

BEYOND SCALE

How to make your digital development program sustainable



BEYOND SCALE

Acknowledgments

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Core partners

Sara Chamberlain, Tanmay Guha Roy, Priyanka Dutt, and the BBC Media Action team in New Delhi

Wameek Noor, Kate Wilson, Melissa Johns, Jeff Wishnie and David McCann, Digital Impact Alliance (DIAL)

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Derek Treatman, Brendan Smith, Chris Lukolyo, Julie Pohlig, Leah Gatt and Brooke Partridge, Vital Wave

Other contributors

Benjamin Winters, Akros

Professor Dr. Abul Kalam Azad, Bangladesh Directorate General of Health Services

Ajai Adusumilli and Sai Rahul, BeeHyv

Erica Layer, D-tree

Selorm Adadevoh, Digicel

Rikin Ghandi, Digital Green

Jonathan Jackson, Neal Lesh, Stella Luk and Krishna Swamy, Dimagi

James Mwangi, Echo Mobile

Kirsten Gagnaire, FSG

Dominick Atweam, Ghana Health Service

Natalia Pshenichnaya, GSMA

Peter Benjamin, HealthEnabled

Nora Oleskog Tryggvason, Humanitarian Innovation Fund

Mafalda Castro Guimaraes, IESE Business School, University of Navarra

Ravi Karin, IMImobile

Amajit Mukherjee, International Center for Research on Women (ICRW)

Annie Neo Parsons, Jembi Health Systems

Neha Madan and Kapil Sapra, Kapil Sapra & Associates

Dr. Cathy Mwangi, mHealth Kenya

Erik Luttjehuizen, MR. SOLAR

Breese McIlvaine Arenth and Dr. Chilunga Puta, PATH

Cees Hesp, PharmAccess

Luke Shankland, Praekelt Foundation

Kenneth Muhangi, Signum Advocates

Brent Chism, TaroWorks

Hee Sung Kim, United Nations Capital Development Fund (UNCDF)

Edmund Page, Xavier Project



Authors' Note

Beyond Scale details key questions and challenges that non-governmental organizations (NGOs) and social enterprises face when scaling and sustaining digital development programs.

It is particularly relevant for programs at the four-to-five-year mark, which some describe as the 'valley of death'.

It shares learning from practitioners who have made this journey, navigating pitfalls while pursuing alternative pathways to scale and sustainability. These include replicating programs in new geographies to achieve greater economies of scale, and diversifying products and services to deepen impact and create new income streams.

Beyond Scale also shares practical guidance from practitioners who have transitioned program ownership to government, or are covering costs through user fees or private-sector investment.

While there are guides and toolkits available to plan the initial implementation of a digital development program, there are fewer guides for organizations at this later stage of maturity that examine both public- and private-sector routes to scale and sustainability across sectors (e.g., health, agriculture). We recognize that every digital development program is unique. Each goes through different phases, and the phases are triggered by different circumstances. However, we found that no matter what sector or geography we examined, there are some questions and approaches that are remarkably common.

Beyond Scale:

- Provides key steps for addressing relevant questions and challenges
- Offers tested templates and tools the reader can apply
- Provides real-life examples of how others have tackled similar problems
- Suggests a set of curated resources where the reader can learn more about topics integral to scale and sustainability

Our hypotheses and findings, based on our review of more than 400 books, articles and interviews, are intended to spark a dialogue about how mature digital development programs can prepare for scale and sustainability.

There are no one-size-fits-all answers to the challenges faced in the next phase of digital development, and this guide is not intended as a peer-reviewed or academically rigorous inquiry into all issues organizations deal with at this stage. Rather, we have focused on suggesting frameworks and providing examples and templates for practitioners to stimulate thought and discussion. We included experiences from multiple sectors, geographies and perspectives from nonprofit, for-profit and government-based programs.

We hope that by documenting these perspective and experiences, it might help your program or organization make a smooth transition into your next phase. Most importantly, we want to hear from you. Please contribute your feedback and examples to [**beyondscale@digitalimpactalliance.org**](mailto:beyondscale@digitalimpactalliance.org)



Introduction

Some time ago, leaders of two very different digital programs sat 5,500 kilometers apart, thinking about the future. One led a nonprofit digital health program for new and expecting mothers in India; the other led a for-profit digital agricultural program for farmers in several African countries. While they worked in different sectors and deployed different technological solutions, they had similar questions about their program's growth trajectory, including how to ensure not just scale but sustainable impact for years to come.

In Delhi, BBC Media Action had just begun planning the transition of three mobile health education services to the Government of India. The organization had already scaled two of its services to three states in collaboration with local government, but the program was still dependent on donor funding for survival. The program was in year four of its five-year grant cycle, and BBC Media Action had less than two years to develop strategies for transitioning each service to government, secure government buy-in at the state and national levels, plan and cost the transition process and raise funds to pay for it.

Many questions arose: What strategic approaches to transitioning the services to government would be most effective? How much would it cost to scale and run the services? What costs could the government cover in compliance with its procurement policies, and what costs would need to be covered by donors? How would the solution design need to change to balance the need for localization with the requirements of scale? How could contracts with mobile operators be transitioned to government, and what service level agreements would the government require? Would BBC Media Action's existing technical partnerships be able to accommodate these changes, or would new partnerships be needed? These were just a few of the questions being asked, with many more yet to be discovered.

At the same time in Nairobi, Esoko, a social enterprise providing mAgri services to farmers, was contemplating its future and how to prioritize its scant resources. After a successful start delivering donor-subsidized services in Ghana, the company's growth had slowed as it reached market saturation.

Looking for new strategies to ensure financial sustainability, Esoko recognized potentially high demand for its services in other countries. Expansion to new countries would increase the number of communities Esoko served, but it would also require experimenting with new business models and diversifying its service offering. The Esoko team faced a challenge familiar to software entrepreneurs the world over. How would changes to its services affect payment processes and vice versa? What new legal and regulatory issues would the company face as it entered new markets in Kenya and Uganda? How would they affect current employees? What activities should they outsource, and which skills would they need in-house?

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Over the past decade, the number of public- and private-sector programs providing digital solutions to underserved communities in areas like agriculture, education, financial services, health and resilience has increased exponentially. In 2009, the GSMA estimated there were just 400 such programs worldwide. By 2015, this number had swelled to over 1,500.¹ Rapid growth has been driven by an explosion in mobile phone use: the majority of the world's population now has access to a mobile device.

In the last decade, practitioners have learned a lot of hard lessons about designing, developing and implementing effective information and communications technology for development programs, also known as digital development. Many excellent guides have been published about best practices and guiding principles for developing new solutions, based on insights gained from innovative pilot projects.

