

DRNotes Mobile EMR for the Philippines and Other Developing Countries

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Proposal Status: Out of Scope

Executive Summary

DRNotes was conceptualized to be a mobile application for doctors that would efficiently capture patient notes and charges for the purpose of facilitating the claims processing of independent practicing physicians in the United States. A key part of the specification was to create an application that simplified the entry of Patient Notes. The objective was to reduce the time that doctors spent in capturing notes and the time spent in reviewing and signing these notes for claims submission.

The core development team for DRNotes is based in the Philippines. In the course of the product development it was realized that DRNotes could actually be used as a very effective physician based EMR and EHR system in countries that do not have significant penetration rates of EMR usage such as the Philippines. It was also realized that while the country's national health insurance service, the PhilHealth, had been working for over 10 years to develop universal health coverage, the lack of an efficient EMR based electronic claims submission system hindered the efficient deployment of the national health coverage plan. PhilHealth benefit payments have grown over 300% to over USD 2 Billion from 2011 to 2017 yet the switch to electronic claims and the use of EMRs is still at its infancy. From an initial plan of creating a note capture and charge capture application for small doctor clinics in the USA, the DRNotes project gained a renewed purpose as an EMR mobile app that can capture patient notes, ICD10 information and procedure code information to be used to support the digitalization initiatives of the claims process of PhilHealth. The PhilHealth has already started implementing an electronic claims system (with no EMRs) for the targeted 2,000 hospitals in the country and has stated a desire to shift to an EMR based claims system. Capturing EMR data will bring many benefits including the ability to use national EMR data to help define national public health policy, but one of the most immediate tangible benefits would be the ability to use EMR data to assist in the reduction in the high fraud rates in the PhilHealth claims system which is estimated to dissipate anywhere from 10% to 30% of member benefits.

DRNotes has been built to be usable as a mobile standalone EMR application that can be used by physicians even in remote mountain "barrios" but can also be connected to a cloud based nationwide mobile network for the purpose of collecting and submitting claims information to the national health insurance service. In 2016, the PhilHealth covered 91% of the population but only paid for less than 15% of the medical expenses in the country. But as the country continues its rapid economic growth averaging over 7% over the past 10 years, it is expected that universal health coverage will become one of the largest social benefits in the country. The standalone DRNotes APP is currently a free application that can be used by any doctor in the Philippines, but we are still exploring what is the best way to be able to use the application for public healthcare applications like that of the PhilHealth. Aside from the knowhow we may derive from participation in this digital health initiative, we hope to tap into external funding sources for the following purposes:

1. Additional development resources to add required functionality.
2. Support pilot deployments throughout the Philippines to demonstrate to the PhilHealth and the Department of Health (DOH) the benefits that can be obtained through the deployment of a national mobile EMR/EHR system.
3. Develop the operational structures to support the above objectives.

Consortium Team

DRNotes is owned by Dryve IT Inc. a Philippine company and Jackson Purchase Pulmonary Medicine (JPPM) in Mayfield, Kentucky.

Dryve IT Inc. is a software development and consulting firm with extensive experience in building mission critical and ultra-reliable broadband telecommunications systems. Dryve IT built and developed broadband systems that have been deployed in the Philippines, Bangladesh and Africa. Dryve IT has extensive experience in developing broadband networking and telecommunications software. The team has over 20 years' experience in deploying, supporting and developing applications for Oracle ERP systems. Over the past 3 years much of the efforts of

Dryve IT have been spent in developing the platforms and mobile applications and advanced synchronization applications that are used in the DRNotes system.

The JPPM team serves as the key application feature consultant. The JPPM team defined the features needed for the use of the app for note and charge capture and insurance reimbursement reporting in the United States. JPPM also helped design the medical dictation and cloud based transcription features of DRNotes.

DRNotes has also received assistance from Apple Inc. on UI design and application design.

DRNotes is open to collaboration with third parties in the development of features and systems for private and public health EMR/EHR applications.

