Social Innovation Mapping:
Social Entrepreneurs Changing Lives Through ICT

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Intel and Ashoka share a deep commitment to the power of entrepreneurship and innovation to drive systemic changes that enrich the lives of all. Both have worked to empower people to succeed in a rapidly changing world by building their skills as problem solvers and critical thinkers.

In 2012, Intel and Ashoka came together to invest in technology-based innovations on a global level in order to enrich the lives of vulnerable groups and build their potential as changemakers. The partnership resulted in the election and support of eight new Ashoka Fellows, including social entrepreneurs with system-changing technology-based solutions that improve the lives of women and girls, as well as to launch the She Will Innovate Competition.

Through the Ashoka Changemakers platform, the competition identified a broad base of social innovators that are launching technology ideas to improve the lives of women and girls, which led to providing support for the six winning ideas that emerged from this competition.

Building on this partnership, the following report showcases how ICT is being used by social entrepreneurs to help them succeed in a rapidly changing world. It identifies key challenges that need to be tackled in order to unlock the full power of ICT for social good, and it highlights opportunities for technologists to become changemakers.

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Technology, particularly Information and Communication Technologies (ICTs), can be powerful tools; used appropriately, they can increase scale and impact, and multiply positive results. A 2011 independent evaluation by the World Bank, the largest multilateral financier in developing countries in the ICT sector, illustrates the difficulties of achieving development results through ICT. It found there is a 40 to 60 percent failure rate for the ICT objectives of the projects it supported (predominantly ICT components in projects that supported public sector governance, education, and health, among others).

The following Social Innovation Mapping report identifies patterns of innovation in the work of technology-based social entrepreneurs who are empowering people to succeed in a rapidly changing world, and the key challenges that need to be overcome to unlock further impact.

The report is rooted in the stories of social entrepreneurs and how they are creating widespread impact across a wide range of fields, from education and civic participation to economic development and health. Guy Etienne, for example, is redesigning a Haitian curriculum so that teenagers use their school projects to solve city-wide problems, such as building the country’s first solar powered street light; Shivani Sorya is ensuring that being un-banked isn’t a barrier that prevents obtaining a credit-rating and building wealth for tens of thousands of people in India and Kenya; Hilmi Quraishi has reached more than 22 million Indians through games that address public health issues such as HIV/AIDS and infant mortality; and Jamila Abbass is increasing the wealth of more than 7,000 farmers by creating a mobile tool that collects and shares real-time price information for different crops in markets throughout Kenya. A common thread weaves through the work of each of these innovators: it is their entrepreneurial drive that turns challenges into opportunities, and sparks new possibilities for using ICT to transform lives.

The Social Innovation Mapping offers an inductive understanding of how the solutions work together in context to effect change, based on case studies and interviews with Ashoka Fellows whose solutions have proven successful. Addressing a complex or entrenched social challenge can easily get mired in descriptions of the problems and their numerous causes. This report avoids that trap by telling stories about effective solutions in order to provide a different way of thinking about systems change—one that values practice over theory, and on-the-ground invention over deductive analysis.

Thus, the solutions profiled in this report give cause for hope, and reason to believe the future will improve. Ultimately, these pages are an invitation to re-envision what is possible, through the eyes of entrepreneurs.

Based on analyzing the work of leading social-entrepreneurs, this report highlights nine common patterns observed in 16 countries around the world. Two types of patterns are featured: the Barriers that social entrepreneurs choose to focus on, and the Design Principles they use to overcome these barriers. It tells the stories of how these social entrepreneurs are creating widespread impact through common approaches, even in disparate contexts.
The common design principles that these social entrepreneurs use to create solutions and increase their impact include:

1. Moving Beyond Digital Literacy to Cultivating Digital Citizenship: not only providing digital literacy, but ensuring ICT skills are used in a hands-on way to solve social problems.

2. Ensuring ICT Solution Contains Deep Stakeholder Engagement: anchoring ICT success in the strength of service-delivery team and relationships with the community.


4. Creating Decentralized Knowledge Networks: enabling the exchange of information without the need for a central coordinating body.

5. Aggregating Citizen Driven Data to Influence Decision Makers: influencing central decision making bodies by aggregating data that is reported by citizens.

Common barriers social entrepreneurs identified as the core component of a problem that they would choose to tackle include:

A. Centrally Owned ICT Infrastructure is Restricted by Traditional Business Models: technological solutions remain monopolized and do not reach all populations that need them.

B. Data Value Chain is Broken: Timely ground-level data that is essential for successful development is still difficult and expensive to collect, transfer, and use.

C. Educational and Vocational Training Can’t Keep up with Changing Job Market: young people are not fully equipped with the ICT knowledge they need as future job-seekers.

D. Social Enterprises Can’t Afford to Drive Technology Innovation: the cost of maintaining upgrades for technology solutions, let alone driving new innovation, remains very high.

OPPORTUNITIES TO ACCELERATE SOCIAL IMPACT

The report further highlights common challenges that these social entrepreneurs are facing when using ICT, let alone driving technology innovation. Each challenge is an area of opportunity for grantmaking organizations and entrepreneurs to find better ways to tackle these issues:

1. Doubly Challenged Technologist Hiring: hiring technologists in any sector is competitive to begin with, and doubly challenged because of lower salary levels in the social sector, and the scarcity of in-house managerial experience to optimize technologists’ contributions.

2. Traditional Grant-Making Doesn’t Cover ICT needs: Two types of critical needs are not fully met by grants: ICT needs directly to social impact goals (e.g. a mobile tool that better prevents infant mortality) and ICT needed for the organization to run more efficiently (e.g. financial management systems). Partial funding increases the costs of coordination, or doesn’t account for the cost needed to create, maintain, and improve custom ICT solutions.

3. Lack of Capacity to Utilize Pro-Bono or Open-Source Options: there is limited capacity to accept pro-bono offerings or knowledge on how to use open-source options that will increase social impact.

4. Partnerships Require Longer Commitment and Specialization than Feasible: Technological consulting and partnerships have limited impact because they are often not longitudinal and/or context specific enough to be successful, given the possible complexity of each technological solution.

5. Data is “Too Big” for Social Entrepreneurs and “not big enough” for Big Data experts: organizations are not poised to fully use the unprecedented amount of data they can collect for the unique target populations or social issues they work with, and their data sets remain smaller and more fragmented than the “big data” sets that experts focus on.

LOOKING FORWARD

Overall, this report aims to build an understanding of the potential for ICT’s role in creating remarkable social impact, and to identify key challenges that can be overcome in order to accelerate social entrepreneurs’ impact. We hope this will inspire increased adaptation of technology, spark conversations between social innovators that will spread highly effective solutions, and inspire technologists to leverage their skills they make a contribution as changemakers.
The world is an increasingly more connected place. There are nearly 7 billion mobile phone subscriptions around the world, approaching 96% penetration globally. And even as wired broadband lags at roughly 10% of the population, a full third of the world subscribes to mobile broadband. As information and communication technology (ICT) is embraced in emerging markets, we have a tremendous opportunity to turn it to positive social impact.

With these issues in mind, the following Social Innovation Mapping is centered on identifying solutions that tackle the following framing question:

**HOW ARE SOCIAL ENTREPRENEURS USING ICT TO INCREASE THE SOCIAL IMPACT OF THEIR WORK AND THAT OF THEIR FELLOW SOCIAL INNOVATORS?**
SELECTIoN oF ASHoKA FELL owS

Ashoka is the world’s largest association of leading social entrepreneurs, with over 3,000 Fellows worldwide. After reviewing an initial pool of over 10,000 candidates annually, Ashoka elects approximately 150-200 of the most promising candidates as Ashoka Fellows. In order to be elected a Fellow, each candidate undergoes an extensive interview process with Ashoka leadership and global sector experts. Each Ashoka Fellow must meet the following five criteria:

1. New Idea:  
The work of a Fellow must be genuinely unique, with the potential to cause disruptive systems change.

2. Social Impact:  
A Fellow’s idea must have clear social impact on a national, regional, or even global scale. It must address the deep, systemic problems facing society.

3. Creativity:  
A Fellow must creatively approach a situation, devise unique solutions to overcome obstacles, and build networks and partnerships for success.

4. Entrepreneurial Quality:  
A Fellow must be passionate and dedicated to his or her work. He or she will not rest until the social problem is completely resolved.

5. Ethical Fiber:  
A Fellow must act ethically, and have a high level of integrity and commitment to the social cause.

Through a rigorous five-step, global process, each entrepreneur is thoroughly vetted for his or her character and capability to create systemic change. The process is long but fruitful. In fact, many candidates describe the selection procedure as one of the most difficult but enlightening experiences of their careers.

