dimagi

Managing Devices at Scale

Key learnings from managing thousands of devices in a large-scale mobile health project

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Introduction

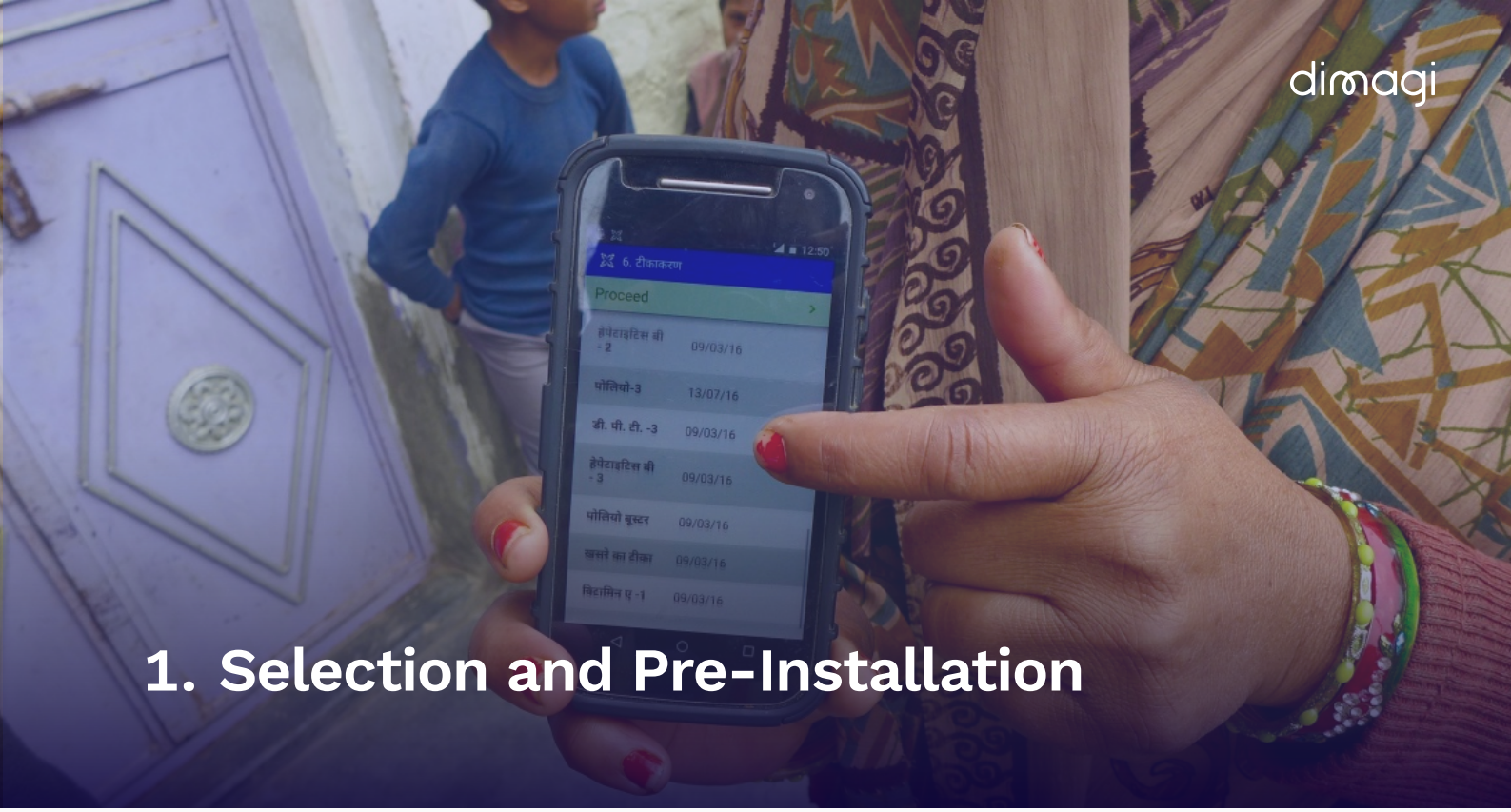
This year, as part of a large-scale mobile health project in India, Dimagi helped equip over 50,000 community health workers with CommCare applications, downloaded on Android smartphones. This project, which is one of the largest mobile health interventions in the world, presented our team with many new challenges and opportunities.

