

Chapter VIII

Mobile Comprehensive Emergency System

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ABSTRACT

This chapter is an application of Mobile Web Services into the health sector and specifically to the emergency system where the communication between a number of parties is critical in terms of time, efficiency and errors. The proposed application is to implement a mobile system based on cellular phone network in ambulances. It will equip doctors with mobile devices that have the capability to be connected to the Internet network with a bandwidth that makes it feasible for the doctor and the ambulance to access the health record of a patient from the database and to communicate with hospitals with enough speed. This chapter will illustrate the new proposed Mobile Comprehensive Emergency System (MCES) application that is based on Web services provided by static and mobile servers. The implementation of this new system will enhance the current system communication and make it more reliable, consistent, quick and free of human errors.

INTRODUCTION

Most of the existing communication systems set to communicate between ambulances and hospitals rely on radio communications. Some new systems include a computer system as a tool to help in the management of communications like the Computer-Aided Dispatch (CAD), implemented in 1995 in Victoria, Australia. This system was enhanced with a Medical Priority

Consultant's Advanced Medical Priority Dispatch. The computer version of the new assistance was introduced in April 1998. The Victorian system is considered one of the best emergency systems in the world in providing clinical information about the patient to the hospital and recommending some care from the hospital to the ambulance. The system is also backed by an automatic vehicle location system to locate the ambulances (Service, 2002). Another ad-

vanced system is Hospital & Emergency Ambulance Link (HEAL), implemented in Singapore. The HEAL system is based on wireless data communication between ambulances and hospitals, and it assists hospitals and doctors at the emergency departments of the hospitals with information about patients provided by ambulances. HEAL also assists ambulances with medication recommendations from doctors. This system has been built on the public wireless network and is based on server-client architecture (Ministry of Health, National Computer Board, Singapore Civil Defence, & Singapore General Hospital, 1998).

The proposed new system is more comprehensive than any existing emergency system in terms of the number of parties involved, and it is more advanced in terms of technology proposed. The new system is also intelligent when it comes to finding the right ambulance, hospital, and doctor that are suitable for the conditions and location of the accident. The main advantage and strength of the new system comes from the Mobile Web Services technology that would be used in the system (Chatterjee & Webber, 2004; El-Masri, 2005). This technology can overcome any problems of interoperability between systems running different applications based on different programming languages on different platforms (El-Masri & Suleiman, 2005; El-Masri & Unhelkar, 2005). More details of the new system will be found in next sections of this chapter.

APPLICATION OF MOBILE WEB SERVICES TO A COMPREHENSIVE EMERGENCY SYSTEM

In this section, the new system business process will be explained in detail, followed by the

technical details about the new technology applied.

Case Study

In the case of a car accident, for instance, and when we dial 000 (in Australia) for emergency and ask for an ambulance, the current operator (human) on a phone-based system tries to find the nearest available ambulance to be sent to the accident location. After picking up the patient, the ambulance officer heads for the nearest and available, suitable hospital.

In this chapter, the proposed system is a comprehensive emergency system based on Mobile Web Services. As shown in Figure 1, when there is a car accident, any nearby mobile holder can enter information about the accident such as how many cars are involved, how many people are injured, and how far the caller is from the accident. The mobile phone (First Informer) will send this information to an operator, which is a Web services centre. The operator will access the situation based on the incoming information from the First Informer Mobile Phone (FIMP).

Let us imagine the following scenario in which police, the fire brigade, and an ambulance are needed. The Web services-based operator (emergency operator/WS) will look through its service directory, which is timely, updated based on the mobile system locator, to find the nearest available police car, the nearest available fire brigade, and the nearest available ambulance. The operator will send electronic emergency requests to the selected police car, fire brigade, and ambulance, and request confirmation from their systems. The systems of the police car, fire brigade, and ambulance can be based on a mobile or wireless system. To simplify the case study, only the communication with the ambulance will be explained. This communication scenario is applicable to the police and fire vehicles as well.

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