Candidates must communicate their ideas, scrutinize their methods, and reflect on themselves as individuals. Ashoka then provides stipends to allow Fellows the financial flexibility to fully dedicate themselves to their new ideas and offers a lifetime of engagement with a network of peers.
The following are common patterns that were found among 26 social entrepreneurs selected for case studies and interviews (See Appendix A for full list of social entrepreneurs) The two types of patterns featured include the Barriers which the social entrepreneurs choose to focus on; as well as the Design Principles they use to overcome them. While the pattern itself might not be entirely novel, the creative ways they have customized their solutions to create impact in their local context are innovative and presented as short case studies to illustrate each pattern.

DESIGN PRINCIPLES

Design Principles are clarifying insights that are distilled from the work of leading social entrepreneurs; they can be incorporated into how solutions are designed in order to increase their impact. Similar to the identification of principles in any design process, these principles apply more broadly than just a single tool or organizational strategy.

DESIGN PRINCIPLE 1. MOVE BEYOND DIGITAL LITERACY TO CULTIVATING DIGITAL CITIZENSHIP

While teaching digital literacy is essential, it is not sufficient. Given that ICT will keep changing rapidly, what counts as literacy at one time, very quickly no longer counts as literacy soon after. Thus, social entrepreneurs are not only providing digital literacy, but expanding how it is taught with three essential elements. Firstly, they incorporate hands-on experiences in real-world situations to ensure that what is taught is retained and challenged to remain up to date. Secondly, they cultivate life skills and other 21st century skills needed to ensure lifelong learning such as creativity, critical thinking, and collaboration. Thirdly, they design their programs with the intended outcome of not only ensuring that students’ have increased employability and self-sufficiency, but that they are utilizing ICT to solve social problems. This commitment to empowering others through ICT represents “digital citizenship”, and drives students’ opportunities for hands-on experiences and the development of 21st century skills. Thus, entrepreneurs are achieving many goals at once by deliberately moving beyond teaching digital literacy to instead cultivating digital citizenship.

Examples of social entrepreneurs modeling this approach include:
* Guy Etienne, Haiti
* Janet Longmore, Ethiopia, Kenya, Lebanon +6
* Karim Sy, Mali, Burkina Faso, France, Senegal
* Onno Purbo, Indonesia

DESIGN PRINCIPLE 2. ENSURE ICT SOLUTION CONTAINS DEEP STAKEHOLDER ENGAGEMENT

Social entrepreneurs repeatedly highlight the most successful component of their solution lying in non-ICT components. They recognize how multidimensional their solutions need to be in order to solve the social problems they are tackling and recognize that the provision of technology alone will not ensure that it is adapted or that it will lead to behavior change. An approach that is already well-recognized by the design community such as participatory and human centered design, social entrepreneurs anchor the success of their ICT innovation in how strong their on-the-ground relationships are, how creative they are in meaningfully fulfilling the needs of each of their stakeholders, and how patient they are in iterating until their solutions are fully adapted.

Examples of social entrepreneurs modeling this approach include:
* Anne Roos-Weil, Mali, France
* Hilmi Quraishi, India
DESIGN PRINCIPLE 3. UNLOCK POTENTIAL OF MARGINALIZED CLASSES IN ICT BY ALTERING PERCEPTIONS

Social entrepreneurs are altering perceptions of marginalized persons who are not well represented in ICT in ways that demonstrate their ability to not only succeed in ICT-based careers, but also offer unique competitive advantages. This is achieved changing the perspectives of both the broader society as well as the perception of marginalized persons about their own potential. As a result, previously marginalized classes are able to meaningfully participate in ICT-based careers in unprecedented numbers, transforming their own quality of life as well as that of society around them.

Examples of social entrepreneurs modeling this approach include:

* Khalid Alkhudair, Saudi Arabia
* Thorkil Sonne, Denmark
* Yuhyon Park, South Korea, Singapore, +2

DESIGN PRINCIPLE 4. CREATE DECENTRALIZED KNOWLEDGE NETWORKS

Social entrepreneurs are customizing ICT and creating local community networks that enable the exchange of knowledge without the need of a central coordinating body. The knowledge that is collected and shared is highly localized, specific, and received more quickly, which leads to a greater ability to act upon the information, and therefore succeed in creating local health, prosperity, and education.

Examples of social entrepreneurs modeling this approach include:

* James Nguo, Kenya
* Sanjeev Arora, United States, Uruguay, +2
* Serra Titiz, Turkey
* Jamila Abass, Kenya
* Eaklak Loomchomkhae, Thailand

DESIGN PRINCIPLE 5. AGGREGATE CITIZEN DRIVEN DATA TO INFLUENCE DECISION MAKERS

Social entrepreneurs influence central decision making bodies by aggregating data that is reported by citizens. Whether these decision making bodies are government policy makers, educational institutions, or technology companies - the ability to aggregate important data, and deliver it in meaningful ways to decision makers, are driving significant change in each of the social entrepreneurs’ intended sectors.

Examples of social entrepreneurs modeling this approach include:

* Sascha Meinrath, United States
* Alexandra Bernadotte, United States
BARRIERS

Barriers are core components of a problem that, if altered, could allow for true systems change. Barriers are not underlying causes that merely describe a situation, such as something as broad as “cultural attitudes”. Instead, they are movable, actionable, and specific to the problem. This is because the pattern-mapping is designed to highlight the key issues social entrepreneurs have chosen to tackle with pragmatic solutions. The following is a synthesis of the key barriers to emerge from our analysis of leading social entrepreneurs’ approaches.

BARRIER A. CENTRALLY OWNED ICT INFRASTRUCTURE IS RESTRICTED BY TRADITIONAL BUSINESS MODELS

Technological solutions do not reach all populations that need it due to a disincentive for reaching less wealthy or less concentrated populations. Companies that are already making lucrative profits by serving urban populations, for example, don’t see a need to take on the increased cost needed to reach more sparse, and less lucrative markets. While some countries have put in place funds to try to incentivize development in rural areas, the problem of full reach persists. Furthermore, for many exciting infrastructures, monopolies over the infrastructure or a limited set of providers leads to greater difficulty in overcoming abuses to human rights. Solutions that are not locally devised, locally informed, or diversified are less likely to have lasting impact.

Examples of social entrepreneurs tackling this barrier include:
* Sylvestre Ouedraogo, Burkina Faso
* Santosh Choubey, India

BARRIER B. DATA VALUE CHAIN IS BROKEN

Although there is greater access to data than ever before, timely, ground-level data which is essential for successful development is still difficult and expensive to collect, transfer, and use. This leads to difficulty in delivering higher quality of services such as healthcare and financial access for rural or poor communities.

Examples of social entrepreneurs tackling this barrier include:
* Josh Nesbit, United States, +20
* Shivani Siroya, India, South Africa, +2

BARRIER C. EDUCATIONAL AND VOCATIONAL TRAINING CAN’T KEEP UP WITH CHANGING JOB MARKET

The pace of ICT development drives rapid changes in the job market, but much of educational and vocational training is ill-prepared to meet these needs. Not only is it lagging in preparing youth for the current job markets but it is not equipped to prepare job-seekers to adapt to constantly changing job markets of the future.

Examples of social entrepreneurs tackling this barrier include:
* Mike Feerick, Ireland
* Donny Budi Utoyo, Indonesia
* Njideka Harry, Nigeria, Uganda, +3

BARRIER D. SOCIAL ENTERPRISES CAN’T AFFORD TO DRIVE TECHNOLOGY INNOVATION

Social enterprises by definition are not profit maximizing and are often structured as non-profits. They find it difficult to justify the large upfront cost of implementing a new technology and cannot afford to keep up with the salaries of quality technologists given that they are in high demand. Even when technology is open-source, it is difficult to know which solution to use, and cost-prohibitive to know how to customize the technology appropriately, let alone continue to maintain and upgrade it. And even when technology or technologists are offered pro-bono, there is limited capacity and know-how to be able to utilize these offerings. These limitations combine to make it difficult for social enterprises to easily incorporate the latest technologies or to drive innovation in technology.

Examples of social entrepreneurs tackling this barrier include:
* Sunil Abraham, India
* Daniel Ben-Horin, United States, +89 countries
* Ken Banks, United Kingdom, +70 countries
The following grid shows how existing solutions address specific components of a challenge within the field. It can show which strategies are most commonly (and most powerfully) used. Additionally, it can point to “holes” or areas where there can be an unmet potential for a solution that has not yet been invented, at the nexus of a need and an idea. For the purposes of this mapping, entrepreneurs have been categorized by the predominant design principle they are applying, and the barrier they are focused on. This does suggest that innovators are limited to these principles and barriers; in fact, most solutions of leading social entrepreneurs apply several principles to address multiple barriers.