One hurdle in dealing with a project of this size is device management. On this particular project, Dimagi and its implementation partners were responsible for the procurement, testing, setup, distribution, and management of all 50,000 devices. This was no easy feat. As more mHealth projects around the world look to scale, we want to share what we learned to help other organizations avoid pitfalls and ensure success in this important — and somewhat tedious — process.

This eBook looks back at our key learnings for managing devices at scale, from selection all the way to delivery. We identified four tips in the five phases of this process:

1. **Selection and pre-installation**
2. **Sample testing**
3. **Quality check**
4. **Device setup**
5. **Distribution and management**

If your organization is gearing up for a large-scale mobile-based project, don't miss our key learnings!



1. Selection and Pre-Installation

The first, and most important, step in this process is selecting the correct device for your project. Keeping the user experience in mind is critical to ensure you choose phones that are of sufficient quality and are software-compatible for the app you created.

For this project, as the software partner, Dimagi played an important role in specifying minimum requirements for the devices that needed to be procured, in accordance with the project's objectives. The Dimagi team recommended that the device vendor pre-install the CommCare app and all supporting applications for ease of distribution to end-users.

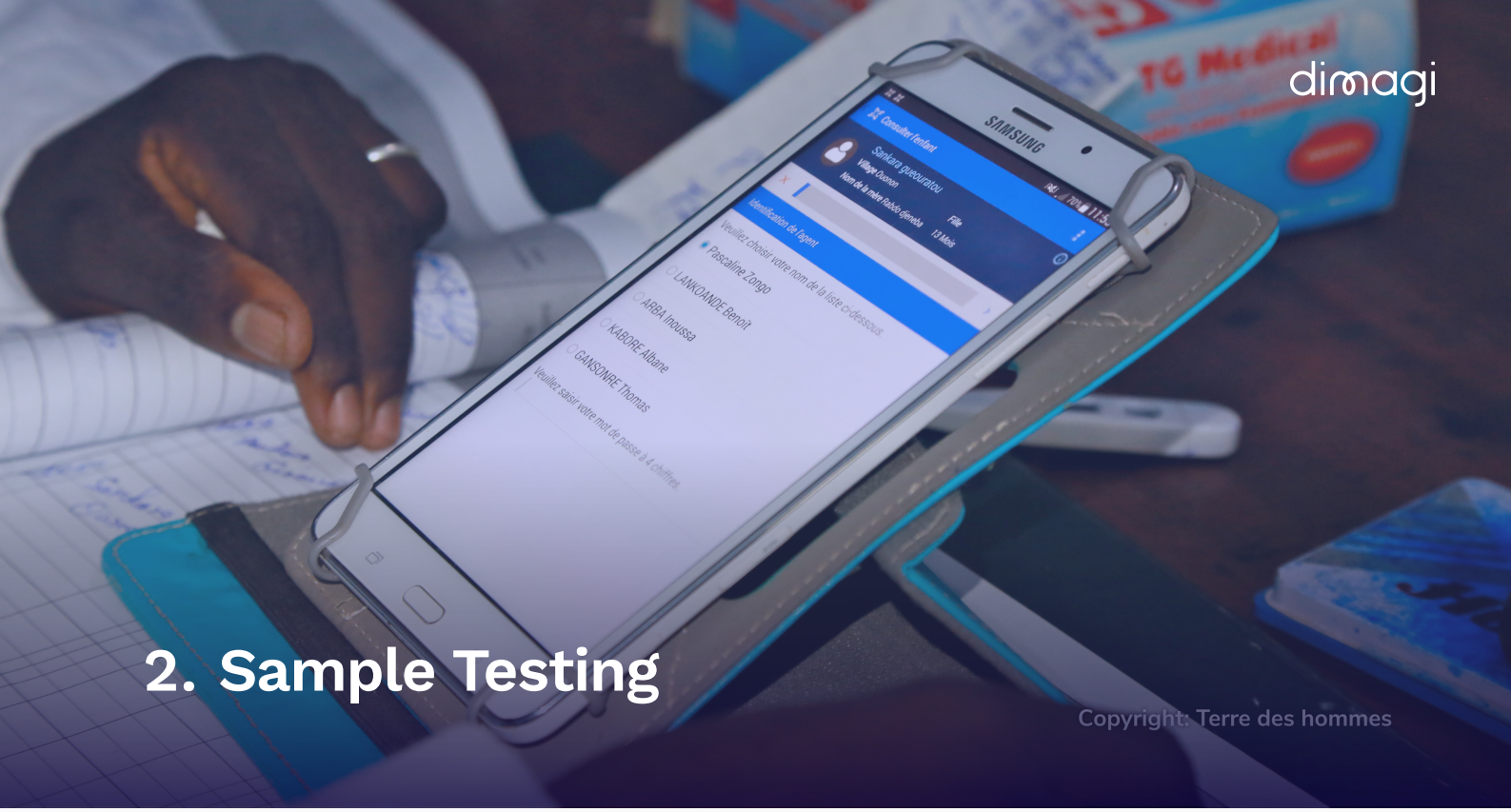
To ensure you choose the correct device and mitigate any mistakes that happen during preinstallation, here are a few key learnings from our pre-procurement experience:

