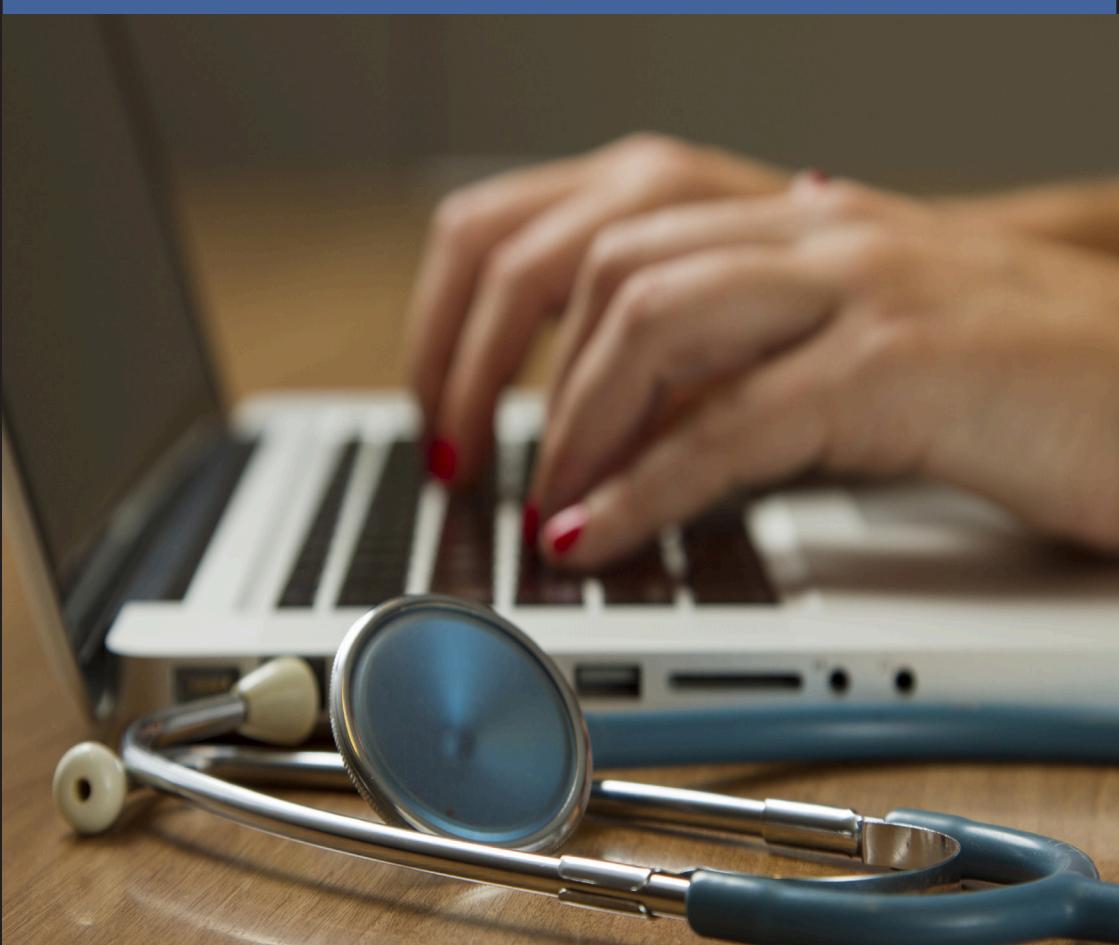


# GUIDELINES: INFORMATICS FOR NURSES ENTERING PRACTICE

## 2018



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# Contents

Introduction	5
Principle 1: Professional Practice	7
Nurses are accountable and responsible for their use of information and communication technologies (ICT)	
Principle 2: Information Management	9
Use of information to inform and manage patient care	
Principle 3: Information and communication technologies to enhance the health of New Zealanders	10
Nurses effectively use ICT to assist with the delivery of quality nursing care to improve patient outcomes	
Principle 4: General computer and ICT Skills	12
The nurse is adaptable in different healthcare environments through transferrable ICT skills	
References	14
Glossary	16

*Nursing informatics is defined as a “science and practice [which] integrates nursing, its information and knowledge, and their management, with information and communication technologies (ICT) to promote the health of people, families and communities worldwide”.<sup>1</sup> Or more simply, the use of computers, information and communication technologies to support nursing practice.*

**Notes:**

For convenience the word ‘patient’ is used to denote the person/family or whānau/community or population receiving healthcare.