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* social entrepreneurs listed as an example for more than one pattern.
THE STRENGTHS OF ASHOKA’S SOCIAL INNOVATION MAPPING

- It creates an entrepreneur’s view of the world by focusing on common patterns across solutions. Entrepreneurs—of necessity—design solutions that address the thorniest aspect of effecting change: the human interactions in a system. Recommendations based on entrepreneurial solutions can predict and show ways to circumvent behavioral barriers to change that are often not addressed in strategies crafted from a more idealized viewpoint.

- It allows successful solutions to be examined in context with one another. The mapping shows how ideas relate to one another, as well as to the core elements of the problem. The result is the emergence of clear patterns: Which aspects of a problem are going unaddressed? Are some strategies underutilized? Over utilized? Is there an aspect of a problem that has yet to be named? Are there holes in the system that await the design of a new solution?

- It provides the map for deriving a theory of change at a systems level. The patterns and insights revealed by the mapping allows the development of an integrated strategy around what mix of solutions could lead to an overall increase in heat applied to the problem. While any theory of change is subjective, this contextual mapping allows for a holistic approach that merely quantifying the success of individual projects may not provide.

- It creates criteria for predicting success. The design principles and barriers provide a road map for evaluating new projects and for guiding the invention of new ideas.

SOCIAL INNOVATION MAPPING METHODOLOGY

Overall, the social innovation mapping methodology (figure 4) is based on a framing question, which determines the focus of the analysis (figure 4). A sample across the network of social entrepreneurs is selected in order to pinpoint common innovation patterns - barriers the social entrepreneurs are focused on tackling and principles that enable social entrepreneurs using ICT to increase the social impact of their work and that of their fellow social entrepreneurs. The innovations are mapped onto a grid to further identify common patterns, accompanied by short case studies of the social innovations that have been analyzed, together with excerpts from interviews of the social entrepreneurs that are driving the solutions. Finally, the report concludes by identifying common challenges that all social entrepreneurs faced in driving social impact through ICT. Each challenge is an area of opportunity for grantmaking organizations, investors, technologists, and entrepreneurs to problem-solve better approaches.
Figure 5

PATTERN-RECOGNITION METHODOLOGY

FRAME QUESTION

RESEARCH SOLUTIONS

IDENTIFY PATTERNS

IDENTIFY BARRIERS

IDENTIFY DESIGN PRINCIPLES

CREATE SOCIAL INNOVATION MAPPING

IDENTIFY OPPORTUNITIES
DESIGN PRINCIPLES IN FOCUS
SOLUTION EXAMPLE:

Guy Etienne developed an innovative curriculum at the College Catts Pressoir in Haiti that integrates science, technology, innovation, and entrepreneurship into every lesson throughout the school day from primary to high school. The focus on student input, innovative thinking, creativity, or teamwork is a large departure from the traditional Haitian education system which emphasizes rote memorization. At College Catts Pressoir, students practice self-reflection, problem solving, and develop their creativity, all of which stimulates their growth as agents of change.

Students’ annual team projects address real community needs and often incorporate technology, and local and recycled materials. In the 90s, students built the first traffic light in Haiti after 20 years without operation, drawing the attention of the Haiti President. Other student innovations range from a surveillance camera offered to the National Police to a public transportation system for Port-Au-Prince that was later adopted by the Minister of Public Works.

Etienne’s school model is successfully implemented through the engagement and training of multi-stakeholders in education, including parents, school directors and teachers. The buy-in of parents into the new education system was essential to the implementation of the results-based approach.

IMPACT:

> Students at the College Catts Pressoir model begin learning about robotics as early as 1st grade and demonstrate their robotic inventions at the school’s annual ExpoScience which draws 5,000 people, including government officials.

>40% of innovations created by students are later adopted by the school, government or other external institutions, such as a robotic prototype to help clean the streets of Port-Au-Prince.

>40,000 copies of a civic education textbook for community development has been printed and distributed across five regions.

>The school model is being spread nationally through the training of 18 public schools and 6 officials of the Ministry of Education, and internationally through collaboration with 2 major universities in Haiti and social entrepreneurs in France to build a collaborative platform.

Additional Patterns:
* Educational & Vocational Training Can’t Keep up with Changing Job Market (Barrier C)
**SOLUTION EXAMPLE:**

Karim Sy created collaborative working spaces, called Jokkolabs, to allow young entrepreneurs in Africa to create social and business ventures, particularly as a part of professional tech communities inspired by the open-source culture. Through Jokkolabs, Sy is combating the notion that ideas should be cultivated in secret; rather he encourages entrepreneurs, or Jokkoworkers, to share resources and pursue even greater visions through joint ventures.

Jokkoworkers are not only connected to each other; Sy connects them to thinkers and doers from the local and international community. Jokkolabs offers office space, staff, and other support mechanisms such as online platforms to boost projects that are new or growing. Sy emphasizes the need for entrepreneurship for the betterment of society; he taps the innovative energy in Jokkolabs to tackle pressing social issues in health, education (including youth creativity and innovation's development), agriculture, open technology, media and governance. Moreover, Jokkolabs develops future entrepreneurs in the community by offering public seminars and training programs.

**IMPACT:**

> As of 2014, Jokkolabs has welcomed over 142 young Jokkoworkers, which have gone on to launch various entrepreneurial ventures, a number of which continue being incubated within the co-working space.

> 6 Jokkolabs have been established in four countries: Mali, Burkina Faso, France and Senegal.

> One of Jokkolabs' initiatives in response to timely social issues has included setting up the IT backbone which allowed local COs to monitor the recent contentious elections in Senegal in real time. Similar collaborative, open source initiatives are being cultivated for health & agricultural challenges.

"The sharing of experiences and good practices could be the mainspring of innovation and social entrepreneurship for a common prosperity." [4.1]
DESIGN PRINCIPLE 1
Move Beyond Digital Literacy to Cultivating Digital Citizenship

SOLUTION EXAMPLE:

Onno Purbo is playing a central role in transforming Indonesia into a knowledge-based society by pioneering the development of low-cost technologies, recruiting and mobilizing a growing network of “techies” committed to broadening access to and use of the Internet, and advocating related changes in public policy and education. Indonesia lags behind much of the world in bringing internet access and ICT to the broader population. While it has made great strides, a majority of the population still does not have access, at great economic and developmental cost.

Onno’s primary strategy is establishing a network of young technology professionals who share his vision. Beginning with a small student group, the now-nationwide network produces an array of knowledge work and serve as community technology advocates and educators. These change agents work on low-cost, local technology solutions in their communities.

A major component of Onno’s work is also low-cost internet access technology. He uses low-cost WiFi deployments as well as open source cellular base stations to deliver “last mile” internet access at a lower cost than slow dial-up. In particular, he focuses on educational institutions at all levels, delivering access technology as well as continually lobbying the government for appropriate resources.

IMPACT:

> Purbo’s network of young technology professionals refined a low-cost WiFi technology approach to extend affordable internet access to excluded communities. With a cost of $15-$45 per month for a household, the self-financed system is dramatically lower than dial-up systems.

> Through the International Development and Research Centre, Purbo helped to lead an advocacy campaign to change regulations surrounding Internet access.

Additional Patterns:
* Centrally Owned ICT Infrastructure is Restricted by Traditional Business Models (Barrier A)
**SOLUTION EXAMPLE:**

Janet Longmore founded the Digital Opportunity Trust which is addressing the global problem of youth unemployment through practical peer-led engagements, an interconnected global network and strategic cross-sector partnerships. Through modern technology and management training, she equips youth from around the world to become leaders of economic and social growth within their communities. DOT empowers young university graduates to be agents of change in their communities by developing their life, business and technological skills as well as work experience.

The DOT Interns program effectively bridges the digital divide between formal education and labor force entry with a two-week training in entrepreneurship, ICT, and workforce development and a 9 month internship. DOT program also commits to maintaining a 50-50 gender balance to address the challenges women face in entering the workforce and serving as role models. The DOT program is customized to the local context of social enterprises, and thus has established programs worldwide. Communities with DOT programs are transforming; they are attracting more micro capital, generating employment and becoming more safe and stable.

