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MASSEY UNIVERSITY
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A thesis presented in partial fulfilment
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Masters

in

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**A feasible and effective remote diagnosis system for
healthcare**

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Summary:

This master thesis documents the research and developmental process in creating a feasible and effective remote diagnosis system for healthcare.

The research is within the sector of the rapidly expanding practice that is Telemedicine. Telemedicine is defined as “the remote diagnosis and treatment of patients by means of telecommunications technology” [1]. It has become a reality for delivering high quality healthcare to patients not only in remote locations but also to monitor elderly patients as well as patients living with chronic diseases. In the past decade, advancements in technologies have been fuelling the growth of telemedicine. Numerous healthcare products have appeared on the market and are moving towards smartphone applications (apps), some of which include remote consultation using video calling software. The majority of these products are stand-alone applications with limited monitoring of patient’s vital signs. A number of systems are novel, low cost and specifically designed for monitoring the patients’ vital signs, but few offer a fully integrated system for remote diagnosis. Remote healthcare diagnosis systems, especially affordable small devices that provide reliable data in real-time, still challenge researchers.

This research studied the currently available telemedicine systems, cloud database and the features of smartphone apps. The research confirmed the possibility to develop a hand-held system that could obtain remote patient vital signs and transmit the data, effectively in real-time to healthcare professionals for diagnosis via a cloud database and smartphones. A proposed system was designed, and a physical prototype developed. Tests made on the prototype proved the system can capture remote patient’s vital signs and transmit them to a doctor through a cloud database and a smartphone app. The system consists of three major units:

- A hand-held device that measures patient vital signs.
- A smartphone application with a simple user interface to communicate with health professionals via internet and to the device via Bluetooth.
- A cloud database for data transfer and the communication with the smartphone application through an internet connection.

The outcome of this research confirms it is feasible to develop small, economic and portable systems for health diagnosis. Such systems could be very useful for remote patients, especially those living with chronic diseases and requiring regular medical checks, without traveling to access health services to obtain professional treatment.

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