Project Description

DRNotes is a mobile medical information application that is designed to allow a physician to electronically capture medical notes using an Apple iPhone or iPad tablet. DRNotes generates and stores permanent and secure Electronic Medical Records (EMR) on a mobile device and can synchronize all these records with a secure scalable cloud server.

DRNotes is designed to be used at the point of patient contact in order that doctors need not set aside separate time for EMR data entry. The system is designed to streamline physician data entry. DRNotes can be used even if Internet connectivity is not available. This allows DRNotes to be used even in areas where internet connectivity is quite slow. Synchronization with the cloud databases occurs automatically whenever the application has access to the internet. The DRNotes synchronization system is designed around a mobile distributed database application that is very data efficient and it is expected that monthly data usage for synchronization will be well below 500MB per month per device. This is well within the capabilities of a low cost mobile data subscription in the Philippines costing around \$6 per month for 3GB of data. This low cost mobile data service is available over more than 95% of the country's population.

The notes can be entered as text, dictations or images. DRNotes also has a cloud transcription system that allows the transcription of dictated notes using any PC connected to the Internet through a secure web browser based application. Even though DRNotes has a very streamlined data entry system with excellent speech to text input capabilities, it is expected that dictation/transcription will still be the most efficient data input method from the point of view of doctor convenience. It is expected that as AI capabilities improve (such as in the iOS platform) the need for transcription will eventually be reduced, but the dictation platform will still be relevant for the foreseeable future.

DRNotes is also designed to be sufficiently scalable to address national EHR applications. The experience of the DRNotes developers in building scalable telecommunications company applications is an invaluable skill set for developing a scalable system with mission critical reliability.

DRNotes is also designed to be a highly functional FREE standalone EMR application. The only hardware requirement for a doctor to set up a clinic EMR is an iOS mobile device and a WiFi printer. No server is required. If connectivity to the cloud is available, DRNotes can share patient information between doctors. Highly secure backup to the cloud is also available. iOS based backup, either to a PC or to the iCloud, is also available whether or not DRNotes cloud service is available.

Proposal

The DRNotes project team has been self-funding the project since 2014. We have evolved from developing a medical note capture and charge capture application to developing a doctor centric EMR that can interface with clinics, hospitals, HMOs and even a national healthcare service.

We are looking at bringing in more partners and collaborators to help achieve our goal of developing a system that can significantly contribute to better health care in the Philippines.

We have built upon our expertise in building large scale telecommunications applications that can handle high intensities of transactions while

maintaining the highest levels of security and data integrity. But we need to address many different areas of the healthcare ecosystem, build in many more features and address all kinds of medical practices, including public healthcare processes. We also need to develop relationships

with third parties such as NGOs to facilitate trials of our systems with target public healthcare users and stakeholders. We also need to build up a business oriented team focusing on promoting our solutions to potential public and private users.

We believe that working with Digital Square, a partnership of digital health experts and organizations with extensive expertise in developing countries, will be invaluable in helping us achieve our vision of contributing to a digitally enabled health care system for the Philippines. At the same time we believe that a partnership will also help us achieve a good ROI for our solution by looking at the best practices and experiences of other healthcare software providers.

Investments in the following areas will be needed to achieving our objectives:

1. Support for additional software development resources
2. Meetings and cooperation with other digital health experts
3. Documentation and marketing resources
4. Community project implementation management
5. Scaling of our cloud based infrastructure

We expect that with added funding we should be able to implement our planned pilot projects focused on delivering EMR connectivity to Rural Health Centers. As of the 2013 DOH report, the country has 18,639 Rural Health Centers. After an effort spanning over 5 years, only around 2,000 of these health centers have an EMR system. While the need is large, the main constraint is the cost of these PC and server based systems. We expect to be able to deploy a more efficient mobile device based solution at a significantly lower cost than any of the available competition. Our low Internet resource footprint will allow us to address areas that currently cannot be served by existing alternative EMR solutions.

We expect that a successful deployment in the Philippines will also open up opportunities in other developing countries.

We estimate the additional annual funding needed to launch the DRNotes Pilot projects described above to be USD 250 thousand per year. The current contributions of the developer team are valued at USD 150 thousand per year.