1. **Review every feature of the app comprehensively** to decide what device specifications are necessary to support your app's functionalities. From audio format support and processor speed to storage capacity and battery, it is essential to test how the app functions on various devices to hone in on the minimum specifications. You should also consider how the industry landscape is evolving to future-proof the specs as much as possible.

2. **Clearly outline minimum specifications and software compatibility checks** for device selection. This will help you articulate and standardize the requirements to ensure all stakeholders are aligned.

3. **Describe in-detail what state the device should be in after pre-installation is done.** Be sure to give clear directions on what the device settings should be, and what the app should look like on the device.

4. **Prepare for any eventuality.** In our project, we specified that the software should be removable and reinstallable from all phones. If all else fails in the field, at least it is possible to start from scratch!



2. Sample Testing

So does this mean any vendor that claims to meet these set of requirements can be selected to deliver all devices? Not so fast...

Before choosing a vendor and ordering devices, you want to ensure that what you choose is compatible with the app, and that pre-installation is done correctly. In order to avoid winding up with 50,000 devices pre-installed with unusable apps, we recommend following these four steps:

1. **Require the vendor to submit a sample of pre-installed devices for testing** before any large orders are placed. This may be the most crucial learning from our experience. These samples should apply the pre-installation method used at scale to emulate the real situation (for example, a factory injection of the app, rather than a manual installation).

2. **Understand the testing scope.** Define what your testing requirements are and ensure all partners are aligned.

3. **Determine accountability** for specifications that fall outside of your scope, such as the life of the touch screen, processor configuration, or other hardware requirements. You may want to request that the manufacturer provides certification on these specifications, particularly the ones that partners cannot feasibly test for.

4. **Conduct high-load and field sanity tests** on the device with the application to ensure the sample device is field-ready.

3. Quality Check

After passing sample testing, the vendor is given the go-ahead to deliver devices. Hurray! But how can we be sure all these phones arrive in an acceptable state?

