Digital Channels
in healthcare service provision:
A study of midwives and women's understanding of
and engagement with Information and
Communication Technologies (ICT)

A thesis submitted to the University of Otago, Dunedin, New Zealand
in fulfilment of the requirements for the degree of
Doctor of Philosophy in Information Science

Dallas Knight

October 2013
This thesis is dedicated to

PETER DOUGLAS KNIGHT

Abstract

This study is about pregnant women, midwives, and information and communication technologies (ICT) during the provision of primary maternity services. It explored (n=35) midwives and (n=55) pregnant women's perceptions and lived experiences of information and communication technologies (ICT) within this context, and sought to understand the factors that may influence the use or non-use of these technologies. Using a constructivist grounded theory approach (Charmaz, 2006), midwives and women's interview data was analysed across the conceptual framework of Assets, Actions and Attitudes.

The findings showed that midwives valued ICT for increased business efficiency and for professional purposes and that they did not feel the need to use ICT to assist their interactions with the women. Midwives felt threatened by ubiquitous information, loss of transparency and the lack of control brought by the internet. The tension between the 'hands-on' orientation of midwifery and the virtual orientation of ICTs, and a historical predisposition towards a non-technical birthing environment, were deterrents to midwives using women-centred ICT. Women routinely accessed flows of health information, and valued the internet for recreation and socialisation. Compared with midwives, Generation Z women had new and different digital skills for communicating, with their mobile devices acting as an extension of their selves, as they interacted in virtual spaces. Women valued virtual methods of support while midwives felt digital communication could be ‘dangerous’ as they did not have the digital skills to safely use new media channels.

This study offers a theoretical understanding of ICT as understood by key stakeholders within the provision and consumption of maternity services. The substantive theory of ‘unused and underused channels’ contributes to an understanding of factors surrounding midwives’ digital non-engagement with women.
Research findings suggest that midwives and their professional organisation's sub-optimal digital literacy and digital awareness are restricting women's information and communication choices. By understanding the impediments to providers’ digital engagement, stimulation strategies including dialogue, education, policy changes, resources and support opportunities to foster capability can be considered.
Acknowledgements

This doctoral journey has been a long and interesting process. The journey would not have started or been able to continue without the assistance and support of many people. I am grateful for their help.

I wish to acknowledge the University of Otago for awarding a PhD scholarship to undertake this research. This scholarship provided me with freedom, space and resources to undertake this research. Importantly it gave me encouragement and confidence to embark on this project.

Thanks and appreciation is due to my supervisors Mr Russell Butson, Senior Lecturer in Higher Education, Professor Holger Regenbrecht, Department of Information Science and Mr Alec Holt, director of the Health Informatics Group within the Department of Information Science at the University of Otago. Their helpful reassurance, support, comments, advice and confidence in my ability, have been pivotal in giving momentum to this undertaking. Being able to freely consult on big and small matters has been enormously helpful. Staff of the University of Otago, in particular Professor John Knight, and the Information Science Department staff have provided friendly assistance along the way.

The midwives of Hawke’s Bay have been generous in their time and willingness to become involved and contribute to this doctorate. Women generously gave their valuable time, insights and accounts of their experiences, and staff and students of the William Colenso Teen Parent Unit were welcoming and helpful. My friends and family have always inspired me to do better. Their understanding, encouragement and support are valued.

Above all, a doctoral thesis is not possible without support in everyday life. Most of all, special thanks are due to my husband Doug Knight. This thesis would not have been possible without his interest, love, support and enduring patience.
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Glossary of terms

Information and communication technology (ICT)

‘Information and communications technology’ refers to a broad field encompassing software, hardware, computers and networks. It includes communication infrastructure and technologies such as regular telephony, cellular networks, satellite communication, broadcasting media, and other forms of communication’ (Soriano, 2003). ICT is used throughout this study to cover: classification, storage, retrieval, manipulation, dissemination, transmission and receipt of digital data, using a multitude of devices, software and services.

Health informatics

Health Informatics is the study of ‘the use of information technology in healthcare’. This definition is used within the University of Otago, Department of Information Science1, although there are many definitions of health informatics.

Information Science

‘Information Science is the study of information and how it is used by people within organisations’ (Winikoff, 2011). This thesis will refer to information science as the broad term to embrace information systems, understanding information science includes knowledge management and that systems are complex sociotechnical entities within cultural and organisational settings.

EHealth or e-health

The concept of EHealth is accompanied by an understanding that it has positive benefits for users and providers (Oh et al., 2005).

‘…an emerging field at the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve healthcare locally, regionally and worldwide by using information and communication technology’ (Eysenbach, 2001).

1 Department of Information Science, University of Otago, Dunedin.
**EHealth literacy**
In New Zealand, health literacy has been described as ‘the degree to which individuals have the capacity to obtain, process and understand basic health information and services in order to make informed and appropriate health choices’ (Ministry of Health, 2006).

**Consumer informatics**
Consumer informatics is a sub-discipline within health informatics and concerned with consumers’ needs, particularly for high quality information, and use of the internet (Eysenbach, 2000).

**Patient-centred care**
Key dimensions of patient-centred care are access to information, communication and social technologies that support patients and providers (Jayadevappa and Chhatre, 2011).

**Participatory healthcare**
In a participatory model of healthcare, the role of an informed, empowered and active patient is emphasised.

**MHealth**
In this thesis, MHealth refers to the provision of healthcare services via mobile communication devices.

**Knowledge**
Knowledge is information that has been processed in some meaningful ways (Faucher, 2010).

**Psychosocial support**
Psychosocial support is the process of meeting a person’s emotional, social, mental and spiritual needs.

**Gatekeeper**
A gatekeeper refers to ‘an attendant employed to control who goes through a gate’ and ‘a person or thing that controls access to something’ (Oxford Dictionaries, 2012).

**Paternalism**
Paternalism in health is a restrictive practice that usurps a person’s right to choose (Sandman and Munthe, 2009: p.2).
**Cyborg**
A cyborg is ‘an organism to which exogenous components have been added for the purpose of adapting to new ambient spaces’ (Case, 2012).

**Sociotechnical**
The term ‘sociotechnical’ was first used by Trist (Trist, 1967) to describe a view of which takes into account the entanglement and interrelatedness of human and non-human entities within a system and subsystems (Pan and Scarbrough, 1998: p.57). Also, ‘the sociotechnical view contends that organisations are made up of people that produce products or services using some technology, and that each affects the operation and appropriateness of the technology as well as the actions [and interactions] of people who operate it’ (Pasmore et al., 1982: p.1182) as cited by (Pan and Scarbrough, 1998: p.57).

**Sociomaterial**
‘Sociomaterial perspectives not only question the acceptance of differential categories such as individual/organization and binaries of subject/object, knower/known etc, but also challenge the givenness of fundamental distinctions between human and non-human’ (Fenwick, 2010: p.108).
The sociomaterial view is ‘a way of seeing the world that considers human and non-human (objects, technologies, artefacts, etc.) as mutually dependent’ (Michael, 2012).

**Structuration**

**Embodied**
‘Be an expression of or give a tangible or visible for to (an idea, quality of feeling). Provide with a physical form’ (The Merriam-Webster Dictionary, 2013b).

**Enacted**

**Intertwined**
‘A portmanteau of ‘intertwined’ and ‘intermingled’ coined by Ted Nelson to describe computerdom and information, but can be used in any situation’ (The Urban Dictionary, 2013). Thesis examiner, Dr Mark McGuire, introduced this
word in the markup of my original thesis examination document in July - August 2012, and I have adopted it as it relates to computerdom and information, which are topics close to the heart of this thesis.

**Digital void**

Digital (meaning that data is represented as numerical values) and void (gap) relates to the absence of digital ICT.

**Internet technologies**

Internet technologies cover a broad range of hardware, software and services that support and enable package technology over the internet.

**Web 2.0**

Web 2.0 is a web application platform, which enables dynamic interactive content over complex interfaces.

**Mobile technologies**

Mobile technologies include cellular data technology and more recently extended standards that enable multimedia data transmission using internet technologies.

**Cellular technology**

Cellular technology uses cellular wireless transmission from fixed towers to a receiver within a cellular network. Simple mobile phones use cellular technology, although convergence has enabled the interlinking of devices and services into a multimedia digital mobile internet.

**Smartphone**

A smartphone is a cellular telephone with built-in applications and internet access. Smartphones provide digital voice service, text messaging, e-mail, web browsing, still and video cameras, MP3 player, video viewing and video calling. In addition, smartphones can run apps, which increase and personalise the functionality.

**Wireless technologies**

‘Wireless technologies refer to methods or devices that achieve data transfer without the use of wires connecting two devices’ (Soriano, 2003).

**Application**

A computer software programme designed to help people perform an activity.

**App**
The abbreviated form of the word application, in this thesis, refers to a small piece of software for smartphone and tablet devices, to enhance specific capabilities and functions of the device (Granzyk-Wetzel, 2012, Bogost, 2011).

‘Ubiquitous computing’
‘Ubiquitous computing’ is ‘... a scenario in which computers become more numerous and fade into the background, providing information to human users and embedding intelligence and computing capabilities in seemingly everyday objects’ (Weiser, 2002).

Digital technologies
‘The term ‘digital technologies’ is used to describe the use of digital resources to effectively find, analyse, create, communicate, and use information in a digital context. This encompasses the use of web 2.0 tools, digital media tools, programming tools and software applications’ (NZ CETA, 2013). Examples include mobile phones and internet technologies, software and telecommunication services.

Virtual palette
A virtual (having the potential of invisible efficacy without the agency of material) palette (array or menu) is conceptualised as a space, housing an array of evaluated tools as services and apps with the potential to span information and communication processes between the disparate communities of midwifery healthcare professionals and women.

Intervening triggers
Intervening (coming between to provide support) triggers (activating mechanisms) have been proposed in this context. They are: consumers, policy changes, funding, education and training, researchers and support.

New media
New media processes are digital, as opposed to analogue mediated information and communication processes. New media rely on digital infrastructure for distributing and accessing content (Janlert, 2008).

Social networks
Social networks are any set of sociotechnical systems and associated activities that enable many-to-many social interactivity to take place via information and
communication technologies (ICTs), whether via the internet, mobile, personal digital assistant (PDA), (handheld computer with a wireless internet connectivity), or any other device (Boulos et al., 2007).

**Social network sites**

Social network sites are web-based services that allow individuals to construct a personal identity and communicate with others with a defined system. Examples include: Facebook, Flickr, YouTube, Bebo, Twitter, PatientsLikeMe and many more (Boyd and Ellison, 2007).

**Virtual community**

Virtual communities emerge when people within online groups using social network sites generate sufficient feeling to form personal relationships (Rheingold, 2000).

**Community of practice**

‘…group/s of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis’ (Wenger et al., 2002: p.4).

**Social media**

Social media are technologies and platforms that enable social interactions between multiple users on the web and/or mobile devices. Social media include social networking sites such as Facebook, LinkedIn, and Twitter; blogs and wikis; Wikipedia; and photo and video sharing sites, such Instagram and YouTube.

**Virtual**

‘Not physically existing as such, but made by software to appear to do so’ (The Free Online Dictionary, 2013).

**Virtual world**

A virtual world refers to an interactive online simulated environment.

**Computer mediated communication**

Computer mediated communication is taken to mean any transaction that occurs between two or more electronic devices (Wikipedia, 2013a).

**Tacit knowledge**

Tacit knowledge is the kind of knowledge that is difficult to transfer verbally (Wikipedia, 2013b).
**Construct**
A construct is something constructed by the mind as a theoretical entity, or a working concept (The Merriam-Webster Dictionary, 2013a).

**Women**
Women, in the context of this thesis, who use midwifery Lead Maternity Care services, are ‘well-women’, meaning they are experiencing a normal pregnancy. Pregnancy and childbirth are viewed as normal physiological processes, not as illness. Midwives refer to the women they provide LMC care for as ‘women’, never as ‘patients’. This is a clear point of difference from medical practitioners, even though patients may also be well. Sometimes midwives refer to women as ‘clients’ although never as ‘customers’, or ‘consumers’.

**Lead Maternity Care (LMC)**
A Lead Maternity Care midwife is a healthcare practitioner responsible for providing and co-ordinating a woman's maternity care, developing her care plan and attending labour and birth. A Lead Maternity Carer can be a midwife (independent or hospital based), a general practitioner, an obstetrician or a hospital team.

**Midwife**
A midwife is a registered healthcare provider who is a specialist in caring for women experiencing a normal pregnancy and childbirth.

**Primiparous**
A primiparous woman is one who has given birth to one child.
### Abbreviations

<table>
<thead>
<tr>
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<td>DHB</td>
<td>District Health Board</td>
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<td>HBDHB</td>
<td>Hawke’s Bay District Health Board</td>
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<td>HBH</td>
<td>Hawke’s Bay Health</td>
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<td>HDC</td>
<td>Health and Disability Commissioner</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<td>PHO</td>
<td>Primary Health Organisation</td>
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<td>NGO</td>
<td>Non-Government Organisation</td>
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<td>GP</td>
<td>General Practitioner</td>
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<td>LMC</td>
<td>Lead Maternity Carer</td>
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<td>NZCOM</td>
<td>New Zealand College of Midwives</td>
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<td>MMPO</td>
<td>Midwifery and Maternity Providers’ Association</td>
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<td>SAMCL</td>
<td>South Auckland Maternity Care Limited</td>
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<td>NMU</td>
<td>Napier Maternity Unit</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>IS</td>
<td>Information science, including information systems</td>
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<td>GT</td>
<td>Grounded Theory</td>
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<td>GTM</td>
<td>Grounded Theory Method</td>
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<td>CGTM</td>
<td>Constructivist Grounded Theory Method</td>
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<td>SSI</td>
<td>Semi-structured interview</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>ISP</td>
<td>Internet Service Provider</td>
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<td>IP</td>
<td>Internet Provider</td>
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<td>SMS</td>
<td>Short Message Service (text messaging)</td>
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<td>LAN</td>
<td>Local Area Network or WiFi ‘hotspot’</td>
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<td>IP</td>
<td>Internet Protocol (packet technology)</td>
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<td>VOIP</td>
<td>Voice Over Internet Protocol</td>
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<td>UFB</td>
<td>Ultra Fast Broadband (speeds up to 100Mbps)</td>
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<td>Acronym</td>
<td>Description</td>
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<td>WiFi</td>
<td>Wireless IEEE 802.11 standard used for LANs</td>
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<td>GSM</td>
<td>Global System for Mobile Communications</td>
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<tr>
<td>2G</td>
<td>2nd Generation wireless telephone standard, enabling voice and text messaging</td>
</tr>
<tr>
<td>3G</td>
<td>3rd Generation GSM enabling wireless voice, mobile internet, video calls and mobile TV</td>
</tr>
<tr>
<td>4G</td>
<td>4th Generation mobile phone standard enabling mobile ultrafast broadband internet access</td>
</tr>
<tr>
<td>WiMax</td>
<td>(Worldwide Interoperability for Microwave Access) is a communication standard with 4G capabilities</td>
</tr>
<tr>
<td>LTE</td>
<td>Long Term Evolution (a 4G international telecommunications standard)</td>
</tr>
<tr>
<td>TELECOM</td>
<td>Telecommunications service</td>
</tr>
<tr>
<td>DSL</td>
<td>Digital Subscriber Line</td>
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<tr>
<td>WWW</td>
<td>World Wide Web</td>
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<tr>
<td>DVD</td>
<td>Digital Versatile Disk</td>
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<tr>
<td>SST</td>
<td>Social Shaping of Technology</td>
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<tr>
<td>TAM</td>
<td>Technology Acceptance Model</td>
</tr>
<tr>
<td>UTAUT</td>
<td>Unified Theory of Acceptance and Use of Technology</td>
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<tr>
<td>ST</td>
<td>Structuration Theory</td>
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<td>DIT</td>
<td>Disruptive Innovation Theory</td>
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<tr>
<td>U&amp;G</td>
<td>Uses and Gratifications</td>
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<tr>
<td>FAQ</td>
<td>Frequently Asked Questions</td>
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Chapter 1: INTRODUCTION
This thesis started with the question, ‘What is the role of Information and Communication Technologies (ICT) in the provision of primary maternity care?’ In the process I asked, ‘What is important to the stakeholders and why?’ The stakeholders were Lead Maternity Care midwives, and women who had recently used the service. ‘Technology uptake is all about finding out what matters to people’ (Greenhalgh, 2013b), so when I posed the question, ‘What is the role of Information and Communication Technologies (ICT) in primary maternity service provision?’, I needed to know what mattered to the stakeholders. Greenhalgh’s tweet (2013) concisely expresses why I set out to understand what mattered to midwives and women, within a health district on the east coast of New Zealand.

This first chapter establishes the research area by outlining the background and developing a justification for embarking on this study. It discusses the research questions, my influence as a researcher, the chosen research method and describes the organisation of this thesis.

1.1 Background to the research

1.1.1 Information and communication technologies (ICT)
Information and Communication Technologies (ICT) have transformed the way we receive and disseminate information and the way we communicate both individually and socially. The internet has become a vast multimedia platform supporting both information and communication processes. As new technologies become more ubiquitous, it is fitting to explore their role in enhancing healthcare over traditional ways. To more fully understand the role of ICT in maternity service provision, this thesis set out to comprehend and construct a theoretical understanding of midwives and women’s engagement with, and the meaningfulness of ICT, to them during maternity service provision, and in their lives. Using a Constructivist Grounded Theory approach within a theoretical
framework of assets, actions and attitudes, this research will offer an understanding of influences contributing to midwives’ digital non-engagement with women.

Mass media and broadcasting were indicative of the information age. Developed countries are now in the post-information age, which is characterised by personalisation and participation (Negroponte, 1995: p.163). Mobile on-demand information and two-way real-time or asynchronous communication are available to most New Zealanders (Smith, 2011b) and digital technologies have transformed knowledge-based practices and many areas of commerce, entertainment and communications. The use of information and communication technologies (ICT) is significant in everyday New Zealand life, with ICT routinely being used for information, social interaction, entertainment, shopping, banking and trading (Smith et al., 2011).

Contemporary forms of technology and organisation are increasingly understood to be multiple, fluid, temporary, connected, and dispersed (Orlikowski, 2009: p.15). This thesis considers that value of ICT in this specified maternity service provision setting is related to the ongoing interaction between stakeholders’ choice of assets (resources) their actions or use of these resources, and their attitudes, perceptions and the meaningfulness of ICT within the lives of participants. It takes a middle road somewhere between technological determinism (McLuhan and Norden, 1969) and social constructivism. This view – social shaping (Lievrouw, 2003) – holds that people, and institutions through decisions concerning use or non-use of technologies, have an impact on the subsequent development. The social shaping of technology (SST) view emphasises the importance of human choices and action in technological change (ibid p.248). Within this dynamic and slippery context, Baym feels that we need to consider ‘the specific possibilities and constraints technologies offer, and actual practices of use, as those possibilities and constraints are taken up, rejected and reworked in everyday life’ (Baym, 2010: p.45).
The fast-growing range of digital technologies covers an increased range of information and communication methods, including classification, storage, retrieval, manipulation, dissemination, transmission and receipt of digital data, using a multitude of devices, software and services. New developments in software and applications have spawned what is often termed Web 2. It refers to a wider and deeper social response to the technical landscape, promoting the world wide web as an interactive platform for individuals and groups (O'Reilly, 2012), housing tools which permit openness, user-participation, individual empowerment and the power of the crowd (Anderson, 2007). The newly ubiquitous nature of data is another ingredient in the mix.

Traditionally ICT within the healthcare has been used internally for patient management systems, electronic health records, digital radiology, telecare, healthcare management, recording, monitoring, information retrieval, decision support systems and communication. However, this is changing. Populations are typically urban and transient rather than more stationary and family-centred as they were in the twentieth century. Different demographic, geographic, cultural and ethnic profiles have different needs and respond in different ways, reflecting newer technology acceptance and fit theories. Hordern, Georgiou, Whetton et al (Hordern et al., 2011) recognise that consumer participation is a fundamental component of eHealth, and that there still is no deep understanding of how health consumers engage with new ICT, though it holds potential benefits (Duffy and Thorson, 2009: p.93). There is a lack of theoretical knowledge about the use and usefulness of Web 2.0 as a mobile phenomenon in primary maternity care, particularly in the area of consumer participation and empowerment.

Within healthcare, writers advocate a shift from the ‘transaction-based’ approach, to a focus on long-term co-ordination of care and communication between care team members and across multiple service providers (Hogarth et al., 2010) (Ngo-Metzger et al., 2010). Primary maternity service provision is a system involving primary providers, consumers, maternity organisations and
government agencies. Such service provision implies that studies concerning implementation and evaluation issues concerning Information and Communication Technology (ICT) would be useful.

Although these new ICT approaches in health have been heralded with the potential to improve healthcare provision, the implementation of large and expensive information systems is complex and not always successful (Dale, 2000, Greenhalgh and Stones, 2010, Gauld and Goldfinch, 2006). Research has shown that 80% of failure occurring in implementation efforts of healthcare information systems (HCIS), is due to social and organisational factors (Kouroubali, 2002). Scepticism and criticism surround the implementation of the National Health System UK (NHS) summary care record (Greenhalgh et al., 2008), HealthSpace (Greenhalgh et al., 2011) and the ‘choose and book’ systems (Greenhalgh and Stones, 2010). Furthermore, Gauld and Goldfinch (2006) describe large health information systems in New Zealand that did not perform as expected, citing user-resistance, lack of user consultation and training as contributing factors. They warn of an infatuation with technology and an expectation that ICT systems can solve a multitude of problems that they may not be able to achieve (ibid). More research to understand if and how ICT can be safely and sustainably leveraged and evaluated in health, is necessary.

1.2 The research field

This study is situated within the field of Health Informatics. Health Informatics is ‘the study of the use of Information Technology in Healthcare’, although there are many definitions of health or medical informatics. Greenes and Shortliffe (1990: p.1115) define medical informatics as ‘the field that concerns itself with the information cognitive, processing, and communication tasks of medical practice, education, and research, including the information science and the


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technology to support these tasks’. As a discipline, it spans a range of basic and applied sciences including information science, communication science and technologies (ICT). Health informatics is at the intersection within a Venn graphic comprising three variously selected disciplines.

1. The health system | clinical care | ICT (Hannan, 2011).
2. Health management | health information | technology (Bailey, 2011).
3. Computational sciences | social sciences | biomedical sciences (Kirshner, 2011).
4. Information science | healthcare | computer science (Lawton, 2011).

1.2.1 The research focus

Figure 1.2 is a diagram of a standard technology implementation cycle to illustrate that the area of interest for this research lies within the initial needs assessment and identification phase.

![Figure 1.2 A standard implementation cycle outline, and the section relevant to this research](image)

1.3 The research problem and the purpose of this research

Information and communication technologies continue to change and be changed by the way they are adopted and used (Baym, 2010: p.44). Until this study, there was no research on the role of ICT and the degree of digital engagement between LMC midwives and women. Extant research on the phenomenon of the role (value and utilization) of ICT by providers and users of the maternity service has not been addressed as the chief focus for New Zealand
bodies concerned with health. ICT development has been focused on developing infrastructure for a shared record of care (The New Zealand I T Health Board Plan, 2010). ICT innovations in health are difficult to implement, and can disrupt traditional organisational processes and individual relationships (Day and Norris, 2008: p.103), therefore it is relevant to consider stakeholder perceptions (Greenhalgh and Hurwitz, 1999).

New applications and uses of ICT are ‘bearing fruit’ but remain under-examined (ibid). Attitudes to and the meanings attached by users to ICT are important to understand if these applications are to be properly developed, evaluated and accepted (Eysenbach, 2000: p.1716). There is a need to understand the role of ICT by examining consumer’s values, their preferences for new ways of becoming informed (Eysenbach, 2000: p.1716), and the new ways of communicating and realising social support (Coiera, 2013: p.1).