Guidance has been developed around monitoring, measuring and evaluating the impact of digital development investments. There is now a growing evidence base identifying what does and doesn't work. What is scarcer, however, are resources documenting the experiences of implementers who have taken their digital development programs beyond the four-to-five-year mark to achieve significant scale and varying degrees of financial sustainability.

This guide presents the experience of two such organizations, BBC Media Action and Esoko, as well as those of other implementers, including Akros, Bangladesh Directorate General of Health Services, BeeHyv, Cell-Life, Digital Green, Dimagi, D-tree, Echo Mobile, HealthEnabled, IMImobile, Jembi Health Systems, Johns Hopkins Global mHealth Initiative, Kapil Sapra & Associates, Kopo Kopo, mHealth Kenya, MR. SOLAR, PATH, Praekelt Foundation, Signum Advocates, SolarNow, TaroWorks, United Nations Capital Development Fund (UNCDF), Vital Wave and Xavier Project.

It explores the processes of scaling through **replication**, where the experience of a digital solution is **replicated** for more users in more geographies, and scaling through **diversification**, where an organization **diversifies** its products and services to offer new solutions to achieve scale. And finally, *Beyond Scale* examines both **public- and private-sector routes to financial sustainability**, illuminating the complex and transformative journeys that NGOs are making to secure the futures of their digital programs.

Beyond Scale's target audience is implementers in digital development organizations. The guide is specifically tailored for in-country NGO staff who have already successfully piloted digital development solutions and are now exploring not just how to scale them, but how to make them sustainable. This guide will also be especially useful for NGOs, digital development companies and social enterprises facing similar challenges.

¹The Mobile Economy 2015, https://www.gsma.com/mobileeconomy/archive/GSMA_ME_2015.pdf

The guide addresses key questions, including:

- ▶ How might your **program strategy** need to change to enable financial sustainability, and how might this affect your organization?
- ▶ How might your funding or **business model** need to change to ensure financial sustainability?
- ▶ What new **legal, policy or regulatory** issues might need to be considered and how might your legal agreements need to change?
- ▶ Do you have the right **partner relationships** in place to enable scale and sustainability, or are new partnerships required?
- ▶ Do you have the right **human capacity** to make these strategic changes, or do you need to retrain or hire staff with different skills and experiences?
- ▶ How might your approach to **roll out**, including everything from technical support and customer care to marketing and distribution, need to change?
- ▶ How might your **solution design** need to change to enable replication or diversification of your program offering?

Beyond Scale lays out a series of key steps that readers can work through to answer these questions and provides lessons learned by implementing organizations. We believe there are no right or wrong answers about how to evolve your digital development program. But we also recognize that the digital development field is a young and dynamic one and that we all have something to learn and something to teach. We hope you find this guide helpful on your journey *Beyond Scale*, and we hope that you will share your work and thoughts with us. Please contribute your feedback and examples to beyondscale@digitalimpactalliance.org

How to read *Beyond Scale*

This guide is divided into **seven** modules. It is structured so that it can be read whole or in parts. Each module is organized around one topic, such as legal, policy and regulatory concerns, business models or partnerships, and how these relate to the diverse challenges of scale and sustainability. Each module offers a series of key steps brought to life by real-world examples from BBC Media Action, Esoko and other digital development organizations. Useful tools, templates, guides and articles are linked to throughout the guide as actionable how-to tips, which readers can apply to their own work.

It's unlikely that all readers will find all modules useful. Different staff, depending on their role in an organization, are likely to find specific modules more applicable to their work than others. In the table below, we have mapped each module against the roles and job titles typically found in a NGO-based digital development program. For example, if you are the Program or Project Director of a digital intervention, you may find the modules on Strategy, Business Model, Legal, Policy and Regulatory, Partner Relationships and Roll Out most useful.

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MODULE

| ROLE | Strategy | Business model | Legal, policy, and regulatory | Solution design |
|--------------------------------------|----------|----------------|-------------------------------|-----------------|
| Program or Project Director | • | • | • | |
| Head of Operations or HR Manager | • | • | • | |
| Head of Finance or Marketing Manager | • | • | • | |
| Project Manager | | | | • |
| Head of Engineering or IT Manager | | | | • |

MODULE

| ROLE | Roll out | Human capacity | Partner relationships |
|--------------------------------------|----------|----------------|-----------------------|
| Program or Project Director | • | • | • |
| Head of Operations or HR Manager | • | • | • |
| Head of Finance or Marketing Manager | • | | • |
| Project Manager | • | • | • |
| Head of Engineering or IT Manager | | | |

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ROLL OUT

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Module 5 of 7





ROLL OUT

MODULE SUMMARY

When it comes to expanding your digital development program to a new geography or transitioning it to a new owner, success will be determined by how your teams and partners implement your strategy, including rolling out your program to end users. Robust project management, constant attention to detail and the ability to adjust quickly as both challenges and opportunities arise are all keys to success. Many digital development programs don't make it to scale because they lack the planning and processes needed to support a substantially larger user base and decentralized operations. Sustainable scale requires the institutionalization of robust project management processes to ensure effective support, distribution, marketing and sales, training, reporting and monitoring and supervision.

The term “roll out” is a broad one that involves almost every aspect of your program's operation and management. There are several components that are especially important to a digital program's ability to succeed in the next phase of its journey, including:

- clearly defined project management structures and processes to coordinate the activities of staff and partners, and to deliver within budget and on time;
- partnerships with public or private sector organizations to reach new or larger user populations through marketing, distribution and in some cases, sales;
- systems for tracking program and financial performance against your new goals, and
- new channels to distribute your solution to end users.

This module is relevant to nearly all readers because of the number of functional areas it touches. It draws on interviews conducted with digital development leaders of organizations such as BBC Media Action, Esoko, Vital Wave, Akros, Dimagi, PATH, BeeHyv, Digital Green, D-tree and Xavier Project. It documents guidance intended to help you think about how the structures and processes that support the implementation of your digital program might need to change at key transition points to achieve scale and sustainability.

Note that some steps, including those related to monitoring and supervision, may only be applicable to programs where a digital solution is being used by a work force to perform a job. Other steps, including those related to marketing and distribution, may only be applicable to digital solutions that target a subset of the general public.