At this stage, the partners should undertake quality check (QC) of each device consignment within a few days of receipt. Once the QC is complete, the partners either accept the consignment or inform the manufacturer of any issues to resolve. Things to keep in mind while planning QC:

1. **Define and document criteria** for the QC exercise based on minimum specs and pre-installation documents, including the need for hardware testing.
2. **Define the sample size** to be tested and the thresholds for each consignment passing or failing this exercise, based on the project.
3. **Align responsibilities** among stakeholders for any outcome of QC even before the procurement process begins. The vendor should be responsible for collecting and rectifying any hardware or pre-installation issues identified during QC.
4. **Test devices on-site and build capacity** for local or regional teams to be responsible for this exercise.

4. Device Setup

Once the devices pass the QC process, it is time to configure them for the field. Each device will require certain user- or device-specific configurations before considered ready. But how do you get 50,000+ phones setup for a diverse group of users in thousands of remote locations?

This stage of the process is fraught with challenges... and lots of details. In our project, we broke into five teams of 60 support staff, responsible for 10,000 devices each. Here are four recommendations to make device setup as smooth as possible:

1. **Document and disseminate step-by-step guidelines** on what each device must go through to be field-ready. It is critical to align on this before device setup begins to ensure each device goes through the same setup process.

2. **Streamline logistics as much as possible.** At scale, even seemingly minor factors can block the entire process. Account for every detail. For example, consider the seating arrangement, the transport of devices, Wi-Fi connectivity, how each device is tracked, and how you will box devices after review. A useful trick we learned was to include a one-pager with the end-user's username and password, Google account credentials, and other details relevant to the project in each device's box. This ensures that each user receives all key relevant information along with their labeled smartphone.

3. **Ensure sufficient manpower**. Device setup at scale can be a painstaking task that is best accomplished with a team of well trained staff. This should be arranged in advance, along with planning the venue details, meals, and energizer activities!

4. **Internet connectivity** was key to ensuring that device setup at scale happens smoothly. Basic Wi-Fi woes hamper the entire process and impact team morale.

5. Distribution and Management

Following setup, you now must now distribute thousands of smartphones out to the field. Time to celebrate?! Not quite. Before the job is done, we must prepare for a few scenarios, such as:

- What if a phone is damaged or stolen?
- Who should a user contact if he/she has an issue with the application or a SIM card?
- How are the devices tracked if a user resigns and a new person joins in that role?

Thinking through device and SIM card management is an important step of this process. Again, here are our four key learnings from this last step in device management at scale:

1. **Distribute devices to users at events like training sessions** to ensure that each person gets the right device. Users will also be able to open the phone and identify any glaring issues on training day, which can be resolved in-person.

2. **Maintain a master Excel sheet** with device information, phone numbers, usernames/ passwords, and user details to assist in ongoing tracking.

3. **Consider setting up a call center or help desk ecosystem** for a first line of support for end users to report hardware or software issues. The partner may find it difficult to handle thousands of calls from users without such a support system. Help desk staff should have clear roles and responsibilities and receive training and documentation on the application and troubleshooting mechanisms.

4. **Record and analyze data on reported issues** and field feedback to constantly improve the application and implementation.

Summary

There you have it — our adventure and learnings through the various stages of device management. We hope this is useful to any organization planning to implement a large-scale mobile intervention. Many of these best practices may seem dry, even basic, but if there is one big takeaway from our experience, it is that sometimes the simplest of details make the biggest impact on projects at scale!

If you have any questions on this blog or other learnings from large-scale implementations, we'd love to hear from you!

Please reach out to **info@dimagi.com** with your details.

About Dimagi

Dimagi is a global social enterprise that powers impactful frontline work through scalable digital solutions and services. Since 2002, Dimagi has been guided by a vision of a world where everyone has access to the services they need to thrive.

Dimagi is most well-known as the makers of CommCare, the most widely-deployed digital platform for enabling Frontline Workers. Governments and organizations across all sectors use customized mobile, web and SMS applications built on CommCare to deliver services at the frontline. Dimagi is a certified Benefit Corporation with teams in the United States, India, South Africa, Senegal and around the world.