1.4 The research design

A constructivist grounded theory method (CGTM) was adopted as it provides a systematic way of analysing qualitative data; while the nature of the research problem and questions suggested an interpretive approach (Walsham, 1995a). This method outlines a strategy designed to capture, analyse and present participants’ data (Charmaz: 2006). In addition, a theoretical understanding of midwives’ digital engagement with women does not exist and grounded theory methodology is suited for questions about processes (Orlikowski, 1993) and behaviours where no previous theory exists (Urquhart, 2013: p.55).

This tool has a sound philosophical basis and a structure (Crotty, 1998: p.2) that enabled me to explore the degree to which ICT was used to augment traditional healthcare interactions between midwives and women who had recently used maternity services. I could also explore how technological artefacts were individually perceived and used by participants.

This empirical study is aiming to gain knowledge of reality through the study of social constructions. This approach to IS is interpretive (Doherty et al., 2006: p.572). Insights into what technology means to people, and the processes of how it is used or not used, are key to understanding how information systems may be adopted (ibid p.580). Interpretive research in information system research can help us to understand human thought and action in social and organisational contexts (Walsham, 1995a, Lawrence, 2010) and are ‘aimed at producing an understanding of the context of the information system and the process whereby the information system influences and is influenced by the context’ (Walsham, 1993: p.4). Greenhalgh and Russell call for ‘interpretivist’ approaches to eHealth systems and note that this approach assumes a ‘socially constructed reality’, where individuals value perspectives and relationships; where participants frame situations; and where other issues such as their individual values, perspectives and relationships are considered (Greenhalgh and Russell, 2010: p.1).

Constructivist enquiry is interpretive as theorising cannot stand outside of the researcher’s views, and findings are co-constructed by both researcher and participants’ interpretive understanding of the phenomena (Guba and Lincoln, 1994, Charmaz, 2003: p.250, Schwandt, 1994). The constructivist grounded theory method works as a tool for developing, refining and relating concepts (Charmaz, 2006), as it moves towards building a substantive theory. A substantive theory may offer a deeper understanding of participants’ individual assets (resources), actions (practices) and attitudes, (perceptions, perspectives,
beliefs and meaningfulness) concerning information and communication technologies (ICT) within the setting of primary maternity care in Hawke’s Bay, New Zealand.

1.5 Assets, Actions and Attitudes to ICT

In setting out to determine the role of ICT and what matters to stakeholders, this project focuses on the availability of assets (ICT resources), participants’ actions or practices with regard to these resources, and most importantly, their attitudes towards the role of ICT in participants’ professional and maternity experiences and in their lives. While it is not within the scope of this research to examine in minute detail the various definitions of the selected factors, a basic understanding of the terms as understood in this thesis follows. The adoption of ICT is complicated by the dynamic interplay between human, technological and organisational factors (Rogers, 1995, Venkatesh et al., 2003, Davis, 1989, O’Connor, 207, Nemetz, 2011, Chiu and Eysenbach, 2010, Yang, 2011, Greenhalgh et al., 2011, Greenhalgh et al., 2008). The availability and access (assets) to an infrastructure comprising hardware, software and service resources may determine the opportunities for how ICT are used (actions) in health (Watts, 2006, O’Mara et al., 2010, Banna et al., 2010).

The category of ‘attitude’ in this study will collectively include participants’ perceptions, perspectives, beliefs and the meaningfulness of ICT within their lives.

*Attitude* is ‘the disposition to respond favourably or unfavourably to an object, person, institution or event’ (Ajzen, 2005: p.3, Ajzen, 2001), and is a key determinant of technology adoption (Rogers, 1995: p.216). Attitudes underlie and influence behaviours (Ajzen, 1985, Ajzen and Fishbein, 1980) and are based on beliefs (Fishbein and Ajzen, 1975: p.131). The concept ‘perception’ is the ‘process by which organisms interpret and organize sensation to produce a meaningful experience of the world’ (Lindsay and Norman, 1977). It has to do with participants ‘awareness’, in this case, of ICT. A ‘perspective’ is ‘the capacity to view things in their true relations or relative importance’ (The Merriam-
Webster Dictionary, 2013d) and is indicative of a person’s values and ‘point of view’ (ibid). The word ‘meaningfulness’ also denotes the ‘value or significance’ of ICT in the lives of participants (WordNet Search (Princeton University), 2013). The category ‘attitude’ in this study will incorporate participant’s beliefs, perceptions, perspective and the meaningfulness of ICT to participants.

1.6 Framing the questions

The questions were framed as follows:

**Assets**
What ICT are available and accessible to midwives and women in the two cohorts?

**Actions**
How do LMC midwives and women who use their service, exploit or not exploit, information and communication technologies in midwifery service provision and in their lives?

**Attitudes**
What are the attitudes and perceptions of ICT and what is their meaningfulness to LMC midwives and women who use the LMC primary maternity service?

**Context**
What factors influence – (facilitate or hinder) the use/nonuse of digital technologies (ICT) in primary maternity service provision?

Can ICT play a role in maternity service provision, and if so, how?

The world belief for guiding the ontological basis of this study is the interpretivist-constructivist paradigm (Guba and Lincoln, 1994, Schwandt, 1994, Rowe, 2002, Mills et al., 2006). Knowledge is construed as actively constructed by people rather than passively received by them. Truth is determined through the eyes of individuals; each influenced and shaped by a multitude of different sociocultural and temporal forces.

Qualitative interview text was the predominant data source, with quantitative demographic and descriptive preliminary data designed to determine readiness
to engage with ICT. LMC midwives and women who have used maternity services provided primary data.

Interview data was captured from two cohorts: (1) Lead Maternity Care midwives, and (2) women who had recently used their services. Data sets as: assets (hardware, software, services), actions (practices) and attitudes (perceptions and views) provided a framework to give structure to the data. The interviews were transcribed and analysed from the beginning, and concurrently with the literature search. Categories, concepts and patterns grounded in the data were constructed.

1.7 Researcher Positionality

The reasons for my interest in this topic reflect my observations of patient needs within the healthcare setting where I work, my interactions with other healthcare professionals working within smaller practices, small hospitals and larger organisations, and their use of information and communication technologies. Outside of the healthcare setting, there has been a burgeoning of new technologies. Following the proliferation of ICT outside the healthcare setting, there has been a steady infiltration of new web technologies beginning to make their way into the healthcare setting.

My constructivist worldview is of significance, as this view holds that the way we think, and our reaction to objects or symbols is conditioned by our individual lens, and shaped by our unique experiences. The meaning we attach to a word, sentence, symbol or object is always within a temporal sociocultural context and this meaning is based on a ‘complex relation between subjectivity and objectivity’ (Note, 2010).

My experiences as a student of health informatics in the academic world, and my experiences as a health information worker in the field, lead me to seek a deeper understanding of factors around the place of ICT in specific health situations. I
wanted to understand and make sense of what was going on in a specified situation that was chosen as the provision of maternity services, and specifically LMC midwifery services, as they provide most of the primary maternity care. Given that the focus of service provision is oriented towards the patient, or women in this case, I wanted to understand how interacting systems could better meet their needs, and as a qualitative researcher, I was interested in the relationship between participants and ICT technologies as actors within the sociotechnical and sociocultural-organisational setting. In the process of determining the role of ICT in this health setting, I sought to explore the meaningfulness of ICT to stakeholders, and gain a deeper understanding of how stakeholders framed ICT.

1.8 The objectives of this study

In aiming to understand the role of ICT in this setting, the specific objectives of this study were:

1. To examine through interviews, participants’ assets, actions and attitudes to ICT, their midwifery practice and/or their pregnancy experiences.

2. To locate midwives and women’s assets, actions and attitudes relative to ICT in the wider context of their social world.

3. To construct a substantive theory or deep understanding of women’s and LMC midwives engagement or non-engagement with ICT during provision of primary maternity care, reflective of both context and process.

4. To reflect on the role of new technologies in primary maternity service provision
1.9 Thesis outline in four sections

This thesis consists of eleven chapters and is structured into four sections, as illustrated in Figure 1.3. The first six chapters set the scene for the thesis and outline philosophical and methodological considerations. The third section presents the findings in two chapters.

The final section presents an analysis, discussion and conclusions drawn from the thesis findings.

Figure 1.2 The structure of the thesis in four sections and eleven chapters
Chapter 2: LITERATURE REVIEW

In considering the role of ICT in maternity care, this thesis topic relates to Lead Maternity Care (LMC) midwives, pregnant women and their relationships with Information and Communication technologies (ICT). The term ‘technology’ is capable of ambiguity, but this thesis understands that ICT relates to tools, applications and services for information and communication purposes, and assumes that people can make choices about these tools.

Section one relates to midwives as internet users, midwives and the role of technology in their professional practice, and the intrusive and gendered connotations of technology. As no literature was found that related to how midwives positioned ICT, I looked wider to the nursing profession, as most (60%) of the midwives’ cohort trained as nurses before becoming midwives. Section two then looks at pregnant women and their use of the internet during maternity care. The third and final section considers the requirements to engage with eHealth, uses of the mobile phone in health, restraints to engaging with ICT in healthcare situations, social media in health, and a model of healthcare which encourages patients to be active participants in their health and well-being. Section four looks at the unique nature of New Zealand’s maternity care.

Before looking at the relevant literature in relation to the topic of this study, it is worth considering the contested place and purpose of reviewing the literature within my theoretical framework: grounded theory method, and more specifically constructivist grounded theory method.

2.1 The contested position of a literature review in GTM

In broad terms, an initial literature review aligns the research within the current literature and ‘summarises and evaluates a body of writing about a topic’ (Knopf, 2006: p.127). A preliminary review of the literature as part of a research process...
is standard practice in qualitative research, although the timing and positioning of the literature review in grounded theory method research is fiercely contested (Halberg, 2010) and depends on the researcher aligning the research method with the specific GTM approach. I have argued for the use of a Constructivist Grounded Theory Method (CGTM) approach, which implies a preliminary review of the literature before the fieldwork (Charmaz, 2006: p.165).

In Grounded Theory Methodology, the topic of reviewing literature has been discussed at length (Strauss and Corbin, 1998, Weymillar, 2009, Urquhart and Fernandez, 2006, Charmaz, 2006: p.165, McCallin, 2003). Glaser considers that:

*To undertake an extensive review of literature before the emergence of a core category violates the basic premise of GT* (Glaser and Holton, 2004: p.10), and advises that grounded theory researchers:

*Do not do a literature review in the substantive area and related areas where the research is to be done; and when the grounded theory is nearly completed during sorting and writing up, then the literature search in the substantive area can be accomplished and woven into the theory as more data for constant comparison* (Glaser, 1998: p.67).

In the past, other GTM researchers have also advocated postponing the literature review to maintain an open mind to the data (Glaser & Strauss, 1967).

*There is no need to review all the literature in the field before hand, as is frequently done by analysis using other research approaches* (Strauss and Corbin, 1996: p.49).

This delaying position was advocated in order to prevent student researchers from preconceiving concepts and forcing these onto the data rather than discovering concepts within the data (Glaser, 1992: p.31). The preliminary literature review was seen as a distraction.
Others disagree. A review of this topic shows that postponement of the literature review is a common misconception (Suddaby, 2006: p.365), while Urquhart, Fernandez and others, consider that there is a widespread acceptance of an initial literature review to establish the problem (Urquhart and Fernandez, 2006: p.460, Suddaby, 2006: p.634, McCallin, 2003).

Constructive grounded theory researchers favour a preliminary literature review. Charmaz (Charmaz, 2006) advocates a ‘sharply focused’ literature review and advises that key points and theories from earlier works are important to acknowledge (p.166). A colleague of Charmaz, Bryant, believes that

*It is often precisely people’s prejudices that enable them to produce innovative insights and alternative models and accounts (Bryant, 2009: p.18).*

There is support for an initial literature review as an important and necessary aspect of CGTM.

### 2.2 Section One: Midwives and ICT

An initial review using the words “‘midwives’ and ‘ICT’” did not return any useful literature. Search terms were changed to use the key words ‘midwives’ and ‘technology’. The results indicated that the term ‘technology’ in midwifery terms is associated with technology during childbirth and that there is a resistance to technology associated with childbirth (Banks, 2007, Kornelsen, 2009). This was considered relevant as it indicated midwifery attitudes to technology per se.

In a study looking at New Zealand midwives’ use of the internet, Stewart (2001), conducted an online survey of 54 (2.56%) midwives, finding that nearly 80% of this predominantly academic group had used the internet to search for midwifery information. This early (2001) study found midwives were becoming aware of the potential of the internet in their midwifery practice. A similar survey today may reveal different results as different factors prevail.
Nevertheless, timely research provides benchmarks with which to compare subsequent studies.

Practice management systems streamline healthcare practices and by 2008, 30% of LMCs used a version of the practice management system developed and provided by the Midwives and Maternity Providers Organisation (MMPO). Hendry is a New Zealand midwife who has researched change in midwifery, and she has championed the use of technology in the form of this electronic practice management system for midwives (Hendry, 2008, Hendry et al., 2006, Hendry, 2003). This practice management system is a specialised solution only used by midwives and not used interoperably with other midwives or healthcare providers such as Plunket systems or systems used by general practitioners. Both Sarah Stewart and Christine Hendry as New Zealand midwives researching in technology have focused on technology and its potential to advance midwife focused tasks, rather than technology for women to reap advantages from the use of ICTs.

Midwives typically associate technology with intervention and with the biomedical model of care, which is carried out in institutions by doctors who are associated with the medicalisation of childbirth (Surtees, 2003). Tertiary institutions are seen as ‘high technology environments’ where unnecessary obstetric interventions take place (Earl, 2004b: p.6, Banks, 2011), and a place where technology threatens to undermine midwives’ ‘confidence’ and control of birth (Crozier et al., 2006: p.96). Midwives believe in and promote the concept of midwives ‘being with’ or attending women (Vague, 2003, Calvert, 2002). They see the use of technology during childbirth as intrusive to the ‘natural’ ‘normal’ process (Gilkison et al., 2005, Curry, 2007, Davis, 2003), although if needs be, minimal but appropriate use of technology during may be justified (Earl, 2004a). ‘Intervention’ is seen by midwives to refer to both technology and the influence of medical personnel residing in tertiary institutions (ibid: p.19), so midwives continually strive for ‘normal ‘births in a location that they see as one largely controlled by medical intervention and technology (Crozier et al., 2006: p.97).
Technology can be associated with elements of male medical political power (Sinclair, 2009: p.39, Hastie, 2008: p.97). There has historically been a gender imbalance within the medical profession although the profession now trains as many women as men. Gender studies on technology attest to the ideas that gender is expressed through the attitudes to and use of technology and technical skills and expertise, which have been previously constructed as masculine attributes (Maclaran et al., 2004).

As midwives have been part of the nursing profession until 1990 in New Zealand, and older practise LMC midwives are trained nurses, I considered nursing attitudes towards technology. The nursing profession views technology as tools of the trade, with seemingly little regard to autonomy and control (Crozier et al., 2006). Nursing tools range from thermometers and stethoscopes through to complex monitoring in intensive care settings and practice, including the use of computers for multiple functions. Sandelowski contends that technology has always been part of nursing to the extent that the technology has been subsumed into the nursing care and even become invisible or ‘semiotically linked’ and ‘inextricably bound’ (Sandelowski, 1999: p.198). This is a dynamic relationship. Sandelowski (ibid) points out the identity of nursing as ‘feminine and caring’ compared with technology as ‘male and de-humanizing’. Both Crozier and Sandelowski testify to dynamic gender and power politics as influences in attitudes to technology in both the nursing and midwifery.

Kaminski considers (Kaminski, 2007: p.15) that ICT enhances rather than threatens patient-centred compassionate care. This nursing informatics perspective found that nurses should be enticed to fully participate in the computerisation of healthcare as nurses’ previous technological skill and knowledge have increased the profession’s prestige and power (Kaminski, 2007: p.61). This aligns with Haraway’s vision for women to be involved with the world of technology and gain control over these tools (Haraway, 1990: p.170). Midwives’ willingness to use technology may be affected by their level of
training, competence and perceived confidence (Sinclair, 1999: p. 2), as Sinclair found that new midwifery entrants were more confident and competent with computers and technology, and were motivated to use technology appropriately (Sinclair, 1999).

Nursing and midwifery are two distinct professions with different perspectives towards the inclusion of technology within their different practices. The two female-dominated professions have arrived at different understandings of the role that technology can play within their practice. The nursing profession has seen technology as empowering whereas the midwifery profession has been unable to differentiate technology from the ‘male dominated medical profession’ and ‘intervention’ they have fought so hard to overcome in their endeavour to achieve ‘normal’ (without technological intervention) births for women.

2.3 Section Two: Pregnant women and their use of the internet

Literature on ICT and pregnant women predominantly deals with their use of the internet. There is a large and growing body of literature on maternity service provision and ICT but this deals mainly with maternity provision in developing countries (Mechael, 2009a, Mechael, 2009b). Mobile phones have proven to be valuable in these countries, however conditions for participants in my study differ so markedly that they have been excluded from this review.

Since approximately 2006, there have been an increasing number of studies testifying that many pregnant women do access the internet to augment information given to them by their primary maternity provider (Larsson, 2009) (Lagan, 2006) (Lagan and Kernohan, 2010, Gao et al., 2012, Song et al., 2012, Morahan-Martin, 2004). A descriptive survey study to investigate Swedish women’s use of the internet for information retrieval (Larsson, 2009) showed that 91% had access to the internet and 84% used the internet for information on pregnancy related information, but very few of the group (n=182) discussed the information with their midwives.
In 2006, Lagan reviewed evidence from sixteen published papers on the use of the internet by pregnant women and concurred that pregnant women accessed the internet for social support, information and to research specific problems (Lagan, 2006). A later survey by Lagan and Kernohan found the internet played a ‘significant part in the respondent’s health information seeking and decision making’ and recommended midwives should be ready to support women in online data retrieval (Lagan and Kernohan, 2010). The women in her studies pursued information in their own right, over and above the information provided by the maternity service and found that the internet was a useful and ready source of this information (Lagan et al., 2011). Antenatal visits were too infrequent to provide answers to questions and women did not see their midwives as often as they would have liked. Women found that the internet provided support and flexibility for their information needs. Discussion groups were used for support as well and these groups backed-up the discussion with their midwife. Anonymity on the internet was important to these women. They found the pamphlet information midwives gave them was often biased, limited and sometimes out of date, although they still valued their midwife's advice.

Lagan found 97% of pregnant women use search engines to access pregnancy information and for social networking and support (Lagan, 2006, Lagan and Kernohan, 2010, Lagan et al., 2011, Lagan et al., 2009, Cohen and Raymond, 2011, Declercq et al., 2006). Declercq reported 75% used the internet during pregnancy, (Declercq et al., 2006) and, for some, it was the primary source of information. Lagan’s focus was on the read only web, for information retrieval but she also mentions the positive effects from women’s participation in online communities. Women compared their pregnancy progress with other women and benefited from this contact and reassurance. They found that the acquisition of further information, connecting with others in a similar situation and decision support were all helpful and reassuring (ibid).
Since 2006, midwifery researchers have urged midwives to acknowledge and embrace the internet during consultation and direct women to accurate, trusted, appropriate online information (Romano, 2007, Lagan et al., 2009). According to Romano, midwives have a responsibility to acknowledge women’s information needs, and that fulfilling these needs may require new ways of working (ibid). Most midwives were not knowledgeable about the availability of online resources for women during their pregnancy (Lagan et al., 2009).

Screening decisions in pregnancy require women to weigh up advantages, probabilities and risks. Women vary in their ability to assess outcomes and accordingly make informed choices (Lyerly et al., 2007: p.890). Their need to make informed decisions entails timely good quality information and appropriate electronic decision support (Woolf et al., 2005, Lagan et al., 2011), and channels to consult health professionals.

Cohen takes a feminist perspective on women’s information needs (Cohen and Raymond, 2011). This paper claims ‘women are socialised by the medical community to limit their asking of questions’, ‘doctors have been found unsympathetic to women’s fears and discomfort’, ‘the doctor–patient relationship often provides little more than a patriarchal pat on the hand for support, with statements such as ‘well, that’s normal’. Cohen explored online forums and found exchange of information; peer support and empowerment were central themes.

Bessett found women valued the internet because they do not want to appear foolish or appointments were too short (Bessett, 2010). Online anonymity is a ‘critical factor’ for women’s use of the internet when they have questions about breast changes, bladder and bowel discomforts (Romano, 2007). Secondarily, sharing stories and communication were motivating factors.

Ho (Ho, 2011) analysed relevant Australian Web 2.0 sites accessed independently by pregnant Australian women. Sites providing pregnancy-related
information and were analysed according to content and theme. Most websites focused on selling goods or services and promoted activities that may or may not benefit pregnant women. Education was not a prime function and midwives or other healthcare professionals did not endorse many websites.

Midwifery literature focuses on using the internet for information retrieval during pregnancy, though few have dealt with women’s psychosocial needs, social media and mobile technology. The literature suggests that midwives are inadequately prepared or unwilling to facilitate women’s safe access to relevant information on the internet and that pregnant women don’t discuss their online activities with midwives. There was no literature that considered New Zealand women’s perceptions and experiences of the role of ICT. Furthermore, there was no literature addressing factors that may influence the women-centred use or non-use of these technologies.

The literature review reflects that midwives’ use of information and communication technology during antenatal and postnatal periods of their service provision is under-considered compared with the large body of health informatics literature that deals with medical, nursing and patient’s use of ICT.

2.4 Section Three: ICT in healthcare situations

This section looks at the advantages of engaging with information and communication technologies in health, an overview of mHealth (mobile health), Short Message Service (text messaging) in health situations, participatory healthcare and social media in health.

The advantages of being able to engage with eHealth lies with the empowerment that comes with having access to information, and being able to participate in healthcare decisions (Eysenbach, 2001). Eng agrees (Eng et al., 1999). He sees eHealth as a complex construct involving the use of ICT, acknowledging its ability to improve and enable healthcare, and implying that the ability to use
technologies to be better informed and able to take a greater role and responsibility for health decisions is a pre-requisite to gaining health advantages. Ehealth applications also have a place in health promotion and the ability to provide tailored information to help people self-manage and make healthy choices (Kreps and Neuhauser, 2010, Roland, 2011).

Electronic health (eHealth) literacy skills are necessary for health users to fully participate, understand and gain advantages from using ICT and the online health environment (Norman and Skinner, 2006, Cullen, 2005, Knight, 2006). A systematic review of health literacy concluded that low health literacy is linked with poorer health outcomes and poorer use of health services (Berkman et al., 2011, Koh et al., 2012, Hagglund et al., 2009: pp.417-436), and higher health costs (United States Government, 2010, The United States Department of Health and Human Services, 2000).

As information and communication technologies encompass mobile devices and services, the internet and multimedia communication are ubiquitous. This means that both providers and users of maternity services are not bound by location. Midwives are mobile health workers, and pregnant women are well and continuing with their lives but do require monitoring, support and health information. Mobile health (mHealth) broadly encompasses the use of mobile telecommunication services in healthcare provision, and has the potential to increase access to health information and healthcare, especially for the hard-to-reach populations (Tasker, 2010, Mechael et al., 2010, Curioso and Mechael, 2010). Mobile devices using 2G cellular services (voice and SMS) or 3G (multimedia) have made an impact in health, especially in developing countries and in young populations in developed countries (Lester et al., 2011, Danis et al., 2010, Vital Wave Consulting, 2009).
Mobile cellular technology is the most popular personal technology in the world and by the end of 2009, ~4.6 billion people had cellular phone services (ITU, 2011a). Mobile telecommunications and connectivity are dynamic services, and the new potential to use mobile technologies within New Zealand healthcare service provision has been recognised (Mirza, 2008). Hardware, software and telecommunications services have sufficiently penetrated most sectors of the New Zealand population to consider leveraging the advantages in healthcare service provision (Whittaker, 2010). New Zealand has a population approaching 4.5 million people, with most people able to participate using broadband and many accessing the mobile internet (Smith et al., 2011). Since the internet is now available on mobile devices, files, sites and applications afforded by the internet on laptop and fixed computers are similarly available to individuals with an internet-enabled device such as a smartphone or tablet and a service such as a wireless or cellular signal.

