Development and piloting of a unified technology solution for malaria rapid diagnostic tests

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Introduction

Malaria Consortium is using a unified technology solution for the following based on its previous experience in Zambia where delayed data from the field affected supplies and quality control.

- Supply chain and inventory management to track and trace stocks, sales, brands across geographies in quasi/real time
- Quality control provider performance on adherence to national guidelines – through an android based mobile application called the Malaria test and inventory app (MTI)
- Marketing support through loyalty program linked to rapid diagnostic test (RDT) sales and customers to get information on nearest test centers
- Anytime, anywhere viewing of key metrics for partners and stakeholders through data analytics and mining

Trialing of the mobile application was carried out over a two week period between August to September 2014 to determine uptake of the technology by the providers.
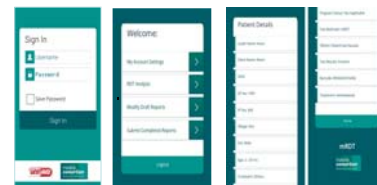
MTI icon and screens

Hands on training session during follow up visit

Objectives

- To determine user perceptions, acceptability and functionality of smart phones and mobile apps in general
- To observe and understand user-experience and time for adoption
- Obtain feedback on ease/complexity of smart phone and MTI app and any improvements to be made

Methods

- Two-week pilot at 20 private clinics and drug shops, both rural and urban settings in Wakiso District, Uganda.
- Training included orientation to pilot, questionnaires on smart phone and features, 'hands-on use' that included battery loading, switching on, charging, introduction to accessories and their usage; locating, opening of MTI app on screen; filling in outlet data, patient details, barcode scanning, conducting an RDT test and saving results on the smart phone
- Users were then visited twice and given on the job training and provided a helpline number to call when needed
- Participants filled in feedback forms at pilot and two follow up visits. The data was then analysed to draw insights on user adoption, areas for change and improvement

Results

Topline findings at training:

- 30% (6) participants were familiar with smart phones
- Preferred mode of maintaining information: 50% (10) chose record book and smart phone and 40% (8) chose only smart phone
- 60% (12) felt a smart phone will help with work, 25% (5) thought it would save time
- Major concerns about not wanting to use smart phones ranged from being stolen 35% (7) and too complicated – 20% (4)
- Initial awareness of safe-keeping and phone care was 100%

Topline findings after two weeks:

- Average time to fill in data using MTI app was 3 to 4 minutes
- RDT tests carried out and records saved using phone in the first week was 137 and week two was 235
- 95% (19) users now felt the phone and the apps would be helpful in their work
- 'No problems faced' and ease of use (Figure 1) in using phone and/or app was 30% (6) in week one and 70% (14) by week two
- Two users (10%) tried to insert their own SIM cards
- All charged their phones as and when needed and stored carefully either in their homes or official premises
- Two patients complained about phone use while attending to a patient in the first week and four in the second week

MTI app improvements – suggestions by providers:

- Include other tests such as typhoid, Syphilis and HIV
- Addition of timer for when the malaria diagnostic test ends
- Addition of 'frequently ask questions' to help in patient interaction and follow up of patients using their contact numbers
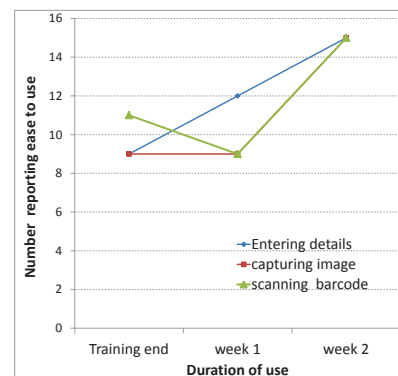- Allow internet services on the phone and removal of password restricting use of the phone

Figure 1: Ease of use of MTI app

MTI app redesign based on pilot:

- **Features added:** Four choices for testing plus ability to carry out multiple tests and timer incorporated
- **User interface changed:** Scrolling function fully eliminated. App redesigned to ensured exact screen sizes, simpler color scheme and bigger font sizes
- **Keeping the smart phone 'dumb':** Since phones need less charging than if it is being used on a continuous basis, the phones were projected as a strictly work-related tool. Users eventually accepted the phone as a project tool and restrictions as a 'necessary evil' that helped them with work

Conclusion

- The pilot helped to understand the importance of 'user-centered' design, as it can then lead to rapid adoption.
- Users were happy that they learnt to use the smart phone and MTI application. It simplified their work on recording patient data, reporting and saved time. For some, it built their confidence and said they can now use computers. One user felt that it was attracting more patients to her outlet.