This module will help you to:

- ▶ **1** Build project management foundations for scale
- ▶ **2** Plan for sustainable technical support at scale
- ▶ **3** Adapt training, monitoring and supervision programs for scale and sustainability
- ▶ **4** Optimize and expand your marketing to acquire new users at scale
- ▶ **5** Develop sustainable, cost-effective distribution channels at scale

Key steps

1

BUILD PROJECT MANAGEMENT FOUNDATIONS FOR SCALE

- Create a shared project management structure to manage work by multiple stakeholders
- Align your project management approach with partners' work cultures
- Commit to shared project plans, meetings and minutes

2

PLAN FOR SUSTAINABLE TECHNICAL SUPPORT AT SCALE

- Evaluate whether your existing technical support can be scaled and transitioned
- Plan for different levels of technical support to optimize efficiency and costs
- Plan for growing customer support needs

3

ADAPT TRAINING, MONITORING AND SUPERVISION PROGRAMS FOR SCALE AND SUSTAINABILITY

- Evaluate training approaches that reduce costs and enable scale and sustainability while still maintaining quality
- Expand your monitoring and supervision structures
- Facilitate data-driven management

4

OPTIMIZE AND EXPAND YOUR MARKETING TO ACQUIRE NEW USERS AT SCALE

- Build a mass-market brand with above-the-line advertising
- Acquire specific target groups with below-the-line advertising
- Negotiate marketing partnerships with mobile network operators or aggregators to reach mobile subscribers at scale
- Explore marketing partnerships with organizations that already have active and sustainable marketing and distribution channels

5

DEVELOP SUSTAINABLE, COST-EFFECTIVE DISTRIBUTION CHANNELS AT SCALE

- Understand how users access digital services to improve distribution
- Assess changes in users' digital access and literacy
- Assess private sector distribution costs
- Consider public sector distribution risks

STEP 1

BUILD PROJECT MANAGEMENT FOUNDATIONS FOR SCALE

Create a shared project management structure to manage work by multiple stakeholders

Scaling a digital intervention or transitioning it to government usually involves managing multiple workstreams across a wide range of stakeholders to meet a common goal. Defining and agreeing on a shared project management structure — collectively tracking, documenting and reporting on progress against deadlines — is critical. Equally important is developing processes that stakeholders can follow in order to complete their tasks. The more detailed a project management structure is and the more guidance it provides, the less likely it is that one party will fail to complete their tasks. Although each partner organization will have its own project or relationship manager, it should be clear which organization or team is responsible for each task, has the authority to coordinate work and ensures different components are delivered on time.

One stakeholder missing a deadline can have an expensive, indirect effect on all the others. Sometimes, hiring an objective third party for overarching project management makes sense. Consider allocating budget for professional project management staff, either hired internally or through a third party, when planning for scale. These individuals are not cheap to employ in the short term, but they deliver longer term value, mitigate risks and are essential to delivering complex projects on time and on budget. Implementers report success with a model where a donor or government department contracts and funds a management consultancy to coordinate work between a consortium of partners and government staff.

FOR MORE INFORMATION SEE:

- ▶ **Partner Relationships: STEP 3. UPDATE AGREEMENTS AND REVISE GOVERNANCE STRUCTURES**
- ▶ **Human Capacity: Skills you may need in the next phase**

In practice | BeeHyv

Watch Sai Rahul from **BeeHyv** explain the importance of agreeing with partners on the time, effort and budget dedicated to ensuring adequate communication and documentation for project management.



Other examples

- ▶ To realize the Government of Ethiopia's Information Revolution, its national vision for digital health, **Vital Wave** was funded by a donor to act as an objective third party to manage the roll out of two foundational health information systems. Vital Wave put out request for proposals (RFPs), selected several technology vendors, coordinated the work of vendors developing customized software platforms and supported the government departments that were responsible for rolling out and maintaining the platforms across the health system. This temporary project management structure ensured that vendor selection, platform development and roll out were fast and efficient, particularly since government procurement processes can be extremely time consuming and vulnerable to government staff turnover at high rates.

How to

- ▶ Read about implementation planning and project management for digital development projects [here](#)
- ▶ Learn about the pros and cons of **Agile**, **Waterfall** and related methodologies used in software development [here](#)
- ▶ See the features and benefits of Basecamp and other popular online tools for project management and collaboration [here](#)

Align your project management approach with partners' work cultures

If you've been working on a pilot or are in start-up mode, you may not have used a formal project management methodology. But when the stakes are higher and multiple partners are involved, a well-defined approach to project management — agreed to by all stakeholders — becomes critical. Otherwise, there may be a clash of working cultures which can delay planning and contracting.

For example, governments and mobile network operators (MNOs) often prefer a linear **waterfall** approach to project management, where timelines, milestones and outputs are clearly defined before the project starts. Software development agencies usually prefer **Agile** methodologies that give them the flexibility to iteratively adapt their products based on continuous user feedback. But government partners may prefer to specify detailed requirements in contracts from the outset, link payments to fixed deadlines and penalize agencies for late delivery. Software development agencies may not be comfortable working this way because they prefer the flexibility to develop requirements and code iteratively. One compromise could be to integrate Agile sprints into an overall **waterfall** project plan.

Commit to shared project plans, meetings and minutes

A shared project plan, which reconciles different project management approaches and covers the work of all relevant stakeholders, greatly increases your team's chances of delivering on time and on budget. Otherwise, managing dependencies between partners can be very challenging. When work by one stakeholder must be completed before work by another can start, a shared project plan helps create visibility for all on progress and potential delays.

Many organizations have found it highly effective to develop shared project plans face-to-face. Discussing tasks and planning their dependencies is much easier done in person by the people who will deliver the work. Ensuring tasks are lined up in the right order with reasonable time estimates before entering them into a formal project plan is valuable, proactive planning. Expensive long-distance flights can be worth the investment. Once all stakeholders have shared expectations, and the project plan has been collectively developed and agreed, the project manager for the program can update it based on inputs from stakeholders.

Communication mechanisms are also key. Successful, large-scale projects usually involve structured, regular communication in the form of weekly or even daily project management calls. These calls are only as good as the notes you have from them. Recording accurate minutes of these calls and making sure the minutes are systematically reviewed and approved by call participants is critical. These minutes become your official record of decisions that have been reached.

A shared project plan which reconciles different project management approaches and covers the work of all relevant stakeholders greatly increases your team's chances of delivering on time and on budget.

STEP 2

PLAN FOR SUSTAINABLE TECHNICAL SUPPORT AT SCALE

Evaluate whether your existing technical support can be scaled and transitioned

You will likely need to sign up to tough service level agreements (SLAs) if you want to scale with MNOs, governments or commercial partners. You will also need to evaluate whether you have the right technical partners on board to deliver **24/7 or 16/5 support** for lightning-fast fixes of critical issues.

One of the challenges of developing a digital solution using open source software is that often the people who built it are the only ones with the skills required to support it. This can make scaling support and transitioning to government challenging. Small technology providers might argue that they can transition knowledge about their software to a large third-party technical support company in-country, but this is easier said than done when the software has thousands of lines of custom-built code and little supporting documentation.

