

ASSESSMENT	2013 STUDY	2016 STUDY
Start-up Creation and Development	<ul style="list-style-type: none"> <li>• Creation*</li> <li>• Revenue generation*</li> <li>• Jobs created*</li> <li>• Investment*</li> </ul>	<ul style="list-style-type: none"> <li>• Creation†</li> <li>• Survival†</li> <li>• Life cycle maturation stage†‡</li> <li>• Jobs created*†</li> <li>• Macro employment climate†‡</li> <li>• Revenue growth over last 3 years†</li> <li>• Revenue growth since joining mLab†</li> <li>• Ranking of mLab services †</li> </ul>
Customer Impact	<ul style="list-style-type: none"> <li>• Processes for mobile application with development impact†‡</li> <li>• Companies' development sector impact (n=8)†‡</li> </ul>	<ul style="list-style-type: none"> <li>• Sector (3) and revenue stream (23)†‡</li> <li>• Economic and social impact mapping†‡</li> <li>• Impact mapping by revenue stream†‡</li> <li>• Ecosystem member perceptions about impact of digital technology on national development† ‡</li> </ul>
Ecosystem Influence	<ul style="list-style-type: none"> <li>• Talent pool*†</li> <li>• Inspiring and stimulating ecosystem*</li> <li>• Connecting local, regional, and international ecosystems†‡</li> </ul>	<ul style="list-style-type: none"> <li>• Ecosystem 3 years ago and now†‡</li> <li>• Talent and human capital*†‡</li> <li>• mLab ecosystem spillover benefits†‡</li> <li>• Access to finance*†‡</li> </ul>

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.<sup>38</sup> 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

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

documents were reviewed, including available mLab progress reports, annual reports, and other analyses pertinent to mLabs.<sup>39</sup> 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
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

<sup>39</sup> infoDev 2014a; Omwansa 2015.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

TABLE E.2. SAMPLE GROUPS, DEFINITIONS AND SIZE

SAMPLE GROUP	DEFINITION	N=162
	<b>mLab Beneficiaries</b>	<b>59</b>
Client	People/firms incubated via services provided by mLabs before 2014.	31
Closed (new)	Clients no longer in the digital technology applications or digital technology market as entrepreneurs. This sample group was not part of Assessment 1.	5
Newcomer (new)	People/firms incubated via services provided by mLabs since 2014. This sample group was not part of Assessment 1.	23
	<b>Non-mLab Startups</b>	<b>39</b>
Comparable	People/firms receiving digital technology incubation or acceleration services from non-mLab incubators	27
Counterfactual	Entrepreneurs, startups and businesses that have developed digital technology businesses without digital technology incubation or acceleration services.	12
	<b>Ecosystem</b>	<b>63</b>
End User	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.	18
Investor (new)	Mobile enterprise investors. This sample group was not part of Assessment 1.	11
Ecosystem Actor	All actors populating the entrepreneurial ecosystem not included in any of the other categories, including Lab staff	34

## 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” beneficiaries.<sup>40</sup>

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.

<sup>40</sup> 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.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

## 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 47 - For enterprises that no longer exist in the mobile development ecosystem, how did you/they exit the market? acquisition/sale/buyout/takeover?

O 48 - Among these exited (closed) firms, did some individuals from the firm reenter the mobile development ecosystem? How many? Where in the market?

O 49 - How did the mLab experience influence what you are currently doing?

O 50 - 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 51 - What applications have the greatest impact on end users? O 52 - How?

C 53 - What applications have the greatest impact on national development? O 54 - How?

C 55 - Are there particular sectors where mobile applications and digital technology are more likely to help national development than others?

O 56 - Why?

O 57 - Do you have demographic and geographic data on end users? - Describe or provide examples.

C 65 - What mobile applications have had the greatest impact on national development?

C 66 - What are the primary sectors where mobile applications have been deployed and had the most impact? Digital technologies?

O 67 - What are common challenges to expanding the utility of mobile apps for national development? Digital technologies?

O 68 - What changes can enable mobile apps and digital

technology developers to boost national development?

O 69 - Are there areas where mLabs and other incubators can increase the impact of their contribution to national development?

O 70 - How has the mobile application and digital technology entrepreneurial ecosystem changed over the past few years? O 71 - The general entrepreneurial ecosystem?

O 72 - 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.

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

# 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](http://coders4africa.org/Gebeya/Anwani/Buymore)

CoinAfrique

Comparez

Concree

CTIC Dakar

Cube Technologies

Dasaran.am

DataIntegrated

Dev Academie

Devcorp

Digitata

DreamGirls International

Echo Mobile

Eduz

Emerging Markets Capital

Eneza Education

Enterprise Innovation Center

Eyone

Fambox

Forex

EntrepreneurEnAction.com  
Former iHub employee  
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  
Looma  
Ma3Route  
MahalaMobile  
M-Changa  
Mdundo  
Medi  
m-Factory  
Microsoft Innovation Center  
Mission East  
mLAB ECA  
mLab SA Pretoria  
mLab SA Cape Town  
mLab start-ups, current (5)  
MobiDev  
Mobile Monday  
Mobile4Senegal  
Mobitainment  
Monniz  
Mugambi  
My Sales  
Nailab  
NaKo Games  
Ndiaye  
Nest  
Nextdream  
Niokobok  
Olive Tree  
Omidyar Foundation

# Do mLabs Still Make a Difference?

## A Second Assessment | Appendices

PaintIn	Union of Information Technology Enterprises
Partech Ventures	Useful and Beautiful
People Input	Volkeno
PicsArt	WeDoApps
Police Tool	WISS
Prestadak	World Bank
Prestadak/Ligueye.com	World Wide Worx
Project codeX/codeX Academy	Yerevan State University students (3)
Senso	Yux
Shield Finance	Zege Tech
Shopmeaway	
Simplimantis	
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	



© 2017 The World Bank Group

1818 H Street NW

Washington, DC 20433

Website: [www.infodev.org](http://www.infodev.org)

Email: [info@infodev.org](mailto:info@infodev.org)

Twitter: [@infoDev](https://twitter.com/infoDev)

Facebook: [/infoDevWBG](https://www.facebook.com/infoDevWBG)