This document in no way endorses or promotes any specific IT solutions or products. Commercial examples are given purely as examples only.

## Introduction

These guidelines identify the key knowledge, skills and behaviours toward nursing informatics for nurses as they enter practice as a Registered Nurse (RN). As such, they have been developed and articulated to inform undergraduate nursing education.

With knowledge continually evolving, nurses need the tools and guidelines to adapt to the diverse and changing needs in the delivery of healthcare for New Zealanders. The national health strategy released by the Ministry of Health<sup>2</sup> calls for us to work smarter, embrace technology and to use technology to provide better health outcomes for New Zealanders. To do this we need to ensure nursing graduates can work with technology, from the simplest form, such as a glucometer right through to the most complex patient management systems in order to provide optimal patient care.

Through curriculum mapping, we identified a mismatch between current nursing education in New Zealand and industry requirements which highlighted the need to make nursing informatics more visible in nursing thus allowing embedding of nursing informatics into everyday nursing practice.<sup>3</sup> Background reading included international nursing informatics literature including from Australia: the Australian National Informatics Standards for Nurses and Midwives<sup>4</sup>; the initiative driven from the United States: Technology Informatics Guiding Education Reform (TIGER)<sup>5</sup>; the Royal College of Nursing in England: Every nurse an e-nurse: Digital capabilities for 21st century nursing<sup>6</sup>; and from Canada: Nursing informatics entry to practice competencies for Registered Nurses.<sup>7</sup>

Drawing this together, the guidelines presented here identify four informatics principles for student nurses to achieve

*The National Health Strategy calls for us to work smarter, embrace technology and to use technology to provide better health outcomes for New Zealanders.*

over the course of their undergraduate nursing education and enter practice as a Level One, or novice Registered Nurse.

The four principles are:

1. Professional practice
2. Information management
3. Information and communication technologies to enhance the health of New Zealanders
4. General computer and ICT Skills

These principles align with Nursing Council of New Zealand (NCNZ) Competencies for Registered Nurses<sup>8</sup> and were informed by an analysis of information collected via curriculum mapping, international nursing informatics competency work and consultation with industry stakeholders to provide beginning registered nurses with a clear direction for embedding nursing informatics within their practice.<sup>8</sup> Inclusion of examples from everyday practice in the NZ health system adds a NZ context and as such, these guidelines form a bridge between theory, education and practice.

## Principle 1: Professional Practice

*Nurses are accountable and responsible for their use of information and communication technologies (ICT)*

Related to	Examples of how this may be evidenced in practice
Nursing Council regulatory obligations	Acts in accordance with Code of Conduct <sup>9</sup> , Guidelines for Professional Boundaries <sup>10</sup> , Guidelines: Social media and electronic communication <sup>11</sup> and Guidelines for Cultural Safety, the Treaty of Waitangi and Māori Health in Nursing Education and Practice <sup>12</sup> .
Ethics	Critically considers the safe and effective use of patient information. Accesses patient records only for the purpose of patient care and ensures the confidentiality of information. Maintains an appropriate professional, caring and ethical relationship with patients.
Life-long learning	Keeps up to date with tools and critically appraises information sources for accessing information. Shows awareness of the changing nature of ICT in healthcare. Engages safely and proactively with existing and emerging technologies, i.e. artificial intelligence (AI), big data, the internet of things (IoT), robotics.
Online presence	Uses social media responsibly by acting in accordance with the Nursing Council Guidelines: Social media and electronic communication <sup>11</sup> and other relevant legislation and policies.
Local policies and protocols	Acts in accordance with organisational policies, for example, adheres to local policy in regards to password allocation, usage and sharing.

Law	Maintaining privacy by working with, but not limited to the following legislation Privacy Act (1993), Health Information Privacy Code (1994) and Health and Disability Commissioners Code of Rights (1996), Harmful Digital Communications Act (2015).
Awareness of national and international influences	Is aware of the national and international position of nursing informatics, through documents such as the New Zealand Health Strategy <sup>2</sup> , Digital Health Strategy <sup>13</sup> , World Health Organisation, International Council of Nurses, the Nurse Executives of New Zealand Position Statement on TeleHealth <sup>14</sup> and the New Zealand Nurses Organisation Position statement on Nursing, technology and telehealth <sup>15</sup> . Aware of and uses the National Health Index as the unique patient identifier.