Thoroughly test Level 3 engineer capability before deciding on a technical support partner; ensure documentation of your system is rigorous and up to date (including architectural diagrams, process flow diagrams, data definitions, and API documentation) and plan for a sufficient number of face-to-face knowledge transfer sessions, as well as ongoing **Level 3** support for as long as needed.

FOR MORE INFORMATION SEE:

- ▶ **Legal, Regulatory and Policy: STEP 6. REVIEW AND REVISE SERVICE LEVEL AGREEMENTS (SLAS)**
- ▶ **Partner Relationships: STEP 3. UPDATE AGREEMENTS AND REVISE GOVERNANCE STRUCTURES**

In practice | BBC Media Action**The complexity and cost of supporting ‘boutique’ open source software applications at scale**

Technical support was one of the biggest challenges we faced when launching national versions of our IVR-based mHealth education services for the Government of India.

Our services have two key technical components: a proprietary IVR system provided by a mobile technology solution provider in India, and an open source back-end system (rules engine and profile manager) developed by an NGO in the United States.

*When the government asked us to scale two of our services nationally, our NGO partner’s strategy was to procure a technology company in India to use their open source application development framework to build scaled versions of the services, and integrate them with an open source management information system (MIS). Through this development process, our NGO partner hoped the technology company would learn how to provide **L1 and L2 support** from launch, rapidly taking responsibility for **L3 support** thereafter.*

Unfortunately, our NGO partner soon realized that the technology company that had been selected by a panel of stakeholders, including BBC Media Action, could not get to grips with their complex open source code-base. As a result, our NGO partner had to take responsibility for much of the development work themselves.

Although our private sector IVR provider was comfortable signing up to the demanding service level agreements (SLAs) required by government, our NGO partner was understandably concerned about how it would honor them from the United States.

After launch, we had significant technical issues with the integration between the back-end system and management information system (MIS). Our NGO partner had to spend more time than anticipated on L3 support, and SLA commitments were not met due to lack of staff capacity and the significant time zone difference.

Finally, our NGO partner had to hire a replacement technology company in India, which already had experience of using its open source software to build technology solutions. This technology company was not initially selected because it is a small start-up, and had no experience of scaled support. Thankfully, despite its small size, it has demonstrated considerable engineering expertise, managing to not just support but further develop the back-end solution and MIS.

Continued on page 165

Plan for different levels of technical support to optimize efficiency and costs

MNOs and technology service providers usually have different levels of technical support staff to optimize efficiency and costs. **Level 1** engineers typically have three years of experience and can carry out routine system monitoring and administrative tasks, logging any issues they find using bug tracking software. **Level 2** engineers, who try to resolve these issues, usually have five years of experience. **Level 3** engineers usually have eight to ten years of experience and can address complicated issues in the code.

Level 1 and **Level 2** staff are often expected to work shifts to provide **24/7** or **16/5** support. If you're delivering a service for government, they may expect your **Level 1** and **Level 2** staff to sit locally in their data center. **Level 3** engineers usually log in to a system remotely to fix issues and need security clearances and sufficient internet speed and bandwidth to connect to the servers through a **virtual private network** (VPN).

L3 support is rarely calculated on the basis of individual roles, because it would be very expensive to have all the necessary experts sitting on a bench available for support calls. Many commercial software vendors provide annual maintenance contracts for **Level 3** support and commit to fixing or replacing software or hardware for an annual fee, usually calculated as a percentage of the license fee.

FOR MORE INFORMATION SEE:

- ▶ **Human Capacity: STEP 5. EXPRESS, MODEL AND REINFORCE DESIRED BEHAVIORS**

Plan for growing customer support needs

In addition to arranging technical support for your hardware, software, data center and connectivity needs, you'll also need to develop a plan for supporting rapid growth in the number of end users for your digital solution. At a smaller scale, your project staff may have been able to directly support customers, in some cases through face-to-face interaction. However, as you scale up, this approach is likely to become both prohibitively expensive and operationally unrealistic.

Strategies for scaling support to an increasing number of customers include creating a call center or using existing customer support centers — for example, those run by partner MNOs or government entities. Financing a call center may require finding new revenue sources, such as third-party advertising, to cover the associated costs.

FOR MORE INFORMATION SEE:

- ▶ **Business Model: Common digital development revenue models**
- ▶ **Solution Design: STEP 4. PLAN YOUR TECHNICAL DEVELOPMENT FOR SUSTAINABILITY AT SCALE**

In practice | BBC Media Action**The complexity and cost of supporting ‘boutique’ open source software applications at scale***(continued from page 163)*

However, we remain conscious that finding technology companies capable of supporting other organization’s open source code is challenging, and a risk to consider when transitioning services to government. Our learning is that unless an open source software solution has a significant development community in the country where you’re operating, it may prove challenging to find effective in-country support. Purchasing proprietary software licenses with standardized Annual Maintenance Contracts may be less expensive in the long run than free open source software, when not just capital investment, but also operating costs, are taken into consideration.

Other examples

- ▶ Listen to Benjamin Winters, Regional Director at **Akros**, talk about how they planned the transition of user support for their digital solution to the Government of Zambia.



- ▶ When **Dimagi** was supporting the Government of India in deploying a national nutrition program using its CommCare mobile phone platform, Dimagi encouraged the implementation of technology support system with a government support staff member at each block, district and state, for all states included in the rollout. Issues escalated by end users to staff in the block can be escalated to the district and then the state depending on their complexity. Escalation of issues is done through a CommCare application built for technology support. For the most difficult issues, eight **Level 3** staff provide support at a government data center. Dimagi’s **Level 3** software developers support the government data center remotely. For Dimagi, the ideal **Level 1** staff-to-user ratio is between 1:20 and 1:250.

How to

- ▶ Learn more about **Level 1**, **Level 2** and **Level 3** IT support [here](#)
- ▶ Read more about delivering large-scale projects on time, on budget and on value [here](#)

STEP 3

ADAPT TRAINING, MONITORING AND SUPERVISION PROGRAMS FOR SCALE AND SUSTAINABILITY

Evaluate training approaches that reduce costs and enable scale and sustainability while still maintaining quality

If you have a business to business (B2B) or business to government (B2G) digital solution, being able to cost-effectively train corporate or government staff could be critical to its success. At a smaller scale, you might have had a resource-intensive approach to training. Your own staff might have conducted training, with a high ratio of trainers to users. Now that you are faced with rolling out your solution at a larger scale, you will probably need to reassess your approach, especially if the training will be delivered by government partners.

