Rwanda Maternal and Child Health System

Technical Proposal

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TABLE OF CONTENTS

1. INTRODUCTION.....1
2. TECHNICAL APPROACH.....2
3. PROJECT MANAGEMENT AND STAFFING 5
4. DOMAIN KNOWLEDGE AND EXPERIENCE.....6
5. RESUMES/COMPANY PROFILE.....7

1. INTRODUCTION

The Ministry of Health, in cooperation with UNICEF wishes to implement an SMS based system to provide a real time community based surveillance and alert system for maternal and child health.

In this project, Pivot Access will analyze the current Community Health Worker Program, the different stakeholders' needs and the work flow between involved parties and based on the findings, implement a system that will serve the following high level objectives:

- to send emergency alerts to a hierarchy of health professionals
- to give tailored feedback to community health workers to help them make more informed decisions
- provide a general surveillance mechanism for better health policy

Each CHW will be provided with a basic mobile phone that they register within the system, linking their unique location and chain of reporting (clinic/district) to this number.

During the course of their work, selected data will be sent by the CHW via SMS into a central server in Kigali. Feedback loops will be immediately sent back to CHWs via SMS, tailored to help them make more informed decisions.

During emergencies, automated SMS alerts will also be sent by the server to key maternal health supervisors at the clinic and district levels.

This data will also be integrated into the national Health Management Information System (HMIS), and available in real time via a web-based user interface for monitoring of risk trends and general surveillance.

This document specifies the features required for Phase1 of this work, to be completed within one month by Pivot Access. It is expected that additional phases will be specified and implemented in the future to further enhance the functionality.

2. TECHNICAL APPROACH

The technical approach for implementing Rwanda Maternal and Child Health System is divided into three key components:

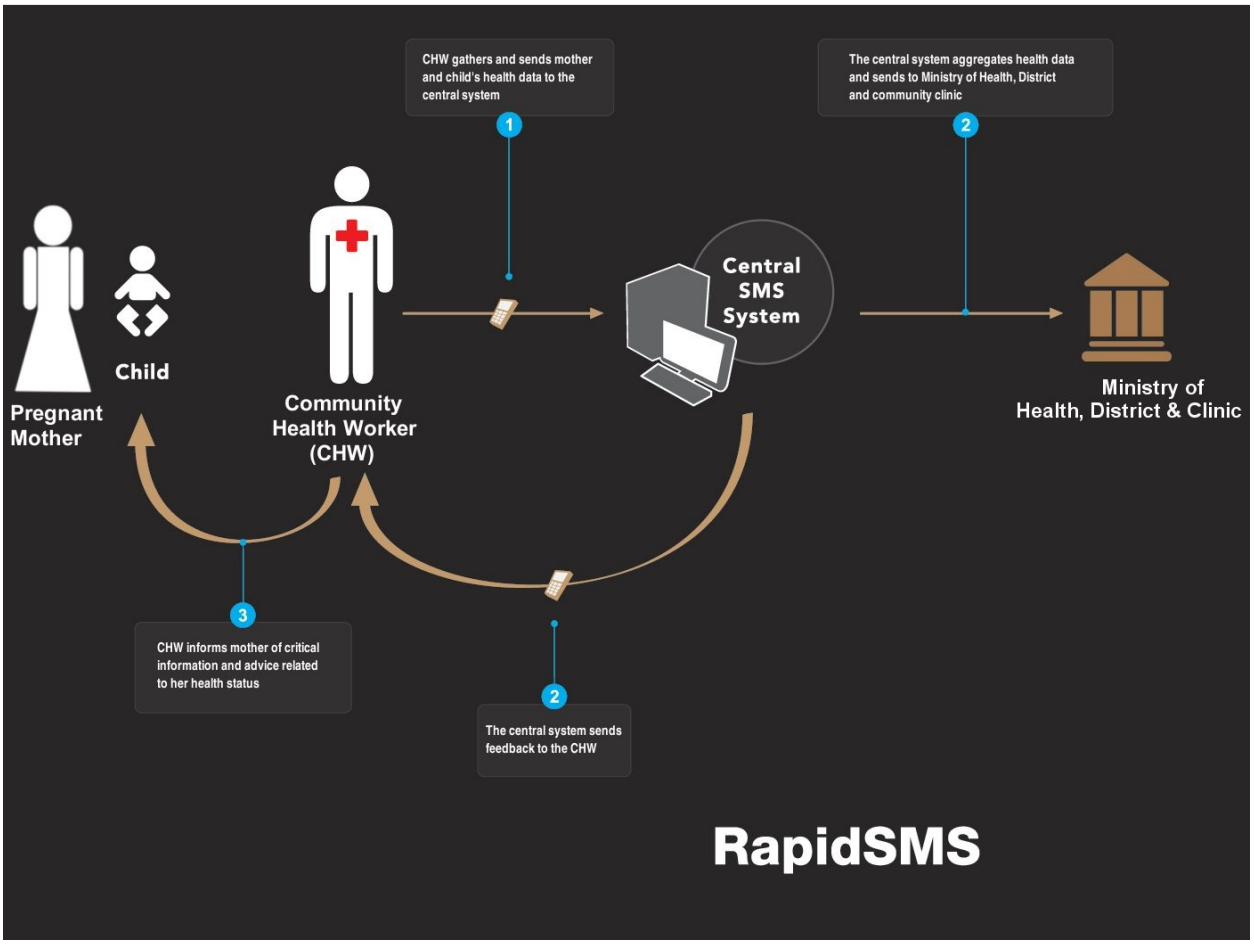
(1) system analysis and design, (2) system functionality, (3) system integration. The system will be implemented using a phased, rapid-prototyping approach as a way to solicit user feedback in the development process. This will insure that user needs are met, and the system is tailored to user specifications.