Fox and Duggan (Fox and Duggan, 2012: p.9) found a rapidly increasing number of young Americans used their mobile phones to access health information. Smartphone apps were used to track or manage health and fitness (p.13). Apps which could be used for pregnancy cover monitoring, include blood pressure, diet, and exercise topics. There are apps for timing conception, timing contractions in labour, naming babies and educational apps which answer frequently asked questions and show videos of the developing baby related to gestational date. Information exchange, psychosocial support, communication, monitoring, support for both healthcare professionals and patients and data collection are tasks now possible using mobile devices connected to the internet or a cellular network. Although mobile technology is available, it is not known if health workers such as midwives are aware of the ways it could be used or modified to support their work in their situation.

---

Short messaging service (SMS) or text messaging using low-end mobile cellular technologies is in widespread use within health, particularly in developing countries (Mechael, 2009a). This technology is widespread as it is affordable by all socioeconomic groupings and in both developed and developing countries (ITU, 2011b). Within New Zealand, smoking cessation programmes have successfully used this technology, as there is 100% mobile device penetration (Whittaker et al., 2008) and the service is affordable. Text messages have the characteristic of directly and cheaply reaching large populations via a personal device. Messages can be customised, time-sensitive and ubiquitous. New Zealand programmes have incorporated text messaging and video messaging for smoking cessation and depression support (ibid).

In the United States, an SMS message channel has had very favourable uptake by pregnant women and new mothers. Text4baby is a free service whereby women sign up and insert their baby’s due date of delivery to receive timely health messages, support and reminders. Text4Baby (Meyer, 2011, text4baby.org, 2011) information has high acceptability and success and from start-up in 2010 to mid-2012 has 95% of users saying they would recommend the service (Jordan et al., 2011).

Any new technology brings potential risks, and although mHealth has had success in the specific healthcare situations, there are barriers to adoption. Nemetz looked at the potential barriers to health technology adoption in mHealth, considering barriers from the perspective of both provider and patient (Nemetz, 2011). He called on classic theories of technology adoption to understand the mHealth scenario. Nemetz (Table 2.1) found that inadequate support and the reluctance of health workers to engage were factors that must be addressed and that both health workers and users had issues. Knowledge and support were concerns across the board. Despite the barriers, Nemetz found that mHealth provided a ‘fertile platform’ as it has widespread adoption and extended functionality now that smartphones are increasingly widespread (ibid: p.25).
SECTION ONE: Setting the scene

Chapter Two

Literature Review

Table 2.1 Redraw and modified tables based on work by Nemetz (2011)

<table>
<thead>
<tr>
<th>Potential barriers to mHealth uptake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical issues</td>
</tr>
<tr>
<td>Doubts arising over the quality of care provided (associated with risks of litigation)</td>
</tr>
<tr>
<td>Lack of evidence</td>
</tr>
<tr>
<td>Evidence of the effectiveness of digital technology to improve clinical outcomes is scant</td>
</tr>
<tr>
<td>Lack of user-engagement</td>
</tr>
<tr>
<td>Inadequate support, knowledge and leadership, and a concern about implementation and the advantages of technology prevail</td>
</tr>
<tr>
<td>Organisational structure</td>
</tr>
<tr>
<td>Integration and interoperability are concerns</td>
</tr>
<tr>
<td>Privacy</td>
</tr>
<tr>
<td>Consent and privacy are issues</td>
</tr>
<tr>
<td>Security</td>
</tr>
<tr>
<td>Transmission, storage, retrieval and accessibility need consideration</td>
</tr>
<tr>
<td>Workload and time management</td>
</tr>
<tr>
<td>Increased time and reluctance to be further available, especially after hours, are barriers</td>
</tr>
<tr>
<td>Workflow modalities</td>
</tr>
<tr>
<td>Change to current practices and work flows need consideration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential barriers seen by consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology design</td>
</tr>
<tr>
<td>Consideration of the user interface, the complexity and individuals’ physical ability to use technology may hinder adoption</td>
</tr>
<tr>
<td>Lack of evidence</td>
</tr>
<tr>
<td>Women have no knowledge about how useful, accessible or easy the technologies are to use</td>
</tr>
<tr>
<td>Lack of knowledge</td>
</tr>
<tr>
<td>There is no present understanding about how to use technology</td>
</tr>
<tr>
<td>Digital literacy</td>
</tr>
<tr>
<td>Skill levels may be insufficient</td>
</tr>
<tr>
<td>Reliability of the technology</td>
</tr>
<tr>
<td>Technical failure may increase error and risk</td>
</tr>
</tbody>
</table>

The mobile channel choice offers immediate, easy personal communication with the potential for actionable responses on a device that is already the habit of most people. As mobile phones now enable internet access, and their penetration is providing new opportunities for data transfer, access to web-based information, and use of decision support tools, social networking and mobile apps. MHealth and eHealth are merging and these platforms need to be fully integrated into systems and individual’s lives, and driven by the consumers who may benefit (Mechael, 2013).

Web 2.0 has enabled internet users to be interactive. These social media platforms are used extensively in New Zealand, judging by a Neilsen survey showing that 2.7 million of 4.5 million New Zealand population use the Facebook website (Boyte, 2012). Social media in healthcare can be used for finding information, sharing goals and finding support and have the potential to change the way disease is treated (Coiera, 2013). Since 2004 when the nature of the web changed into a participatory and interactive environment, online social media has become a potential vehicle for dissemination of health information (Scanfeld
et al., 2010). Social media tools with this potential include blogs, YouTube videos, microblogs such as Twitter, and social networks such as Facebook, wikis, social bookmarking, RSS feeds, user reviews and video- and photo-sharing sites. Social media sites are now the fastest growing category of sites on the web, and are being used by health groups to educate, facilitate social interaction and promote health messages (Sarashon-Kahn, 2008).

Media are used to disseminate healthcare information and the use and uses of new media are diverse and increasing. Aase, of the Mayo Clinic in the United States, published 10 ways patients can use social media for health education and support (Aase, 2011). Aase describes the environment as a new media landscape inhabited by social networking spaces with new ways to communicate, contribute and share. He suggested, '[social media are] the third millennium’s defining communications trend' (Aase, 2009).

Patients and their families can follow Mayo on Twitter, read a Mayo Clinic blog, listen to a podcast, watch a video on Mayo Clinic YouTube channel to hear patient’s stories, subscribe to Mayo Clinic Facebook application, and use ‘care pages’ to inform friends and family when a family member is unwell. Patient education is delivered using these new media, with the YouTube channel, blog and Twitter streams constantly updated to provide up-to-the-minute information for patients and their families. An integrated online community site brings users together for discussion forums and other shared resources and has made it easier for patients to be more closely involved and participate in their own healthcare decisions. Social media already has a role within contemporary healthcare provision (Aase and Timimi, 2013; Ministry of Health, 2010) and others consider it is relevant (Schein et al., 2010, The Change Foundation, 2012, Terry, 2011, Coiera, 2013).

Participatory and patient-centred healthcare is a new model of healthcare, which encourages people to take charge of decisions concerning their own health and wellness (Gallant et al., 2011, Weitzel et al., 2009, VanUden-Kraan et al., 2009). It
is in antithesis to the paternalistic model of healthcare, which characterised the first half and middle of last century. Active participation requires ICT devices, services, and a skill set comprising computer, eHealth and communication skills. It involves the use of the internet as it has evolved into what is termed Web 2.0, of which the essence is active participation and involvement (Sarashon-Kahn, 2008). Patients with are being encouraged to understand and manage their wellness and conditions with the assistance of more effective communication (Heisler et al., 2002). This style of service extends the traditional model by encouraging patient empowerment and is characterised by collaboration and patient choice. Swan (Swan, 2009) considered this concept in the light of new services such as the internet, social networks, self-tracking and personalised medicine. She believes the use of new tools is timely and presents a great opportunity for both consumers and health professionals. The use of Web 2.0 has seen the rise of the ePatient, who is engaged and proactive, compared with the passive patient in a paternalistic top-down model of care. Fox found nearly 20% of e-Patients use social networking sites for information and support, although they still rely on their doctor (Fox, 2011b). The participatory model relies on the resources and the abilities of consumers but is especially applicable in areas where care involves knowledge and lifestyle choices and monitoring conducive to optimal health. The participatory model also incorporates the concept of patient-centred care, based on the common understanding of goals of care and a partnership between provider and patient (Mead and Bower, 2000) such as during maternity service provision.

2.5 Section Four: New Zealand midwifery care is unique

The New Zealand practice of midwifery care is unique to this country. The way midwifery services are provided varies markedly from country to country as the professional role and identity of the midwife varies. The partnership episode of care starts at first registration with a midwife, which can be from approximately eight weeks after conception, to six weeks after the birth. During this time, midwives are fully autonomous and incorporate other services at their
discretion, although this does not always sit well with members of the medical profession (Hopcroft and Trumpelmann, 2008, Douglas, 2007).

Australian midwives have less autonomy than midwives in Britain and Europe (Taylor, 2008). In Australia, the professional role and identity of midwives is more closely associated with the nursing profession, and midwives are more subordinated to the medical profession, but this is a dynamic situation as midwives all over the world seek greater authority over normal birthing practices. While each country has different social, political and historical influences that have shaped and continue to shape childbirth services, common threads across countries are interprofessional rivalries (Drife, 2007, Donnison, 1977), and women’s rights, choices and control (Carolan and Hodnett, 2007). As each country is subject to such differences and ongoing change, it is important to understand the influences in specific situations, consequently, the contextual influences in this study are outlined in the following chapter.

2.6 Summary

Midwifery research is has not fully addressed the role of information and communication technologies in maternity service provision and as services and conditions vary so considerably between countries, research needs to be local therefore not be generalisable.

Issues concerned with pregnant women's information and communication have received attention since 2006, and papers have mostly considered the internet (Lagan, 2006, 2009, 2010, 2011). There is little known about ICT in midwifery service provision although most (~80%) women in New Zealand use an autonomous midwife for birthing services (Guilliland, 2012).

New technologies and eHealth applications are growing and changing at a rapid rate. They are shaping and being shaped by healthcare services, however little is known of that in maternity service provision. Outside of maternity care, the use
of information and communication technologies in health have been heralded to bring the advantages of patient empowerment by better access to information and decision-making (Kreps and Neuhauser, 2010, Neuhauser and Kreps, 2003, Coiera, 2013, Eysenbach and Jadad, 2001), although there are challenges to achieving these promises. The internet is now accessible on mobile devices, and has evolved into a participatory social environment. The use of social media in healthcare has the potential to change health education and support for patients and their families, as it can foster participation, empowerment and self-responsibility (Gallant et al., 2011).

It is an aim of this thesis to more fully understand the role of information and communication technologies by looking at the assets, actions and attitudes of two stakeholder groups (primary maternity providers and consumers). By doing so, healthcare applications that are meaningful to New Zealand women can be more successfully developed and implemented.
Chapter 3: SITUATIONAL CONTEXT

An understanding of the situational context is an important aspect of the grounded theory method (Clarke and Friese, 2007). Constructive grounded theorists adhere to the premise that knowledge is embedded in historical moment, and in the social, cultural, and organisational structures of the research participants (Clarke, 2005a).

In this chapter, I outline the situational contexts that were relevant to understanding the study.

In part one, the Hawke's Bay Health District’s administrative and organisational characteristics are outlined. Part two looks at the most important events that have brought New Zealand midwives through a full circle from autonomy in the early part of the 20th century, through a period when they were seen as birth assistants and back to the early 21st century where they are again fully autonomous health professionals. The third part considers the currently available hardware, applications and services pertinent to information and communication in health.

3.1 Part One: Geographical and administrative features of the study region

Nationally, the New Zealand Minister of Health is responsible for governance of health services. Twenty District Health Boards (DHB) defined by geographical regions provide health services for their district. The study region is one of these New Zealand DHBs.

Figure 3.1 outlines the health funding structure, demonstrating that non-government organisations (NGOs) are funded by Sector Services (previously known as HealthPac). Local midwives use Hawke’s Bay Health birthing facilities as independent healthcare workers.
Midwifery services are a self-governing Non Government Organisation. Midwives claim remuneration directly or through a midwives’ organisation to Sector Services, the payment arm of the Ministry of Health (Ministry of Health, 2011b).

3.1.1 Geographical context

The provincial region of Hawke’s Bay, New Zealand lies on the east coast of the North Island, bounded to the east by the Pacific Ocean and by mountains to the west. Pastoral farming, wine, fruit and tourism are the mainstay of the local economy. Figure 3.2 shows the geographical extent of the HBH administrative area. All participants were resident within this area.
SECTION ONE: Setting the scene

Chapter Three

Situational context

The region's population was just over 154,800 in June 2010, (StatisticsNZ, 2011)\(^5\), with most people living in one of the two main urban concentrations of Napier or Hastings, which are twenty minutes apart by road. The town of Wairoa lies to the north, and Waipawa and Waipukurau to the south. The Hawke's Bay region’s population is the ninth in size out of the 16 regions in New Zealand.

3.1.2 Māori population

Hawke's Bay has a greater proportion of Māori people per population, than other regions of New Zealand. Nearly 25% state they are of Māori ethnicity, compared with 14.5% of the total New Zealand population. Other ethnicities include Pacific Island and Asian, but percentages of these peoples in Hawke’s Bay are smaller than in the rest of New Zealand as a whole.

3.1.3 Reproductive health (Hawke’s Bay)

In 2008, a comparison with the rest of New Zealand showed that women in Hawke's Bay have a far higher percentage of younger mothers than is the case nationally. Nearly three quarters of Māori women in Hawke’s Bay gave birth before they were 30 years old. Teen pregnancy (13–17 years) is associated with greater health risks, including low birth weight, perinatal mortality, behavioural problems and education under-achievement. Low socio-economic status, smoking, alcohol consumption and poor nutrition have been associated with low birth weight babies and are also associated with teenage mothers in Hawke's

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\(^5\) All population statistics are drawn from Statistics New Zealand.
Bay. Māori comprised 45.3% of all Hawke’s Bay births in 2008 (Hawke’s Bay District Health Board Maternity Services, 2011).

### 3.1.4 Hawke’s Bay maternity services

Hawke’s Bay Health (HBH) provides secondary maternity services comprising birthing facilities (Ata Rangi) and a full range of primary and secondary maternity and obstetric services to women and their families in the region. Core hospital midwives provide primary, secondary, postnatal, and in-patient services to women. Specialist obstetricians provide secondary outpatient services and clinics. Autonomous caseload midwives (LMCs) are licensed to use DHB facilities to attend women who have contracted them for care. The number of LMC midwives fluctuates between ~35 and ~40. Hawke’s Bay Regional Hospital in Hastings has a fully supported delivery suite providing labour and birthing facilities for most of the women birthing normally in Hawke’s Bay. A further birthing facility, the Napier Maternity Unit is used for normal births only.

### 3.1.5 Information and communication technology in the Hawke’s Bay region

The following tables give an overview of information and communication technology in Hawke’s Bay compared with the rest of New Zealand. Relevant statistics have been drawn from Statistics New Zealand (2009). Younger people in New Zealand have greater internet access: mobile internet access was up from 16% in 2006 to 29% in 2009 for male users, and from 13% in 2006 to 22% in 2009 for female users. Internet access using a copper telephone wire and modem is currently the method used to access broadband services, which are widely available and being increasingly accessed (Table 3.1).

Within New Zealand overall, 75% of the population has internet access, compared with 66% in Hawke’s Bay. Of those, 63% and 51% respectively have broadband (Table 3.2)

---

Table 3.1 Household access to the internet (Hawke’s Bay)

<table>
<thead>
<tr>
<th></th>
<th>Internet access %</th>
<th>Broadband access %</th>
<th>Dial-up access %</th>
</tr>
</thead>
</table>
Most people use fixed line access, with rural sectors using satellite services.

Table 3.2 Type of broadband connection in H. B. households (2009)

<table>
<thead>
<tr>
<th></th>
<th>Telephone line %</th>
<th>Mobile device %</th>
<th>Satellite dish %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB</td>
<td>88</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>NZ</td>
<td>86</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>

Nearly all people under 20 years of age access the internet. More than half of all New Zealanders access the internet on a daily basis (Table 3.3).

Table 3.3 Individual internet use by age (N.Z.)

<table>
<thead>
<tr>
<th>Age</th>
<th>Internet use %</th>
<th>Daily Internet use %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
<td>2009</td>
</tr>
<tr>
<td>15-19</td>
<td>87</td>
<td>96</td>
</tr>
<tr>
<td>20-24</td>
<td>84</td>
<td>94</td>
</tr>
<tr>
<td>25-29</td>
<td>82</td>
<td>92</td>
</tr>
<tr>
<td>30-34</td>
<td>83</td>
<td>92</td>
</tr>
<tr>
<td>35-39</td>
<td>77</td>
<td>89</td>
</tr>
<tr>
<td>40-44</td>
<td>78</td>
<td>87</td>
</tr>
<tr>
<td>45-49</td>
<td>69</td>
<td>83</td>
</tr>
<tr>
<td>50-54</td>
<td>64</td>
<td>81</td>
</tr>
<tr>
<td>55-59</td>
<td>53</td>
<td>77</td>
</tr>
<tr>
<td>60-64</td>
<td>42</td>
<td>70</td>
</tr>
<tr>
<td>65-69</td>
<td>35</td>
<td>61</td>
</tr>
</tbody>
</table>

The use of laptop computers in preference to desktop computers has jumped considerably during the last three years. Laptop computers are the most popular hardware used to access the internet (Table 3.4)

Table 3.4 Devices used to access the internet (H.B.)

<table>
<thead>
<tr>
<th></th>
<th>Desktop computer %</th>
<th>Internet-enabled mobile phone %</th>
<th>Laptop or hand-held computer %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB</td>
<td>96</td>
<td>68</td>
<td>6</td>
</tr>
<tr>
<td>NZ</td>
<td>95</td>
<td>69</td>
<td>6</td>
</tr>
</tbody>
</table>

Mobile phone or tablet access to the internet, although increasing globally in 2010 (ICU), is not reflected in these 2009 figures (Table 3.5).

Table 3.5 Mobile access to the internet (N.Z.)
SECTION ONE: Setting the scene
Chapter Three

Situational context

<table>
<thead>
<tr>
<th>Age</th>
<th>Total mobile access %</th>
<th>Cellular access %</th>
<th>Wireless access %</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>19</td>
<td>35</td>
<td>16</td>
</tr>
<tr>
<td>20-24</td>
<td>20</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>25-29</td>
<td>20</td>
<td>34</td>
<td>17</td>
</tr>
<tr>
<td>30-34</td>
<td>16</td>
<td>31</td>
<td>13</td>
</tr>
<tr>
<td>35-39</td>
<td>17</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>40-44</td>
<td>13</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>45-49</td>
<td>11</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>50-54</td>
<td>8</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>55-59</td>
<td>9</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>60+</td>
<td>5</td>
<td>9</td>
<td>3</td>
</tr>
</tbody>
</table>

Increasing numbers of New Zealanders use the internet to access health information, (Table 3.6), which is in keeping with global trends (Fox, 2011a).

Table 3.6 Use of the internet for health information (N.Z.)

<table>
<thead>
<tr>
<th>Age</th>
<th>2006 %</th>
<th>2009 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>20-24</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>25-29</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>30-34</td>
<td>34</td>
<td>44</td>
</tr>
<tr>
<td>35-39</td>
<td>35</td>
<td>43</td>
</tr>
<tr>
<td>40-44</td>
<td>30</td>
<td>38</td>
</tr>
<tr>
<td>45-49</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>50-54</td>
<td>33</td>
<td>38</td>
</tr>
<tr>
<td>55-59</td>
<td>32</td>
<td>34</td>
</tr>
<tr>
<td>60-64</td>
<td>30</td>
<td>38</td>
</tr>
<tr>
<td>65-69</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td>70+</td>
<td>27</td>
<td>33</td>
</tr>
</tbody>
</table>

Nearly all individuals under 20 years of age in New Zealand are using a mobile cellular phones, although far fewer use the internet to access health information (Figure 3.7 Over 90% of under 50-year-olds use mobile cellular phones, and most people over 50 are now using this type of communication device.

Table 3.7 Mobile phone use (N.Z.)

<table>
<thead>
<tr>
<th>Age</th>
<th>2006 %</th>
<th>2009 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>89</td>
<td>92</td>
</tr>
<tr>
<td>20-24</td>
<td>93</td>
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<td>25-29</td>
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<td>90</td>
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<tr>
<td>50-54</td>
<td>81</td>
<td>87</td>
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</table>
The above tables provide evidence of the increasing accessibility of ICT hardware, software and services in the study region.

### 3.1.6 Local telecommunication services

Accessibility and use of telecommunication services have increased regionally and nationally during the last 5 years (Vodafone, 2011). The increase in Hawke’s Bay’s is about the same as the national increase in uptake and slightly below the national average in use.

Telecom and Vodafone networks provide cellular coverage over urban districts within Hawke’s Bay (ibid). A third provider, ‘2degrees’ mobile services, uses the Vodafone network and there is variable rural cellular coverage.

Rural internet connections have been slow, although the New Zealand Government is now prioritising rural broadband access. Ways of connecting with the Internet are changing as alternative technologies become available. Cellular, cable and satellite are being increasingly used to connect. These services have grown at a faster rate than other broadband connections (ibid). In February and March 2012, fibre-optic cable was put into the ground in the suburbs of the study region, in preparation for ultrafast broadband connection to households, and is available in 2013.

### Summary

The core features of the Hawke’s Bay Health population are the high percentage of Māori, of teenage pregnancies, and of Māori births (45.3%) (Hawke’s Bay District Health Board, 2010: p.127). Most women go to a LMC midwife when first pregnant. LMC midwives oversee care until six weeks after the birth, when most are transferred to either the Plunket service or Tamariki Ora, and referred back to a GP for the baby’s immunisation at 6 weeks.
During the last five years, hardware, software, cellular services and broadband services have meant most rural and urban populations can access the internet and cellular services.

3.2 Part Two: The professional midwifery context

The New Zealand Government’s policy for birthing requires healthcare providers to:

‘...give each woman, her partner and her whānau or family every opportunity to have a fulfilling outcome to the woman’s pregnancy and childbirth by facilitating the provision of primary maternity services that are safe, informed by evidence and that are based on partnership, information and choice.

Recognise that pregnancy, childbirth are a normal life-stage for most women.

Provide the woman with continuity of care through her LMC, who is responsible for assessment of her needs, planning her care with her and the care of her baby.

Facilitate the provision of additional care for women and babies who need it.’

(Ministry of Health, 2007)

The New Zealand Government, through the Health Practitioners Competence Act 2003, contracts the Midwifery Council of New Zealand, as a non-government organisation (NGO), ‘to protect the health and safety of women and babies during the childbirth process’ (Ministry of Health, 2007).

The Midwifery Council (The Midwifery Council Of New Zealand, 2013) is responsible for providing and regulating midwives to ensure they are competent to provide a safe service. Midwives are entitled to operate as autonomous private healthcare providers or may be employed as ‘core’ midwives by a District Health Board. The New Zealand College of Midwives directs this service by providing a handbook for practice (NZCOM, 2002) and a standards review handbook and system (NZCOM, 2007). Self-employed midwives control their own practice as a
business and are subject to biennial review by the New Zealand College of Midwives (NZCOM). Remuneration is claimed directly from Sector Services funding body, or indirectly through a support organisation. In 2009, there were nearly 800 autonomous LMCs, each providing care, on average, for 45 women. LMC midwives often are caring for their own families and do not take on a full-time caseload during those years (primary data). Midwives’ support organisations include the Midwifery and Maternity Providers’ Organisation based in Christchurch, which is affiliated with NZCOM, and the South Auckland Maternity Care Limited (SAMCL), an Auckland providers’ organisation. Both providers’ organisations support different practice software for members. Both LMCs and core midwives use birthing facilities provided by Hawke’s Bay Health.