Many organizations use a **training-of-trainers** (TOT) approach where NGO staff train government master trainers, who train local government staff, who then train end users. Supporting the government in developing micro-level training plans, following up on the execution of these plans, and monitoring the quality of training through spot checks have all proved necessary in transitions of program ownership.

Identifying the right trainers is also a success factor. Consider testing different training approaches before scaling up your training program. For example, do community health workers (CHWs) perform better after being trained by their direct supervisors, a district-level health officer or a community leader? Does an all-day training session work better than two half-day sessions? Exploring different training approaches in different locations can help you identify the most effective model. Once you've decided on a training approach, develop customized training manuals and tools to meet trainer needs. Implementers report that it is difficult to achieve the same training results at scale if the intensity of training is significantly reduced, and suggest managing stakeholder expectations about what can realistically be achieved.

FOR MORE INFORMATION SEE:

► **Human Capacity: STEP 4. SHARE KNOWLEDGE TO BUILD SKILLS**

In practice | BBC Media Action**Training isn't enough; the importance of ongoing monitoring and supervision**

*When we began transitioning **Mobile Kunji**, our IVR and print-based job aid for community health workers (CHWs) to state government in Bihar, India, we decided that training government trainers to train CHWs would be the most cost-effective model.*

We started building the capacity of government trainers early, and let them eventually take over. This required a phased approach with multiple trainings conducted to allow for knowledge transfer and change management, with training outcomes presented at government review meetings. Despite this approach, we noticed a drop in the quality of training, and Mobile Kunji usage.

We realized that CHWs' supervisors were not strongly encouraging them to use Mobile Kunji, because the supervisors themselves had not been trained to use the job aid and did not fully understand the value it offered. Following this realization, we changed our strategy to include supervisors in the trainings, alongside CHWs, to make sure they did not feel left out, understood the program and could advocate for its use.

The result was that Mobile Kunji usage was higher in districts where CHWs had been trained by government trainers and then managed by trained supervisors than in the districts where we had trained CHWs directly.

Other examples

- ▶ Watch Dr. Chilunga Puta from **PATH** talk about the importance of monitoring and supervision when scaling digital solutions for government field staff and how to make it happen.



- ▶ As **Digital Green** grew, one of their biggest challenges was ensuring the quality of their service. To tackle this, they created checklists and processes for cross-validating the data that came in from the field and ensuring the integrity of its approach. Using a quality assurance model they developed to manage and track key metrics — such as whether farmers were adopting suggested practices on their farms after watching a video — Digital Green created a uniform data verification methodology. This required training agricultural extension workers on the new methodology and institutionalizing it as a part of the public and private extension systems that it partners with, so that they could carry it forward as a part of their day-to-day operations in the field.

Expand your monitoring and supervision structures

You will need someone to monitor the work performance of the people you've trained, and to supervise their ongoing work. At the pilot stage, your staff may have been supervising a limited number of trained users. But if you're planning to scale and need to achieve sustainability, you may need to adapt your approach.

Implementers that have successfully scaled and transitioned digital tools and services to government have found it critical to engage users' supervisors in training, even if supervisors do not use the solution. For example, if CHWs are being trained to use a mobile app, then the nurses who supervise them should also be trained, even if they will never use the app.

Successful implementers develop training programs specifically for supervisors, integrate monitoring and supervision of digital solutions into the agendas of staff meetings, and make regular visits to provide support to supervisors and participate in their staff meetings. Supervisors who understand how a digital solution works and how staff are supposed to use it, are better able to ensure its effective use.

Facilitate data-driven management

Supervisors need performance information to effectively monitor their staff or any end users of a digital solution. Regardless of whether supervisors are government officials or commercial retailers, they need to know how their staff or outlets are using your digital solution. This performance information needs to be timely, which means they need to have regular access to frequently updated data. At scale, this can be hugely challenging as there could be thousands of supervisors working in the field. You will need a robust **management information system** (MIS), which provides easy access to digestible, actionable data — down to the field level — in order to train and persuade the relevant people to use the system.

Implementers that have successfully developed and rolled out MIS to support data-driven management in the field recommend developing templates for actionable reports in close consultation with supervisors. They know best how much — or how little — information they need to effectively monitor the performance of their staff (the end users of the digital solution).

It's also important to identify how supervisors will access performance reports, as their time, equipment, skill, electricity and internet access can be limited. In addition to the standard online or downloadable reports, some implementers have found it effective to build a system that automatically generates regular reports and emails them to government staff rather than expecting supervisors to access the data online.

FOR MORE INFORMATION SEE:

► **Human Capacity: STEP 5. EXPRESS, MODEL AND REINFORCE DESIRED BEHAVIORS**

Other examples

- ▶ **Zambian health technology provider Akros** changed their approach to monitoring and supervision when they decided to scale. To scale, they knew they would have to decentralize field-based supervision activities. They assigned supervisory roles to “community champions” who became responsible for managing roll out activities in the districts. This process required intensive training and support through field visits by central Akros staff over a period of nine months, but eventually these field visits were reduced and support to community champions was provided remotely. This example highlights how an up-front investment in training field-based staff can pay off in the long-term.
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- ▶ **D-tree** has developed tools designed specifically for supervisors, which provide them with guidance and troubleshooting support to address user issues identified when they conduct one-on-one supervision visits. These tools not only support supervisors to be more effective mentors, but the data generated from these interactions is made available on program dashboards to provide an additional layer of accountability for supervisors themselves. D-tree has found that giving supervisors access to data is only effective if there is a way to monitor and hold supervisors accountable for acting on that data.

How to

- ▶ See sample training of trainer (TOT) packages [here](#) and [here](#)
- ▶ View a training observation checklist template to improve training quality [here](#)
- ▶ Read more about data-driven management [here](#) and about some of the common pitfalls organizations face when trying to implement it [here](#)
- ▶ Find some useful resources for dashboards [here](#)
- ▶ See an example dashboard with performance metrics [here](#)

STEP 4

OPTIMIZE AND EXPAND YOUR MARKETING TO ACQUIRE NEW USERS AT SCALE

Build a mass-market brand with above-the-line advertising

If your digital program is targeting end users, consumers or clients that use a digital solution by choice rather than for work, marketing will play an increasingly important role as you scale. In the early phases of a digital development project, you may not have needed a sophisticated marketing strategy. But scaling it to a large number of end users requires developing plans for both mass-market advertising [above-the-line](#) (ATL) and targeting specific households or individuals [below-the-line](#) (BTL). ATL advertising — via television, radio and billboards — can be the most powerful tool for establishing a new brand or generating awareness of a new digital service among the general population.