## **Principle 1 is related to the following NCNZ Competencies for Registered Nurses:**

**Competency 1.1** - “Accepts responsibility for ensuring that nursing practice and conduct meet the standards of the professional, ethical and relevant legislated requirements”

**Competency 1.2** – “Demonstrates the ability to apply the principles of the Treaty of Waitangi Te Tiriti o Waitangi to nursing practice”

**Competency 1.4** – “Promotes an environment that enables health consumer safety, independence, quality of life, and health”

**Competency 1.5** – “Practises nursing in a manner that the health consumer determines as being culturally safe”

**Competency 2.3** - “Ensures documentation is accurate and maintains confidentiality of information”

**Competency 2.9** – “Maintains professional development”

**Competency 4.2** – “Recognises and values the roles and skills of all members of the health care team in the delivery of care”

**Competency 4.3** – “Participates in quality improvement activities to monitor and improve standards of nursing”

## Principle 2: Information Management

*Use of information to inform and manage patient care*

Related to	Examples of how this may be evidenced in practice
Information and digital literacy <ul style="list-style-type: none"><li>- Access, collect, use, evaluates and stores evidence to inform practice</li><li>- Evidence based practice</li></ul>	Critically appraise the quality, relevance and context of online sources and web based information. Able to use technology to search and locate appropriate resources and patient data to inform nursing practice. This includes but is not limited to: Scholarly literature, appropriate websites, library databases, and governmental websites. Understands and respects the use of intellectual property and copyrighted material. Able to access, understand and critique multiple sources of information including guidelines and policies. Use of Electronic Health Records to record care plans, progress notes and facilitate handovers.
Health literacy <ul style="list-style-type: none"><li>- Supporting patient's health knowledge</li></ul>	Assists the patient to access, retrieve and evaluate electronic information. Uses appropriate resources and approaches to educate patients and assist them to make informed decisions and enhance their health literacy.

**Principle 2 is related to the following NCNZ Competencies for Registered Nurses:**

**Competency 2.8** “Reflects upon, and evaluates with peers and experienced nurses, the effectiveness of nursing care”

## **Principle 3: Information and communication technologies to enhance the health of New Zealanders**

*Nurses effectively use ICT to assist with the delivery of quality nursing care to improve patient outcomes*

Related to	Examples of how this may be evidenced in practice
<p>Working in partnership to improve health outcomes with patients:</p> <ul style="list-style-type: none"><li>- Individual</li><li>- Whānau / Family</li><li>- Community</li><li>- Population.</li><li>- Shows awareness of nursing as part of an interprofessional team.</li></ul> <p>Shows awareness of nursing as part of an interprofessional team.</p>	<p>Complete, accurate and relevant data collection and documentation.</p> <p>Interpersonal and interprofessional communication using digital mediums.</p> <p>Knows when and where ICT use is appropriate to ensure this does not adversely affect patient care.</p> <p>Safe and accurate use of ICT such as:</p> <ul style="list-style-type: none"><li>- Electronic monitoring</li><li>- Electronic Health Records (EHRs)</li><li>- Personal Health Records (PHRs)</li><li>- Telehealth</li><li>- Blood glucose monitoring</li><li>- Laboratory results</li><li>- Electronic prescribing and administration</li><li>- Picture Archiving and Communicating System (PACS) used in medical imaging</li></ul>
<p>Aware of the importance of data/information to support quality patient outcomes, quality work environments for staff and best use of health resources.</p>	<p>Knowledge of patient acuity systems, patient management systems, and what patient data can be utilised for, e.g. Care Capacity Demand Management (CCDM).</p> <p>Knowledge of health and safety / incident reporting systems</p>

<p>Principles of cultural safety and Te Tiriti o Waitangi are applied to information management.</p>	<p>Considers the nurses obligations under Te Tiriti o Waitangi and the broader diverse aspects of cultural safety</p> <p>Is inclusive in their approach to the use of ICT such as:</p> <ul style="list-style-type: none"> <li>- Ethnicity data collection</li> <li>- Gender data collection</li> <li>- How to use ICT in partnership with patients.</li> <li>- Computer literacy for those who may be less familiar with computer technologies</li> <li>- Adaptive technologies</li> </ul>
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### **Principle 3 is related to the following NCNZ Competencies for Registered Nurses:**