3.2.1 The structure of midwifery provision

The Midwifery Council of New Zealand is responsible for registering midwives and ensuring they are competent to provide primary maternity duties. Midwives must hold a current practising certificate to be able to practise. Figure 3.3 illustrates the structure of midwifery provision and the relationship of self-employed midwives within the service.

![Diagram of the structure of midwifery provision](image)

**Figure 3.3** LMC midwives’ place in the structure of maternity services
SECTION ONE: Setting the scene
Chapter Three
Situational context

The midwifery profession is a distinct and relatively new professional body in New Zealand. Midwives are not aligned professionally with the nursing or medical professions, and did not achieve full professional autonomy until 1990. This section outlines the path to autonomy. Contextually this is important because it colours midwives’ way of thinking about provision of maternity services, which midwives claim is different from the medical or nursing model of care. It also gives insight into how midwives are trained and how they view their relationship with other primary healthcare providers in New Zealand.

3.2.2 Events that have shaped the present service

Midwifery has been regulated in New Zealand since 1904 (King, 2004). Feminists and birth activists during the 1970s and 1980s were instrumental in shaping professional midwifery services as they are practised today (Davis et al., 2011). The midwifery profession is now established as an autonomous feminist body, founded on a partnership with women (Surtees, 2003). It is young compared with the medical profession and the nursing professional body, which spawned independent midwifery.

Through the twentieth century the autonomy of midwives has waxed, waned, and waxed again in line with similar patterns in other countries. From 1900 until 2012, midwifery practice experienced shifts from comparative autonomy to medical dominance, to nursing dominance and back to autonomy (Pairman, 2005, Pairman, 2006). Midwifery, like other professions, developed in accordance with the prevailing social, political, cultural and economic regimes. Socio-political influences are still strong.

**Midwives in New Zealand in 1900** were usually lay midwives working within a community and birthing babies in the woman’s home (Abel, 1997). Training was an apprenticeship with the more experienced midwives. When overseas midwives with more training and experience started coming to New Zealand, training became more formal. There was a high infant mortality rate (Firkin, 2003) at this time, so the Midwives Act 1904 brought a national structure and educational body, which placed midwifery within a medical setting and was the
start of the New Zealand midwifery service (King, 2004). Gradually, more women birthed in the seven state-owned St Helen's hospitals (Abel, 1997) enticed by the possibility of a birth assisted by analgesics and a safer, more sterile environment (Donley, 1986). Puerperal sepsis (infection) had been a common cause of maternal death during this period (Pairman, 2005).

By 1951, 95% of births were under medical care within hospitals, and domiciliary midwives played a small part (Abel, 1997). The swing to medicalisation, hospitalisation and nurse domination of birth culminated in the Nurses Amendment Act 1971, which regulated that nurse-midwives could not attend women without a doctor present. The passing of the Nurses Act 1971 established midwifery as the obstetric branch of nursing and under the control of obstetric medicine. Under Section 54 of the Nurses Act 1971, it was an offence for a midwife to provide a service unless a medical practitioner took responsibility for the care of the client (Clark, 2004, Abel, 1997). During this decade, the medical profession and nurses limited the role of midwives, while providing financial incentives to doctors (Firkin, 2003). Doctors were mostly male, and hospitals had a hierarchical power system with mostly male consultants at the top of the chain. As most births at this time were in hospitals, women had limited choice (Abel, 1997).

During the seventies and eighties, midwives and consumers were becoming increasingly assertive and less willing to accept a male, medically dominated model of birthing services. Nationally and internationally, the feminist movement was accelerating, fuelled by women writers such as Betty Friedan (Friedan, 1963), Australian Germaine Greer (Greer, 1970) and New Zealander Sandra Coney (Coney and Bunkle, 1988). A more women-centred approach to childbirth fitted with the theme of conflict and tension that accompanied destabilisation of the balance of power between the professional bodies of medicine, nursing and midwifery (Davis and Walker, 2010, Abel, 1997).
At the start of the 1980s, nurses, obstetricians and general practitioners controlled childbirth. Midwives’ pay caused resentment, as it was low compared with that claimed by general medical practitioners (Coursey, 2008). The 1980s heralded a series of changes that tipped control of childbirth and maternity services away from the medical and nursing professions and towards the midwifery profession.

Medical dominance subsided, and women entered the medical work force in greater numbers. There was greater consumer interest in women’s health, autonomy and rights within the medically and male-dominated health sphere of that period (Coney and Bunkle, 1988, Mulcahy, 2006). Midwives were considered as post-graduate nurses and a section of the New Zealand Nurses Association.

In 1988, a national conference for midwives galvanised midwives and consumers into further political action. Joan Donley, a politically active leader and midwife during this period, presented a vision of midwives as autonomous practitioners. Intense lobbying and activism led to the formation of the New Zealand College of Midwives (NZCOM) in 1989 a body distinct from the New Zealand Nurses Association (Abel, 1997). A range of social, political and economic forces assisted the shift in balance of power into the midwifery profession’s court. It was a ‘major triumph for women’ (Guilliland, 1999). Philosophical underpinnings of this body accept pregnancy and childbirth as normal life events and midwifery as an independent, women-centred profession that provides continuity of caregiver (Hendry, 2003).

At the start of the 1990s, The Nurses Amendment Act 1990 improved midwives’ remuneration and status and gave women more choices (Clark, 1990, Clark, 2004, King, 2004). With this legislative change, control of primary birth services passed from nursing and medical control to midwifery control overnight. Changes in financial remuneration contributed to most general practitioners ceasing to provide maternity and childbirth services (Kutinova, 2008).
The result is that midwives became autonomous, fully professional primary maternity healthcare providers. They have their own professional organisation and regulatory body, which defines the scope of their practice and maintains their set of standards. Direct entry midwifery education became available in 1992 (Auckland and Dunedin) and is now the only path to registration.

3.2.3 Maternity care in 2013

New Zealand Lead Maternity Care (LMC) midwives provide autonomous primary maternity services to most (78%) New Zealand women (Davis, 2011). They are contracted to provide continuity of care as the sole clinical and budgetary healthcare practitioner for normal pregnancies and birth (Kutinova, 2008). Maternity care is free to women because it is provided through the Ministry of Health by New Zealand taxpayers. Under this system, women are able to choose their lead maternity carer, who may be a midwife (free), a primary general practitioner specialising in obstetrics (free), or an obstetrician (requiring payment) (Figure 3.4).

Engaging an obstetrician as a lead maternity carer may not be an option in all areas as few primary general practitioners still offer LMC services (Miller et al.,
2008). Of ~120 general practitioners in the study region, three provide lead maternity care. As no obstetricians offer private LMC services for the study region, women who require specialist services are referred to the regional hospital’s outpatient clinic.

LMC midwives contributed to this study. Those who have been registered for 10 years or more have experienced, and been shaped by the challenges that have contributed to the midwifery profession’s present status. At the time of writing (2013), it has been more than twenty years since direct-entry midwifery courses have not required a nursing background and midwives have been able to graduate in three years with a Bachelor of Midwifery (Kutinova, 2008). The professional practice of midwifery in New Zealand over the last century reflects constant change on many fronts (Stojanovic, 2010, Hendry, 2003, Pairman, 2005). One front demonstrates an ongoing professional tension between the medical profession and midwifery. Midwifery literature testifies that the medical profession is taking a medical interventional approach to birth (Hastie, 2008, Fahy et al., 2008), while the midwifery profession takes a more humanised, non-interventional approach (Kutinova, 2008, Banks, 2007, Abel, 1997). This tension has not relaxed (Guilliland, 2012).

3.2.4 Fee for service as a key strategy
Midwifery strategists identified the fee-for-service model, with midwives as budget holders for the entire maternity episode for each woman. It was a key control measure (Hendry, 2003: p.205). This coupon or fee-for-case system was negotiated under Section 88 maternity notice (2007). Under this system, midwives have been able to regulate their own income and throughput level by deciding their own individual caseload level.

In 1996, the Maternity Payments Schedule changed the way providers were paid. The health funding authority of the time set out Section 51 of the Health and Disability Act (1993) specifying payment and provision. This provided a fee for service provision that provided impetus for the concept of a lead maternity carer with the control that midwifery strategists were seeking (Barry, 1999, Hendry,
2003, Abel, 1997). Section 51 was later converted to section 88. The midwifery providers’ organisations (MMPO and SAMCL) were set up in the mid-1990s, when medical and midwifery maternity providers were vying for funding and control of maternity services (Hendry, 2003), a situation that continues in 2013.

3.2.5 Section 88 of the New Zealand Public Health and Disability Act 2000
The 2007 notice pursuant to Section 88 of the New Zealand Public Health and Disability Act 2000 now serves as a directive to maternity service providers. This notice dictates the midwifery practice of LMCs, spelling out the terms and conditions.
Remuneration is broken down into four modules: service for the first and second trimester module, the third trimester module, the labour and birth module and the postnatal care module are claimed for independently. There is a fixed budget for each maternity episode. The budget is held by the LMC, who decides which services the woman who is contracted to her receives, and how to coordinate and sub-contract care (Kutinova, 2008). The monetary remuneration places greater value on the labour and birth module than the antenatal or postnatal modules, even though the antenatal period is important. Conditions during the period from preconception to infancy can be associated with permanent changes in physiology and/or structure that affect the body’s response to disease in later life (Gluckman and Hanson, 2004, Gluckman et al., 2008, Gluckman, 2011).

3.2.6 Primary maternity services in Hawke’s Bay
In Hawke’s Bay, three general practitioners provide primary maternity care, including one in Wairoa, fewer than five percent of GPs in the area. Private obstetricians specialise in providing care for women with complications during pregnancy, labour and birth. In some centres, women may choose an obstetrician to provide LMC care, even if there are no complications. Obstetricians in Hawke’s Bay do not provide private care for normal pregnancies. Women who are assessed by their LMC as needing secondary care are referred to the Hawke’s Bay Regional Hospital for an outpatient’s appointment with a hospital obstetrician. If complications occur during labour, the LMC may choose to bring in secondary care, which will be provided by a hospital registrar overseen by a
consultant obstetrician. Women may also choose a midwifery team employed by the regional hospital, which provides full antenatal, birthing and postnatal visits. In the Napier-Hastings district, most women choose a midwife LMC. In Wairoa, the Hawke’s Bay District Health Board employs three or four midwives providing LMC and core services.

Women may choose to change to another LMC at any time during their care. However, it is difficult in practice, because by the time a woman decides to transfer care, other midwives are likely to be already booked for the time required (primary data).

**Summary**

The midwifery profession is a young profession compared with the nursing and medical professions. Feminist activist leaders formed the midwifery profession in 1990 as a breakaway profession from the nursing profession, and these leaders are still active and influential within the profession. Evidence of inter-professional rivalry permeates midwifery literature, more so, rivalry between the midwifery profession and the medical profession rather than with the nursing profession. The use of technology within midwifery work is seen to have negative rather than positive influences on midwives’ work practices (Firkin, 2003: p.74), with midwives as a professional group relying on technology less than other knowledge workers (ibid: p.3).
3.3 Part Three: The technological context

From 2009 to 2013, hardware devices, computers and telephones have further converged into smaller and more powerful devices such as smartphones or tablets, manufactured by companies including Apple, Samsung and Microsoft. In the last decade, there has been a series of technological changes resulting in the ready availability and extensive use of mobile internet-enabled devices and cellular phones (Economist, 2005, Mechael et al., 2010: p.12, Jones, 2008, Boulos et al., 2011).

3.3.1 Hardware: The evolution of hardware

The evolution and convergence of computers and mobile phones has produced a single portable device that can transmit and receive digital media, phone calls, images, video, music and movies, with new third-party applications, features and capabilities continually being added. These function as personalised mobile information and communication devices. Kakihara & Sørensen considered the new aspects of mobile data services and found the new mobile capabilities affect work and communication practices (Kakihara and Sørensen, 2002). They suggested that understanding social aspects of mobile technologies was more revealing than the functional or geographical aspects of mobile ICT (ibid).

3.3.1. Cellular devices

Cellular devices in developed countries use 3G and 4G communication standards and have the capacity to process multimedia data, although the type of subscription purchased may limit this capacity. At the end of 2012, more than 50% of the New Zealand population were mobile broadband subscribers (Statistics New Zealand, 2012). The New Zealand penetration of mobile phones is greater than 100%, as some people own more than one device, and of these, in 2013, 60% now own a smartphone (Carney, 2013).

The convergence of mobile computers and cellular telephones is epitomised in smartphones. They can record, transmit, store and receive multimedia files as well as being internet-enabled and are small enough to be always at hand. Smartphones have the capacity to use 3G and 4G cellular connections, connect...
wirelessly through a WiFi hotspot (also called a local area network (LAN)), or use Bluetooth technology to connect to other devices in the immediate vicinity. With internet accessibility comes access to the realm of social networking possibilities available in the cloud. Mobile access to the internet offers anytime-anywhere information and communication abilities. Smart phones give health professionals the ability to access decision-support and remote databases and to collaborate collegially.

Smartphones have the capacity to collect and transmit multimedia data and can connect to the internet using both wireless and cellular technologies. Data entry at the point of patient care is commonplace in healthcare and direct entry to a central database is proving valuable to healthcare provision in developing countries (Vital Wave Consulting, 2009, Mechael, 2009a).

3.3.1. **Tablet computers**

Tablet computers are portable personal touch screen devices. They first appeared in 2001, but in recent years have become more widely available (Carney, 2013). Features such as handwriting recognition, voice recognition data entry and entry using touch screen and stylus are characteristic of tablet computers, which make data entry satisfactory. Approximately 20% of New Zealanders now own a tablet computer in 2013 (Carney, 2013). Tablets can be 3G enabled or connect to the internet via a wireless LAN or hotspot.

3.3.2  **Software: Applications (Apps) for smartphones and tablets**

Apps for smartphones and tablet computers have extended the functions of these devices. There are hundreds of thousands of apps, with more being added all the time (Harvard, 2010). Apps have a multiplicity of uses in different fields but there are a large number applicable to health situations. Thousands of health apps are available to doctors, patients and well people to monitor health and encourage healthy lifestyle choices. Apps can be gateways for data entry to remote sites, or to record, store and compare data for weight management, blood pressure, diet, medication and mood.
3.3.3 Services: Wireless communication services

Protocols for mobile data services are many and varied and under constant development, and boundaries between services are blurring. The present state of connectivity, a combination of cellular mobile communication and internet technology, maximises the functions of handheld wireless devices. Mobile phones operate using a cellular network distributed by cell towers, serving a geographical area with coverage and capacity. Currently, third generation (3G) cellular network services are predominantly in use, although 4G technologies are now available in urban centres in New Zealand.

3.3.3. 3G cellular technology

Third generation cellular technology (3G) is capable of providing telephone, messaging and, with an appropriate subscription, the ability to transmit multimedia digital data. Laptops with dongles can act as cellular modems to achieve internet connectivity using a cellular telephone network.

3.3.3. 4G cellular technology

Fourth generation technology cellular technology uses an internet protocol (IP) based architecture (Perera, 2008: p.12). Fourth generation services are not just an incremental step from 3G services; they are a major jump, entailing total replacement of both devices and networks (Suman, 2008). This latest generation of wireless access provides fast seamless data — voice, multimedia and broadcasting, and upload and multiple access to networks. It brings high-speed data access and video-conferencing from handheld mobile devices. Long Term Evolution (LTE) or 4G technologies are available in New Zealand’s main cities as at July 2013, and the availability is increasing.

3.3.3. The penetration of mobile phones using cellular telecommunications

Cellular subscriptions are the cheapest way to use a mobile device. In 2013, the overall global mobile cellular penetration rate is approaching 100% (Sanou, 2013). This makes the use of mobile phones for healthcare provision an increasingly useful option, as services using this device increase in number and diversity (Maglavers et al., 2002, Kaplan, 2006). Figure 3.5 reflects the fast
growth in mobile cellular subscriptions. The introduction of pre-paid technology has enabled mobile phone uptake by a broader section of the population than computers (Rashid and Elder, 2009).

![Graph showing population and mobile-cellular subscriptions growth](image.png)

Figure 3.5 The global population and mobile cellular subscription growth (Sanou, 2013)

3.3.3. Broadband access to the internet

Broadband speeds using copper telephone wires depend on the internet service provider choice of subscription plan (Consumer, 2011) but are on average 4.0 Megabits per second (Mbps). Ultra-fast broadband speeds of up to 100 Mbps (Downstream) and 50 Mbps (Upstream) are possible using a fibre optic cable and, in 2013, this is an option in the study region. UFB enables streaming video, higher quality video-conferencing and Voice over internet provider (VOIP) services such as Skype (Skype, 2011).

Within New Zealand homes, wireless access using a WIFI (IEEE802.11) signal is common (Perera, 2008: p.12). WiFi hotspots also provide smartphone, tablet and laptop access to mobile data services in airports, campuses and city centres.

3.3.4 Summary

There has been a convergence of computing and cellular devices with increased global penetration of personalised mobile information and communication devices. Devices are smaller, more powerful and more affordable. All sectors of New Zealand society have been penetrated. Correspondingly, telecommunication
services have become faster and single devices can use both cellular and wireless signals. Mobile devices have multimedia computing capabilities and added personalisation through the addition of applications that extend functionality. This end of the market is still restricted to a smaller (but rapidly growing) sector with financial resources. In 2013, Most New Zealanders are equipped with cellular phones capable of voice, image, SMS messaging and access to the internet.

The people within the Hawke’s Bay Region have options to purchase up to date computing and mobile hardware, software and services including ultrafast broadband and 3G cellular services, but 4G services were not yet available in 2013. Availability does not infer access as other factors such as affordability, perceived usefulness, age, social influence and other facilitating conditions determine behavioural intention (Venkatesh et al., 2003).

3.4 Summary
Chapter three outlined the contextual influences on participants and the setting for the study. These influences were the health district and structure of midwifery services, the historical background to the autonomous midwifery profession and the availability and access to information and communication technologies.
Chapter 4: PHILOSOPHICAL FRAMEWORK

Philosophical perspectives are inextricably linked with any research design and are useful in constructing a framework for the research process (Proctor, 1998: p.73). The research design considers questions regarding the nature of the research and the researcher and their position from a philosophical standpoint. In this section, I present a rationale for the framework and clarify the significance of the philosophical perspective I have taken in this study.

The questions, the type of knowledge the researcher intends to establish, the methodology, and the data collection and analysis methods reflect the researcher's perspective and position in their own academic and wider world. For this reason philosophical assumptions need to be expressed in order to understand and evaluate any research. The researcher's philosophical understanding and assumptions reflect their relationship to reality and truth so the choices made show that the researcher has achieved compatibility and alignment with the previously mentioned elements (Brannen, 2005: p.7). For example, qualitative and quantitative research are each underpinned by different paradigmatic assumptions and require different methodologies, data collection and data analysis.

4.1 Establishing a Research Paradigm

A research paradigm represents an overall worldview, a basic belief, or set of propositions and underlying assumptions, encompassing ontological and epistemological understandings. Such beliefs are basic and must be accepted on faith (Guba and Lincoln, 1994: p.107). Because beliefs cannot be conclusively contested, there is no argument against the position a researcher takes in regard to their research paradigm (Gasson, 2004).

The importance of paradigms within the field of social science research is attributed to Khun (Tashakkori and Teddlie, 1998), subsequent to his book The Structure of Scientific Revolutions (Kuhn, 1970). For example, the set of beliefs,
values and techniques considered good practice by one community may differ from another community and the same data may be viewed differently, so that individuals who hold a particular paradigmatic belief or worldview, may privilege their own thinking above others of a contrary affiliation (Bird, 2013: para.4).

4.2 Difficulties for the researcher

Researchers who share a commitment to the same paradigm share the same foundations and assumptions across their research, and within immature sciences, more than one paradigm may exist as the discipline lacks consensus (Kuhn, 1970). This uncertainty presents a difficulty when embarking on research that spans more than one discipline. Often terminology used in philosophical, theoretical and methodological areas of research literature is inconsistent and confusing.

Crotty describes the difficulty researchers have in describing and negotiating the maze to find clear pathways linking the key design elements (data collection, methodology and analysis) (Crotty, 1998: p.1), and emphasises that the design elements provide a working framework. Both Crotty and Charmaz (2006: p.9) stress the need for flexibility of a framework or guidelines, which are constructed to make sense of research processes and an individual’s belief in nature and the way that knowledge is found or constructed. Lincoln, Lynham and Guba (Lincoln et al., 2005: p.163) testify to contentions for legitimacy between various research paradigms while Tashakkori and Teddlie (Tashakkori and Teddlie, 1998: p.7) describe ‘paradigm wars’ because of mixing qualitative and quantitative models.

Paradigms encompass ontological, epistemological and methodological assumptions (Guba and Lincoln, 1994, Denzin and Lincoln, 2011), but boundaries between paradigms are not clearly defined (Kazi and Rostila, 2002, Creswell and Miller, 2002). No single approach necessarily represents an accurate view of the researcher, as researchers use a variety of research
approaches and come from a wide variety of backgrounds that contribute to their philosophical beliefs (Daly, 1996: p.91). The chosen paradigm represents the intentions and values the researcher brings to the research which in turn determine the appropriate methodology and strategies to accomplish the specific research goals. Thus, the ontology, epistemology, methodology and methods are expressions of the chosen paradigmatic stance and are acceptable to others of the same persuasion.

Guba and Lincoln outline four lines of paradigmatic enquiry: positivism, post-positivism, critical theory and constructivism (Myers, 1997, Guba and Lincoln, 1994). This last paradigm has been termed ‘constructivist-interpretivist’ by Denzin and Lincoln (Denzin and Lincoln, 1994). Orlikowski (Orlikowski and Baroudi, 1991) classified philosophical assumptions into three categories: positivist, interpretive and critical. Creswell categorises them as positivist, qualitative (interpretive or constructionist), ideological, and pragmatic (combined qualitative and quantitative methods) (Creswell, 2002). Ponterotto (Ponterotto, 2005) modifies the schema of Guba and Lincoln to positivism postpositivism, constructivism-interpretivism and critical theory.

Crotty disagrees with Guba and Lincoln’s classification. Crotty (Crotty, 1998: p.10) prefers to use the term ‘scaffolding’ and ‘theoretical perspective’ (p.11). Within this perspective, the philosophical research framework is broken down into epistemology, theoretical perspective, methodology and methods. Within this schema, he considers that expanding the listing of an ontological classification is unnecessary to the research process. He considers that the concepts of ontology and epistemology tend to merge and that to talk of the construction of meaning is to talk of the construction of meaningful reality.

This thesis follows Guba and Lincoln's classification of four paradigms (Guba and Lincoln, 1994) for qualitative research and accepts that the ontology deals with the nature of truth and reality, the epistemology deals with what can be known,
and the methodological question deals with how to find out what can be known (Guba and Lincoln, 1998: p.10).

Guba and Lincoln's (Guba and Lincoln, 1994) motivation for this classification was in response to the dissatisfaction of quantitative methods and the growing interest in qualitative approaches (ibid: p.105). The following table clarifies and distinguishes positivism, postpositivism, critical theory and constructivism, then lays out the associated ontological, epistemological and methodological assumptions drawn from each view. The four paradigms were each considered in relation to this research, prior to a discussion on constructivism, the paradigm adopted to guide this research.