You may need an agency to help with creative production and media. Some agencies and media outlets may be willing to work for NGOs pro bono or offer reduced rates. Also, locally produced TV or radio shows may be willing to showcase your product or services for free if it's useful for their viewers and listeners. Talk with local agencies, marketing associations and corporate and media partners about the possibility of joint campaigns where they might be willing to share costs if they see a mutual benefit in promoting your solution.

However, ATL advertising is not a cost-efficient way to target a relatively small segment of people, or to explain how an innovative or complex digital product or service works. Advertising costs can be prohibitively expensive and access can be an issue. If you're targeting low-income or rural communities, it's worth researching whether they have access to television or radio.

Acquire specific target groups with below-the-line advertising

BTL marketing may be more familiar to most digital development programs. This approach is much more targeted, using digital mobile channels such as SMS, USSD and [outbound dialing](#) (OBDs) to reach specific segments of mobile subscribers defined by characteristics such as gender, location or mobile usage habits.

In practice | Esoko**Adapting your message to your audience**

When it came to marketing our new m-commerce service, we first needed a name that would connect to both our locations. We chose Fasiba for this reason — Fasie (Twi for Save) + Akiba (Swahili for Save). After we had a name, we needed marketing materials. We created brochures for farmers, suppliers and financial institutions. When distributing marketing materials, our materials and approach varied a lot depending on the audience.

The brochures for suppliers and financial institutions were focused on the value proposition of being a partner, and were distributed at conferences, during speakerships and in exhibition halls, at one-on-one meetings, at open houses we hosted in different cities for potential clients and on our website. We found that conferences were a great venue for onboarding clients, but required more of a sales-focused, consultative approach.

The brochures for farmers focused on outlining the steps to join the program and were distributed by field agents. To reach farmers, we do a lot of radio communications on local stations, which is important because farmers in Ghana rely on local radio and it is much cheaper than national radio. A 30-second radio jingle on national radio costs US\$1,000, while the cost on local radio channels is one-hundredth of that.

Regardless of who you are targeting, it's really important to make sure that communications staff get sufficient training leading up to product launch and can speak about the product to others.

Other examples

- ▶ In India, IFFCO, a multistate farming cooperative society, partnered with Airtel, an MNO, to launch **IFFCO Kisan Sanchar Limited (IKSL)** to provide farmers in rural villages with useful agricultural information through prerecorded, outbound IVR calls. The IKSL service comes bundled with a special Airtel SIM card called Green SIM. Airtel Green SIMs are sold by existing IFFCO agents at their fertilizer retail outlets which are ubiquitous in many North Indian states. Any farmer who buys a Green SIM will start receiving free IKSL calls with agricultural tips and advice every day. Green SIM sales support the cost of the free IVR calls. This powerful partnership, which linked an existing retail network with an innovative SIM plan, has secured hundreds of thousands of users across several states. Read more [here](#).

Face-to-face marketing is also very common in rural markets, where events, video vans, street theater and door-to-door promotions are used to reach specific target groups in their villages and homes. Channels such as rural face-to-face marketing can be very expensive, however, and many digital channels may be of limited use in geographies with low levels of literacy or limited access to smartphones and mobile data, or for programs whose users are not regular smartphone or social media users. Use surveys, focus groups and program staff to research the technologies your target users are able to access and can afford to use.

ATL advertising — via television, radio and billboards — can be the most powerful tool for establishing a new brand.

Negotiate marketing partnerships with mobile network operators or aggregators to reach mobile subscribers at scale

One of the biggest challenges faced by digital solutions that aim to reach mass markets — for example, all school teachers or mothers in a particular area — is how to cost-effectively acquire users. This is particularly challenging if those users are low-income and rural. Most digital development services that have achieved scale have marketing agreements with their MNO partners. In exchange for access to free, high-quality content and a healthy percentage of revenue, MNOs may agree to promote your service via their digital channels and through their thousands of [top-up shops](#).

Depending on the nature of your service, MNO marketing can succeed or fail. For example, if your digital service is targeting low-income, rural, illiterate women, MNO marketing might not be very effective. They may not be able to read SMS or USSD promotions or make purchasing decisions without permission from their husband or a male relative. On the other hand, if you're selling English-language learning to literate, male job seekers, MNO marketing could be a great way to reach potential customers. It's thus wise to research what technology your target users consume and their relationships with [top-up shops](#) before finalizing your strategy and MNO partnership agreements.

FOR MORE INFORMATION SEE:

- ▶ **Business Model: STEP 1. UNDERSTAND WHAT THE CHANGING LANDSCAPE MEANS FOR YOUR DIGITAL SOLUTION**
- ▶ **Partner Relationships: STEP 2. IDENTIFY POTENTIAL NEW PARTNERS**

How to

- ▶ Learn more about ATL and BTL marketing in an infographic [here](#)
- ▶ See a customer segmentation toolkit [here](#) and a creative brief template [here](#)
- ▶ Read more about how to develop mutually beneficial partnerships with MNOs [here](#) and [here](#)

Explore marketing partnerships with organizations that already have active and sustainable marketing and distribution channels

If your digital solution is aimed at low-income consumers, it may not generate sufficient revenue to motivate an MNO to commit valuable marketing resources. In these circumstances, it may be more productive to build mutually beneficial partnerships with [fast-moving consumer goods](#) companies or companies that sell agricultural inputs, which already have significant rural marketing budgets and programs.

These corporations may see the value that your digital services could add to their brand more clearly than an MNO. They may be willing to use their existing rural marketing channels to promote your digital solution in exchange for brand promotion, product placement or advertising space. When thinking about these kinds of partnerships, considering whether the firm is one you feel comfortable tying your brand to, and pay special attention to [revenue share](#). The more partners you add to your mix, the further the revenue needs to be split, and your business model may cease to be viable.

If relevant, work with cooperatives and self-help groups that are already active in the communities you're targeting — such as farmers' cooperative and micro-credit groups — to see if they can provide a channel for promoting your solution.

FOR MORE INFORMATION SEE:

- ▶ **Business Model: STEP 3. IDENTIFY WHO IS GOING TO PAY FOR THE NEXT PHASE**

STEP 5

DEVELOP SUSTAINABLE, COST-EFFECTIVE DISTRIBUTION CHANNELS AT SCALE

Ask the big questions that impact distribution

Sustainable distribution at scale is one of the biggest challenges faced by the digital development community today. You will need to figure out how to deliver your digital solution or content to thousands, if not millions, of low-income people, many of whom live in rural communities. This will require asking fundamental questions about how your users access digital services and the types of relationships you'll need to build.

