MobileEMR

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ABSTRACT
Electronic Medical Records (EMR) infrastructures are essential in today's dynamic societies. Patient data needs to be accessed in multiple locations by medical staff. Insurance companies require accurate filing and timely processing of claims. Prescriptions and lab results need to be processed by different principals at different points in time. Medication schedules need to be maintained consistently and clinical notes need to be accessible at multiple service providers - patient interactions. Automated checks for drug and allergy interactions need to be provided. Nevertheless, EMR adoption has been minimal in the United States so far. Less than 10% of American hospitals have implemented health information technology and only 16% of primary care physicians use EMRs. One major barrier behind this slow rate of adoption are concerns of confidentiality of the individual electronic records.

We are exploring and building an initial design and proof of concept in collaboration with the industry partner NOKIA for MobileEMR, a trusted portable EMR device for tamper-proof storage and processing of health information in standards based formats such as defined by the Open HER Foundation. MobileEMR will enable seamless, intuitive transfer of health records. Individuals will simply present their MobileEMR to health service providers. MobileEMR will secure access to the information contained therein and interact only with authorized parties in specialized need-to-know protocols (e.g., in the emergency room). The high tamper-resistant and reactive assurances of the trusted hardware will ensure that no physical compromise of the device can lead to undesired information leaks.

Categories and Subject Descriptors
C.2.1 **[Computer-Communication Networks]:** Wireless communication

General Terms
Security, HIPAA, NAMCS, Open HER

Keywords
MobileEMR, EMR , Trusted Hardware

1. INTRODUCTION
This is a pilot project in collaboration with the industry partner NOKIA (one of the first to market mobile devices incorporating trusted hardware). We are having an ongoing collaboration with NOKIA in which we have been offered pre-alpha access to these novel cell phones.

The latest data from the National Ambulatory Medical Care Survey (NAMCS) indicate that one-quarter of office-based physicians report using fully or partially electronic medical record systems (EMR) in 2005, a 31% increase from the 18.2 percent reported in the 2001 survey. Moreover, just 9.3% of these physicians actually have a complete EMR system with all four basic functions deemed minimally necessary for a full EMR: computerized orders for prescriptions, computerized orders for tests, reporting of test results, and physician notes. Paper seems to be still the medium of choice for the vast majority of health-related transactions. The health-care industry spends only 2% of gross revenues on information technology.

One major barrier behind this slow rate of adoption are concerns of confidentiality of the individual electronic records. The Los Angeles Times reports that during hospitalization, over 150 people (from doctors and nurses to technicians and billing clerks) have access to portions of a patient's records. Additionally, over 500,000 other entities, including payers, providers and billing processors have limited access too. In the United States, the management of this type of information is addressed under the Health Insurance Portability and Accountability Act (HIPAA). In the European Union, this is handled by a set of Directives of the European Parliament. To benefit from EMRs advantages over paper-based systems, it is important to address such privacy concerns. As digital records are physically more difficult to secure, society is witness to increasing number of data compromises.

2. PROPOSAL
In this project, we propose to build design, analysis and implementation of a trusted mobile EMR management system and infrastructure prototype using minimal off-the-shelf mobile hardware of the near future such as cell phones and PDAs many of which will be equipped with trusted components. This project is exploratory in nature as well as extremely timely, especially given the new administration's move to electronic health records by 2011. This project is unique in that it brings together three key components: inter-disciplinary work with doctor partners in an actual hospital, industrial collaboration with NOKIA (and possibly IBM), and last but not least, the healthcare aspect.

3. REFERENCES
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