Table 4.1 Redrawn and modified table of basic beliefs of alternate enquiry paradigms (Guba & Lincoln, 1994: p.109)

<table>
<thead>
<tr>
<th>Item</th>
<th>Positivism</th>
<th>Postpositivism</th>
<th>Critical Theory</th>
<th>Constructivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology</td>
<td>Naïve realism</td>
<td>Critical realism</td>
<td>Historical realism</td>
<td>Relativism</td>
</tr>
<tr>
<td>Epistemology</td>
<td>Objectivist</td>
<td>Modified objectivist</td>
<td>Subjectivist</td>
<td>Subjectivist</td>
</tr>
<tr>
<td>Methodology</td>
<td>Experimental:</td>
<td>Modified experimental:</td>
<td>Dialogic/dialectical</td>
<td>Hermeneutical/dialectical</td>
</tr>
<tr>
<td></td>
<td>Verification of hypotheses</td>
<td>falsification of hypotheses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extreme views may be uncalled for, according to Weber (Weber, 2004) who describes a heated debate in information science circles discussing positivist and interpretivist approaches to enquiry. Rather, researchers need to consider the strengths and weakness of each approach so that the paradigm is chosen with due regard to the research aims and questions, and the approach to the research is consistent with the data collection, methodology and analysis within the chosen paradigm.
4.3 Appraisal of Current Research Paradigms

As the choice of research design is guided by the chosen paradigm, it was appropriate to review the major paradigms considered by Guba and Lincoln (1994). The following paradigms were considered.

4.4 Positivism

Positivism takes a quantitative approach to investigating phenomena and in social science implies a stance that the social scientist is an observer of social reality, and that observation and experiment provide the clearest way of epistemology (Cohen et al., 2011: p.7). This view encompasses the thought that unchangeable natural cause-effect laws govern true reality, patterns can be generalised, stable pre-existing patterns can be discovered and reality is not bound by time or context (Guba & Lincoln, 1994). In the field of natural science, this approach has had success. However, at the beginning of the nineteenth century, intellectuals in Europe questioned the reductionist view of nature, which defined life in measurable terms and excluded concepts of choice, responsibility, freedom and individuality (Cohen et al., 2011). Positivist researchers assume 'human action is intentional and rational' (Orlikowski and Baroudi, 1991), while non-positivist traditions value 'immersion in uncontrolled real-world settings over conducting objective experiments' (Greenhalgh and Swinglehurst, 2011). Philosopher Wittgenstein (1974) in Cohen (2011: p.15) has commented that ‘when all possible scientific questions have been addressed they have left untouched the main problems of life’.

It has been argued to my satisfaction (Cohen, 2011: pp.7-9) that positivism is unsuited to social research as it regards human beings as objects and excludes the recognition that human values and responses differ and social interactions are dynamic (ibid: p.20). Therefore, a positivist approach was not considered applicable to my study, as the focus of my enquiry seeks to explore and understand the ‘meaningfulness’ of ICT within heterogeneous groups of people and is set within a real-world setting involving the provision of maternity services.
4.5 **Postpositivism**

Postpositivism rejects the central tenets of positivism (Trochim and Donnelly, 2007), although both positivists and postpositivists ‘view action as a form of contamination of research results’ (Denzin and Lincoln, 2011: p.117). It is a reaction to the acceptance of scientifically proven facts to explain reality, and ‘one of if not the most significant intellectual current which swept the academic world in the later third of the twentieth century’ (Lopez and Potter, 2001: p.3). It is a modified positivist view contending the truth is best found by a method of experimental research and hypothesis falsification (Guba and Lincoln, 1994, Annells, 1996). Whereas positivism can be labelled ‘naïve realism’, postpositivism assumes a reality, but claims that reality must be ‘subjected to the widest possible critical examination’ (Guba and Lincoln, 1994: p. 110) to determine reality, which would be a lengthy and imperfect process. Both positivism and postpositivism paradigms maintain a goal of objectivity and rational response. This stand does not account for different human responses and changing environmental influences that may exist in my current exploratory enquiry.

4.6 **Critical theory**

‘Critical theory’, is a transformative theory in that it relates back to a small group of German philosophers in the late 19th century, who sought to ‘explain what is wrong with current social reality, identify the actors to change it and provide both clear norms for criticism and achievable practical goals for social transformation’ (Bohman, 2013). There is an emphasis on practicality (Denzin and Lincoln, 2011: p.93. p.117). Guba and Lincoln regard the aim of critical theory is to ‘critique and transform’ societal constraints (Guba and Lincoln, 1994: p.113).

It since has broadened to include many critical theories (Pleasants, 1999: p.149): poststructural, postmodern, feminist, critical pedagogy and cultural studies theory (Denzin and Lincoln, 2011: p.93). Critical theorists look for underlying mechanisms and patterns as a basis for justifying and predicting rational human
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behaviour rather than recognising that individuals are unique and are capable of variable responses (Pleasants, 1999: p8).

This research paradigm was considered for my current project, but it considers society as a whole (Bohman, 2013), and does not fully account for complex and unique individual responses.

4.7 Constructivism and a relativist ontological position

Constructivism is a research paradigm that denies the existence of an objective reality (Mills et al., 2006: p. 3) (Andrews, 2012: p.3). It is not simply a reaction to positivism, but represents its own position, generated from its own assumptions (Guba and Lincoln, 1989: p.173). The constructivist method of enquiry provides a way of considering situations whenever people are being considered (Guba and Lincoln, 1989: p82). Unlike critical realism, constructivism maintains that individuals and groups who have been, and still are, subject to diverse conditions and influences, generate meaning (Cupchik, 2001). The interpretive framework, or paradigm underpinning the postmodern constructivist perspective is based on a relativist ontology (there are multiple realities of any situation) and a subjectivist, as opposed to objectivist, epistemology (Guba and Lincoln, 1994: p.109, Mills et al., 2006: p.31). Constructions are not equivalent to positivists’ ‘reality’ (Guba and Lincoln, 1994: p.12).

Instead, constructivism shares common beliefs with interpretivism, and is the antithesis of positivism. Guba and Lincoln contrast the two positions, pointing out the differences in concepts of reality (Guba and Lincoln, 1994). Constructivists believe in multiple individually constructed realities, whereas positivists believe in one objective reality.

Both interpretivism and constructivism subscribe to a subjectivist epistemology, with interpretivism more concerned with understanding data within a context. Constructivism acknowledges that knowledge and understandings are individually and socially constructed because of lived and shared experiences (Andrews, 2012) and influenced by context (Mills et al., 2006). The term ‘social
constructionism’ as opposed to ‘constructivism’ emphasises a social rather than a personal focus (Crotty, 1998: p.58), although Charmaz has used the two words interchangeably (Charmaz, 2006) (Andrews, 2012). In the context of this thesis, the term constructivism is used.

Constructivism purports to the idea that individuals and sociocultural groups create their own conceptualisations of knowledge and reality. This relativist view opposes the realist notion of one world, which supports the idea of definitive knowledge rather than subjective reality. Educators transmitting knowledge and the practices of memorising and rote learning are illustrative of realist practices. Rather, there are multiple ways of knowing. Piaget, a Swiss philosopher, and Vygotsky, a Russian philosopher, are influential figures associated with constructivism.

4.8 Piaget and cognitive constructivism

Piaget is linked with the field of cognitive constructivism in developmental psychology and learning. His approach to knowledge construction reflects his interest in biology with concepts of adaptation, assimilation and evolution rather than an objectivist reality. The first key principle of his contribution to teaching and learning is the recognition that learning is an active process whereby people construct knowledge and understanding as an outcome of their involvement with direct experiences and real problem solving, while being free to make errors during the process (Laurenço, 2012). This knowledge of personal reality is a continuous dynamic process rather than one having a definitive beginning and end or only occurring within the confines of a particular place or time frame. An important tool to assist the active learning process is the ability to access information. Another key principle is that personal learning is most effective when carried out in a situated meaningful environment, and relates to purposeful goals, rather than as isolated tasks. Bryceson noted that the principles of accommodation, assimilation and equilibrium are attributed to Piaget and that many representations of complex content are helpful to facilitate ‘deep learning’ (Bryceson, 2007: p.191). Piaget developed his constructivist
theories before the advent of the internet, which is now recognised as a complex learning environment (Enonbun, 2010: p.26) and as a technological tool with multimedia, and hyperlinked interconnection capabilities that could fulfil this role.

4.9 Social constructivism
Whereas Piaget was more concerned with individual development and response, a wider view of constructivism found culture and social context are important dimensions in the construction of meaning (Kim, 2001). Socially constructed knowledge pertains to a social group such as a large organisation, sporting codes, professions or small family units. Individuals can simultaneously be part of different groups. Group knowledge or understanding dictates policies, practices, restraints, and is relative because it may differ from another group’s knowledge and is in a state of flux as circumstances change.

4.10 Vygotsky and social constructivism
Vygotsky agreed with Piaget about the constructive nature of learning but his contribution was the recognition that learning and development are closely aligned with language, social interaction and sociocultural setting (Lamon, 2013). Hence, social constructivism is a term associated with Vygotsky (Bourdourides, 2003). Language as a cultural tool and the dynamic nature of both language and culture are integral to the language development, thinking and stages of increasing abstraction developed during the constructive process of learning as described by Vygotsky (ibid). Social interaction generates knowledge and understandings common to the group, with the common objectives and collaborative efforts contributing to a consensus or accepted understandings within the group (Kim, 2001).

4.11 Differences in views of constructivism between Piaget and Vygotsky
Although both Piaget and Vygotsky were developmental psychologists and proponents of theories of constructivism, they differed in crucial areas. Piaget’s focus is primarily on the autonomous individual (Laurenço, 2012: p.286), and he
is accused of underplaying the importance of sociocultural influences in the development, learning and thinking. Piaget’s influence is relevant to this thesis as the Web 2.0 environment and applications are information and communication tools. Vygotsky believed that social interactions play a fundamental role in the development of individual cognition, and that, through a process of ‘proximal learning’, individual experiences contribute to group knowledge through conversation and shared experiences (Vygotsky, 1978).

Social constructivism is relevant to this present study as the social units were determined as women who have recently used maternity services, LMC midwives and the professional and governmental support infrastructure. It is acknowledged that individuals within these sociocultural units have distinct responses and there are realities or shared understandings that are likely to have been constructed within the units.

4.12 The place of Ontology in developing a research paradigm

The term ontology is a metaphysical term commonly interpreted as ‘the study of being’ (Lawson, 2004) (Crotty, 1998: p.10). Lawson enlarges that ontology is ‘the study of what is, or what exists; the study of entities or things; and the study of what it is to be or exist; what all the things that are have in common’ (p.1). Gruber’s commonly cited definition is: ‘a formal specification of a conceptualization’ (Gruber, 1993) which takes into account the place of language and classifications within areas of study. Different disciplines are based on assumptions or bodies of knowledge which use consistent vocabularies. There is no definitive view of the way to express what ontologies exist, as writers prescribe different basic ontological classifications (Ponterotto, 2005, Annells, 1996). The relativist reality subscribes to the position that there are multiple individual and group realities influenced by context (Mills et al., 2006: p.2), and that no reality is definitive. Charmaz (2006) takes a relativist stance against the positivist grounded theory, which seeks to ‘discover’ the definitive verifiable truth (p.273).
4.13 The place of Epistemology in developing a research paradigm

Crotty (Crotty, 1998) adopts the position that an ontological belief is closely related to the epistemological stance. He considers the terms are complementary and uses them interchangeably (p.8), although this view is not universal. Epistemology can also be described as the branch of philosophy that deals with the theory and understanding of knowledge, the study of how we know, and the philosophical basis for claiming what we know (Erikson and Kovalainen, 2008, Jelavic, 2011). While ontological questions ask about what exists and the nature of reality, the epistemological question asks what can be known (Guba & Lincoln, 1994). Epistemological assumptions ‘concern the criteria by which valid knowledge about a phenomenon may be constructed and evaluated’ (Orlikowski and Baroudi, 1991: p.8).

Mills et al (Mills et al., 2006: P.6) following Lincoln and Guba (Guba and Lincoln, 1994) consider constructivist grounded theory to be ‘ontologically relativist and epistemologically subjectivist’. Relativism and realism are polarised positions between objective reality and multiple realities (Andrews, 2012) and all points of view are valid and relative to the individual’s context. The subjectivist epistemology assumes constructions of knowledge are not ‘true’ in the objectivist sense, but dependent on individual and socially constructed understandings or credible ‘truths’ which are subject to revision (Guba and Lincoln, 1994: p. 114). To achieve the congruence necessary for validity within qualitative research, I hold to the view that within social science, people as unique human beings respond differently to identical stimuli and a relativist and subjectivist approach to more deeply understand their responsiveness to information and communication technologies within the chosen setting represented a cohesive path.

4.14 How does this framework relate to this research project?

This study adopts a constructivist position as outlined by Charmaz’s (2006), which assumes that ‘people, including researchers construct the realities in
which they participate’ and that ‘constructivists acknowledge that their interpretation of the phenomenon is itself a construction’ (p.187).

Positivist research seeks to ‘discover’ a single truth, but, for this social research, it must be accepted that there are ‘multiple constructed realities’, which are dynamic and can only give a level of understanding rather than prediction. My intent is to more deeply understand participants’ realities within the area of my research, and this will generate further questions for me to ponder. Guba and Lincoln (Guba and Lincoln, 1989: p.176) consider that constructivists bring the richness of individual tacit knowledge, refuting any possibility of entering the field with a tabula rasa.

Within a constructivist approach to research, it is important to be aware that the influence of the researcher within the research is implicit. The temporal, situational, social, physical and societal context and values of both participants and researcher influence co-constructions. The mutual influence is acknowledged. The choice of problem reflects that I have a deep personal interested in individual and social responses to the evolving and impinging technological landscape that we live in. My choice of paradigm reflects the aims of my research and the research questions. It also reflects my understanding of knowledge and knowledge creation from my viewpoint as a woman, a mother, a teacher and a health information worker. It is beholden on the researcher in this type of enquiry to reflect and be transparent about personal values and interpretations for readers to make sense of the outcomes. From this viewpoint the researcher and the participant/s co-construct meanings and realities from the field of enquiry.  

*The human is the instrument of choice for the constructivist, and, it should be stressed, the only possible choice, during the early stages of an inquiry. Objections that humans are subjective, biased, or unreliable are irrelevant, for there is no other option (Guba and Lincoln, 1989: p.175).*
Finally, it is significant to understand that participants are situated within a social setting, and that these meanings/realities constructed ‘cannot be understood in isolation from their contexts’ (ibid: p.39). The LMC midwives are situated within a defined professional social entity, and likewise, the women are situated within their separate social entity. Another condition that must be accepted is that constructions are dynamic and are mutually shaped. Within this paradigm, generalisability cannot be claimed. This differs markedly from the design and outcomes of objectivist research, which aims to produce scientific results that are reproducible, and are evaluated, and validated on that very premise. Instead, it aims to build a deeper understanding of key issues within the substantive area, that being participants’ embodiment and enactment of ICT within a specified health setting.

4.15 Summary

Once the paradigm for an enquiry is established, a set of assumptions, implications and expectations associated with that paradigm are understood. The philosophical framework adopted for this enquiry is consistent with a constructivist ontology and epistemology with its accompanying set of beliefs and values. This relativist worldview and subjectivist approach guided how I carried out the research and made decisions. This position acknowledged the double hermeneutic. Taking this approach indicated an onus on me as the researcher to be conscious of the need to be reflexive throughout all stages of the research, and to recognise that the findings are co-constructed from my viewpoint as a health informatics researcher, as well as from each individual midwife and woman’s temporal perspective.
Chapter 5: METHODOLOGICAL CONSIDERATIONS

This study uses a Constructivist Grounded Theory Method to examine and understand midwives and women’s practices and perceptions of ICT during their professional and maternity experience and in their everyday lives. Individual responses to service provision sit at the confluence of personal, professional, community, organisational and political influences.

Chapter five considers the aims of the research and the questions asked, and outlines the strategies and methods used in this study. After consideration of the research questions, an interpretivist overview was adopted before an appropriate methodology was considered.

The selection of an appropriate research methodology is shaped by the aims and the questions asked. Ensuring the fit of the research methodology while keeping the overriding paradigm is a necessary and important consideration (Mills et al., 2006: p.2) (Cutcliffe, 2000: p.1481). After the research aims and questions have been posed, Hay (Hay, 2002: p.4), advises researchers to establish a systematic overall structure to the research, which, for this thesis, is outlined in the first section chapters.

The first section describes the nature and background of the grounded theory method and outlines its philosophical roots. The following section explains how the grounded theory method has diverged into strands, which are different from the classic grounded theory method first described by Glaser and Strauss. Following that, the reasons for considering the constructivist version of grounded theory are considered.

5.1 What is the Grounded Theory Method?

Grounded Theory Method (GTM) is a method of conducting qualitative research that focuses on creating conceptual frameworks or theories. The analytic categories are directly ‘grounded’ in the data (Charmaz, 2006: p.187).
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It is a qualitative method that has been widely used across a wide range of disciplines (Strauss and Corbin, 1997, Bryant and Charmaz, 2007). It is used in health, sociology and information science research (Strauss and Corbin, 1997, Bryant and Charmaz, 2007), because it provides a method of analysing qualitative data to ‘elucidate the key forms of action undertaken by participants in particular situations’ (Clarke and Friese, 2007: p.363). Clarke sees it as a ‘theory/method package’ (Clarke, 2005b: p.2). The purpose of this method is to develop theory and concepts that are grounded in data that has been systematically analysed.

Kathy Charmaz views grounded theory methods as a ‘flexible set of principles and practices’ rather than a rigid prescription (Charmaz, 2006: p.9). This flexibility and legitimacy has appealed to qualitative researchers who have been challenged in turn by critics addressing issues of timing of literature reviews, clarity and precision, sampling and the relationship of the researcher with the participants (Cutcliffe, 2000). The relationship of the researcher to the research takes different forms, depending on the approach. In positivist grounded theory research, the researcher is an unbiased ‘neutral observer’ (Bryant, 2003), and theory is ‘discovered’. Charmaz (2006) is critical of the discovery perspective, and by contrast, suggests that the researcher and participants construct a ‘shared reality’ (Breckenridge et al., 2012: p.2).

Data is systematically and iteratively coded into increasingly abstract categories with the relationships among categories expressed as the theoretical concept, or in constructivist theory, further insight and understanding. While all approaches to grounded theory method have elements in common, there are philosophical and methodological differences. Different approaches to grounded theory methodology were also considered prior to the selection of a Constructivist Grounded Theory Method. A constructivist method was chosen based on my ontological and epistemological assumptions and my belief that participant practices and perceptions were not based on objective phenomena. This paradigmatic view is consistent with the belief that people’s view of reality is
shaped by their historical and social experiences. The views are subjective, complex and temporal, so no standard measure is available.

5.2 The discovery of Grounded Theory Method (GTM)


Barney Glaser and Anselm Strauss ‘discovered’ traditional grounded theory in the 1960s. In 1967, their book ‘The Discovery of Grounded Theory: Strategies for Qualitative Research’, was published (Glaser and Strauss, 1967). This book, also called ‘the discovery’, set out a different way of conducting social research, and has been described as a ‘pioneering book’ which conveyed an alternative to the scientific method of creating knowledge, at a time in social research when both Glaser and Strauss were dissatisfied with current methods of qualitative data analysis (Bryant and Charmaz, 2007). It took a positivist view of knowledge, applied to qualitative data, reflecting Glaser’s positivist background. It was a ‘qualitative revolution’ (Hallberg: p.141) at a time when a positivist quantitative approach was predominant in many disciplines. Glaser and Strauss offered a set of logical, systematic steps to deal with qualitative data and analysis with the purpose of generating theory. It involved:

‘Simultaneous involvement in data collection and analysis

Constructing analytic codes and categories from data, not from preconceived logically deduced hypotheses

Using the constant comparative method, which involves making comparisons during each stage of analysis
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Advancing theory development during each step of data collection and analysis

Memo writing to elaborate categories, specifying their properties, define relationships between categories and identify gaps

Sampling aimed towards theory construction, not for population representativeness

Conducting the literature review after developing an independent analysis ‘

(Charmaz, 2006: pp.5-6).

Since Glaser and Strauss’s ‘discovery’ (Glaser and Strauss, 1967) GTM has become complex and varied (Babchuck, 2009), with heated public debate ensuing from philosophical and methodological disagreements (Bryant, 2003, Glaser, 2002). Bryant and Charmaz suggest that GTM is not a distinct group of methods which share clear and precise common attributes, but rather a ‘family of methods claiming the GTM mantle’ (Bryant and Charmaz, 2007a: pp.11-12, Babchuck, 2009, Black, 2009). Bryant enlarges on this, drawing on Wittgenstein’s concept of ‘family resemblances’ (Wittgenstein, 1953/2001, Philosophical investigations) to demonstrate how similarities are often based on judgements around ideas that are not amenable to clear and precise definitions’ (ibid: p.11). Denzin (Denzin, 2007) identifies seven versions of GTM, based on different ontological and epistemological assumptions (Ch. 4): positivist, postpositivist, constructivist, objectivist, postmodern, situational, and computer assisted, and contends a new wave of GTM researchers are moving towards the revised more emergent, constructivist stand (Denzin, 2007). Of the three predominant strands of Grounded Theory Method, the constructivist version of GTM is the most recent evolution and is characterised by an interpretive understanding of participants’ meanings, ‘the co-construction of data, the nation of relativism and the predetermined lens through which data are processed’ (Breckenridge et al., 2012).
5.3 What is grounded theory?

Grounded theory is the **product** of the grounded theory method, whether the method itself is positivist, as proposed by Glaser (Glaser, 2010), interpretivist as in Strauss and Corbin (Glaser and Strauss, 1967), or constructivist, as set out by Charmaz (Charmaz, 2006). Prominent GTM researchers (Creswell, 1998, Dey, 1999, Gregory, 2010) place ‘the development of theory’ first in the purposes of GTM. Grounded theory method can help us organise our thoughts, interpret the world, and evaluate our actions (Bennett, 2008), however, the concept of theory has been variably defined.

The meaning of the word ‘theory’ varies in different disciplines and more particularly between objective and constructivist versions of grounded theory methodology (Charmaz, 2006: p.125). The objectivist view is that theory is simply ‘explanation’ and ‘prediction’ (ibid: p.126). Gregory's positivist view sees theory as ‘categories and the relationships between them’ (Gregory, 2010: p.10). Dey (Dey, 1999: pp1-2), distinguishes formal theory from substantive theory, and argues that the difference lies in the degree of abstraction. He also argues that theory can become more formal with a higher level of generalisability.

Strauss and Corbin's definition of theory is:

> ... a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena’ (Strauss and Corbin, 1998: p.15).

Positivist theory seeks causes. It is exemplified by explanations and emphasises generality and universality (Charmaz, 2006: p.126). The objectives are simply ‘explanation’ and ‘prediction’ (ibid: p.126).

By contrast, constructive grounded theory method adopts a view of theory, which emphasises an *imaginative understanding* of the data, which rests on the researcher’s interpretation.

The following definition of theory guided this study:
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‘Interpretive theory calls for the imaginative understanding of the studied phenomenon. This type of theory assumes emergent, multiple realities; indeterminacy; facts and values as linked; truth as provision; and social life as processual’ (Charmaz, 2006: p.126).

Charmaz explains the congruence with symbolic interactionism (ibid: p.127), which is ‘a theoretical perspective which assumes that people construct selves, society and reality through interaction,’ (ibid: p.189). The constructivist view of grounded theory is that there are multiple realities and truth is provisional (ibid: p.126). Following Charmaz, my aim is to construct meanings and a deeper understanding about my topic, rather than produce a definitive output as a substantive or formal ‘theory’.

