

# Chapter 44

## Rural E–Health Infrastructure Development

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### ABSTRACT

*This chapter describes international humanitarian efforts for the deployment of technology in healthcare centers in developing countries. The IEEE Humanitarian Technology Challenge (<http://www.ieeehtc.org>) develops and implements technological solutions for the provision of reliable electricity, data connectivity of rural district health offices, and identifying individuals and linking them to their medical records.*

*The study reports the proceedings for providing a comprehensive system that will define public health in villages, allowing for trauma and emergency as well as disease response, control and studies, clinical healthcare, disease surveillance and prevention, and health vaccination.*

*The following sections describe the implementation of a healthcare records system in rural areas of India's Gujarat State. The system reduces the risk of misidentification of patients and allows for accessing the records of patients in a more timely process. The electronic medical records improve clinical and diagnostic services and provide alerts on disease trends.*

### 1. INTRODUCTION

Community based healthcare is becoming increasingly important for the wellbeing of inhabitants among many emerging economies. This is partially because road infrastructure are usually less well

developed in those locations which would frequently limit the flexibility of people commuting from distant villages to central medical facilities. It is also a fact that developing countries have a large base of rural population. Some estimated that rural agriculture employs 75% of the population in development countries (Anriques and Stloukal, 2008).

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The overall merits of an RFID-backed community healthcare solution is to enable easy and reliable identification of individual patients, maintain more accurate and consistent medical records and, most important of all, facilitate better healthcare out-reach and enhance the quality of life for the individuals in communities remote from the central medical facility. In addition, it can also help to relieve the loading pressure on the central medical facility when it is overcrowded and can increase revenue opportunities by broadening the addressable base of patients to more remote locations. It may also help to improve the efficiency of the central medical facility to focus resource on the more specialized medical cases.

This project implements a real-time electronic individual identification and tracking system for rural healthcare. The system is planned upon international standards, defining public health in villages, allowing for trauma and emergency as well as disease response, control and studies, clinical healthcare, disease surveillance and prevention.

Section 2 provides some background on healthcare challenges in developing countries, while the description IEEE HTC challenges are given in section 3 with emphasis on individual identification and records keeping. Applicable technologies are discussed in section 4. Section 5 describes the field test in India, with target areas, objectives, and technology solution outline. Healthcare and eHealth provisions in India are surveyed in section 6, offering an availability assessment. Solution implementation details are listed in section 7, with technology items embedded within a solution framework. A comprehensive economic analysis is given in section 8 emphasizing both evaluation methods and practical models, while redressing the case for developing countries and this project in particular. With practical implementation still in progress, section 9 offers an implementation feasibility study illustrated by a simplified case example. Finally, discussions and conclusions are drawn in section 10.

## **2. BACKGROUND**

If developed countries deal nowadays with equity in health and healthcare, most developing, less developed or low-income countries face other types of difficulties regarding health services. In these countries, far too many people have to deal with inadequate nighttime lighting or inadequate communication due to lack of reliable electricity; too many healthcare providers are forced to treat patients without having access to databases of past results and new research trends and a large number of people die from easily treatable diseases because of inadequate health records.

Health has always been a central concern for individuals, groups, communities or the global society and the importance of health cuts across individual of all ages and across all societies. In the 20th century we witnessed an extraordinary progress on health, but progress in health is fragile (The Global Agenda, 2009).

Understanding the challenges of health and of the social response to health problems is difficult. Therefore, the global community tried to set a number of critical goals for development, the Millennium Development Goals. Three of these are health-related: MDG4 – reducing child mortality, MDG5- reducing maternal mortality and MDG6 – reducing major diseases (HIV/AIDS, tuberculosis, malaria). These MDGs have generated endless policy discussions and focus in many settings.

Although real progress has been made, the agenda for global health is much broader than the MDGs. Therefore there is a worldwide lack of coherence in global health governance, which leads to the impossibility of effective representation throughout the globe. The institutional efficiency, mandates, activities, authority and even resources allocated for the global health initiatives show clearly that there is no agreed plan or strategic vision to tackle the major health problems across the world. And given the diversity of the deter-

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