**Competency 1.2** - “Demonstrates the ability to apply the principles of the Treaty of Waitangi Te Tiriti o Waitangi to nursing practice”

**Competency 1.4** - “Promotes an environment that enables health consumer safety, independence, quality of life, and health”

**Competency 1.5** - “Practises nursing in a manner that the health consumer determines as being culturally safe”.

**Competency 2.4** - “Ensures the health consumer has adequate explanation of the effects, consequences and alternatives of proposed treatment options”

**Competency 2.7** - “Provides health education appropriate to the needs of the health consumer within a nursing framework”

**Competency 3.2** - “Practises nursing in a negotiated partnership with the health consumer where and when possible”.

## Principle 4: General computer and ICT Skills

*The nurse is adaptable in different healthcare environments through transferrable ICT skills*

Related to	Examples of how this may be evidenced in practice
Basic ICT Skills	<p>Demonstrates use of, but not limited to, the following:</p> <ul style="list-style-type: none"><li>- Email</li><li>- Personal computers/laptops/tablets/mobile devices</li><li>- Uploading and downloading data</li><li>- Multimedia presentations</li><li>- Word processing</li><li>- Internet</li></ul> <p>Understands some basic ICT terminology such as network connectivity, cloud based, URL, bookmark, internet and intranet, operating system, interoperability.</p> <p>Security awareness and practice; for example, use of passwords and privacy settings.</p> <p>Awareness of how to protect against viruses and malware.</p> <p>Appropriately cleans ICT hardware to maintain personal, patient and staff safety.</p>
Use of specific platforms within the educational environment to develop transferrable skills	<p>Learning management system (eg Moodle, Blackboard, Canvas, Health Learn).</p> <p>ePortfolios (eg Pathbrite, Mahara, Chalk and Wire, PebblePad).</p> <p>Library databases.</p> <p>Academic work repositories (eg Turnitin)</p> <p>Health and safety reporting.</p> <p>Organisational intranets and professional development systems.</p>

<p>Use of specific platforms within the health care environment to develop transferrable skills</p>	<p>The platforms and software available according to clinical environment. Examples could include:</p> <ul style="list-style-type: none"> <li>- Patient or Practice Management Systems (PMS) e.g. MedTech, Houston Medical or My Practice</li> <li>- Patient Acuity Systems e.g. Trendcare,</li> <li>- Clinical Portal e.g. Concerto</li> <li>- e-Prescribing and administration e.g. MedChart</li> <li>- Health and Safety reporting</li> <li>- Data repositories e.g. Health Connect South, Eclair</li> <li>- Electronic Health Records e.g. HealthOne</li> <li>- InterRAI</li> <li>- e Vitals e.g. Patient Track</li> </ul>
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## **Principle 4 is related to the following NCNZ Competencies for Registered Nurses:**

**Competency 2.9** - “Maintains Professional Development”

**Competency 3.3** - “Communicates effectively with health consumers and members of the health care team”.

**Competency 4.3** - “Participates in quality improvement activities to monitor and improve standards of nursing.”

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# Glossary

Artificial Intelligence (AI)	AI is the field that deals with the conception, development and implementation of informatics tools based on intelligence technologies which attempt to capture the complex processes of human thought and intelligence. <sup>16</sup>
Big Data	Very large data sets that are difficult to process using typical data processing, such as a conventional relational database system. <sup>16</sup> Big data sets can be useful to predict healthcare needs and trends.
Bookmark	Bookmark refers to a way of electronically marking a webpage, therefore forming a shortcut, which makes a bookmark an easier way to navigate to a favourite website.
Clinical Portal e.g. Concerto	A clinical portal allows health professionals to view integrated patient information via a single system. Concerto generally refers to Concerto Clinical Workstation, an Orion Health clinical records system which enables health professionals to view integrated patient information via a single system, regardless of the underlying “feeder” applications (for example, laboratory, diagnostic and/or pharmacy systems). Information delivered through a clinical workstation is considered to be easier to interpret because it is accessed and presented through a common interface.
Cloud based	Cloud based services are those provided on servers at remote locations via the Internet. The ‘cloud’ is the ability to host a software platform or service from a remote location that can be freely accessed and used anywhere via Internet access.

