HCD Mobile App Service

1. Development background and the Team.
The main goal of this project is to develop functional ICT tools of USSD & Toll Free service in a mobile clinic tax Service system. The system will consist of several basic elements:
- Main server
- USSD, Toll Free line and Android Client application for customers/beneficiaries
- Android Client application for HCAs, QHDs (taxi like drivers) and Standby nurses

Our beneficiaries/Customers will be able to order our QHDs-Mobile emergence response services to a position via USSD, Toll Free line and Android Client application system for customers/beneficiaries. After the order has been received, main server will determine the zone from which the order or an emergence case has been reported and after that, automatically selects the HCA and the QHD with the Standby nurse from the virtual queue of the appropriate zone and dispatch it to the received location. The beneficiary will receive the code of the HCA and the number of the QHD which will pick her up for health facility delivery. As soon as the HCA locates the caller or the case, he/she will tap on send pick up code to QHD, the moment the QHD accepts the order or pick up, he got from the main server. If the immediate QHD rejects the order or doesn't respond to it in a certain amount of time, IT will be put at the end of the queue and the order will be forwarded to the next QHD in the queue. While driving through the camp or host community, the QHD with a nurse of midwife will change virtual queues as they change camp zones they are driving in. The QHD motor of tax ambulance will be removed from the old queue and put at the end of a new one.

The integration strategy of the system will be feature– based. The development will begin with the core functionality and new features will be added with time. There will be several milestones and new features will be introduced in every. After the feature is developed, first it will be tested standalone and then it will be integrated in the system. After the integration, new series of testing will take place. After the system is fully developed and tested, it will be delivered to project supervisor in 3 parts: Web application for server, Android client application for HCAs, QHDs and Standby Nurses, and USSD, Toll Free line and Android Client application system for beneficiary or customer use. The system software will be followed with the necessary project documentation.

2. Organization
Although all team members are not to be in the same place, the team is actually geographically divided in three locations in the same country-Uganda:
Central team (4 team members)
Refugee camp team (3 team members)
Host community team (1 team member)

The work on the project is divided in three categories: Organization, Documentation and Presentations, and Implementation. It is decided that all team members equally participate in every project part.

2.1 Organization

Project leader (PL)

Project leader is responsible for the team in general. His responsibility is to always be informed about every important issue. His responsibility is also to inform others about those issues. He should also be monitoring the work of all team members during system development and implementation.

Team leader (TL)

Team leader's responsibility is to monitor Refugee and host community team and inform team leader about important issues that are taking place on that side.

Others

All team members share responsibility of organizing internal meetings, meetings with the project supervisor, dividing project tasks and delivering documents on time. **Tools:** Google groups, Skype, Google calendar, Doodle.

3. Documentation and Presentations

Documentation and Presentations are both responsibility of every team member. Every document that is required to deliver is entrusted to several team members (number depends on the document). After they write the document, other team members should check it and make corrections if necessary. The content of the documents will be discussed on weekly meetings.

Presentations should be made by team members, who are going to present them, and checked and corrected by other team members. It is agreed that two or more team members will be presenting. **Tools:** Google docs, Dropbox, SVN

4. Implementation

Since the project is to be divided in three major parts, the project roles are defined similarly:

a) **HCAs, QHDs & Standby nurses Taxi system Mobile Application developer** (2 team members)
Responsibility: developing mobile application that will be used in QHDs/Standby nurse mobile motors/taxis/clinic trailers.
Communication: with server side developers.

b) **USSD, Toll Free line and Android Client/beneficiary application Mobile system developer** (2 team members)
Responsibility: developing mobile USSD, Toll Free line system embedded in the mobile application that will be used by clients/beneficiaries who want to order for HCD Mobile emergence services.

Communication: with server side developers.

c) **Server side developer** (3 team members)
Responsibility: developing a web and offline service which will be communicating with mobile applications, developing web application for the offline clients/beneficiaries who want to order for HCD Mobile emergence services.
Communication: with mobile application developers.

d) **Graphic User Interface (GUI) developer** (1 team member)
Responsibility: developing graphical user interface for mobile and offline systems where applicable.
Communication: with mobile and web application developers.

5. Development process

We follow a modified SCRUM methodology for this HCD Mobile App service. We will do project planning on the milestone level and deliver the project on a feature-by-feature basis.

a) Planning and Delivery Schedule

Planning is done by defining milestones and calculating the time to deliver each.