For example, are you expecting your target users to call or SMS a **short code** to access your digital service? Will they download it from a website or app store such as Google Play? Or will they load it on their existing phones using a wired connection, SIM card or memory card? If distribution needs to be done in person, can you feasibly build relationships with retailers, such as **top-up shops**, willing to distribute your solution? Ask questions now about how your distribution channels, in person and virtual, need to change to become sustainable at scale.

FOR MORE INFORMATION SEE:

► **Solution Design: STEP 1. USE A HUMAN-CENTERED DESIGN APPROACH TO REASSESS YOUR USER REQUIREMENTS**

Assess changes in users' digital access and literacy

The answers to these questions may lie in a rapidly changing digital environment where expansion of fixed broadband, 3G and 4G networks and smartphone ownership are boosting consumer data usage and creating new distribution opportunities. Conducting new research to identify any widespread changes in your target users' access to devices and connectivity may help you identify new ways of reaching users. Do users who previously had access to only brick or feature phones now regularly use smartphones? Do users have better access to mobile data through expanded 3G or 4G networks?

In practice | BBC Media Action**The pitfalls of public sector distribution at scale**

We began transitioning the cost of running Mobile Kunji, our IVR and print-based RMNCH job-aid for community health workers (CHWs), and Mobile Academy, our IVR-based RMNCH training course for CHWs, to governments in three Indian states in 2013.

One of our key strategies was to integrate our short codes into Closed User Group (CUG) SIM plans already procured by state governments for CHWs, thus making calls to our mobile health education services free to CHWs.

In the first state, we successfully supported the government in extending its MNO agreement to provide free calls to Mobile Kunji to CHWs in five districts from their CUG SIMs. The government distributed the SIMs to CHWs, registering their contact details, and providing us with the data for monitoring and reporting. The distribution went well, we received the necessary data, and the CUG SIMs functioned as planned.

Having successfully tested our strategy, we supported the government in the next state in extending its agreement with the same MNO to provide CUG SIMs and free calls to Mobile Kunji and Mobile Academy to 143,000 CHWs. Perhaps because of the scale, distribution was less successful. For example, all the SIMs were registered in the name of one government official, instead of each CHW. It took two years for the government to trace and register all the CHWs who had received SIMs. We never got all the data. And this wasn't the end of our troubles. A year after the SIMs were distributed, they were de-activated due to government nonpayment of an MNO invoice. The government eventually paid the invoice, but reactivation was patchy.

In the third state, government distribution of CUG SIMs to more than 100,000 CHWs was nearly comprehensive, but no explanation about the purpose of the SIM or its features was provided — to the extent that CHWs who received SIMs loaded in dual SIM smartphones didn't know they were there.

Our learning from these experiences has been that the distribution of any physical asset (i.e. hardware of any kind), which needs to be explained and maintained, can prove a significant logistical challenge at scale. Sufficient time and project resources need to be allocated to supporting government with distribution and maintenance.

It's also important to figure out whether your target users' digital literacy levels have changed. For example, they may have phones that can access the internet, but have they ever gone online? If your target users are early adopters such as young men, their digital capability may have changed dramatically since you first launched your digital solution. On the other hand, if they're traditionally late adopters, such as middle-aged rural women, it will take more time before they can be reached through new technology or communication networks, and you may need to continue using legacy technology to distribute your solution.

FOR MORE INFORMATION SEE:

- ▶ **Solution Design: STEP 1. USE A HUMAN-CENTERED DESIGN APPROACH TO REASSESS YOUR USER REQUIREMENTS**

Assess private-sector distribution costs

Once you've figured out which technologies your target users are using, you'll be in a stronger position to identify effective distribution partners. At the pilot stage, your staff or an NGO partner may have managed distribution. But at scale and to make the distribution sustainable, you'll need to build partnerships with the private sector or local government to get your solution into the right hands.

MNOs have powerful distribution channels, including vast retail networks of [top-up shops](#). But most of these [top-up shops](#) are independent and will expect financial incentives for anything they distribute. This is likely to be true of any commercial distribution network. Thus, you'll need to build distribution costs for these partners into your business model and budget.

FOR MORE INFORMATION SEE:

- ▶ **Business Model: STEP 4. FORECAST REVENUE FOR YOUR DIGITAL PROGRAM**
- ▶ **Partner Relationships: STEP 2. IDENTIFY POTENTIAL NEW PARTNERS**

Consider public-sector distribution risks

If you run a public-sector digital development project, you may be relying on local government to distribute devices and SIM cards with data plans to target users, such as community health workers or primary school teachers. This can be fraught with challenges related to time-consuming procurement processes when you're expanding your program.

First, you'll need to negotiate partnerships with device manufacturers to test and bundle your digital solution on their devices. Then you'll need to figure out how the government can procure these devices from these manufacturers. Next, you will have to support the government through a lengthy procurement process. Finally, you'll need to closely monitor distribution.

Other examples

- ▶ Several agriculture, education and entertainment organizations partnered with mobile phone manufacturer, Nokia in a service called **Nokia Life Tools**, to gain access to its handset distribution network in low and middle income countries (LMICs). Nokia pre-loaded SMS-based mobile apps developed by partner organizations onto feature phones, allowing target users to access valued digital content and services after buying a new handset.

Nokia Life Tools was eventually shut down in 2013 when access to smart phones and web-based services became more available to users in LMICs. Simultaneously, MNOs increased the competition with their own value added services and would not provide Nokia Life Tools with cost-effective SMS rates. This example illustrates that digital programs can both expand through partnerships with private sector organizations with large distribution networks and eventually fail due to changes in users' digital access. Read more [here](#) and [here](#).

- ▶ Watch Edmund Page from **Xavier Project** talk about the challenges their programs face in distributing mobile devices to refugee committees in order to provide education using basic mobile-handsets.



How to

- ▶ View the Mobile Economy reports, produced annually for many countries and a good source of data for planning your distribution, [here](#)
- ▶ Read insights about distributing and managing devices at scale [here](#)

Keep in mind that devices will have to be repaired and regularly replaced, and the government will have to monitor and regularly make payments for SIM plans. Lessons from your earlier phases need to be understood and built into your plan for distribution at scale. Keep track of delays and challenges related to distribution that you have experienced, and build the inevitable delays into your time line. If possible, explore private sector distribution channels.

RESOURCE ROLLUP

Who do you need?

