Potential of Mobile Devices in New Zealand Healthcare

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. It contains results of my investigation, except where otherwise stated. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

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Abstract

This thesis examines the potential for the use of mobile devices in New Zealand healthcare. Adoption of mobile technology can potentially improve information access at point of care, increase efficiency and patient safety, significantly reduce costs, enhance workflow, and promote evidence-based practice to help make effective decisions.

Mobile devices of different size and form such as laptops, tablet PCs, PDAs, smart phones, mobile phones, and RFID offer portability, remote access to clinical data, traceability, convergence, and connectivity which traditional computers cannot emulate.

The pervasiveness of mobile devices is increasing both globally and within New Zealand. The potential of mobile technology in healthcare has been recognized by many developed countries; there is adequate evidence for improving productivity, efficiency, and patient engagement.

The study focuses on the three prominent healthcare sectors in New Zealand: Primary, Secondary, and Community. As mobile technology is still an underdeveloped area within New Zealand's healthcare industry, the use of a qualitative research approach involving surveys and interviews helps to determine which m-health applications are most appropriate to adopt here. The sample surveyed consists of health providers, health strategists, and technology vendors.

The potential of mobile devices that were identified from the interviews included real-time access to information such as clinical data, drug database, and medical references. the use of SMS reminders and alerts, use of RFID to reduce medical errors, manage patients and assets, and for identification of medical equipment and drug identification. Over 80 percent of the participants considered privacy, confidentiality, and security to be very important challenges in the m-health domain. Many challenges and implications were identified, including technical constraints such as form factor of mobile devices, storage space, limited battery life, durability, and reading distance of RFID devices. Privacy, security, and ethical issues were discussed including the sensitivity of personal data, sending and receiving of clinical data, RFID tracking ability, security, and encryption standards, authentication barriers, and cultural barriers.

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Allahu-Akbar (God is the greatest)

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Table of Abbreviations

A&E	Accident And Emergency
AIDC	Automatic Identification and Data Capture
CDMA	Code Division Multiple Access
CEO	Chief Executive Officer
CGMH	Chang-Gung Memorial Hospital
CIO	Chief Information Officer
CPT	Current Procedural Terminology
DHB	District Health Board
EHR	Electronic Health Record
ENT	Ear Nose Throat
EPOC	Electronic Piece Of Cheese
GPRS	General Packet Radio Service
GPS	Global Positioning System
GPs	General Practitioners
GSM	Global System for Mobile Communications
HF	High Frequency
HIS	Health Information Strategy
HIS-NZ	Health Information Strategy for New Zealand
HP	Hewlett Packard Taiwan
HTML	HyperText Markup Language
ICU	Intensive Care Unit
IM	Instant Messenger
IOM	Institute Of Medicine
ISM	Industrial Scientific Medical

IT	Information Technology
LAN	Local Area Network
LF	Low Frequency
M-collaboration	Mobile Collaboration
M-commerce	Mobile Commerce
M-communication	Mobile Communication
M-computing	Mobile Computing
M-Health	Mobile Health
MICT	Mobile Information Communication Technology
MoH	Ministry of Health
MUHEC	Massey University Human Ethics Committee
OR	Operating Room
PC	Personal Computer
PDA	Personal Digital Assistant
PDC	Precision Dynamics Corporation
PHCS	Primary Healthcare Strategy
PHO	Primary Health Organization
PMS	Patient Management System
RFID	Radio Frequency Identification
RSD	Reflex Sympathetic Dystrophy
SMS	Short Messaging Service
SOP	Standard Operating Procedures
UHF	Ultra High Frequency
VPN	Virtual Private Network
WAP	Wireless Application Protocol
WCDMA	Wideband Code Division Multiple Access

WHO	World Healthcare Organization
Wi-Fi	Wireless Fidelity
WML	Wireless Markup Language
WWW	World Wide Web