2.1 System Analysis

As with all other phases, the analysis will follow an agile process. The processes involved are:

- Identify system users, their roles and goals
- Define system usage patterns
- Create user interface mock ups

2.2 System Functionality



The solution's feature set includes the following:

Health Center Registration

- support the import of the existing health care location database
- imported health care locations will include health centers and hospitals, including all metadata in existing database
- support the manual listing, editing, insertion or removal of health center locations via the admin web interface

CHW Phone Registration

- support of registration of phones via SMS form
- form fields will include: type of registration (CHW, officer in charge of maternal health, clinic supervisor), clinic id, language and optionally the village name
- system will send a confirmation response or error messaging detailing the result of the action
- support for manual listing, editing, insertion or removal of phone registrations via the admin web interface

Maternal Registration

- support of registration of new pregnant mothers via SMS form
- form fields will include: patient id, mother's date of birth, phone number, movement codes and actions items (see appendix)
- system will send a confirmation response or error messaging detailing the result of the action
- support for manual listing and editing of maternal registrations via the admin web interface

Maternal Risk

- support of recording maternal risks via SMS form
- form fields will include: patient id, movement codes and action items (see appendix)
- system will send a confirmation response or error messaging detailing the result of the action
- support for manual listing of maternal risks via web interface

Birth and Child Registration

- support of recording new births via SMS form
- form fields will include: patient id, movement codes, action items, sex, weight and date of delivery
- system will send a confirmation response or error messaging detailing the result of the action
- support for manual listing of registrations via admin web interface

Child Health Monitoring

- support of recording child health via SMS form
- form fields will include: patient id, date of birth, movement codes, action items, muac/weight
- system will send a confirmation response or error messaging detailing the result of the action
- support of manual listing of child health reports via admin web interface

Alerting

- support the creation of rule based alerts based on action codes given during maternal registration or maternal risks
- rules will specify the action codes which will trigger them, the recipient (clinic and/or hospital contacts) and the message sent
- rules will be applied upon incoming birth and risk forms, triggering alerts as specified
- support listing, creation, editing and removal of alerts via admin web interface

Language Support

- all SMS short codes and messages will be built such as to support English, French and Kinyarwanda
- the web admin interface will be built in English

Since the system to be developed is based on the RapidSMS, Pivot Access developers together with an experienced RapidSMS developer will explore the RapidSMS codebase hosted on GitHub and use the framework to create a functional solution to meet users' goals and usage patterns.