Charmaz is considered an important authority on Grounded Theory Methods, as judged by the action taken by Sage Publications to appoint her as co-editor of The Sage Handbook of Grounded Theory (Bryant and Charmaz, 2007). Her own publications and those she has co-authored are widely cited. Charmaz (2006, 2012) considers Constructivist Grounded Theory Method (CGTM) is a method for studying processes (Charmaz, 2012a: p.2), and she outlines a series of detailed steps and procedures for dealing with the data. The logic starts with the data collection, going on to initial coding, focused coding, theoretical sampling, saturation of codes, development of core categories and development of an understanding or argument. Yet, Charmaz (2006: p.9) insists that CGTM is a flexible iterative approach requiring creativity from the researcher and these steps are ‘a’ way. Charmaz regards CGTM as ‘a set of principles and practices’ and her steps as ‘flexible guidelines’ rather than ‘methodological rules, recipes and requirements’. This view is endorsed by Chamberlain, (Chamberlain, 1999: p.194) who considers that grounded theory method is a methodology ‘with considerable potential for qualitative researchers’ (ibid: p. 198), though researchers must be clear about their ontological and epistemological stance (ibid: p.194). Furthermore, Charmaz acknowledges authors whose writing ‘only acknowledges specific aspects of the approach’ (ibid: p.9).

\[6\] Charmaz’s book ‘Constructing Grounded Theory’ (2006) has had ~7,000 citations since its publication in 2006.
5.4 The philosophical roots of grounded theory
American philosophers from the Chicago school of sociology influenced Kathy Charmaz through Anselm Strauss. GTM has deep roots in pragmatist philosophy (Bryant, 2009) and symbolic interactionist sociology through this school of sociology, which supported social constructionist (relativist) analysis of qualitative data. Human action, interaction and construction of meaning are at the core of symbolic interactionism (Blumer, 1986). These philosophical traditions stem from the end of the 19th century in the United States with William James (1842-1910), Charles S Pierce (1839-1914), Charles Cooley (1864-1929) and John Dewy (1859-1952), who later influenced Strauss in Chicago. The influence of Dewy and George H Mead (1863-1931), was carried on through Anselm Strauss who later taught Charmaz in San Francisco, at the time when both Barney Glaser and Anselm Strauss taught and influenced a generation of American sociologists (Charmaz, 2006: p.xii). The early American social philosophers, rejected the idea that there was one ‘independent scientific truth’, arguing that scientific truth results from both observation and the emerging consensus within a community of observers as they make sense of what they have observed (Suddaby, 2006). At this time, there was a focus on symbolic interactionism, social processes and pragmatism (Suddaby, 2006).

Glaser’s background was fundamentally different. He was educated at Columbia University where there was an emphasis on positivist methods, and with this, training in quantitative methodology (Bryant and Charmaz, 2007: p.269). Glaser and Strauss met and collaborated at the University of California while studying patients confronted by terminal illness. This collaboration led to their ‘discovery’ book.

5.5 The evolution of grounded theory method
Grounded theory method is dynamic; constantly evolving, refining and diverging (Chamberlain, 1999: p.191). Currently, three predominant strands of grounded

\[\text{7} \text{ Discussed on page 19.}\]
theory method are recognised; classic or positivist grounded theory method (Glaser and Strauss, 1968), interpretivist or evolved grounded theory method (Strauss and Corbin, 1998) and constructivist grounded theory method (Charmaz, 2006). Figure 5.1 shows the evolution of GTM and the different relationships between the data – researcher – participants and literature, and the interactive relationship between entities within CGTM (Knight, 2008). The relationships in Classic GT are separatist and the researcher is a disinterested\(^8\) party, whereas in Constructivist GT the co-constructive development of meaning is recognised (Mills et al., 2007).

Figure 5.1 Evolution of GT, redrawn from Knight (Knight, 2008: p.118)

Although Glaser and Strauss, as first generation grounded theorists, collaboratively published their seminal book, this collaboration did not endure. Both Glaser and Strauss aimed to generate theory grounded in empirical data, but began to disagree. Methodological differences came in the late 1980s and early 1990s (Strauss and Corbin, 1996, Strauss and Corbin, 1998, Glaser, 1992, Kelle, 2005), when GTM diverged into two distinct strands. Glaser disagreed with Strauss over methodological issues introduced by Strauss, which, Glaser contends, resulted in ‘forcing’ the data, as opposed to the ‘emergence’ of categories (Kelle, 2005).

Glaser contends that the data tells the story, with the researcher coming to the data as a blank slate with no pre-conceived ideas, although the notion of the researcher as a ‘tabula rasa’ is widely discredited (Urquhart and Fernandez, \(8\) Disinterested as in ‘free from bias’.

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By contrast, Strauss and Corbin acknowledge the influence of the wider social context on the data source. Glaser’s version of GTM is called ‘classic’ GTM. Coders are recommended using a fixed set of pre-existing coding families, or theoretical concepts, related to attributes, relationships and cultural phenomena. Strauss prescribes a step he calls ‘axial coding’, and in collaboration with Corbin, he wrote prescriptive texts outlining their version of GTM (Strauss and Corbin, 1996).

The year of publication of research papers is relevant, as eminent grounded theorists continue to debate their stance (Babchuck, 1996). Strauss and Corbin’s interpretive approach shifted the focus to meaningful interpretation, rather than ‘discovery’, and opened the way for grounded theory strategies to be adopted ‘without embracing the positivist leanings of earlier proponents of grounded theory’ (Charmaz, 2000: p. 510).

### 5.6 Choosing the most appropriate generation of GTM

Constructivist axiology acknowledges the researcher’s values and I believe that even my choice of questions reflects these values. The choice of methodology concerns how the researchers feel they can best find what can be known or understood. In my case, making sense of reality is based on my agreement with constructivist writers (Guba and Lincoln, 1994: p.109) that truth and reality are relative to time and context and that individuals construct local and specific realities (Charmaz, 2006).

Charmaz (2006) proposed her view of a constructivist approach to grounded theory as a different way of viewing qualitative data compared to classic (epitomised by Glaser) and interpretive (epitomised by Strauss) variations of grounded theory method (Charmaz, 2006). Judging by Glaser’s response, this was seen as a challenge (Glaser, 2002). Glaser endorses the action of researchers who aim to set their ideas aside and not allow them to intrude into the analysis. Some researchers do not agree with this perspective (Dey, 1999, Charmaz, 2006, Urquhart and Fernandez, 2006, Guba and Lincoln, 1989). After considering both
perspectives, I chose to draw on the third generation of grounded theory, which is the constructivist approach to grounded theory method proposed by Charmaz (2006). The purpose of choosing this approach fitted with the aim of generating a deeper understanding and perspective on the topic. I was strongly influenced by Charmaz’s challenge to the belief that ‘there is one objective truth’. This approach acknowledges multiple individually and jointly constructed views, and concurred with my acknowledgement that there are subjective influences from both the researcher, the participants as well as multiple factors within the research area that play a part in the co-construction of data.

It is important to differentiate between grounded theory (GT) and grounded theory method (GTM) and to differentiate between the three generations, or approaches to using the grounded theory method, as each is built on different assumptions about ontology and epistemology (Chamberlain, 1999: pp.190-191).

5.7 Constructivist grounded theory method (CGTM)

The third more recent constructivist version of GTM assumes researchers take an interpretivist epistemological perspective to construct categories (Gregory, 2010). The fundamental difference between the positivist approach to grounded theory method, and the constructivist approach to grounded theory method is that the former ‘discovers’ and the later ‘constructs’.

Kathy Charmaz et al. (Charmaz, 2000, Charmaz, 1990, Bryant and Charmaz, 2007b) argue that ‘we can adopt grounded theory strategies without embracing the positivist leanings of earlier proponents of grounded theory’ (2000: p.510) and that ‘people create and maintain meaningful worlds through dialectical processes of conferring meaning on their realities and acting within them’ (2000: p.521).
Charmaz describes a need for researchers to get close to the data and even ‘immerse themselves’ in order to keep the final theoretical analysis close to the original or raw data (Charmaz, 2000: p.256). Constructivist grounded theory contrasts with the two earlier versions by aiming for ‘interpretive understanding and situated knowledge, rather than explicit generalities or parsimonious explanations’ (Charmaz, 2008).

Mills describes CGTM as ‘ontologically relativist and epistemologically subjectivist’, highlighting the involvement of the researcher (Mills et al., 2006). The middle ground between postmodernism and positivism assumes the relativism of multiple social realities and offers an accessible method for qualitative research (Charmaz, 2000). This path offers clear guidelines to analyse qualitative data, while assuming the relativism of multiple social realities, and acknowledging the creative roles of the participants, researcher and readers to construct knowledge (Charmaz, 2003: p.250). The view is that ‘[a] constructivist approach does not seek truth, single, universal and lasting’ (Charmaz, 2006: p.523), but assumes what we take to be the truth is based on our perspective (Kelle, 2005, Charmaz, 2006).

‘Constructive grounded theorists:

- Begin with an inductive logic,
- Use broad concepts to conceptualise projects and proposals,
- Subject these concepts to empirical scrutiny,
- Follow emergent directions,
- Adopt key methodological stances,
- Engage inconstant comparison,
- Conduct theoretical sampling, and
- Attend to the construction of the research project as well as its product ’ (Charmaz, 2008: p.135).

Grounded theory is suited to the study of new sociotechnical phenomena (Fernández, 2004: p.59, Tan, 2010: p.94) or other areas that have not been extensively researched or understood. The exploratory nature of this investigation aligned well with Constructivist Grounded Theory (CGTM). CGTM
has been used in a diverse range of disciplines, and particularly when the researcher does not have prior knowledge of the area (Urquhart, 2001). While CGTM is lengthy and time-consuming compared with other approaches, the in-depth nature of a PhD study makes the grounded theory method an attractive proposition for this type of project (Tan, 2010: p.66).

5.8 Researcher perspective

The idea of immersing oneself or becoming steeped in the data is a way of carrying the participants’ meanings forward to the final theoretical outcome (Charmaz, 1995, Mills et al., 2006: p.4). The Charmaz (2006) approach, takes into account the researcher's 'positions, perspectives, priorities, and interactions' (Bryant and Charmaz, 2007) in (Black, 2009: p.84). This self-reflective state has been described as the ‘critical examination of one’s effect as a researcher on the research process’ (Reay, 1996). This positioning provokes the need for the researcher to reflect on his or her experiences, values and abilities to be able to make sense of participants' contributions to the research. The ongoing need for critical reflection throughout the whole research project is acknowledged. As the researcher's position informs the research, this position must be clear to the reader (Charmaz, 2006: p.189). There is a degree of intimacy with participants and their data, so it is incumbent on the evaluator to duly respect participants’ views (Lincoln and Guba, 1985: p.10). According to Charmaz, reflexivity denotes a requirement for the researcher to scrutinise and self-monitor decisions and to examine and express the interests, positions and assumptions that might influence the research project. This reflexive stance informs how the researcher relates to the research participants, and how the researcher approaches and conducts the research (Charmaz, 2006: p.189). Mills (Mills et al., 2006), discussing Strauss and Corbin (Strauss and Corbin, 1998), acknowledge the integral, delicate and intimate role the researcher plays in grounded theory method research. There is an underlying assumption that the interaction between researcher and participants ‘produces the data and therefore the meanings that the researcher observes and defines ‘(Charmaz, 1995). The notion
of immersing oneself or becoming steeped in the data is discussed by Charmaz who sees this as a way of staying close to the data and carrying the participants voice and meaning forward and retaining their presence in the final theoretical outcome (Charmaz, 1995, Mills et al., 2006). Clearly, within the GTM movement, there are widely and strongly differing stances that are unresolved and hinge on objectivist (Glaser) versus constructivist (Charmaz) worldviews.

For this enquiry, I have been influenced and guided by the constructivist grounded theory methodology as described by Charmaz (Charmaz, 2006), which takes into account the researcher's 'positions, perspectives, priorities, and interactions' (Bryant and Charmaz, 2007, Black, 2009).

An enquiry into constructivism has affirmed my belief that confirms relativism as my ontological position and subjectivism as an epistemological assumption. I believe that individuals and social groups exhibit multiple realities coloured by physical, cultural, social, psychological and temporal contexts, existing in the area of sociotechnical aspects of health informatics.

As the constructivist perspective maintains that knowledge and ways of knowing are socially and individually constructed and subjectivist, the researcher's involvement and lens in effect, provides a voice for participants. The responsibility of a reflexive researcher is to design, decide, conduct and interpret all aspects within the research process (Charmaz, 2006: p.188), which becomes a deeply personal process. My personal and professional interests and assumptions needed to be acknowledged and declared as it is accepted they will colour the outcome of this endeavour.

This perspective sees technology as empowering tools for both health professionals and health consumers. The availability of information and decision support tools brought about by the internet and participatory Web 2.0 technologies has provided a new opportunity for those who choose to be more involved in their own health outcomes.
SECTION TWO: Philosophical and methodological outline

Chapter Five
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My Physical Education background provides a focus on healthy choices and wellbeing rather than a biomedical perspective of the body, which focuses on healing the ‘sick’ body. Midwives perspective of expecting a normal birth resonates with this perspective. This stand is tempered by my experiences of well people with good lifestyles who need surgical intervention and other medical treatments, sometimes acutely.

The experiences of my life as a mother of three children born during the 1970s, and as a wife to a busy surgeon for over forty years adds another dimension which colours my views of health professions and health professionals practices. During the last ten years, my own children and their friends have been having families, and during this time, I have interacted and observed their experiences as they transitioned to parenthood. I have also been interested in, and observed their interactions and their children's interactions with technology.

The medical influences in my background shape my perspective. My husband qualified at a time when a different style of healthcare provision was practiced. At that time, the gender roles and professional relationships between medical and nursing staff reflected a male dominated medical profession with female nursing staff as assistants. I have witnessed, supported and benefited from the radical changes in gender and professional areas that have brought greater equality forged by feminist and societal influences. This is not a feminist discourse, although the midwifery profession is almost entirely made up of women with strong feminist political beliefs. I needed to be reflexive about my attitudes towards a feminist profession, which has only in recent years become responsible for birthing and maternity care. From a privileged pakeha woman's perspective, I assume gender equality and not been subject to gender discrimination, although have seen women's role within the health professions strengthened by the strong voices of radical feminists (Coney and Bunkle, 1988, Davis-Floyd, 1993), particularly in the midwifery profession (Surtees, 2003: p.31-32, 68, Abel, 1997: p.35, 80, Hendry et al., 2006: p.63, Fleming, 1995).
During my early experiences of health, there were no mobile phones, or internet, although when the brick-type mobile phone made an appearance my husband was an early adopter, and saw this as a convenient way to be available, when on call, while not being physically present.

Within my husband’s private surgical practice, patient management systems, electronic data transfer and other technologies were adopted within this practice as they became available in the 1980s. I have worked in a healthcare setting and have been closely associated with the development and adoption of information and communication technologies within this private surgical practice for thirty-three years. In this position, I was able to observe patients, clinicians and healthcare provision and health informatics. I was a very early adopter of technology in this medical setting. This close involvement with the practice has enabled me to observe and interact with general primary practice and practitioners, and with secondary healthcare facilities, as they have gradually adopted health ICTs. Formal health informatics study and personal observation and involvement in the maturing web has influenced my knowledge of the ways and value that Web 2.0 and associated digital technologies have been found useful in health settings.

As these experiences have contributed to my views knowledge and values, it is important to declare and remain aware of my assumptions when considering data within this research.

My position as a health informaticist, working with both patients and health professionals, my experiences as a woman, a mother and the wife of a working surgeon have contributed to my experiences and ability to listen to both midwives and women’s experiences and attitudes to understand and co-construct influences and factors relating to this sociotechnical study.
I appreciate the multiplicity of different factors that shape attitudes, views and values held by individuals and groups of people as they act and interact. Temporal fluidity adds a dynamic to unseat certainty. It was my view that an interpretive qualitative study within the constructivist paradigm was an appropriate methodological way to explore participants' perspectives and take account of the complex sociocultural and organisational complexities that affect the participants. Constructive grounded theory method was considered and selected because it provided a mechanism and structure for the methodological stance and a consistent philosophical fit for the exploratory research process.

5.9 Rigour, validity and authenticity of grounded theory methodology

Cutcliffe considers suiting the method to the research study a pre-requisite of rigour, and approves of mixing methods to better suit research questions (Cutcliffe, 2000: p.1481). Gasson (Gasson, 2004) addresses the criticism of rigour in grounded theory method research by contributing a set of solutions and recommendations. She says that findings should represent the situation under study rather than the beliefs, biases and opinion of the researcher, although this statement is quantified by the remark ‘as far as possible’, the researcher's intimate role must be acknowledged. The importance of adopting a stance of ‘theoretical agnosticism’ was espoused by Henwood and Pidgeon (Henwood and Pidgeon, 2003: p.138), although the possibility of the researcher as a blank slate is strongly refuted (Urquhart and Fernandez, 2006, Charmaz, 2006, Mills et al., 2006, Fernando and Dawson, 2009). Further, Gasson emphasises that scientific positivist research and the interpretive approach differ in their understanding of ‘rigour’. She accepts that claims for generalisability cannot be made using the same constructs as those used by positivist methods (Gasson, 2003: p.98).
This study is set in time and place, which are impossible conditions to replicate. In the time since the original proposal, conditions have changed. The pace of change in information and communication technology is ongoing and rapid, as is the dynamic socially constructed reality of the actors in the study. Generalisability was not sought, as it is a positivist construct.

Patton (Patton, 2002) listed rigorous techniques, researcher competence, perceived trustworthiness, and paradigmatic and methodological suitability as areas to consider when assessing qualitative research. Appleton (Appleton, 1995) suggested enlisting the resources of experienced colleagues to review coding and concepts, but Cutcliffe claims a single view of categorisation is valid in interpretive research (Cutcliffe, 2000) and this PhD project, this research aligns with this perspective as a co-constructed understanding.

Reflexivity enhances validity and reliability (Hall and Calery, 2001). In addition to personal reflection throughout this whole research process, notes were made after each interview was transcribed. Transcriptions were usually completed on the day of the interview, when all aspects of the interview were fresh; therefore, location, surroundings and other impressions were carried forward. In the process of data collection and analysis, the relationship between researcher and participants must be transparent and equitable (ibid). The process of gaining ethics approval for this research project gave the opportunity for reflection on the personal qualities required to embark on the research and receive honest answers. The topic of reflexivity has been considered central to this enquiry and was seen as a way to procure my transparency and honesty within this research project.

Lincoln and Guba (Lincoln and Guba, 2003) dissected out ‘authenticity criteria’ they believe to be hallmarks of constructive research as fairness, ontological
authenticity, ‘catalytic authenticity’ and ‘tactical authenticity’. Fairness is the attempt to achieve balance and give all participants equal voice. The objectivist criticism of subjectivity is met with the retort that objectivity can be compared with a chimera: ‘a mythical creature that never existed, save in the imaginations of those who believe that knowing can be separated from the knower’ (ibid: p.279). Simple representations of the truth, such as conventional scientific methods in social science, may give readers the ‘dangerous’ illusion that truth is bounded and uncomplicated rather than messy and non-linear. Denzin (1994) has said that ‘in the social sciences there is only interpretation’ as ‘nothing speaks for itself’ (p.500).

5.10 Conceptual Framework guiding data collection

The conceptual framework of ‘Assets – Actions – Attitudes’ was developed to give structure and coherence to the thesis, and guided my approach to the interviews, which were semi-structured with open-ended questions to stimulate discussion.

Meso et al. found that accessibility to assets (ICT tools) influences the way in which they are used (Meso et al., 2005), while Fishbein and Ajzen’s theory of planned behaviour (Ajzen, 1985, Ajzen and Fishbein, 1980) links attitudes to behavioural intentions. This thesis was exploratory and was seeking a qualitative perspective rather than measuring items to test a theory.

Assets

In this thesis, ‘assets’ refer to tools their services for digital information and communication practices. As my research sought to explore participants’ perceptions and experiences of ICT, it was essential to understand the interviewee’s access and the availability of what I considered to be assets and to help me to understand the choices participants might make. Hardware such as mobile devices, fixed personal computers, laptop computers, photocopiers and

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9 ‘Catalytic authenticity’ refers to how the research process stimulates and facilitates the participant’s behaviour’. ‘Tactical authenticity’ refers to ‘the extent to which participants are empowered to act’ Schwandt, T. 1997. Qualitative inquiry: A dictionary of terms, California, Sage Publications.
facsimile machines were considered as assets. In addition, software and applications such as patient management systems were considered, although software common to computers such as emailing and word-processing software and browsers were not. Also, access to services such as landline services, fixed broadband, wireless broadband, mobile broadband, secure messaging, mobile cellular and 3G\textsuperscript{10} subscriptions were considered assets. 4G wireless technologies\textsuperscript{11} were not yet available in the study district, although in 2013 this very fast service is present in New Zealand’s larger cities.

**Actions**

For the purposes of this thesis, ‘actions’ refers to the practices of using information and communication tools. How the assets (especially mobile and internet technologies) were used in the everyday setting for both cohorts was of interest. In addition, midwives use of ICT in the professional role was captured, and women’s experiences of the use of ICT during their maternity experience. Actions were considered an important category as behaviours and interactions are associated with the meanings participants assign to their chosen assets.

**Attitudes, perceptions and experiences**

For the purposes of this thesis, ‘attitudes, perceptions and experiences’ refers to participants’ thoughts and feelings about any aspect of ICT. Interviews aimed to elucidate participant’s views (cognitive factors) and feelings (emotive factors) as well as capturing their perceptions and experiences of ICTs, as the study sought to understand factors that may or may not influence the use or non-use of these technologies. Attitudes and preferences for future use of ICT within the maternity setting were also of interest.

My research aims and research questions drove the selection of participants, data and data collection methods. In this case, LMC midwives and women were the principal participants and sources of interview data. Data is commonly in the

\textsuperscript{10} Defined in the glossary.
\textsuperscript{11} Defined in the glossary.
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form of intensive co-constructed interviews (Charmaz, 2006: p.16) depending on the purpose and objectives of the situation (Charmaz, 2006: p. 14). Figure 5.2 outlines the framework developed for the interviews of all participants.

![Diagram](image)

**Figure 5.2** Outline of the framework for the data and interview questions for both LMCs and women

5.11 Summary

1. Constructivist Grounded Theory Method was chosen as a method to orient this study as it is appropriate to the study aims and reflects my perceptions of the world.

2. Constructivist Grounded Theory Method (CGTM) reflects the basic beliefs of the constructivist paradigm of enquiry.

3. CGTM has evolved from the objectivist classic Grounded Theory Method although by contrast, it has roots in symbolic interactionism and assumes that reality is *co-constructed* by participants and myself as the researcher rather than ‘discovered’.

4. A conceptual framework was developed to structure the data collection and research analysis.
Chapter 6: RESEARCH METHOD

6.1 Setting for this study

Selecting and defining the boundaries of the study area is an important design consideration. The Hawke’s Bay District Health Board catchment on the East Coast of New Zealand is the setting for the study. The data collection area is bound by temporal, geographical, administrative and professional parameters. Here, the selection of geographical and administrative boundaries was guided by the accessibility of the data. Hawke’s Bay was appropriate because Hawke’s Bay is a provincial geographical area serviced by a typical, middle-sized DHB, if measured by the annual Ministry of Health performance achievements for DHBs (New Zealand Ministry of Health, 2012). The district contains rural and urban populations, and different ethnicities. Hawke’s Bay has a higher proportion of Māori than other areas of New Zealand. Māori people of Hawke’s Bay feature disproportionately highly in sub-optimal health outcomes, so research insights into reducing health inequalities are valued.