To build a milestone, first we break down the problem into vertical features, meaning things that make sense to the users of the system. So, for example, since implementing a part of the database on the server is not something that would be visible to any of the stakeholders of the project, it isn't considered a feature. An example feature is "HCAs and QHDs with Standby nurse reports their current location to the central server continuously," implying that user interface and back-end work need to be completed on both the HCA and QHD/Nurse devices and the server and integrated before it would be considered done.

Once we have a set of features that covers the functionality we want to cover in the next milestone, we estimate the complexity of each feature in complexity points, assigning an integer value between one and three. The complexity measure is only relative, so a lower score for Feature A compared to Feature B means that Feature A is relatively simpler to implement than Feature B.

When all milestone features are estimated, we sum up their complexity values to get the total complexity of the milestone. We then use our current velocity (measured in complexity points per week) to estimate how long it will take to complete the milestone (total complexity divided by velocity). The result is a release schedule.

The current velocity is measured throughout the project, averaging the velocities of past iterations. The initial velocity (for the first milestone) is will be a matter of agreement between the team members. In this case, we will have picked a target initial velocity of two complexity points per week.

b) Development Process

Development is done on a feature-by-feature basis.

Once we have scheduled a milestone, we begin work on it in weekly iterations (what is commonly known within SCRUM as "sprints"). Our current velocity provides us with an easy way to calculate the capacity of the team for any given week (velocity multiplied by iteration length in weeks). At the beginning of the week we will pick enough features to work on to fill that capacity and start developing. We implement, test, and integrate each component throughout the week in an ad-hoc manner. At the end of the week, we check how many of the features we have worked on are completed, show them to Project leader, and sum up their complexities to give the new current velocity. We then check to see if that velocity keeps on track to finish the milestone on time and make appropriate adjustments (simplifying features, adding more features, postponing the milestone delivery date, etc.).

The team will then move on to plan the following iteration, repeating the same process until all the features of the milestone are completed.

Once a milestone is completed, they start again, building a list of features that will constitute the following milestone. This process continues until the final delivery deadline for the project.

c) **Project Roles;**
- Product owner: YAGANET-Baluku Isaya
  The development team with him in order to define requirements and features. He also reviews and signs off on each feature the development team delivers.
- Scrum Master: The development team communicates obstacles and difficulties they are experiencing that prevent them from doing the work required to deliver the work on time and he tries to remove said impediments.
- Development team: The development team members gather requirements and design, implement, test, and integrate features.

6. Configuration management

Subversion (SVN) will be used for sharing and managing code. There will be a person in charge for administrating SVN repository. SVN administrator is responsible for making regular backups in case of SVN error. Since project is feature-based, decision has to be made that every feature will be developed and tested in separate branch and integrated into trunk afterwards. Every member is supposed to follow SVN and code policies.

For sharing documents team will decide on whether to use Dropbox or no, where all formal and informal documents will be stored and maybe Google Drive in case two or more people work on same document at same time.

The team will also use Trello collaboration tool for project management. Trello will be used to help team members organize their work and monitor the status of the project.

For the purpose of this project the team will use:
- Windows Azure cloud service.
- Trello collaboration tool.

7. Project risks

Risk		Preventive action
High	Challenges in getting enough funds to develop and Install the mobile system.	We designed proposal seeking funds from OpenIDEO to be used for development of this infrastructure.
High	Problems with system integration during the development.	Well defined interfaces between components and constant communication between members who are developing connected components.
High	Lack of time to finish deliverables on time	Planning in advance, dividing work equally between team members to avoid overloading some team members who will be working of the project.
Medium	The need for licensed tools (because of using commercial platforms and technologies)	Planning the project from start, elaborating requirements. Deciding on the tools at the beginning of the project and making sure all needed licenses are available.
Medium	Bad communication between team members	Regular weekly meetings, PL and TL coordinating the team.
Medium	Lack of motivation for working on a project	Constant communication between team members and solving problems together.
Low	Lack of knowledge in technologies	Hiring the right people and Choosing technologies that most team members are familiar with, and dividing the work to team members considering their knowledge.
Low	Losing work because of SVN error	Making regular backups
Low	Team member leaves the project	Making sure that PL and TL are always informed about project status. Making sure that always at least two team members work together on important parts of the project.
Medium	Final product doesn't meet the requirements	Regular contacts with the users and beneficiaries for adaptability purposes (frequent testing with users). Regular contact with project supervisor, daily supervising of work of every team member.
Medium	Sustainability challenges after the first funds have been used.	Beneficiaries are expected to pay 30% of the total cost after using the product services. Effective and efficient partnerships have been planned with relevant development partners.