Expanding your digital development program requires bringing in new skills and augmenting the size of current teams supporting different functions. The table below indicates the types of human resources you will need to complete the steps in this module. Your partners' support with technology, distribution and marketing will be integral to rolling out a scaled program successfully.

| Activity | Resource type |
|--------------------------|-----------------------------------------------------------------------|
| Project management | Program and/or Project Manager, Coordinator |
| Solution support | Technical implementation specialist, Technical support partners |
| Distribution and sales | Distribution and Sales Manager, Project Manager, Partnerships Manager |
| Marketing communications | Marketing Communications Manager, Coordinator, Marketing partners |

Pro tips

- **Establish discipline around process.** Roll out at scale requires building program systems and infrastructure, which takes time and involves working through many details. Adopt a process mindset: simplify repeatable processes, document them, train your staff to use them, and apply them.
- **Invest in good project management.** Spend the time and resources needed to find the right people, methodology and tools to manage the growth of your program. A qualified and experienced project manager is indispensable for managing roll out at scale and helping your team navigate the unexpected.
- **Think outside the box when it comes to marketing and distribution.** Exploring new partnerships with public and private organizations with massive distribution networks and new communication technologies can help you reach millions if you know how these end users prefer to be reached.

| Key step | Referenced resources |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. BUILD PROJECT MANAGEMENT FOUNDATIONS FOR SCALE</p> | <ul style="list-style-type: none"> • Guide: Planning for Implementation • Article: What's the Difference? Agile vs Scrum vs Waterfall vs Kanban • Article: Best Project Management Software |
| <p>2. PLAN FOR SUSTAINABLE TECHNICAL SUPPORT AT SCALE</p> | <ul style="list-style-type: none"> • Article: IT Support Levels Clearly Explained: L1, L2, L3, and more • Article: Delivering Large Scale IT Projects on Time, on Budget, and on Value |
| <p>3. ADAPT TRAINING, MONITORING AND SUPERVISION PROGRAMS FOR SCALE AND SUSTAINABILITY</p> | <ul style="list-style-type: none"> • Guide: Train-the-Trainer Manual • Guide: Becoming a Trainer • Example: Training Observation Checklist • Article: Developing Business Decision-Making Models that Really Work • Article: 4 Common Errors that Kill Data-Driven Decisions • Article: What is a Digital Dashboard? • Example: cStock Dashboard |
| <p>4. OPTIMIZE AND EXPAND YOUR MARKETING TO ACQUIRE NEW USERS AT SCALE</p> | <ul style="list-style-type: none"> • Case Study: Rural Telecom-Related Services • Infographic: Above-the-Line vs Below-the-Line Marketing • Toolkit: Customer Segmentation Toolkit • Example: Creative Brief Template • Guide: Building Effective Partnerships between MNOs and NGOs in Complex Environments and Crises • Guide: A Practical Guide for Engaging with Mobile Network Operators in mHealth for Reproductive, Maternal, Newborn and Child Health |
| <p>5. DEVELOP SUSTAINABLE, COST-EFFECTIVE DISTRIBUTION CHANNELS AT SCALE</p> | <ul style="list-style-type: none"> • Article: Nokia Life Tools Launched across India • Article: Nokia Life • Report: GSMA The Mobile Economy • Guide: Managing Devices at Scale |

| Term | Definition |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16/5 support | A support service that is provided 16 hours a day Monday to Friday. |
| 24/7 support | A support service that is provided 24 hours a day and seven days a week. |
| Above-the-line marketing Source | Mass media marketing, through television, radio and print media, which is not targeted at a particular customer but to a wide audience. |
| Aggregator Source | An organization that acts as a middleman between application and content providers, and mobile carriers. Provides message traffic throughput to multiple wireless operators or other aggregators; provides mobile initiative campaign oversight and administration, as well as billing services. |
| Agile methodology Source | An approach to project management utilized in software development. It uses incremental, iterative work sequences, commonly known as sprints. |
| Below-the-line marketing Source | One-to-one marketing through the distribution of pamphlets, handbills, stickers, promotions and brochures placed at point of sale or roadshows. |
| Closed user group (CUG) Source | Closed User Groups are groups of mobile telephone subscribers who can only make calls and receive calls from members within the group. |
| Fast-moving consumer goods (FMCG) Source | Products that are sold quickly and at relatively low cost, including non-durable goods such as over-the-counter drugs and food. |
| Level 1 support Source | Basic help desk resolution with lower-level technical personnel trained to support basic customer issues, such as solving usage issues and fulfilling service desk requests that need IT involvement. Also called Tier 1 support. |

| Term | Definition |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level 2 support Source | <p>In-depth technical support from experienced and knowledgeable technicians, but not necessarily engineers or programmers, for problems that cannot be handed by Level 1. Also called Tier 2 support.</p> |
| Level 3 support Source | <p>Expert-level product and service support with access to the most skilled technical staff for problem resolution or new feature creation. Support is provided by chief architects, engineers or product developers who attempt to duplicate problems and define root causes using product designs, code or specifications. Also called Tier 3 support.</p> |
| Outbound dialers (OBDs) Source | <p>An outbound dialer, also known as a predictive dialer, dials a list of telephone numbers and connects answered dials to people making calls, often referred to as agents. Predictive dialers use statistical algorithms to minimize the time that agents spend waiting between conversations, while minimizing the occurrence of someone answering when no agent is available.</p> |
| Revenue share Source | <p>The distribution of profits and losses between stakeholders, such as partners, employees or companies in an alliance.</p> |
| Service level agreements (SLAs) Source | <p>A contract between a service provider and an end user that defines the level of service expected from the service provider. SLAs are output-based specifically defining what the customer will receive.</p> |
| Short code Source | <p>A short digital sequence, significantly shorter than a telephone number, that can send and receive SMS and MMS to and from mobile phones. Users send a message to a short code to receive a canned response such as a web link. Each country has its own system.</p> |
| Top-up shop | <p>A business where an individual can add value to their mobile phone package.</p> |
| Train-the-trainer (TTT) or Training-of-trainers (TOT) Source | <p>An education model whereby individuals identified to teach, mentor or train others attend training themselves.</p> |

| Term | Definition |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Unstructured Supplementary Service Data (USSD) Source</p> | <p>Unstructured Supplementary Service Data (USSD), sometimes referred to as “Quick Codes” or “Feature codes”, is a protocol used by cellular telephones to communicate with the service provider’s computers. USSD can be used for browsing, prepaid callback service, mobile-money services, location-based content services, menu-based information services and as part of configuring the phone on the network.</p> |
| <p>Virtual private network (VPN) Source</p> | <p>A virtual private network (VPN) extends a private network across a public network, and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network. Applications running across the VPN may therefore benefit from the functionality, security and management of the private network.</p> |
| <p>Waterfall methodology Source</p> | <p>A sequential, non-iterative design process, used in software development processes in which progress is seen as flowing steadily downwards, like a waterfall, through the phases of conception, initiation, analysis, design, construction, testing, production/implementation and maintenance.</p> |



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