Availability of data is critical to any research process. As the research is a PhD study, and does not have the status associated with a major project, access to patient data and sensitive health areas was difficult. As a result, the health area selected was primary maternity care, provided by lead maternity carer (LMC) midwives. In addition, it was possible to collect interview data from midwives and women outside of the healthcare provider–patient situation. Midwives were interviewed first, and provided information in preparation for interviewing of the women who had recently used the service. Maternity care provided clinically and temporally defined boundaries by nature of the ~40 weeks a woman is in contact with her LMC. Women commonly approach a healthcare provider (either midwife or general practitioner) from 6 to 12 weeks after the start of a

Registration with a Lead Maternity Carer (LMC) is a contract in which the LMC is responsible for maternity services provided to the woman during pregnancy, birth and early postnatal periods, unless formal handover to another provider is necessary.

Constructivist Grounded Theory Method was used for data collection, treatment and analysis of data captured from two cohorts comprising midwives (1) and women (2).

6.1.1 The supporting infrastructure

Both the women’s and the midwives cohorts (figure 6.1) are enshrouded by the situational context. A ‘supporting infrastructure’, consisting of midwifery organisations and the New Zealand Ministry of Health influences the primary maternity service and these influences are considered in the discussion. Information and communication technologies were also influential and integral to the topic and pictured as the evolving non-human topic of interest.

Figure 6.1 Two cohorts and their contextual influences

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13 Digital information and communication transfer for this study will include both mobile and landline phone communication as landlines can be either digital or analogue.
6.2 Participant recruitment and sampling

My research centres on midwives and women in the Hawke’s Bay of New Zealand, so the selection of participants was restricted to that place and persons. It was necessary to locate ‘good’ participants to obtain good data (Morse, 2007: p.231). Morse (Morse, 1994) in Guba and Lincoln (Guba and Lincoln, 1994: p.224) defines a ‘good’ participant as ‘one who has the knowledge and experience the researcher requires, has the ability to reflect, is articulate, has the time to be interviewed, and is willing to participate in the study’.

The study focused on two groups as cohorts: those involved in either the provision or the utilisation of primary maternity services. Unlike statistical sampling for a qualitative research enquiry, I was not concerned with the sample size, rather that the participants were relevant to my investigation (Tavakol et al., 2006: p.2).

Qualitative research studies rely on selecting suitable participants to provide rich data, while quantitative studies rely on numbers. In grounded theory, theoretical sampling is often used. This strategy refers to the process whereby participants are selected after initial coding and as analysis progresses, on the basis of what data is needed to saturate categories and develop theory (Charmaz, 2006: p189). In a true theoretical sample, the data source evolves throughout the research rather than being pre-determined.

Midwives were selected purposively. ‘Purposive sampling’ is ‘a subset of some larger population constructed to serve some very specific need or purpose’ (Sommer, 2013). The participants were selected based on ‘preconceived notions of when, where and from whom the most fruitful data will come’ (Monsen and Van Horne, 2008: p.59). I identified and selected Hawke’s Bay LMC midwives on the basis that they provided primary maternity care in the target area, and so their contributions would be meaningful and relevant to my study goals. A list was compiled from various sources, and I systematically contacted each midwife to explain my research, request permission and arrange an interview. As data
was analysed, questions were modified (in keeping with CGTM practices), to explore and enlarge developing categories. For example, the developing category relating to midwives ‘feeling threatened’ was probed to elaborate on the underlying reasons behind this feeling.

The women cohort participants were selected on the basis that they had experienced primary maternity care within the six months prior to interview, had lived within the Hawke’s Bay Health catchment area and had a child as the result of that pregnancy. The sample was in essence a **purposive** sample. It was also a **convenience** sample as it was based on women who fitted the criteria, were selected by practice nurses as fitting the criteria as outlined, and who agreed to be interviewed. Midwives were not paired with women, although during the interview many women mentioned the name of their midwife. This data was disregarded.

The recruitment of people from outside of the midwifery profession may have incorporated a wider range of perspectives. The sampling method used in this study was not the classic grounded theory method of theoretical sampling, and I did not see this as a limitation within this research.

Although theoretical sampling was not used to identify participants, the data was relevant and reflected different levels of experience and a range of attitudes and values throughout both cohorts.

### 6.2.1 The midwives’ cohort (cohort 2)

The midwives’ cohort comprised 35 Lead Maternity Care (LMC) midwives, practising at the time of interviewing in Hawke’s Bay in 2010. All midwives were registered midwives holding an annual practicing certificate, working as independent businesswomen and receiving a fee for service from the Ministry of Health. They all had access to use the local DHB birthing facilities. LMC midwives are not the only group comprising lead maternity care to New Zealand women,
but this group was selected as they provided primary maternity care to women experiencing pregnancy and childbirth and they birth nearly all pregnant women in the Hawke’s Bay. Secondly, Lead Maternity Care midwives are the group of healthcare providers who care for women when they are pregnant, during birth and for six weeks following birth.

The Yellow Pages of the telephone directory, the New Zealand College of Midwives website and the Ministry of Health list of midwives were all used to locate and contact midwives in Hawke’s Bay. No single source listed all the midwives correctly because the workforce is very dynamic. Midwives were telephoned, given a description of the research and then invited to participate. A written description was available (appendix B).

Rural midwives in the Wairoa district were visited twice. The first time, I arranged a presentation of my research to garner interest, and then rang each midwife to request an interview. The presentation was a lunchtime session during which I gave a 30-minute talk and slide presentation about my research goals. Medical, nursing and midwifery staff attended this session, which was designed to be friendly and inclusive. A free lunch was provided to encourage attendance. I followed this talk with phone calls and as a result, interviews were arranged with two midwives who were practicing in Wairoa during this time. Another midwife did not agree to an interview. Later I found from discussion with hospital staff, that this non-participating midwife was ‘technophobic’ and unable to meet normal job requirements to the extent that her colleagues needed to assist her with data input and in providing other computing support. I was unable to probe further as this midwife was not willing to be interviewed.

6.2.2 The women’s cohort (cohort 2)

All women within the cohort had experienced primary maternity provision during the six months prior to the interview. They all lived within the catchment
of the Hawke’s Bay District Health Board at the time of the interview, and all had a child as the outcome of the pregnancy.

Fifty-five women in total were interviewed. All General Medical Practices in the catchment area were either visited or telephoned to request the names of women who had given birth within the last six months. I was directed to the practice nurses to outline my research and request names and contact details. Women were telephoned, given a description of the research (appendix B) and then invited to participate.

**Teen Parent Unit**

A local teen parent unit was approached to interview women under 20 who had used maternity and childbirth services in the last few years. It was important to include women from this group as it included a high number of young Māori women. Health research to investigate the needs of this ethnic group is valuable as young Māori mothers and their babies have high and complex maternity care needs with a higher risk of low birth weight, stillbirth and neonatal deaths compared with other ethnicities (Ratima and Crengle, 2013).

Teen Parent Units (Ministry of Education, 2011) are specialised educational units attached to existing high schools. They provide educational and social support to young parents who might otherwise face difficulties and be disadvantaged. Teen parents are at risk of underachieving owing to lack of learning, social difficulties and parenting obligations (Ministry of Education, 2013).

Ethical approval for the Teen Parent Unit was granted through a separate Plunket Society process, as this school was served by Plunket services.
6.3 Data collection

6.3.1 The semi-structured interview as the instrument for data collection

Interviews were chosen as the preferred and primary method of data collection because of the depth of meaning, understanding and insight that was sought in this exploratory study. Interviews are one of the most important sources of evidence for qualitative analysis and Grounded Theory Method (GTM) (Walsham, 1995b: p.78, Horton et al., 2004) and particularly Constructivist Grounded Theory Method (CGTM) (Charmaz, 2006: p.25-26). Interviewing allowed me to clarify participants’ experiences and the flexibility allowed me to ask both closed and open questions (Jarratt, 1996: p.7, McKenzie et al., 1997: p.21). Interviews started with questioning focused on demographic information and then moved to questioning aligned with my framework. It is worth noting that I allowed the sessions to develop in a conversational style. It was important that the participants’ were relaxed and open in their comments concerning experiences, attitudes, and perceptions of ICT.

Recording the interviews allowed me to go back over the sound file to elicit nuances that would not have been possible if the method of recording had been note taking. I preferred to record, then transcribe verbatim on the same day, and then imported the transcription into qualitative data analysis software (Nvivo). Unlike a structured survey, this format also gave me the flexibility to probe new leads and enabled the interview to go in a direction that allowed me to explore previously unconsidered dimensions categories that developed (Wengraf, 2001: pp.162-163).

Constructivist Grounded Theory proponent Kathy Charmaz emphasises the importance of setting the scene and conducting the interview in a manner that facilitates the collection of good quality data (Charmaz, 2006: p.27-29). The language used to frame the questions, and the pace, management and shape of the interview, affect the quality of data. A greater directness was necessary at the
start of the interview but a managed conversational type of interview was preferred as the interview progressed.

At the start of each interview, it was important to establish a trusting relationship. Considerable preliminary time was spent establishing rapport and explaining the informed consent process, which entailed discussing the issue of confidentiality in detail. There was no opportunity to conduct preliminary focus groups, and so the first midwife interviews were pilot interviews, in that I had intended to ask about ‘microblogging’\(^\text{14}\) e.g. Twitter, but none of the interviewees had hear of this application, and so the question was dropped. Before each interview, the general nature of the questions was discussed. I explained that I was the one who would be transcribing the files, and that a code would be allocated to each interview to ensure anonymity. At the initial transcription, midwives were coded using M001 onwards and women W001 onwards, and thereafter, the real names were dropped and codes were used. Participants were invited to ask questions before, during or after the interview, and it was explained that they did not have to reveal any information they might feel uncomfortable about.

I conducted the interviews at the time and place that suited the interviewee. This involved travelling to many homes and clinics situated throughout the urban and wider rural area of Hawke’s Bay.

Each interview provided the opportunity for reflection during the recording and transcription process and there was constant referral back to the research questions.

**Recording the interviews**

An Olympus DS-2400 digital dictation device was used to record interviews, which were downloaded directly onto the researcher’s password-protected computer. Audio files were in .dss format, which is an Olympus file type. The files

\(^{14}\) Short status updates.
were transcribed within 24 hours using an Olympus DSS Player Transcription module Version 1.0.3.0 and headphones into a Microsoft Word docx file. The device was placed clearly in view of interviewees and they were informed whenever it was turned on or turned off. It was switched on after the introduction, informed consent process and pleasantries and switched off at the conclusion of interviews. No written notes were taken during the encounter, however a description recording the time and place was written into the transcribed document.

**Interview outline and questions**

The initial interview questions were modified after the initial pilot interviews, and as work in the field progressed. The open-ended nature of questions, exploratory stance and constructivist grounded theory method (CGTM), with a focus on theory as understanding, guided my interview process. Focus questions 1 and 2 related to demographic data and availability, and access to hardware, software and services required direct questioning and quantitative answers, but because they were in the interview context rather than a survey, ‘why’ questions were possible. For example, 4 out of the 90 participants did not have a mobile phone, and the reasons they did not have one could be explored.

Figure 6.2 illustrates the information sought from midwives at the start of the interview.

![Figure 6.2 Demographic data captured during interviews with midwives](image-url)
Demographic data from women were also captured during the interview, as illustrated in Figure 6.3.

![Figure 6.3 Women's demographic data set](image)

During the initial interviews, a question concerning each midwife’s age was phrased as ‘Please tell me your age’. This question clearly made some midwives uncomfortable; so it was phrased ‘Which age group do you fall within?’ and a chart with 5-year age groups was provided. Women were asked, ‘Please tell me your date of birth?’ which produced no hesitations, possibly because ‘date of birth’ is such a frequently required demographic. Ethnicity was readily forthcoming. Participants could identify with only one ethnicity, even although more were applicable in some cases. New Zealand statistics data collection allows recording for three ethnic groups. Following the demographic data collection, questions and discussion on the hardware, software and services available were introduced. At the same time, it was possible to find out preferences, needs, and emotional responses.

### 6.3.2 Midwives’ data set interviews

Midwives as a group were interviewed before the women. It was important to understand how midwives provided the service. LMCs in the Hawke’s Bay region were recruited, all of them women, which is indicative of the almost completely female (99.8%) workforce (Pairman, 2010).

Midwives’ interviews took place either in the midwife’s clinic, her home, or a café. Thirty-three of the midwives were located in either Napier or Hastings, and
two in Wairoa. The reason for giving the interviewee a choice of time and place was to make the interview as relaxed and comfortable as possible. Interview recording times were between 35 and 65 minutes, with additional time for preparatory explanation, informed consent and greetings, before and after the interview. Thirty-five interviews from midwives were recorded. A further case was not included in the dataset because the midwife chose not to be interviewed. A brief conversation with the midwife and information during interview from colleagues determined the reason for refusal.

Interviews took place from November 2009 to October 2010. In September 2010, three first-year midwives were located who were not in the original list. It was important to understand newly graduated midwives’ views, attitudes and feelings and the way they practised to better understand women’s experiences. In total, 35 midwives were interviewed.

Although all midwives were offered the transcript, only one interviewee requested the printed transcription for perusal. In this case, the interview was conducted, transcribed and emailed on the same day. A brief response six weeks after the email confirmed that all of the transcription could be considered for analysis.

Remuneration for midwives
Prior to interviews, a local beauty therapy business and pharmacy were asked if they would donate a product to give interviewees. A small sample of skin cream was donated. It was usually given to the midwife during the pleasantries before the interview and this gesture helped to make the interviewee feel valued. Whenever the interview took place in a café, midwives were offered refreshments as part of the remuneration and in appreciation of their time. This gesture contributed to the relaxed, conversational style that was sought. The noise level in some situations had the potential to make the audio file difficult to
hearing on transcribe. However, choosing a quiet corner and placing the recording device closer to the interviewee prevented this problem.

**The interview setting**

Interviews were held in midwives' homes, in clinics attached to the home, in clinics within a medical centre, and in clinics in suburban houses that had been converted to dedicated midwifery centres. At the outset, the purpose of the interview was again outlined, and it was clearly stated the interviewer was not a midwife and had no political affiliations. Interviewees were informed the interview would be recorded and transcribed. The recording device was placed clearly in view and the interviewees were aware of when it was switched on and off. On two occasions, subsequent conversation was useful; so, with permission, this post-interview conversation was also gathered.

**Rural midwives**

To capture rural midwives it was necessary to travel and to stay in the Wairoa area for several days. To engage health professionals in Wairoa, a preliminary visit involved a lunchtime meeting and presentation of the nature of the research project to GPs, practice nurses and midwives. Two midwives in Wairoa were interviewed. In Wairoa (rural Hawke’s Bay) the LMC midwives work at Wairoa Hospital and are employed by the Hawke’s Bay DHB. These midwives care for Wairoa women throughout the antenatal, birth and postnatal periods, and deliver approximately 59 (2009) births annually. Women in a higher risk category are sent closer to the secondary birthing unit near the expected time of delivery.

**6.3.3 Women’s data set interviews**

Women were recruited through general medical practices. All general practices within Hawke’s Bay were contacted, the majority were visited, and documents were posted or faxed to the remaining practices, which had previously been contacted by telephone. After recruiting, women practice nurses faxed a contact sheet with the woman’s permission to arrange an interview. Women were contacted by telephone to arrange an appointment time. Eighteen women were
interviewed from February 2010 to May 2010. After transcription, interviews were entered into NVivo and analysis was initiated. A difference in attitudes and use of technology relevant to the women’s age was noticed, and it was appropriate to explore a cohort of younger women.

Most of the initial group of women were interviewed in their homes with their babies present. The presence of the baby made the interview less formal, and at times, the interview had to be interrupted because of the baby’s needs. This setting provided additional insight into socioeconomic background. Teen parents were interviewed without their babies present, at the Teen Parent Unit, where the young mothers attend school.

Teen parent interviews

Teen school administrators allowed students interview time during school hours. Interviewing took place over a month. As interviewing took place at the school, where they were supported by teachers and carers, they could be expected to feel safe and were happy to contribute. A local business contributed to the project by supplying a range of baby products. Products were given at the end of the interview in appreciation of the interviewee’s time. When the women returned from their interview to the classroom with a baby product, the next interviewee was eager to contribute.

Rural women were interviewed at the Wairoa Hospital.

6.3.4 Following each interview

Data management software was used for managing the files. Following transcription, each document file was uploaded into a qualitative data analysis package (Nvivo, 2013) for further analysis. Nvivo software is commercial software, which assists in qualitative data management by holding and supporting data organisation. Data can be text, as in this case, or mixed media format. Reading and becoming familiar and intimate with data is the essence of data analysis. Constant comparison and the ability of software to assist with the adjusting and changing of initial coding structures is an advantage, but the software alone ‘is not capable of the inductive-deductive cycle that is integral to
grounded theory generation’ (Gasson, 2004: p.79). I used Nvivo software to assist with data management in this research.

### 6.4 Data processing and analysis

CGTM involves the microanalysis of text, searching out concepts and variables behind the text, and then generating codes and categories. Data analysis started as soon as data has been collected. When conducting grounded theory method research, concurrent data collection, coding and analysis allow the researcher to become ‘theoretically sensitive’ to the data (Charmaz, 2006: pp.135-140, Calman, 2011). This allowed me to start the analysis process prior to the more detailed initial line-by-line coding of transcripts. Reflection is an important part of the grounded theory process. As I was both the interviewer and transcriber, I could reflect on the interview data and my interview skills.

#### 6.4.1 Coding

Coding is ‘the process of defining what the data are about’ and ‘a pivotal link between collecting data and developing a theory to explain the data’ (Charmaz, 2006: p.46). Coding involved studying the text for processes, actions and meanings, rather than for topics and themes (Charmaz, 2012b).

My CGTM coding process involved becoming immersed in the data to create the codes as opposed to conceiving the codes and assigning them to data. I remained cognizant of the need for theoretical sensitivity which Charmaz (2006: p.135) considers can be acquired by studying life from multiple vantage points, making comparisons, following leads and building on ideas. In chapter 4, I declared my constructivist beliefs which hold that reality is seen through a value-laden window, and that knowledge is socially constructed (Guba, 1990: p.21). It was important to remain self-aware and to acknowledge my experiences during the process of comparing codes, actions and categories. The categories become more meaningful, as properties of the categories were generated. During the later stages of coding, I looked for gerunds because gerunds prompt thinking about
actions and processes rather than individuals and types of individuals (Charmaz, 2006: p.136).

Figure 6.4 outlines the coding process. Coding up from data towards theory was achieved iteratively, as illustrated, rather than in incremental steps. Constant comparison was made between codes and categories, as well as in relation to raw interview data.

Coding data allowed me to interpret the interview data and convert the data into categories. During the process of categorising, I gave segments of data short names that both summarised and gave an account of the segment. Coding was the link between the data and the theory, giving me a condensed, abstract view of complex data (Holton, 2010: p.266).

During the initial stage, I went through transcript data and coded line-by-line and word-by-word (Charmaz, 2006, Gasson, 2003). Initially I sought non-theoretical information regarding the availability of ICT to both cohorts, and descriptive data. Charmaz suggests initial codes are provisional but serve to
capture actions and condense meanings to assist further analysis. As I transcribed further interviews, I continued coding. Focused coding is the second coding stage, where codes are more selective and conceptual (Charmaz, 2006: p.57). During this stage, I sifted the initial codes, while still making constant comparisons with other codes and original data.

Coding for both data sets sat within my framework of Assets, Actions, and Attitudes.

6.4.1. *Midwives’ codes*

As I interviewed and analysed data, codes and categories were created. During the first part of the interview, I established each midwife’s assets and actions. This section of the interview essentially remained the same. As interviews progressed, I was interested to enlarge on attitudes to ICT and enlarge on my evolving finding that midwives chose to use ICT for their own business use but were reluctant to engage digitally with women and reluctant to use digital information sources. In doing this, I tried to engage each midwife in a more conversational way to elicit attitudes. Figure 6.5 shows an early mind map of midwives’ actions. Categories relating to why midwives used different practice management software, and for what purposes generated categories that needed to be understood and compared with other categories. To assist the comparison, I used mind maps (X-Mind, 2013) and diagramming tools (Draw-io, 2013)

![Figure 6.5 Early coding mind map of midwives’ actions](image)
The codes named 'valuing autonomy' and 'balancing' needed further understanding and why midwives were 'driven by a business model' became more focused for me when they were represented diagrammatically. The flexibility of the software enabled me to easily reposition categories as I compared them both across other categories and went more deeply into each category (figure 6.6).
By the final interviews, I was satisfied that no further interviews would have given more insight into my categories, and the final categories for midwives within the Assets, Actions and Attitudes framework were as follows in figure 6.7. In CGTM terms, my categories were ‘saturated’ (Charmaz, 2006: pp.196-122).

**1.3 Midwives’ Actions (practice)**
- 1.3.1 Limited use of email (action)
- 1.3.2 Demonstrating variable skill sets (action)
- 1.3.3 Using Google in a sub-optimal fashion (action)
- 1.3.4 Using variable but mostly basic keyboard entry skills
- 1.3.5 Using the mobile phone in a basic fashion (action)
- 1.3.6 Using limited broadband and wireless internet access and use
- 1.3.7 Limited use of the mobile internet (action)
- 1.3.8 Intermittent sharing of internet sites with women (action)
- 1.3.9 Limited use of the internet to advertise services (action)
- 1.3.10 Resisting social media (Facebook) (action)
- 1.3.11Extensively using pamphlets and discussion as decision
- 1.3.12 Entering the same data multiple times (action)
- 1.3.13 Being a sporadic technical star (action)
- 1.3.14 Using the internet for personal requirements (action)
- 1.3.15 Freely choosing business processes and tools (action)
- 1.3.16 Freely choosing the place of work (action)
- 1.3.17 Choosing an appropriate caseload (action)
- 1.3.18 Catekeepers rather than facilitators of information (action)

**1.4 Midwives’ Attitudes: beliefs and perceptions**
- 1.4.1 Feeling insufficiently skilled and having difficulty keeping pace
- 1.4.2 Hesitant to access electronic information/knowledge (attitude)
- 1.4.3 Appreciating an easier way of submitting a biennial review
- 1.4.4 Feeling that women are well women (attitude)
- 1.4.5 Balancing work–life requirements (attitude)
- 1.4.6 Feeling pressure from professional bodies (attitude)
- 1.4.7 Threatened by transparency and needing a boundary (attitude)
- 1.4.8 Protecting the ownership of information (attitude)
- 1.4.9 Preferring to keep a low profile (attitude)
- 1.4.10 Preferring face-to-face communication over digital methods
- 1.4.11 Finding the computer intrusive (attitude)
- 1.4.12 Appreciating support from family (attitude)
- 1.4.13 Reluctant to invest financially in business tools (attitude)
- 1.4.14 Insufficiently supported technically (attitude)
- 1.4.15 Unwilling and unable to digitally share women’s information

Figure 6.7 Midwives’ categories

6.4.1. Women’s codes

As interviews and analysis progressed, categories were compared to determine dimensions and variations. For example, I was interested to find out how women felt about the call service. The category ‘not knowing normal’ was further understood, as women who phoned their midwife were unsure of whether their problem was urgent or not when a telephone operator queried the call. As it became clear that women did not have an opportunity to engage digitally with
midwives during their maternity care, their relationship with accessible ICT was probed.

Gen Z (described in chapter 8, under ‘Women’s generational status’) categories included ‘transient’ and ‘preferring mobile devices’. These categories suggested that Gen Z had different characteristics and needs, so it was decided to further explore and explain these concepts. During the selective sampling, I asked more structured questions to assist me to understand and refine the categories related to differences in the way women experienced their mobile devices. When women did not have a landline, further understanding led to this category being expanded, as women were transient and changing their place of residence. Figure 6.8 shows the women’s developing categories within the theoretical framework.