**IMPACT:**

- Youth-led DOT programs are in 7 countries including Ethiopia, Kenya, Lebanon, Mexico, Rwanda, Tanzania, Uganda, and UK
- Over 4,000 interns have been mobilized and 800,000 community members empowered
- Each DOT Intern directly impacts the lives of 200 community members
- 90% of DOT Interns have found employment or started their own businesses upon completion of the program, with 71% of participants reporting an increase in income

**Additional Patterns:**
- Ensure ICT Solution Contains Deep Stakeholder Engagement (Design Principle 2)
- Educational & Vocational Training Can’t Keep up with Changing Job Market (Barrier C)
**SOLUTION EXAMPLE:**

Donny Budi Utoyo works to encourage responsible use of ICTs by an informed populace through education and social change. He was inspired to found ICT Watch after a personal experience with Internet addiction following the online chatting boom of the late 1990s. Spending hours online with only a couple hours of sleep every night and becoming increasingly withdrawn from real social life, he realized how people should be prepared for the sometimes negative repercussions of Internet usage in order to benefit from it. ICT Watch is committed to freedom of information as essential to the future of Indonesia and sees that there are legal threats to that freedom. Rather than direct advocacy, he is showing that citizens can use the internet safely and healthily, so that the government need never curtail their freedoms out of fear.

Through the Internet Sehat (healthy internet) program, Donny has endeavored to show the government that people can take responsibility for their online activities. For this ICT Watch introduced a how-to module for parents and teachers, and a comic book for children/youngsters containing basic knowledge about the Internet, Internet hazards, and means of safety and privacy protection. These modules are patented under creative common license, and have been used by other organizations in various internet skills training. Donny also distributes an Internet Code of Conduct that asks users to agree to a set of guidelines for healthy use of ICTs and has worked with Indonesian ISPs and internet cafes on a voluntary filtering system for family internet use.

ICT Watch aims to build capacity among Indonesians for participation as creators and distributors of online content. It sponsors the Internet Sehat Blog Award to appreciate those who positively use the internet for knowledge exchange. It is also developing a curriculum for Citizen Organizations on how to optimally use the Internet and social media to achieve social change. Topics in the curriculum include social media, blogging, content strategy and privacy security. The success of Donny’s model, called Internet Sehat (healthy internet), has led to it being offered as an alternative model to government censorship bills.

**IMPACT:**

> Tens of thousands of people have received training while 15,000 Facebook members and 950 Twitter followers respond to internet posting daily

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**Additional Patterns:**

* Aggregate Citizen Driven Data to Influence Decision Makers (Design Principle 5)
Anne Roos-Weil founded Pesinet to create a cost-effective medical system to drastically reduce the number of African children and mothers who die from easily preventable and treatable diseases. Because of the difficulty for Malians to access primary healthcare, Roos-Weil customized mobile technology and created partnerships with community health workers and centers to enable the collection of basic health data on women and children through home visits.

Pesinet recruits and trains a female workforce who conduct the home visits; they use cell phones to send data to local doctors at partnering health centers. The doctors then follow up with patients that may need further attention or diagnostic tests. By evaluating how Pesinet injects demand (consultations and medication) into the primary health centers, Anne has convinced the National Federation of Community Health Centers to sign a national agreement to deploy her service. It defines the responsibilities of each stakeholder to successfully deploy Pesinet in a determined area as well as the financial conditions: local primary doctors are paid to dedicate an average of 15 hours a week to treat Pesinet patients; each staff has to regularly follow basic trainings on preventative care and customer-friendly behavior to become more empathic, weight agents become members of the primary centers’ medical teams to better integrate the service.

Pesinet partners include mutual insurance companies and private corporations interested in offering health services to their employees. It is able to create a sustainable, affordable model due to participating households effectively buying into a micro-insurance plan that prioritizes prevention and wellness.

**IMPACT:**

> Pesinet prevents 80% of child mortality from benign diseases, meaning a reduction of more than half of child mortality in the populations covered by the service.

> Children subscribing to Pesinet see a doctor three times as often than average.6

> 97% of subscribers consider the monthly subscription fees as inexpensive and 85.42% of the families are satisfied with the speed of detection.7

> As of 2012, Pesinet had reached 1,138 children from a total of 27,112 home visits by Pesinet staff.8 It is working with the Malian Ministry of Health to further scale this cost-effective medical system.

**Additional Patterns:**

* Create Decentralized Knowledge Networks (Design Principle 4)
* Social Enterprises Can't Afford to Drive Technology Innovation (Barrier D)
SOLUTION EXAMPLE:

Hilmi Quraishi created ZMQ Software Systems to disseminate public health messages through entertainment. Through mobile communication technology, Quraishi crafts opportunities to spread knowledge and awareness that can reach both under-privileged or marginalized communities as well as younger, tech-savvy consumers that are otherwise unmoved by traditional public service announcements through TV and radio.

Mobile games have been designed to work effectively without requiring literacy, and have expanded to cover topics ranging from public health, education and skills development to enterprise development, livelihood generation, disaster management and agriculture. Before fully releasing a game that meets the educational needs of a particular community, ZMQ Software system will often spend years building relationships with local communities and finding complementary services by partner organizations to ensure adaptation. The games are further iterated upon based on the impact and effectiveness of the messages in the game through anonymously stored game data.

For example, to tackle the urgent problem of HIV/AIDS among young outsourcing industry employees, ZMQ Software Systems created multi-lingual and culturally sensitive messages about HIV/AIDS prevention, transmission, and myths to this risk group through adventurous and appealing mobile games. The action-oriented games attract players with sports themes while simultaneously breaking down social sensitivities and misperceptions about HIV/AIDS, including Safety Cricket, AIDS Penalty Shoot-out, and Mission Messenger.

IMPACT:

> Over 22 million people have used ZMQ Software System educational cellphone games in topics ranging from public health, education and skills development to enterprise development, livelihood generation, disaster management and agriculture.

> ZMQ Software Systems was recognized with the World Business and Development Award in 2008 for its support of the United Nations Millennium Development Goals

> In its efforts to create a more fulfilling careers for technologists, ZMQ Software Systems has achieved high retention rates of its technology staff, with an average of over eight years.

Additional Patterns:
* Data Value Chain is Broken (Barrier B)
Pictured: Participants in largest regional jobs fair for women by Glowork, Saudi Arabia. See page 24.
SOLUTION EXAMPLE:

In a society that has both traditions and laws that make it nearly impossible for most women to find a job, Khalid is working to change the role and perception of women through economic empowerment. To achieve an objective of having women represent 50 percent of the Saudi workforce, Khalid Alkhudair founded Glowork, an initiative dedicated to integrating Saudi women into the workforce through recruitment, technology customization, public awareness campaigns, and policy changes.

As an online platform, Glowork fills the gap between job seeking females and companies that are ready to hire women by facilitating over a million job-seekers to share their resumes, and apply for thousands of previously unlisted vacancies. Alkhudair has also customized technology to create the “Virtual Office” monitoring tool, which allows companies to hire women to work from home, and thereby avoid the types of segregation laws or transportation challenges that make in-person work difficult.

Alkhudair works with the Saudi Ministry of Labor to change policies that make it difficult for companies to hire women, proposing and passing new laws mandating the hiring of women in several sectors including retail and manufacturing. He is also launching a series of marketing campaigns that encourage both Saudi men and women to think differently about the role of women in the workplace.

IMPACT:

> As of 2013, over 1.2 million women have shared their CVs on Glowork.net in order to apply to over 6,000 jobs posted by 159 companies.

> Efforts to support policy changes, such as staffing at surpermaket chains, have created over 50,000 jobs for women.

> Glowork has established the largest regional job fair for women that features prominent corporations and universities.

> In 2012, the United Nations and World Bank awarded Glowork as one of the most innovative solutions for job creation of the year.

Additional Pattern:

* Data Value Chain is Broken (Barrier B)
SOLUTION EXAMPLE:

As a mother of two, Yuhyun Park was worried about how easy it was for children to freely access digital media. 8-10 year olds in the U.S., for example, spend more than 7.5 hours daily on average engaged with digital media, which is a longer time than they spend in school or with family.

Park was particularly concerned about how most program interventions are targeted for children that are 13 and over, ignoring the needs of younger children. She saw the need to change society’s approach to younger children and technology as especially pressing since exposure to negative online content and digital addiction can stunt children’s social, emotional, and physical development. It can cause them to spend so much time in the virtual world that their development of life skills stagnates.

To overcome such information pollution, Park founded “infolutionZERO” (IZ). While traditional approaches to digital risk education focus on instructive methods for adolescents, the organization’s iz HERO program prioritizes prevention, rather than intervention within the 6-13 year old age group.

The program provides an integrated multimedia play & learning experience, including a web game, online portal, and comic book in addition to an interactive digital exhibition. It aims to provide an engaging, safe, and fun environment for children and their families. In so doing, the goal is to empower young children with responsible digital citizenship and character development through participation in a wide range of online and offline activities.

