

# Implementation of an Electronic Medical Record System

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## Abstract

This project focuses on the development of an Electronic Medical Record (EMR) system that would provide medical professionals access to vital patient information. It not only would allow the storage of past medical history, but other important information such as medication status and sensor readings. An EMR implementation has numerous advantages over the traditional medical record, but due to its distributed nature, introduces security issues that were less obvious than before.

## Motivation

The EMR system is being developed out of the need to have access to pertinent information. Senior citizen independence is a key factor in the development of EMR. By incorporating motion sensors, fall sensors, and cameras, elderly citizens can enjoy independence at home knowing that if something goes wrong, the EMR system will be able to store and analyze sensor readings and trigger alerts to the user's doctor as needed.

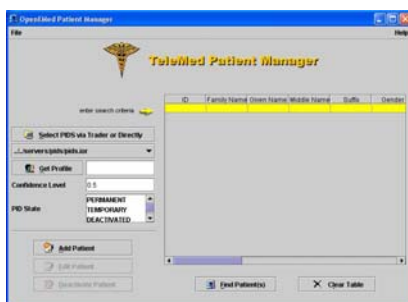
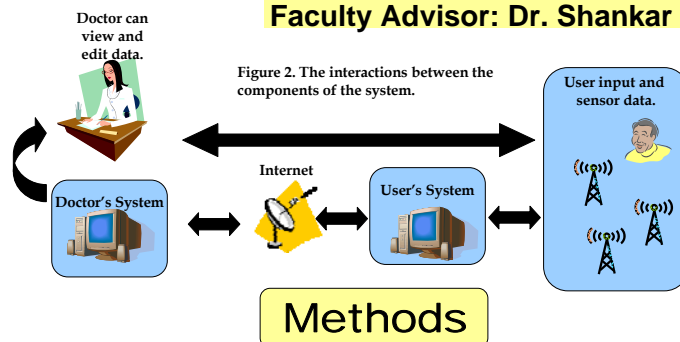
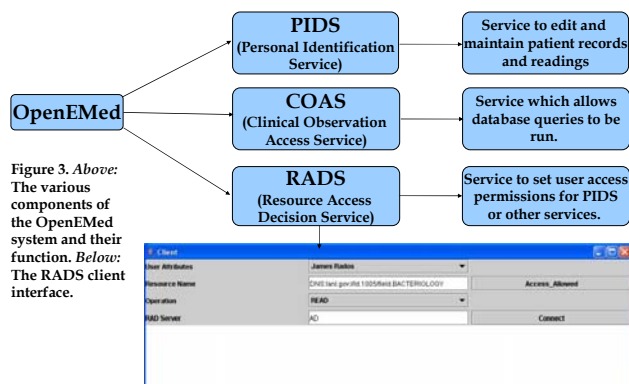


Figure 1. The interface for the PIDS. This is what the doctor will utilize to maintain and edit patients.



## Methods

The EMR System is built upon preexisting open-source components from the OpenEMed system. The more critical components are the Personal Identification Service (PIDS), the Clinical Observation Access Service (COAS) the Resource Access Decision Service (RADs). The programming is done in Java and uses HSQL databases to store data. The system we were working with was quite large and intricate, and accordingly required a very thorough and in-depth analysis to figure out the inner-workings of the system. Upon gaining a better understanding of the system and getting the preexisting components running properly, modifications were carried out. Many modifications to the components of OpenEMed were required. The most critical was the inclusion of an actual place to keep a medical record.



## Results

With the system thoroughly analyzed, a mapping of the various components was created for the researchers who will continue development of the system. The source code is laid out and recommendations to where to make modifications are noted as well.

The PIDS system was modified to handle not only contact and personal information, but it now has a field where the patient's medical record can be viewed and edited.

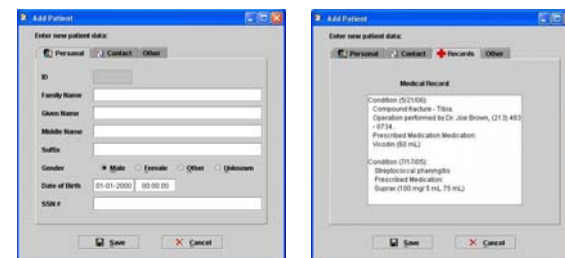


Figure 4. Left: The add/edit portion of the PIDS interface. Right: The modified version of the PIDS. It now has a medical record text field where entries can be read and modified by authorized users.

## Future Work

The system still requires integration with the sensor readings. There should also be an overall application that ties the components together, because as they stand, the RADs and PIDS have no connection to each other. The RADs component can be used to grant permissions to access or modify the information from the PIDS component. The PIDS should have a way to customize alerts and notifications the doctor receives from their patients.

**Acknowledgements:** Thanks to Berkeley's EECS Dept. and TRUST, Dr. Sastry, Arsalan Tavakoli, Mike Eklund and the TRUST Mentors.

