

Mobile System for Medical Control of Chronic Diseases through Intelligent Devices

Vladimir Villarreal¹, Jesus Manzano², Ramón Hervás², and José Bravo²

¹ Technological University of Panama, David, Chiriquí, Panamá
vladimir.villarreal@utp.ac.pa

² MamI Research Lab - Castilla-La Mancha University, Ciudad Real, Spain
manzanocaminojesus@gmail.com,
{ramon.hlucas, jose.bravo}@uclm.es

Abstract. The ageing of the population is a factor that in the future will increase the percentage of dependent people, given that there is a close relationship between dependence and age. When patients are in a health care environment, it is often isolated from their social environment; a situation which greatly complicates the medical follow-up, either complicated patient privacy. In this paper, we present a solution, through an application, which allows the patients monitoring, integrating the use of mobile phones in their activities. Through this device the patient keep updated all your medical information, from the reading of their vital signs, diet control, administration of medications, physical analyses, recommendations and others monitoring modules. We have evaluated the application in a group of patients. This application is evaluated in design, functionality and utility like efficiency.

Keywords: software architecture development, web services, communication technologies, users interfaces design, ambient assisted living.

1 Introduction

“Liz, is a girl diagnosed with diabetes. She uses a glucose meter to control the level of sugar in blood. Daily, she keeps the adequate level of glucose through several measurements of the diseases. In the same way, she has to do all the annotations in her notebook, whenever a measurement is realized, annotating the irregularities and changes presented in the day. If it has some problem it has to call the doctor to consult the happened him. To Liz it would like to have a constant follow-up of her measures, obtaining recommendations and messages whenever it changes her levels of glucose in blood. In the other way, she would like to have to hand, without need to register in her notebook, all the incidents that she has presented in the last days. She wanted also that her doctor was informed without she should be calling him. This would give him better quality of life and a more constant follow-up of her disease”.

This is a situation that would like to take a patient who suffers from a chronic illness and need constant monitoring. We are developed and implemented an application to

facilitate this every day, allowing patients to lead normal lives, without worry of how to control this follow-up medical. This is a not intrusive application with low level of interaction that once obtained the measurement of vital sign; the application can perform all activities of processing and visualization of the results.

In this article we present some related works that we have studied the structure of the application developed and finally the outcome of the assessment to a number of patients suffering from diabetes problems. Some aspects of quality have been assessed like the design of interfaces, the content of the modules and functionality of responses generated by the application.

2 Related Works

The use of such technologies is contemplated due to the low cost and energy consumption. Some research have brought with it the creation of different technological platforms that have offered a timely solution to problems of health care, some of them are mentioned in this section.

Health Buddy System [1] is a system that provides health monitoring of patients by reducing the scope of hospitalization. This system connects to patients in their homes to their healthcare providers. What distinguishes it from others is its ability not only to communicate the historical information of the patients with chronic diseases, but also to facilitate the education of the patient and encourage compliance with medication and lifestyle. AirStrip Patient Monitoring [2] is a platform for software development with a vision of safe critical patient information delivery directly from the monitoring systems of the hospital, devices of header, and health mobile clinical records. AirStrip was also designed to solve major challenges in the development of mobile software, such as the development of native applications that provide a rich user experience requirements, while at the same time, be able to scale and adapt to an ever-changing world of operating systems and mobile devices. WellDoc [3] is an application designed to be a service of monitoring for diabetics, integrated with Ford Sync, designed for iOS, which allows to monitor the current status of a patient using manual registry of food and glucose. Thanks to its integration with Sync, it will synchronize with this service via Bluetooth, which will detect if not we have not introduced a record recently, and through a system of questions (Yes or No), will make sure see if our blood levels are correct. It is not be so, it will suggest the next recommended action to take, or in extreme cases, will send an *SMS* to the contact that we have previously selected in emergencies, with the option to send another message to arrive home, confirming that we are safe.

Ambulation [4] is an important tool to assess the health of patients suffering from chronic diseases that affect mobility such as multiple sclerosis (MS), that of Parkinson's and muscular dystrophy through the assessment when they walk. Ambulation is a monitoring system of mobility that uses Android and Nokia N95 mobile phones to automatically detect the mobility of the user mode. The interaction that the user needs with the phone is turn it on and keep it with him throughout the day, with the intention that could be used as your everyday mobile phone for voice,