IMPACT:

> The iz HERO Exhibition serves as a learning hub for primary schools and is installed in three Korean cities as well as in Singapore. It is also creating a web-based game to help children become leaders in digital citizenship.

> 90% of children report enjoying the iz HERO educational exhibition, while a study by the Singaporean National Institute of Education found iz to improve attitudes toward cyber-risks.

> iz is expanding globally through partnerships with the U.S., Korean, and Canadian governments on a global mobile security campaign, and expansion of programs in Southeast Asia through UNESCO.

Additional Patterns:
* Move Beyond Digital Literacy to Cultivating Digital Citizenship (Design Principle 1)
* Educational & Vocational Training Can’t Keep up with Changing Job Market (Barrier C)
SOLUTION EXAMPLE:

Thorkil Sonne is transforming the way society perceives autism—from viewing it as a handicap to recognizing that it can become a competitive advantage. By demonstrating that autistic people can function in the business world and thrive as specialists in certain types of work, he is offering an often isolated population the opportunity for active, productive and fulfilling lives. Thorkil's employees are beginning to identify themselves as “specialists” rather than “autistics,” turning the focus to their capabilities rather than their disabilities. Characteristics and abilities such as precision, attention to detail, structured work style, and patient acceptance of repetitive tasks are particularly relevant to jobs in the IT field.

Sonne has created a for-profit software testing company, Specialisterne, which assesses and employs high-functioning autistic adults and uses their special skills to outperform the market and offer an isolated group of people opportunities for active and productive lives. Specialisterne’s assessment and training staff use toys such as LEGO to observe and interpret abilities and motivation. In addition to the technical knowledge necessary for software testing jobs, the training program covers a wide range of topics including how to approach a manager and how to prepare a CV.

IMPACT:

> Specialisterne has provided direct support to over 230 individuals in Denmark and has expanded its work to ten countries in Europe and North America.

> New companies using Specialisterne’s concept have emerged in Sweden, Belgium, the Netherlands, and Israel.

Additional Patterns:

* Social Enterprise Can’t Afford to Drive Technology Innovation (Barrier D)
SOLUTION EXAMPLE:

Eaklak Loomchomkhae is creating a crowdsourcing platform to share the information needed to recover missing persons in Thailand. The Missing Persons Information Center against Human Trafficking is a network of volunteers nationwide who contribute to the search for missing persons in diverse forms - from donating advertisement spaces in newspapers to providing transportation to retrieve missing persons. This crowdsourcing model is altering the view that missing persons are not a private family matter, but a pressing public concern. Through the creation of a national database of missing persons and initiating training for police officials on the recovery of missing persons, Mr. Loomchomkhae has redefined the process of searching for missing persons from the passive responsibility of the government to the active leadership by affected families and society at-large.

Mr. Loomchomkhae harnesses the strategic skills of the online members, including emergency response volunteers and traffic radio stations. The Missing Persons Information Center also analyzes data across police forces and government agencies, allowing analysts to identify historical trends in abduction or trafficking cases.

IMPACT:

> The Missing Persons Information Center has 40,800 online members with an active engagement ratio of 50-80%
> Every day 20,000-32,000 people are spreading information daily
> The recovery rate of missing persons is as high at 70%.

Additional Patterns:
* Data Value Chain is Broken (Barrier B)
SOLUTION EXAMPLE:

James Nguo has established a network of knowledge hubs through the Arid Lands Information Network (ALIN). Across rural East Africa this network is increasing access to agro-information for farmers, increasing the capacity of extension workers in supporting farmers, and creating employment opportunities for rural youth. The Maarifa (Knowledge) centers allow rural farmers to learn information and communications technology (ICT) that shares and coordinates farming information.

Each center is governed by a community-elected body, which promotes local ownership and greater sustainability of the decentralized model. The knowledge centers are powerful not just because they improve the skills of farmers. The centers empower farmers in their attitudes towards modern agriculture by shifting from being viewed as a livelihood for the poor and uneducated to a dignified profession.

IMPACT:

> 15 Maarifa centers have been established, with plans to build 100 more Maarifa centers

> ALIN has published 60 issues of the Baobab magazine which features practical information on development in agriculture and the environment. The publication has reached 2.5 million development workers in Africa.10

Additional Patterns:

* Centrally Owned ICT Infrastructure is Restricted by Traditional Business Models (Barrier A)
SOLUTION EXAMPLE:

Serra Titiz realized that because many Turkish youth are unaware of their career opportunities and discouraged from making self-determined choices for their studies, they do not make informed decisions in regards to their future and capabilities. This corresponds to a myriad of negative consequences including a youth unemployment rate of 17% in Turkey. Further, the little relevance between education and occupation leave many dissatisfied with their career choices after years of schooling.

To address this problem, Titiz founded Gelecek Daha Net in 2009 to help young people in Turkey be more self-determined, proactive, and well-informed members of society. Titiz’s internet platform, gelecekdaha.net, allows youth to access mentoring, coaching, career counseling, and skill development approaches in one central location. It leverages the experiences, knowledge, skills, and networks of hundreds of voluntary role models, professionals, organizations, and companies from all over the country to provide accessible videos as well as one-on-one mentorship for youth. Additionally, special mentoring guidelines and handbooks have allowed high schools and universities to embed the Titiz’s initiatives in the curriculum and activities of their institutions.

IMPACT:

> Gelecek Daha Net has engaged with more than 1,000 youth.

> More than 440 professionals have participated in this program – many of whom interacted on an eye-to-eye level with youth for the first time through personal mentoring and trainings.

> 299 videos of different professionals from the corporate and non-profit sector have been made available for free to youth.

"This online platform has become a reference point for youth to explore interests in vocations and the future. It is a one-stop shop reference point to reach people, information, and services like e-mentoring.”

Additional Patterns:
* Educational & Vocational Training Can’t Keep up with Changing Job Market (Barrier C)
SOLUTION EXAMPLE:

Jamila Abass created M-Farm, a tool that enables farmers to acquire information about the current prices of different crops in specific markets throughout Kenya. Farmers receive real-time price information using mobile phones, data that was previously very difficult to access. The M-Farm platform also brings together small-scale farmers in the same regions, allowing them to market crops jointly in larger regional or international markets. M-Farm additionally connects farmers to suppliers, allowing them to buy discounted farming product such as seeds and fertilizer.

M-Farm has thus connected farmers, wholesale buyers and agricultural input suppliers, changing the scattered landscape of subsistence farming in Kenya. M-Farm uses both sophisticated ICT management systems and offline ground networks to build an entrepreneurial, data-driven commercial farming infrastructure. M-Farm has created a geo-map that visually displays real-time data and aids market players to connect with each other.

M-Farm has the goal of creating direct market channels and information systems through its infrastructure to formalize the buyers and sellers in the market, effectively getting rid of middlemen. The M-Farm exchange allows farmers to pursue entrepreneurial opportunities in a strategic manner.

IMPACT:

> The first 686 farmers using the platform in 2012 saw a 100% increase in profits on average

> 7,400 farmers currently use M-Farm and provide data to the system, with a goal to reach 28,000 by the end of 2014 and 180,000 by the end of 2015

Additional Patterns:

* Ensure ICT Solution Contains deep Stakeholder Engagement (Design Principle 2)
* Data Value Chain is Broken (Barrier B)
SOLUTION EXAMPLE:

Sanjeev Arora founded Project ECHO (Extension for Community Healthcare Outcomes) to form a knowledge network of health specialists and rural providers to combat Hepatitis C and other diseases in New Mexico. ECHO has the capacity to bring specialized treatment to thousands of patients who would have otherwise gone untreated while empowering isolated providers to stay and work in rural areas. ECHO provides practical and cost-effective continuing education for rural providers, which allows specialists and providers to communicate laterally and co-manage cases. Arora has created a model to demonopolize health knowledge through weekly case-based trainings and videoconferencing.

ECHO fills the gap for patients in rural areas who lack access to specialized treatment. ECHO introduces a feedback loop for primary care providers in rural areas to consult with specialists about chronic and complex cases. Specialized healthcare can be provided without requiring a patient to travel long distances to be seen.

IMPACT:

> ECHO has hubs anchored out of 31 universities assisting providers in more than 1,000 clinics who focus on 26 specialties including rheumatology (video), H.I.V., addiction, women’s health, hypertension, dementia, breast cancer, childhood obesity, diabetes and chronic pain.

> Beyond the United States, the model is being used in India, Uruguay, the Irish Republic and Northern Ireland.