Care Capacity Demand Management (CCDM)	A [software] programme that supports DHBs to achieve their core mandate to safely and consistently match the demand it places on its services (care required by patients) with the resources required to meet this (staff, knowledge, equipment, facility). That is, balancing demand vs capacity. CCDM is about improving the quality of care for patients, the work environment for staff and the organisational efficiency <sup>17</sup> .
Connected Health	This is a Ministry of Health secure, standards-based, commercial model for the delivery of universal connectivity across the New Zealand health sector.
Data repository e.g. Health Connect South, Eclair	A clinical data repository contains a core set of clinical information, along with additional clinical data that may be context specific.  Health Connect South provides clinical staff in the South Island with a single repository for patient clinical records, as it aggregates information from other underlying systems into one clinical workstation therefore simplifying access to patient information and ensuring that patients and their clinical information are more easily transferred and accessed throughout the South Island ( <a href="https://www.sialliance.health.nz/our-priorities/information-services/health-connect-south-/">https://www.sialliance.health.nz/our-priorities/information-services/health-connect-south-/</a> ). A further example is Éclair, a clinical information system used extensively in the North Island provided by Sysmex ( <a href="http://www.sysmex.co.nz">www.sysmex.co.nz</a> ).
Digital literacy	The American Library Association defines “digital literacy” as the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills <sup>18</sup> .

<p><b>Electronic Health Record (EHR)</b> e.g. HealthOne</p>	<p>An Electronic Health Record (EHR) is defined as “a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting”<sup>19</sup>. An electronic health record is accessible by healthcare providers and in some instances the patient.</p> <p>HealthOne is a secure electronic record which is maintained and operated by Canterbury District Health Board (DHB). As a secure record it stores health information including GP records, prescribed medications and test results. Authorised healthcare providers such as GPs, community nurses, pharmacists and hospital doctors and nurses can access stored information with the patient’s permission, and patients can also opt off HealthOne if they do not want any of their information to be shared (<a href="http://www.healthone.org.nz">www.healthone.org.nz</a>).</p>
<p><b>Electronic prescribing and administration (ePA)</b> e.g. MedChart</p>	<p>Electronic prescribing and administration (ePA) systems enable prescribing, dispensing and administration of medicines to be recorded electronically. ePA covers the entire hospital medicines cycle including prescribing, review and dispensing of medication orders, and administration of medicines.</p> <p>MedChart is an electronic medication management system replacing paper-based medication charts (<a href="http://www.dxc.technology/providers/offering/139499/140202-medchart-electronic-medication-management">http://www.dxc.technology/providers/offering/139499/140202-medchart-electronic-medication-management</a>).</p>
<p><b>e-Portfolio</b></p>	<p>An electronic or e-portfolio is a collection of electronic evidence assembled and managed by the user. E-Portfolios may be web based. In nursing the student may complete an e-portfolio as a way to show evidence of meeting course requirements. Proprietary e-portfolio options include Pathbrite, Mahara, Chalk and Wire and PebblePad.</p>

Evidence Based Practice (EBP)	Evidence-Based Practice (EBP) is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research” <sup>20</sup> .
eVitals e.g. Patient Track	A computer programme for collecting physiological vital signs data electronically instead of on paper. As the data is collected automatic calculation of an Early Warning Score (EWS) and alerts are possible. Patient Track is an example seen in New Zealand.
Hardware	Hardware is the physical hardware or components which make up a computer system. Hardware includes the monitor, keyboard, data storage, graphic and sound cards and processing units. Computer hardware and software require each other and neither can be realistically used on its own.
Health Literacy	“The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make informed and appropriate health decisions” from Health Literacy Review <sup>21</sup> .
Information and communication technologies (ICT)	Information and communication technologies refers to information technologies (often thought of as computers, though also includes mobile devices such as laptops, notebooks, tablets and mobile phones), with communication ability (internet, phone and wireless means to transfer and share information). It also encompasses the software or systems that are used.
Information Literacy	The American Library Association defines “information literacy” as a set of abilities requiring individuals to “recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” <sup>22</sup>

