eHealth Monitor - Using Mobile Technology

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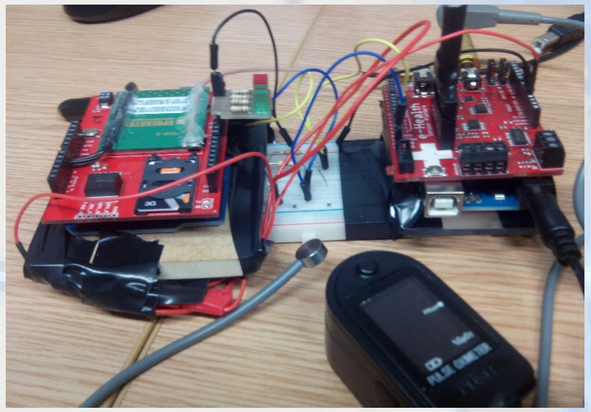
Introduction

The e-health kit is a prototype monitoring device that allows the reading of body (human and or animal) statistics and connection to microcomputers to allow the gathered data to be collected and processed. This system is designed to allow a patient the freedom of their own home and neighbourhood while still being monitored for changes in their health condition in real time. Due to the increase in the ageing population of the country and more being asked of the health professionals. It frees up expensive nursing care and practitioners while still keeping them informed of abnormalities, allowing them to take action if necessary.



The use of mobile technology makes this possible as the mobile system improves and is more reliable. The system will allow a carer or the patient themselves to put on the monitors for the kit to provide data to health professionals for analysis.

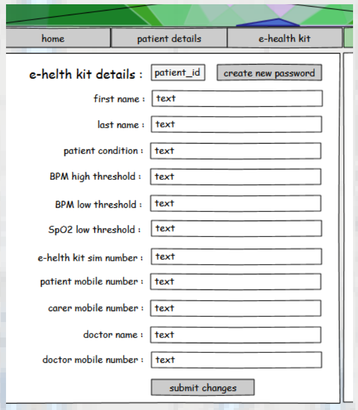
The system can be tailored to suit the patient's physiological issues, there are a total of ten different monitors for the system; pulse, oxygen in blood (SPO2), airflow (breathing), body temperature, electrocardiogram (ECG), glucometer, galvanic skin response (GSR - sweating), blood pressure (sphygmomanometer), patient position (accelerometer) and muscle/eletromyography sensor (EMG).

Although this monitor is not to be used in a medical situation the combination of the data and the mobile technology show what is possible with this type of setup between new micro computing hardware, mobile technology, web services and cloud computing.

Aim of Application

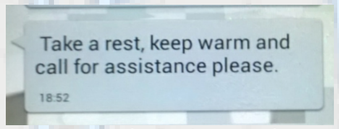
The data being collected for this example to demonstrate the principle are external body temperature (degrees Centigrade), pulse rate (beats per minute) and oxygen saturation level (percentage ratio of oxyhemoglobin). There are seven other stats that can be monitored on the kit.

The patient data is registered on a database with the reference to the e-health kit i.e. the kit sim phone number, this registration data will include the patient mobile contact, carer contact and doctor contact to ensure all are aware of any abnormalities in the patient status. The record of patient stats are available from the database through a secured web access for presentation and analysis by the doctor. Currently this data is only shown as a list from the web site to a mobile website with a further page to show a short history of the patient status. Certain criteria are used for each reading to analyse the patient's status and what action they should take.

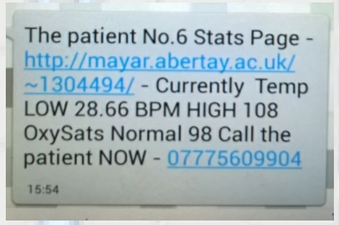


Method of Operation

The system predominantly uses sms messaging to inform of the patient status. This is a cheap and consistent method of communication, the messages will be delivered to the doctor and the carer to ensure action, if required is taken. The messages are compiled by the system to provide a summary of the patient status based on the criteria stored for thresholds from the database. An sms is also being sent from the server-side of the system ensuring that even where the reception is poor an alert will be put out.



Example Patient and Carer Messages



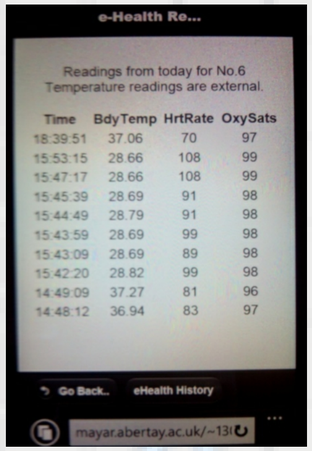
The patient will receive instructive sms messages on the best action for them to take, these messages are not to alarm but to assist and are sent from the e-health kit they can be tailored to that particular patient needs. The messages received by the carer and doctor are populated with links to a mobile website where access to the patients currently available data would be shown, allowing them to take action. The message also has the patient's mobile number where they can be immediately contacted.

Access to Results

The record of patient stats are available from the database through a secured web access for presentation and analysis by the doctor to inform the patient of their condition.

Currently this data is only shown as a list from the web site to a mobile website with a further page to show a short history of the patient status.

Certain criteria are used for each reading to analyse the patient's status and what action they should take.



eHealth Kit on arduino uno Process Diagram