> A study published in the New England Journal of Medicine shows that the ECHO model is effective in treating Hepatitis C in underserved communities. The research suggests that patients adhere better to treatments at ECHO sites versus university clinics, which results in better cure rates and lower incidence of serious adverse events.of programs in Southeast Asia through UNESCO.11

Additional Patterns:

* Educational & Vocational Training Can't Keep up with Changing Job Market (Barrier C)
SOLUTION EXAMPLE:

Sascha Meinrath is designing and deploying a disruptive communication architecture to ensure free and open communication as a fundamental human right. While the United States has had a leading role in the development of ICT, broadband access is lacking in many rural areas, and even cities are lagging behind the rest of the world in speed, access and cost.

Sascha’s Open Technology Institute is a technology lab and policy center. On the technology side, Sascha and his team have been working on decentralized mesh network technology, Commotion (via the X-Lab). Traditional ICT infrastructure is a centralized hub-and-spoke model, which puts a great deal of power in the hands of the hub and is very expensive to expand. A mesh model means that individual devices can communicate with one another without a central authority, which is cheap, secure and disaster tolerant.

On the policy side, OTI runs the Measurement Lab, a data hub that provides policymakers with the information they need to analyze national infrastructure and make good policy decisions. By collecting data from a large number of partners, they synthesize it and paint a clear picture of the state of broadband in the US. Both the platform and the data is open source and publicly available.

IMPACT:

> OTI developed an action plan for integrating new federal spectrum management policy into the 2010 omnibus transportation bill.13

> Meinrath won a government grant to pilot accessible Internet infrastructures in Detroit and Philadelphia

> Measurement Lab has grown into the world’s largest broadband measurement data platform with 500 tetrabytes of peer-reviewed data.

> OTI has grown between 100 and 200 percent per year over the last four years, with 30 current staff members.

Additional Patterns:

* Centrally Owned ICT Infrastructure is Restricted by Traditional Business Models (Barrier A)
SOLUTION EXAMPLE:

Alex Bernadotte founded Beyond 12 to increase the number of low-income students who successfully graduate from colleges and join the workforce. To do so, Beyond 12 creates technology applications that enable data sharing between students, high schools and colleges. Participants exchange feedback that otherwise usually remains siloed, incorporate student-level insights and individual student data into their practices, and make decisions about how effective their college preparation and their college support models are for low-income students.

Beyond 12’s High School Alumni Tracker is a high school-facing tool that collects quantitative and qualitative data about students once they get to college and eventually, once they enter the workforce. The type of data points collected to ensure long-term success and retention include GPAs, remedial coursework, and study habits. In addition to sharing the data back with the students’ schools, Beyond 12 also uses this data to identify the students who are most in need of help, and match them with virtual college coaches. These coaches help students to set personal and academic goals, as well as balance financial, academic, and social challenges.

Other applications developed by Beyond 12 include “My Coach”, a student-facing app that interfaces with popular social media and allow youth to self-report data, a test message reminder tool which sends reminders about key deadlines from the student’s academic and financial aid calendars. Applications by Beyond 12 also provide reminders about resources, activities and behaviors that lead to college success, a system of points and badges, and an analytics tool to enable predictive modeling.

IMPACT:

> In less than two years, Beyond 12 has tracked the post-secondary progress of nearly 12,500 students and worked with over 90 partner schools and organizations throughout California.

> 82% of all the students that have received coaching thus far have made it to their third year of college, significantly higher than national rates for students are low-income, first-generation students.

Additional Patterns:
* Create Decentralized Networks (Design Principle 4)
* Data Value Chain is Broken (Barrier B)
* Social Enterprises Can’t Afford to Drive Technology Innovation (Barrier D)
BARRIERS IN FOCUS
**BARRIER A**  
Centrally Owned ICT Infrastructure is Restricted by Traditional Business Models

**SOLUTION EXAMPLE:**

Sylvestre Ouedraogo realized that small farmers in Burkina Faso faced many challenges, especially with the government’s centralized approach to agriculture. Although Burkina Faso’s agriculture is mostly based around small-scale farming, the government does not have a good grasp of what farmers are planting and when. As a result, when there are seed shortages, seeds are sent to the wrong farmers. Rather than risking losing seeds, farmers often prepare them for raw consumption rather than for proper cultivation. Further, Burkina Faso has limited ability to monitor the flow of agriculture traffic across its borders.

Ouedraogo’s initiatives are grounded in creating a decentralized computer servers located in rural areas in Burkina Faso. This server ensures that up-to-date agricultural information and data are independently accessible for small-scale farmers. Additionally, Ouedraogo encourages the emergence of new knowledge networks and broadened grassroots access to resources and opportunities across the sub-region. His knowledge system tools will make it possible to create efficient, user-rated online systems for the purchase and sale of products across the West African sub-region.

**IMPACT:**

> Ouedraogo has increased the network of decentralized serves that provide up to date agricultural information to include more than 400 active members.

**Additional Patterns:**

* Create Decentralized Knowledge Networks (Design Principle 4)
SOLUTION EXAMPLE:
Santosh Choubey noticed how a key need in India was how rural youth were getting left behind in the IT and mobile revolution. While Indian cities have charted unprecedented growth over the last two decades, rural areas had remained almost untouched by any technological development. Choubey started AISECT centers to build a bridge between the educational and digital divide between urban and rural India through providing a strong IT infrastructure, training, education, and skill development.

AISECT has built and strengthened the non-formal education sector in rural India by promoting ICT based training and services through its centers. Academics and professionals to update content in local languages, and provide a host of certified courses in the local languages. Certified courses include diploma and postgraduate diploma programs in the fields of software and IT, hardware and networking, industry-oriented vocational education, insurance, arts, and commerce.

Santosh later evolved AISECT to include a multitude of services for entrepreneurs offered at the centers, ranging from placement to banking services. This provides entrepreneurs with the flexibility to choose services to be provided (and add others) depending on their local needs, and generate additional revenues. Thus, the centers begin by functioning primarily as IT training, education and skill development centers and slowly expand to provide other services.

AISECT’s spread and credibility in rural areas led to a partnership with the State Bank of India (SBI), making it easy for centers to facilitate the process of opening new accounts, accessing loans and making deposits and withdrawals for rural citizens. With the Government of India, AISECT centers also facilitate payment of telephone bills and taxes, applying for various government services, accessing pension and land records for citizens. Most importantly, AISECT centers act as placement agencies connecting rural youth to local opportunities.

IMPACT:
> The AISECT Network currently has over 8,500 centers spread across 27 states and 3 Union territories in India.
>
> AISECT has worked with almost one million students through a host of skill enhancement programs and over 10,000 entrepreneurs have been generated in India.  
>
> AISECT’s entrepreneurship model has given birth to over 6000 self employed people, generated further employment of over 24,000 people.

Additional Patterns:
* Ensure ICT Solution Contains Deep Stakeholder Engagement (Design Principle 2)
* Educational & Vocational Training Can't Keep up with Changing Job Market (Barrier C)
SOLUTION EXAMPLE:

Josh Nesbit and his organization, Medic Mobile, are repositioning the role of the community health worker through smart, decentralized mobile phone solutions. Rural health clinics have long been plagued by difficult communications issues. Health workers lack the data and swift communications channels needed to properly respond to emerging health issues and keep abreast of patient developments. Travel between clinics, hospitals and patients can be long and time-consuming, taking away from actual care. At the same time, mobile phones have a remarkable penetration rate even in rural areas.

Josh’s solution is to build a simple and reliable communications network between health workers, clinics and hospitals, based on basic mobile phones and SMS. Using Medic Mobile’s technology and methodology, hospital staff can contact health workers about upcoming vaccination campaigns, and health workers have quick access to physicians in emergency situations.

Medic Mobile also uses SMS for data collection into the OpenMRS medical record system. Community health workers can text data into the system for physician access and can make basic diagnoses.

Josh and his team are currently working on expanding to cover all of Malawi through the Ministry of Health, and ongoing relationships with organizations like USAID and the UN promise further scale and expansion.

IMPACT:

> 21 countries have projects where Medic Mobile tools are being used — in Africa, Latin America, and Asia.

> 7,836 community health workers were using Medic Mobile tools at the end of 2013, an increase of 71% from 2012.

> An SMS reporting pilot in Malawi with 75 community health workers saved 2,048 hours of hospital worker time and $2,750 on net ($3,000 in fuel savings minus $250 in operational costs), while doubling tuberculosis treatment capacity to 200 patients.14

> Vaccinations rates in India increased 60-95% by sending mothers a SMS notification when their children were due for vaccination.15
SOLUTION EXAMPLE:

Shivani Siroya and InVenture are building a credit rating system for the rural unbanked that delivers financial education to users and valuable data to financial institutions. Microcredit has had a tremendous impact on the poor, but the high interest rates can keep budding entrepreneurs in a cycle of debt. Microfinance institutions can’t offer lower rates or larger amounts due to the high lending risk for borrowers with no history.