Internet	The Internet is the global system of interconnected computer networks to link devices worldwide. It is a network of networks that consists of private, public, academic, business, and government networks, linked by an array of electronic and wireless networking technologies. The Internet includes the World Wide Web (WWW) and electronic mail.
Internet of things	The Internet of Things (IoT) describes the connection of devices or physical objects with embedded electronics, sensors and software by networking technologies to enable the exchange of data with other connected devices, operators and users. <sup>23</sup>
Interoperability	The ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged. <sup>24</sup>
InterRAI	InterRAI stands for 'International Resident Assessment Instrument' and refers to a suite of software providing standardised clinical assessment tools developed by an international collaboration. The licence to use InterRAI throughout NZ is held by the Director-General of Health. InterRAI is the primary assessment tool in aged residential care and home care in New Zealand ( <a href="http://www.interrai.co.nz">www.interrai.co.nz</a> ).
Intranet	Unlike the Internet which is public, an intranet is a private network, often within an organisation, and therefore only accessible by their staff.
Learning Management System (LMS)	A Learning Management System is a software application for the administration, documentation, tracking, reporting and delivery of educational courses. Examples include Moodle, Blackboard, Canvas, and Health Learn.

Library databases	Library databases are an electronic collection of records containing full-text documents, citations, abstracts or articles and as such are powerful research tools. Commonly used in nursing is the Cumulative Index to Nursing and Allied Health Literature (CINAHL).
National Health Index (NHI)	The National Health Index (NHI) number is a unique identifier that is assigned to every person who uses health and disability support services in New Zealand. A person's NHI number is stored on the NHI database along with that person's demographic details.
Network Connectivity	Network connectivity describes how various parts of a network connect to one another. For example, wired or cabled connections, wireless, Bluetooth or near field communication (NFC) connections.
Operating System	An operating system (OS) is the system software that manages the computer hardware and software and provides common services for computer programs. It is considered the most important software that runs on a computer as it manages the computer's memory and processes, as well as all of its software and hardware.
PACS	A Picture Archiving and Communication System (PACS) comprises data storage, image display and links to equipment for diagnostic imaging (digital x-rays), though PACS manages images from other sources, including ultrasound, Magnetic Resonance Imaging (MRI), Nuclear Scintigraphy, Computed Tomography (CT), Digital Subtraction Angiography (DSA), radiology (plain x-rays) and medical photography.

Patient acuity systems e.g. TrendCare	Acuity refers to the measurement of the intensity or amount of care required for a patient. This data is often used for estimating nurse staffing allocations and therefore costs. An example of a patient acuity system seen in New Zealand is TrendCare.  TrendCare is described as a workforce planning and workload management system based on patient acuity data.
Patient Management System (PMS)  Patient Administration System (PAS)	A patient management or administration system is software that allows for tracking by collecting patient and clinical information such as patient demographics, diagnoses, interactions and encounters within the healthcare organization.
Patient Portal	Patient portals are secure online sites that give people convenient and secure electronic access to their health information, increasing their ability to manage their own health care. A New Zealand example is seen in general practice settings.
Personal Health Record (PHR)	A personal health record (PHR) is a health record where health data and information related to the care of a patient is maintained by the patient. The patient allows access or shares their health records with care providers.
Practice Management System e.g. MedTech, Houston, myPractice	Practice management software or system (PMS) is a category of healthcare software that deals with the day-to-day operations of general practice. A PMS usually holds patient demographic information, allows for scheduling appointments and can generate reports.  Medtech is an example of a PMS seen commonly in New Zealand and is provided by a health information technology company who create practice management software ( <a href="http://www.medtechglobal.com">www.medtechglobal.com</a> ). A further example is Houston Medical (now owned by Best Practice Software, <a href="http://www.bpssoftware.net">www.bpssoftware.net</a> ) and myPractice ( <a href="http://mypractice.co.nz">mypractice.co.nz</a> ).

Robotics	The design, development and use of robotics and machines to carry out tasks typically performed by people. <sup>25</sup>
Software	Software refers to computer software, denoting the part of a computer system that consists of data or computer instructions. This contrasts to the physical hardware. Computer hardware and software require each other and neither can be realistically used on its own.
Telehealth	Telehealth is the use of information and communication technologies to deliver health care when patients and care providers are not in the same physical location <sup>26</sup> . This can include using phone, video, texting or personal messaging.
Turn it In	Turn-it-In is proprietary software used in education, from high schools to university because it provides a content comparison database which detects plagiarism.
URL	URL stands for Uniform Resource Locator and is often called the web address. URLs often start with http:// or https:// (for secure sites) and if the information is put into a web browser (such as Microsoft Internet Explorer (IE), Google Chrome, Apple Safari or Mozilla Firefox) directs the reader to a specific website.

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