2.3. System Integration

This phase involves the following

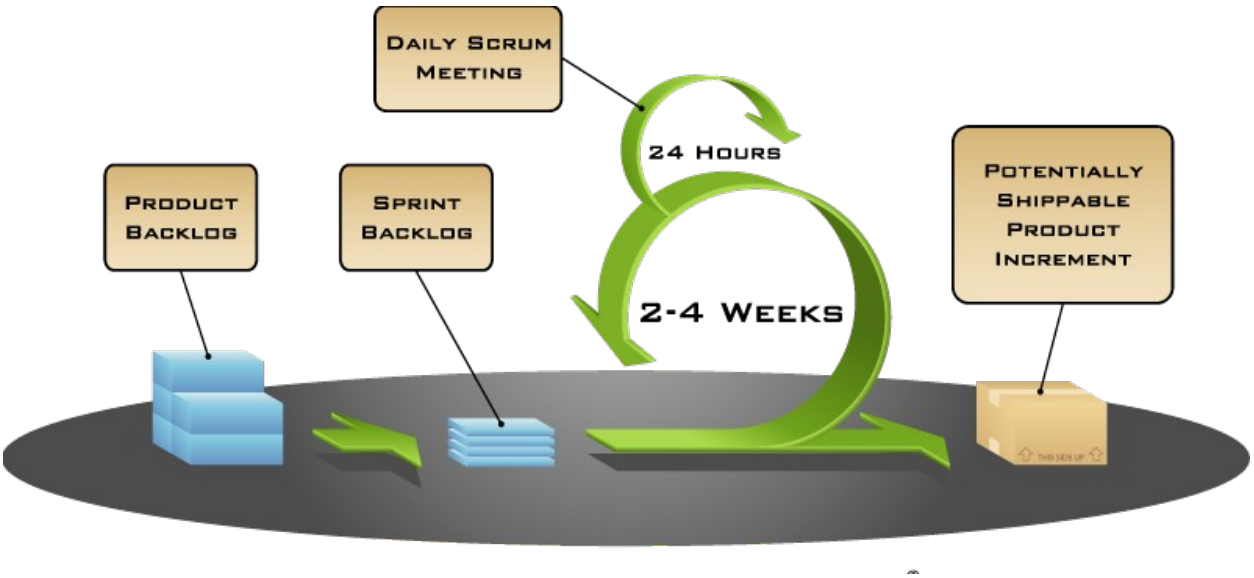
- recommending the server hardware and software
- setting up a production server environment
- installing the software
- assist in acquiring an SMPP account and related short code with different mobile phone operators
- testing the software
- integrating with the national Health Management Information System
- Setting up a backup plan
- training users of the system

3. PROJECT MANAGEMENT AND STAFFING

The project will follow SCRUM project management methodology. This agile methodology emphasizes iterative software development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams.

It encourages frequent inspection and adaptation, teamwork, self-organization and accountability, best practices intended to allow for rapid delivery of high-quality software, and a business approach that strikes a fair balance between customer needs and company goals.

The diagram below illustrates the processes in the SCRUM methodology



The product backlog is a set of the requirements to be developed; the sprint backlog is a subset of the requirements that is chosen to be implemented as a working prototype after which another sprint is chosen.

In the case of the Health system, the set of functionality mentioned in the previous section is the sprint backlog, after which other functionality such as reporting and mapping tools would be agreed upon by the different stakeholders and implemented at a future date. It should be noted that such future functionality would entail a different contract.

Among the best practices that apply to this project:

- Adhering to the RapidSMS coding standards
- Test Driven Development where test cases are implemented before the actual code so as to minimize debugging time and also make sure code is shipped bug-free

.Pivot Access has dedicated two programmers to do the actual analysis, design, implementation, testing, etc plus one project coordinator who will liaise with the different stakeholders.

4. DOMAIN KNOWLEDGE AND EXPERIENCE

Pivot Access is a leading provider of software solutions for both businesses and public institutions. Launched in November 2007, Pivot Access remains unique in the software industry by offering innovative and useful tools to all types of users.

Pivot Access has built a substantial market presence with many customers, including companies such as Electrogaz, Lotto, and Bank of Kigali.

All these applications are SMS applications that use complex protocols; which give us enough experience to successfully undertake similar projects.

For an example application we have built, see: http://www.pivotaccess.com

Pivot Access is located, at 260 Boulevard de L'Umuganda in Kacyiru area of Kigali, in the Republic of Rwanda.

5. RESUMES/COMPANY PROFILE

[See attached Documents]