InVenture’s primary system is a mobile application called InSight. InSight allows users to log financial transactions for their personal and business accounts. They can generate periodic reports on their financials for their own analysis and education, building financial literacy. Data gathered from InSight is crunched by InVenture and turned into a credit score for the user. This data is provided to finance institutions, who are then able to make better lending decisions based on borrower responsibility. By providing a real financial identity, Shivani is bridging a major gap in the financial data chain for the first time.

InVenture uses appropriate technologies for each market, ensuring that data can be collected reliably. In India, it is an SMS based system, because of the simple mobile devices available in that market. In Kenya, an Android application for smartphones is the primary means of collection.

IMPACT:

> InVenture is operating in India, South Africa, Kenya, and the United States. 80,000 users increased their revenue by 9.5% and their savings by 8% on average. 16

> Over 4,000 people use InSight, with a 80% conversion rate (first-time borrowers who start using InSight pre-loan) and 66% daily usage among InSight users.

> InSight users experience 30% increase in revenues and 6% increase in savings.

Additional Patterns:
* Ensure ICT Solution Contains Deep Stakeholder Engagement (Design Principle 2)
* Aggregate Citizen Driven Data to Influence Decision Makers (Design Principle 5)
SOLUTION EXAMPLE:

Mike Feerick created the ALISON initiative to serve as a global source for online community college education. Online training is too often prohibitively expensive, barring potential employees from gaining the requisite training for certain jobs, while in-person trainings may not offer the most up-to-date, workplace learnings.

ALISON includes a free, online community college that offers everything from computer courses to English classes, and opens up employment opportunities for users. Its new approach to skills training is designed around a system of alternative certification and immediate competence testing, with programs adapted to stay within relevant copyright laws. Quality control is secured through the use of adapted curriculum, stringent peer review, and a strong international volunteer base. To add validity to online training offers and create accountability, ALISON provides services to employers, who can immediately test the skill level of potential hires through “flash tests.”

Many of the courses are structured around and adapted from existing licensing tests or curriculums recognized nationally or internationally. Thus ALISON offers “generic” versions of these well-known programs. The high level of flexibility and mobility of ALISON allows any individual to access the appropriate trainings. Feerick has also partnered with organizations and institutions to offer relevant certifications and e-learning courses for current and future employees. The US Department of Labor, for example, offers free ALISON courses on their unemployment website to help prospective job-seekers enhance their skillset.

IMPACT:

> Since 2007, some 350,000 people all over the world have graduated from ALISON’S free certificate and diploma courses. And more than 10,000 have shared their stories.17

> Over 3 million learners have utilized ALISON’s 600 free courses, with over 350,000 ALISON students graduated in 2014.18

Additional Patterns:

* Move Beyond Digital Literacy to Cultivating Digital Citizenship (Design Principle 1)
SOLUTION EXAMPLE:

Njideka Harry fondly recalls going to the farm in the mornings with her aunt and learning through her challenges of farming. It was during these memorable times spent with relatives that Njideka first experienced rural farming. She made a commitment then to make a difference for rural women, like her aunt. Harry realized that an older generation of women engaged in subsistence farming and living in poverty exist in much of Africa, including Nigeria. These women are unable to draw on technology or best practices that are widely known, and they are also unaware of strategies to get better prices for their crops. Many of these problems can be attributed to the isolation of farmers, inability to use technology, and the focus of agricultural services on men.

Harry started the Youth of Technology Foundation (YTF) to transform rural communities into enriched learning environments where the appropriate use of technology affords opportunities for marginalized people. YTF’s programs focus on the powerful role youth can play in their communities with the right resources and tools. These programs focus on teaching youth how to identify social issues in their community, and then how to document, report, and potentially solve these issues using technology as an enabler.

Harry is now working on the Agricultural Platform Offering Women Empowerment Resources initiative, or Agric-P.O.W.E.R., a social enterprise platform which supports a woman-to-woman farmer distribution network while employing youth as agricultural information workers. Agric-P.O.W.E.R. uses SMS messaging on mobile phones to allow farmers and businesses to post, buy, and sell offers which will be compiled and sent through SMS to service providers.

IMPACT:

> The Youth Technology Foundation (YTF) works in five countries including the United States, Nigeria, Kenya, Cameroon, and Uganda

> YTF has impacted over 1.4 million youth and women across YTF’s pillars – entrepreneurship, education, agriculture and health.

Additional Patterns:
* Move Beyond Digital Literacy to Cultivating Digital Citizenship (Design Principle 1)
* Ensure ICT Solution Contains Deep Stakeholder Engagement (Design Principle 2)
SOLUTION EXAMPLE:

Sunil Abraham is providing web services and products that are affordable and effective for the Indian voluntary sector, as well as creating research and policy recommendations to expand the democratic potential of the Internet. His first organization, Mahiti, based on “open-source” sharing of programs, enables citizen organizations to effectively use the Internet in the areas of fundraising, networking, advocacy, and knowledge management.

A major barrier to open source software is its relative complexity and lack of quality support. To address this, it utilizes open source platforms, and any other organization can customize Mahiti’s software after undergoing training, allowing for a broad range of uses that are dialed in to each user’s needs. They also provide support for a broad array of Indian languages, helping to bridge another potential communications barrier.

Sunil’s second organization, the Centre for Internet and Society (CIS), conducts both policy research and academic research - particularly for the protection of human rights or public interest in contemporary information societies. Keeping with the spirit of open data, it seeks to structure its institution as an open network of research and policy fellows and partners. Areas of focus include accessibility for the disabled, access to knowledge (including patent and copy-writing reform, free and open source software and standards, and open data), internet governance, internet governance institutions at the international level, and telecommunications.

IMPACT:

> Mahiti has provided training and custom applications that meet the needs of hundreds of voluntary sector clients, such as software for field monitoring for Mahila Samakhya, an organization working with barely literate village women.

> CIS has produced research and policy recommendations at the local, national, and multi-national levels, a number of which have been directly adopted. Its international work has included research and recommendations within Tajikistan, Afghanistan, Iraq, China, and Indonesia.

> CIS research staff are based within partners at over 8 international academic institutions such as the Yale Information Society Project in the U.S., Leuphana University in Germany, Centre for Communication at the National Law University in Delhi, India and four other Indian universities.

> CIS will be publishing an upcoming book reviewing 50 laws and 50 cases that have configured the right to privacy in India, in support of a new a privacy bill for India.

Additional Patterns:

* Aggregate Citizen Driven Data to Influence Decision Makers (Design Principles 5)
SOLUTION EXAMPLE:

Daniel Ben Horin and TechSoup Global are connecting nonprofits with the technology they need and the expertise to use it well. Through a web portal, NGOs can find both software and hardware donations through a streamlined process. By offering any certified nonprofit a single location, Daniel is freeing up time and resources for mission-oriented work and increasing the likelihood that organizations will acquire the tools they need to achieve impact.

TechSoup also provides mentorship and consulting through their community and services. Through partnerships with technology firms, nonprofits have access to high caliber consulting services across several ICT domains. For general mentorship, they provide a community forum space, as well as a “Donate Your Brain” program, through which technologists can donate their time and expertise to needy nonprofits.

Daniel's other initiatives include NetSquared, a collaborative community for technology and social impact, and NGOsource, a platform for international grantmakers that streamlines the grantee equivalency determination process.

IMPACT:

> TechSoup works with over 100 partners in 89 countries, with the goal to expand particularly in underserved areas.19

> $4.75 billion in retail value of technology product donations have been distributed, which amounts to over 13 million products.

Additional Patterns:

* Move Beyond Digital Literacy to Cultivating Digital Citizenship (Design Principle 1)
SOLUTION EXAMPLE:

Ken Banks created FrontlineSMS, a software program that allows a computer to send SMS through an attached mobile device. SMS has long been a popular means of communication in the developing world. Cheaper than voice and simple to use, it can be a powerful tool for nonprofit organizations around the world to conduct surveys, data collection and outreach. However, many SMS solutions are either highly centralized and expensive (through network operators) or require internet usage, both of which can be prohibitive for a small organization. Ken created FrontlineSMS to tackle both of these issues.

The program’s interface is designed to be simple and intuitive, enabling anyone to implement a quick communications solution with just a laptop and a phone in an hour or so. FrontlineSMS can send mass messages for outreach, or receive and process incoming messages for surveys and information collection. FrontlineSMS is also available as a cloud-based software-as-a-service for larger organizations or for those working in areas with more reliable internet connections.

More than just the software, Ken has built up a community around FrontlineSMS that has helped it become as widely used as it is. The online community is divided among sectors like governance and health work, and members support one another with their rollouts. Ken recognizes that the technology is only 10% of the solution, while human power makes up the rest of it. By focusing on building a simple tool and creating an enabling environment, he has enabled thousands of small organizations to take advantage of a potent technology.

IMPACT:

> FrontlineSMS has been downloaded over 200,000 times by citizen organizations in over 70 countries.

> FrontlineSMS has a community of 2,500 members that lead discussions

Additional Patterns:
* Create Decentralized Knowledge Networks (Design Principle 4)
Despite social entrepreneurs deep connection their communities' needs and desire to utilize ICT, the following are common challenges social entrepreneurs flagged during the interviews that make it difficult to utilize ICT, let alone drive its innovation. Each challenge is an area of opportunity for grantmaking organizations, investors, technologists, and entrepreneurs to problem-solve better approaches. While there are a number of other shared challenges common to social entrepreneurs, the following focuses on ICT-based challenges:

1. **DOUBLY CHALLENGED TECHNOLOGIST HIRING:** Hiring of technologists for any sector is competitive to begin with, and doubly challenged due to non-profit salary levels. Non-profit revenue structures are not always conducive to technology and software development work. Such work requires highly qualified engineers and a specialized culture that can be difficult to create in a mission-oriented non-profit. Software management and traditional management are very different; without managerial experience in technology, this problem can be exacerbated by miscommunication between leadership and developers.

2. **TRADITIONAL GRANT-MAKING DOESN’T COVER ICT NEEDS:** Social entrepreneurs recognize the importance of investing in ICT given its important role as an enhancer and a scaler, but have found it difficult to secure funding for two types of critical ICT needs. The first is ICT needs directly to their social impact goals (e.g., a mobile tool that better prevents infant mortality) and the second is ICT needed for the organization to run more efficiently (e.g., financial management systems, databases, servers). Partial funding increases the costs of coordination, or doesn’t account for the cost needed to create, maintain, and improve custom ICT solutions.

3. **LACK OF CAPACITY TO UTILIZE PRO-BONO OR OPEN-SOURCE OPTIONS:** When technology is offered pro-bono, there is limited capacity and know-how for utilizing these offerings. The amount of training, capacity building, and time needed to make the pro-bono offering succeed is underestimated, and thus proves too intensive to sustain. Even when technology is open-source, it is difficult to know which solution to use, and cost-prohibitive to know how to customize the technology appropriately, let alone continue to maintain and upgrade it.

4. **PARTNERSHIPS REQUIRE LONGER COMMITMENT AND SPECIALIZATION THAN FEASIBLE:** Partnerships have to be longitudinal and highly context specific to be successful given how complex each technological solution may be, and failing to anticipate this leads many partnerships to end without significant impact. Technologist volunteers in particular may come and solve one problem but might create a dependence or not solve the problem in a lasting way.

5. **DATA IS “TOO BIG” FOR SOCIAL ENTREPRENEURS AND “NOT BIG ENOUGH” FOR BIG DATA EXPERTS:** Organizations are not poised to fully utilize the unprecedented amount of data they are able to collect for the unique target populations or social issues they work with. Their data may still be seen as too small and fragmented relative to how large “big data” sets area, so the valuable information remains an untapped opportunity. A large part of this challenge lies in how difficult it is for the organizations to categorize and digitize the knowledge within network due to capacity constraints.

**LOOKING FORWARD**

These challenges are opportunities for social entrepreneurs, investors and technologists alike to increase the way social innovators use ICT to maximize social impact. Combined with spot the case studies on innovative applications of ICT, we hope the understanding shared in this report can inspire the increased adaptation of technology, spark conversation between social innovators and other actors in the field to help spread solutions that work, and inspire technologists to leverage their skills to contribute as changemakers as well.

“Being a social entrepreneur is a challenge itself because there are no incentives. We are a not for profit company, but there is no legal basis for that so we are registered as a for-profit company. We are expected to pay all taxes. You have to be innovative in sustaining yourself and the company.” - Serra Titiz, Gececekdaha.net, Turkey
A CASE FOR HOPE

Through its network of the world’s leading social entrepreneurs, Ashoka has intimately explored how an entrepreneurial mindset can unlock solutions to the world’s most pressing problems. Across over 75 countries, and dozens of sectors, social entrepreneurs in Ashoka’s Fellowship network have been undaunted by how complex or unsolvable a problem may appear to be, instead turning challenges into opportunities. They create sustainable solutions for the communities they are rooted within and find creative ways to ensure their impact spreads regionally, and even globally, to become new, widespread norms.

Ashoka’s Social Innovation Mapping illustrates common patterns in how social entrepreneurs are creating widespread change. It centers on two types of patterns: Design Principles—the innovative approach that is a defining feature of an entrepreneurs’ work, and Barriers—the components of a complex problem that entrepreneurs target for tackling, based on their decades of iteration on-the-ground.

The Social Innovation Mapping offers an inductive understanding of how the solutions work together in context to affect change, based on case studies and interviews of solutions that have proven success. Addressing a complex or entrenched social challenge can easily get mired in descriptions of the problems and their numerous causes, but this report tells the stories of effective solutions in order to offer a different way of thinking about systems change—one that values practice over theory, and on-the-ground invention over deductive analysis. Thus, the solutions profiled in this report give cause for hope, and reason to believe the future can be better. Ultimately, these pages should be seen as an invitation to re-envision what is possible, through the eyes of entrepreneurs.

INNOVATION PATTERN-RECOGNITION PROCESS

Ashoka’s Social Innovation Mapping is built on an analysis of solutions created by Ashoka Fellows, experts, and thought leaders to distill “design principles” for change. The mapping illuminates how change is happening by uncovering patterns of what works in the field, and what new solutions deserve further exploration. For any given pattern-analysis, we begin by determining a single framing question. The question both describes

The Social Innovation Map should be seen as an invitation: to re-envision what is possible, through the eyes of entrepreneurs.

Next, we sift through Ashoka’s Fellow database of more than 3,000 tested solutions from social entrepreneurs to select those most applicable to the field. These innovators have gone through a rigorous approval process before their election to the Ashoka fellowship, which includes a thorough vetting of their ideas and performance.
Then, we pare down the set of solutions to those that are the most relevant and innovative, focusing on a further 15 to 30 solutions for case studies and interviews. Finally, we cluster them and look for patterns in how the innovators both define the problem they face, and the actions they take to solve it. These patterns can point to powerful ways to re-frame a problem, as well as new ways of addressing it. Ultimately, this analysis reveals the “a-ha” moment of recognition, in which an entrepreneur accurately pairs a powerful idea with a compelling need.

Once the analysis is mapped in a grid, the distribution of the solutions becomes apparent, showing which strategies are most commonly (and most powerfully) used. Additionally, it can point to “holes” or areas where there may be unmet potential for a solution to be invented at the nexus of need and idea.

An analogy illustrates why two main patterns are at the core of the Social Innovation Mapping: to unleash the potential of social change, it is as important to identify the keys (Design Principles) as it is to clearly see the locks (Barriers) that inhibit change. It is also vital to explore new combinations that can further unlock successful change.

"To unleash the potential of social change, it is as important to identify the keys (Design Principles) as it is to clearly see the locks (Barriers) which inhibit change."
APPENDIX B: INDEX OF SOCIAL ENTREPRENEURS

The social entrepreneurs chosen for analysis were as follows:

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<td>Anne Roos-Weil</td>
<td>Pesinet</td>
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<td>Daniel Ben-Horin</td>
<td>Compumentor</td>
<td>United States, partners in 89+ countries</td>
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<td>Donny Budhi Utoyó</td>
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<td>Janet Longmore</td>
<td>Digital Opportunity Trust</td>
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<tr>
<td>Josh Nesbit</td>
<td>Medic Mobile</td>
<td>United States, implementations in 20+ countries</td>
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<td>Kiwanja</td>
<td>United Kingdom, implementations in 70+ countries</td>
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<td>Mike Feerick</td>
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<td>Njideka Harry</td>
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<td>Onno Purbo</td>
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<td>Project Echo</td>
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<td>Thorkil Sonne</td>
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<td>Yuhyun Park</td>
<td>Infollution Zero</td>
<td>South Korea, Singapore, Canada, United States</td>
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APPENDIX C: REFERENCES


APPENDIX D: ACKNOWLEDGEMENTS

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