Figure 6.8 Women’s categories
It was also useful to constantly refer back to my original objectives and questions, which sought to explore midwives’ and women’s attitudes which included their perceptions and experiences with ICT, and understand factors that may or may not influence the use or non-use of these technologies. As I coded midwives’ data, and the way they used ICT, data that pertained to ‘why’ they may or may not use technologies the way they do were created.
6.4.2 Memo writing

Memo writing accompanies the coding process and provides the opportunity to document conditions relating to what is happening. Asking ‘who’, ‘when’, ‘what’, ‘where’ and ‘what are the outcomes’ questions provides a way of moving from description to conceptualisation of data (ibid: p.9). Writing memos assists in determining which initial codes are raised to tentative categories.

This process starts simultaneously with coding, and is a more abstract look at the data, and a step further towards theory development (Bex-Lempert, 2010: p.608). Memos enable the researcher to explore patterns, theorise and develop ideas. They are a fundamental link between data and theory.

The following mind map (figure 6.10) shows the memo ‘professional issues’ and a description of codes in this category.

![Figure 6.10 Memo for 'professional issues' during early coding](image)

Memos can be short paragraphs, or descriptions of meanings, concepts or relationships. They lead naturally towards diagramming, which is a more visual representation of the concepts and relationships between concepts. Again, mind maps and diagrams were used to understand and ask questions of codes and categories (figure 6.11).
Constant comparison was an ongoing part of the memoing process.

Examples of diagrams constructed during memoing (figure 6.12 and 6.13).
6.4.3 Developing the categories

During the data collection, coding and theoretical sampling, I went backwards and forwards through data, codes and categories, trying to piece together relationships. Women’s data collection and coding continued until additional interviews did not add to my further understanding of categories and ‘theoretical saturation’ was reached (Charmaz, 2006: p.96). The final stage of analysis involved reaching a theoretical understanding of the core categories and their relationships and reviewing my findings.

Theoretical concepts are the basic units of analysis from which theory is constructed. Charmaz describes a process relating more closely to the interaction between researchers and data (Charmaz, 2012: p.5). In this final stage, I merged the categories into theoretical concepts.
6.4.4 Theoretical saturation

Theoretical saturation refers to the point when gathering more data about a theoretical category reveals no new properties nor yields any further theoretical insights about the emerging grounded theory (Bryant and Charmaz, 2007: p.611). Dey (Dey, 1999: p.257) challenges the notion of ‘saturation’, preferring the term ‘theoretical sufficiency’ because ‘saturation’ insinuates completeness (ibid; p.117). Data collection stops when theoretical saturation is reached, meaning, more data does not bring forward any new insights (Charmaz, 2006: p.113). In some studies, saturation may be achieved after only a very small sample; however, in this study, a large data set was considered advantageous because as new perspectives arose interviews were modified. Interviewing concluded when theoretical saturation was reached.

6.5 Consideration of ethics

Research has the potential to adversely affect those involved (Cohen et al., 2011: p.50). Ethical considerations are of prime importance when conducting research studies and especially those involving interviews (Kvale, 1996). Ethical approval should be sought before data collection and was a prerequisite for this research. The four pillars approach to ethics was used as the underlying approach to ethical considerations for this study (Beauchamp and Childress, 2001). This approach is commonly used in clinical settings, but has wider applications. It is attributed to the American ethicists, Beauchamp and Childress (2001) and expounds four principles used as general guides in actual situations. The pillars are respect for autonomy, beneficence, non-malificence and justice.

The Central Ethics Committee of New Zealand granted ethical approval in September 2009. Ethical issues covered informed consent, confidentiality, storage of data, use of the information, potential harm to participants, rights of the participant to receive information, and participants’ right to decline. The effect this research would have on the tangata whenua was considered. A local iwi representatives and specialist in the area of cultural safety was consulted on my research proposal. Although this research was not solely
interested in Māori women, I was advised to collect women’s ethnic status as Māori births constitute a high proportion (45.3% in 2008) of births in Hawke’s Bay (Hawke’s Bay District Health Board, 2010: p.127) and insights into Māori health are considered valuable in New Zealand. Women in this ethnic sector give birth at a younger age and children born to young mothers are at greater risk for poor birth and health outcomes (ibid: p125).

Interviews involve interpersonal interaction. Respecting participant’s autonomy, ensuring they were comfortable and safe in the interview situation, and respecting and ensuring their privacy were considered essential throughout this study. ‘Ethically informed social research should be the goal of all social researchers’ (Blaxter et al., 2003: p.58). Ethical issues surrounding the interview process were addressed during the consent process, interview process and in dealing with interview data.

Conditions of the interview were outlined before each interview, and participants gave oral and written informed consent. Informants were invited to bring support person/s, and interviews were conducted in a location chosen by each interviewee. Questions were both closed and open-ended. Interviewees knew they were not obliged to answer any question they did not feel comfortable answering. Interviewees were known and selected by practice nurses in a primary care setting. Anonymity was assured by coding of interviewees during transcription, the transcribing being done by the interviewer and researcher, and the information stored on a private, password-protected, backed-up computer. Data was transferred to the University of Otago for safe storage for 7 years, after which time it will be destroyed. Coded transcriptions were made available to the supervisors of the research.

6.6 Summary

1. The setting for this study is the Hawke’s Bay District Health Board catchment area situated on the East Coast of New Zealand.
The source for data collection was bounded by the administrative context, professional context, place, time and health condition.

The study aim was to construct meaning by deeply understanding the data derived from two primary data sets.

Quantitative and qualitative data were sought from semi-structured interviews. Data sources were:

a. LMC midwives (primary data set),
b. Women who have used the primary maternity service during the six months prior to interview (primary data set),

Lead Maternity Carer midwives who were practising in the area were recruited by telephone (cohort 1).

Most midwives were interviewed before recruiting women.

General practice clinics in the Hawke’s Bay were contacted to seek the names of women who had experienced maternity service provision within the previous six months (cohort 2).

Ethical approval was sought to recruit women attending a Teen Parent School in the area.

The conceptual framework for the study and interview questions: assets – actions – attitudes.

Constructivist Grounded Theory Method guided data processing and analysis.

The ethical principles of beneficence, non-malificence, autonomy (informed consent) and confidentiality were kept in mind throughout the research process (Beauchamp & Childress, 2001a).
Chapter 7: FINDINGS FROM THE MIDWIVES’ DATA

This chapter presents and summarises the initial codes and categories derived from interviews with midwives. The first section describes demographic and professional characteristics of the midwife participants. The following sections describe midwives’ assets in terms of hardware, software and services they have chosen to use. The availability of ICT was ascertained before actions and attitudes were determined. Midwives’ actions or use of ICT within midwives’ practices and for their everyday use is then described. The fourth section captures midwives’ attitudes involving ICT, which are core to the central questions of this research.

Data presentation follows the core conceptual framework, (described in section two, chapter five), which was developed to give structure to the thesis and an approach to the interviews.

7.1 Description of midwife participants

This section describes characteristics of the midwife participants, in order to understand the group and tease out characteristics that may influence the use or non-use of ICT in their professional practice.

7.1.1 Midwives’ age groupings

<table>
<thead>
<tr>
<th>Midwives’ Age Range</th>
<th>Data sample</th>
<th>Percentage</th>
<th>National workforce data</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>n=4</td>
<td>(11.5%)</td>
<td>(4.6%)</td>
</tr>
<tr>
<td>30-39</td>
<td>n=6</td>
<td>(17%)</td>
<td>(17.4%)</td>
</tr>
<tr>
<td>40-49</td>
<td>n=13</td>
<td>(37%)</td>
<td>(35.9%)</td>
</tr>
<tr>
<td>50-59</td>
<td>n=10</td>
<td>(28.5%)</td>
<td>(29.4%)</td>
</tr>
<tr>
<td>60-69</td>
<td>n=2</td>
<td>(5%)</td>
<td>(11.6%)</td>
</tr>
</tbody>
</table>
Most cohort midwives were aged 40–49 (table 7.1), and this aligns with the midwifery workforce statistics (Pairman, 2010). All midwives in the cohort were female. The midwifery workforce is older on average than the whole national workforce (ibid). Direct entry midwives may be women who have completed their own families before commencing midwifery training, or young single women who have chosen to train to be a professional midwife (n=3).

### 7.1.2 Midwives' ethnicity

Table 7.2 Midwives' ethnicity group

<table>
<thead>
<tr>
<th>Midwives' Ethnicity</th>
<th>Data sample</th>
<th>Percentage</th>
<th>NZ workforce (midwives)</th>
</tr>
</thead>
<tbody>
<tr>
<td>European - New Zealand</td>
<td>n=23</td>
<td>(69.5%)</td>
<td>(65%)</td>
</tr>
<tr>
<td>Māori</td>
<td>n=4</td>
<td>(12%)</td>
<td>(4.6%)</td>
</tr>
<tr>
<td>South African</td>
<td>n=2</td>
<td>(6%)</td>
<td>(.5%)</td>
</tr>
<tr>
<td>Scottish</td>
<td>n=1</td>
<td>(3%)</td>
<td>(15.8%)</td>
</tr>
<tr>
<td>European /other</td>
<td>n=3</td>
<td>(9%)</td>
<td>(2.9%)</td>
</tr>
</tbody>
</table>

Ethnicity was self-reported, with only one option allowed. Midwives of European New Zealand origin dominated ethnicity. The sample group contained a slightly higher percentage of Māori midwives than the national group. In 2009, Hawke's Bay had five Māori midwives (4.2%). Hawke's Bay has a high percentage of births to Māori women and the slightly higher proportion of Maori midwives reflects the population make-up of Hawke’s Bay (table 7.1).

### 7.1.3 Midwives’ family status

Table 7.3 Midwives’ family status

<table>
<thead>
<tr>
<th>Midwives' Family Status</th>
<th>Data sample</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midwives with a young family</td>
<td>n=5</td>
<td>(15.6%)</td>
</tr>
<tr>
<td>Midwives with a teenage family</td>
<td>n=13</td>
<td>(40.6%)</td>
</tr>
<tr>
<td>Midwives with independent adult children</td>
<td>n=10</td>
<td>(31.2%)</td>
</tr>
<tr>
<td>Midwives with no dependent children</td>
<td>n=4</td>
<td>(12.5%)</td>
</tr>
</tbody>
</table>
Most midwives had teenage children living at home, which reflects the average age of midwives, 40–49 locally and the average age of 47 for the total New Zealand midwifery workforce (table 7.3). Midwives are able to choose their caseload and it is common for midwives with young children to reduce their load. For example, M032 had two young children while maintaining her practising certificate with a small caseload.

### 7.1.4 Midwives’ case load

<table>
<thead>
<tr>
<th>Case Load</th>
<th>Participants</th>
<th>NZ workforce (midwives)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40 = 2</td>
<td>n=2 (6%)</td>
<td>&lt;40 (30.2%)</td>
</tr>
<tr>
<td>40-49</td>
<td>n=5 (15.1%)</td>
<td>41-50 (19.2%)</td>
</tr>
<tr>
<td>50-59</td>
<td>n=7 (21.2%)</td>
<td>51-60 (17.6%)</td>
</tr>
<tr>
<td>60-69</td>
<td>n=6 (18.1%)</td>
<td>61-70 (12.3%)</td>
</tr>
<tr>
<td>70-79</td>
<td>n=5 (15.1%)</td>
<td>71-80 (7.2%)</td>
</tr>
<tr>
<td>80-89</td>
<td>n=5 (15.1%)</td>
<td>80-89 (2.9%)</td>
</tr>
<tr>
<td>90-99</td>
<td>n=1 (3%)</td>
<td>91+ (2.5%)</td>
</tr>
<tr>
<td>100-109</td>
<td>n=1 (3%)</td>
<td></td>
</tr>
<tr>
<td>&gt;110</td>
<td>n=1 (3%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 7.4 Midwives’ caseload

Participant midwives carried a higher caseload than the national average (table 7.4). Independent LMC midwives are able to choose the number and timing of cases. The NZCOM recommends a caseload of 40–50 births per year (Guilliland, 1999: p.38), although some midwives are able to practise safely with higher caseloads (Ministry of Health, 2008). This number varied widely, with some midwives taking only a few cases per year to maintain their practising certificate. Nationally, the overall average in 2005 was 44 and in 2009, 46.6. Many midwives work part-time, although the average time per week for caseloading midwives was 40 hours (Pairman, 2010).
SECTION THREE: Findings
Chapter Seven
Midwives’ Findings

7.1.5 Midwives’ registered nurse status

Table 7.5 Midwives’ registered nurse status

<table>
<thead>
<tr>
<th>Midwives’ Registered Nurse Status</th>
<th>n=35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered nurse</td>
<td>21   (60%)</td>
</tr>
<tr>
<td>Direct entry midwife</td>
<td>12   (34.2%)</td>
</tr>
<tr>
<td>Comprehensive nurse</td>
<td>2    (5.7%)</td>
</tr>
</tbody>
</table>

Direct entry midwives\textsuperscript{15} may be women who have completed their own families before commencing midwifery training, or young single women who have chosen to train to be a professional midwife (n=3). In this sample, n=12 (34%) women had trained as a direct entry midwife, and these women were not registered nurses (table 7.5). The cohort had a higher number of registered nurses than the national average, although not all had a current annual practising certificate. The question asked of the sample group was ‘Are you a registered nurse?’ Once a nurse or midwife is registered, they are registered for life, but separately require an annual practising certificate to practice nursing or midwifery. Maintaining practising certificates requires time and effort as each profession requires evidence of recent hours spent and competency.

7.1.6 Midwives’ professional experience

Table 7.6 Midwives’ professional experience

<table>
<thead>
<tr>
<th>Midwives experience n =35</th>
<th>Data sample</th>
<th>NZ workforce (midwives)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 years</td>
<td>n =6</td>
<td>&lt;5</td>
</tr>
<tr>
<td>5-9 years</td>
<td>n=4</td>
<td>6-10</td>
</tr>
<tr>
<td>10-19 years</td>
<td>n=16</td>
<td>11-20</td>
</tr>
<tr>
<td>&gt;20 years</td>
<td>n=9</td>
<td>&gt;21</td>
</tr>
</tbody>
</table>

These figures show a slightly more experienced local sample workforce than national workforce, with over 70% (56%) having more than 10 years’ midwifery experience, and 25% having over 20 years of practice (table 7.6). Direct entry midwives have been through midwifery training only and very few are trained nurses.

\textsuperscript{15} Direct entry midwives have been through midwifery training only and very few are trained nurses.
midwifery is the usual pathway to registration now, and the ratio of midwives who have qualified through the direct entry programme is increasing as those with dual qualifications retire.

### 7.2 Midwives’ Assets (infrastructure)

Midwives were questioned about the hardware, software and service resources available to them as this reflects their assessment about the cost-effectiveness and self-perceived value of the assets to them and their business practice. Individual midwives are owner-operators of their private practices, free to make a personal business choice whether or not to purchase technology, and how they use it.

#### 7.2.1 Midwives’ computer assets (hardware)

Table 7.7 Midwives’ computer assets (hardware)

<table>
<thead>
<tr>
<th></th>
<th>n=32</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Home PC only</td>
<td>n=4</td>
<td>(12.5%)</td>
</tr>
<tr>
<td>Dedicated laptop</td>
<td>n=21</td>
<td>(65.7%)</td>
</tr>
<tr>
<td>Laptop with mobile dongle</td>
<td>n=2</td>
<td>(6.2%)</td>
</tr>
<tr>
<td>Hospital computer system</td>
<td>n=2</td>
<td>(6.2%)</td>
</tr>
<tr>
<td>Corporation computer</td>
<td>n=3</td>
<td>(9.4%)</td>
</tr>
</tbody>
</table>

All midwives had access to a computer, with 65% having a dedicated laptop (table 7.7). Most midwives had a computer present in the consulting room although one midwife, who was close to retirement, had a home computer and relied on her husband to assist. The computer was used to send and receive email referrals and reports to and from outpatient clinics.

I: You said that you don’t use emails, but you get your husband to print it off. Do you write emails yourself?

M029: No, but if I want them sent ....(husband) will send them for me.

A group of three midwives (M007, M008, M009) provided midwifery services as part of a Māori corporation, and used a desktop PC, which was owned by the
corporation. These midwives practised from different clinic locations, and desktop computers were available in each location.

### 7.2.2 Midwives’ mobile phone/smartphone assets (hardware)

<table>
<thead>
<tr>
<th>Mobile phone</th>
<th>n=28</th>
<th>3G plus data plan</th>
<th>n=1</th>
<th>(2.8%)</th>
<th>Smartphone</th>
<th>n=3</th>
<th>(8.5%)</th>
<th>Shared hospital phone</th>
<th>n=2</th>
<th>(5.7%)</th>
</tr>
</thead>
</table>

All midwives used a mobile phone (table 7.8). M030 and M031 shared cellular phones owned by the hospital for their professional role, as women were given one number to ring to reach the duty midwife. As the phones were constantly being handed over to the midwife on call, text messaging was not a reliable way to communicate with women.

### 7.2.3 Facsimile (fax) and photocopying machine assets (hardware)

The use of a multifunction fax machine was a common method of information transfer, although specific use varied. All midwives had access to this hardware and they were used extensively as a ‘hands-on’ and ‘hard-copy’ way of dealing with stored data. Midwives chose to use a fax machine to send information to Plunket centres and general practitioners, at discharge, and to receive laboratory results and scan results. Forms and referral letters were sent to the hospital using the fax machine, or delivered in person when the midwife would normally be at the hospital. Specialist letters from the DHB were sent by fax until authorities considered fax was not as secure as email. Fax documents would arrive at an unsecured office. Birthing plans were photocopied and then faxed to the hospital. Clinic rooms were likely to have photocopy and fax facilities, but not shared internet facilities.

Photocopying of notes was common especially at the end of the care, when midwives would photocopy a set of the woman’s maternity notes and either gives the woman the hard copy or keep it for herself.
7.2.4 Pamphlets (hardware)

Pamphlets played an important role in dissemination of information to women. These were evident in the waiting room or easily accessible within the consulting room. The Ministry of Health, midwifery organisations, DHB, Plunket, and other health bodies produced the pamphlets, which had information for pregnant women. Commercial organisations, such as an organisation offering blood banking of cord blood, and companies with goods and services targeted at pregnant women also produced printed matter. Midwives used pamphlets to inform women and initiate discussion on positive pregnancy, preparation for birth and preparation for parenting. According to M008, many of the women are not interested in reading and just throw them into the rubbish bin.

7.2.5 Women’s hand-held note booklet assets (hardware)

Most midwives provided women with handheld notes, although the degree of detail in the notes varied. A small booklet, *You and Your Pregnancy*, recorded demographic data, contact details, pregnancy history, medical history, checklist for care, laboratory results, weight and movement records, simple advice and appointment record. Midwives who used this booklet felt it was sufficient in the event of another midwife attending the woman. At the end, it was often photocopied for the midwife’s records and the booklet given to the woman to retain.

Midwives have a professional obligation to give women hand-held paper notes. This obligation can lead to the recording of basic data in triplicate (M025): the women’s hand-held copy of her notes; the midwives’ hard copy of the women’s notes, and the same notes entered onto a Patient Management System. Triplicate data entry of information collected at a consultation is at odds with midwives’ aim to achieve efficient systems and overcome the burden of paperwork (M001).

*M002* I don’t want to go home in the evening and spend two hours on the computer when I have worked eight hours. That is my home time with the family. I guess if the kids were not there, it would be a different story. Some of the midwives you should interview are much more into the computer than I am. Some of them are really into it.
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7.2.6 Practice management software (PMS) assets (software)

Table 7.9 Midwives’ practice management software (PMS) assets

<table>
<thead>
<tr>
<th>Patient Management Systems Used By Midwives</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMPO Maternity Plus</td>
<td>24</td>
</tr>
<tr>
<td>Medtech 32 and MMPO</td>
<td>3</td>
</tr>
<tr>
<td>Medtech 32</td>
<td>3</td>
</tr>
<tr>
<td>My Practice PMS</td>
<td>1</td>
</tr>
</tbody>
</table>

Most local midwives use MMPO Maternity Plus practice management software (Briggs, 2011) (table 7.9), although many functions of the software were not fully used and not all midwives were happy with this software. Three midwives practicing within a large medical practice each used two computers in the consulting room, Medtech 32 on the medical system and MMPO for maternity information. Information was sometimes entered into more than one system, and two sets of hard copy notes, one for each woman and one for the midwife, were sometimes used. One midwife (M018) felt very progressive regarding technology. She had a smartphone and data-roaming stick and used (Healthlink, 2013) My Practice PMS, which had only recently been installed. She was still in the process of learning the new system, having switched over to one system in the week before the interview.

There is no professional obligation for midwives to use electronic systems, as all administrative functions can be paper-based, and some midwives felt more in control by using this method.

7.2.7 Healthlink assets (services)

Table 7.10 Healthlink assets (services)

<table>
<thead>
<tr>
<th>Number Of Midwives Using Healthlink n=35</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthlink subscription</td>
<td>12</td>
<td>(43.2%)</td>
</tr>
<tr>
<td>No Healthlink subscription</td>
<td>18</td>
<td>(51.4%)</td>
</tr>
<tr>
<td>Hospital system</td>
<td>2</td>
<td>(5.7%)</td>
</tr>
<tr>
<td>Corporation computer</td>
<td>3</td>
<td>(8.6%)</td>
</tr>
</tbody>
</table>
Most midwives did not use Healthlink software (table 7.10). Healthlink (Healthlink, 2013) is a private New Zealand company providing secure electronic transfer of health information between health providers. It has provided a service since 1993. Midwives who were affiliated with, or had premises in, a larger corporate structure used Healthlink, while midwives who had independent rooms were least likely to use Healthlink. Midwives were used to receiving hardcopy laboratory results and these were kept as part of the midwife’s hard copy or inserted into the woman’s notes.

Cost deterred M007 from adopting an electronic laboratory reporting.

M007  *I don't need to spend that money at the moment. I have my wedding coming up in January and I have got far too much to save for. An extra $30 a month at the moment, I don't need to spend. But possibly next year, I will do it. Plus I get my results now. I get results hard copy.*

<table>
<thead>
<tr>
<th>Number Of Midwives Using Broadband n=35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to broadband n=35 (100%)</td>
</tr>
<tr>
<td>Access to broadband in while consulting n=18 (51.4%)</td>
</tr>
<tr>
<td>Access to mobile broadband n=3 (8.6%)</td>
</tr>
</tbody>
</table>

All midwives could access the internet at home, although not all could access the internet in the consulting situation. The mobile internet was available to three midwives (table 7.11).

### 7.3 Midwives’ Actions (practice)

#### 7.3.1 Limited use of email (action)

Email was available to all midwives and used by many to send patient referrals to outpatients’ clinic to secondary care, and for receiving consultant reports in response to the patient referral. Letters were generated in a word document, although many midwives did not know how to use a template that could
populate the letter with demographic information. This was a frequent cause of frustration.

_M006_ My referral letters are in Microsoft word. MMPO have templates. That is one HUGE void in their system. We just use the basics. And I actually have a meeting on line. She actually volunteered to train me. I need to know how to use the system but I still don’t know how. [Frustration]. I need to learn. That will make life much better.

Although emailing to outpatients was common practice, hospital administrators stopped this practice for security concerns. It was re-instigated after discussion, as midwives found it convenient and some considered it was safer than faxed information left unsecured in a clinic.

_M001_ We got a letter saying emails were not secure and that we should not be getting consultant specialist letters by email, so they started faxing them. They were coming through at work on our general fax machine and I rang. I can’t remember if I wrote a letter. I just moaned and groaned at staff meetings. I said this is not good and what is wrong with an email compared with a fax machine where it is left at work and people have to come and get their faxes from work?. Why can’t you email? So anyway, they have only just gone back to emailing probably the last couple of months. So now we are back to sending emails.

The use of email was minimal.

_M011_ Minimal. Mainly clinics, to the hospital clinic. I send them a fax and also email. I just use ordinary email. Not encrypted.

_M003_ I mainly just receive emails (from the hospital outpatients). I don’t use it that often.

_M006_ Not a lot. I am beginning to email the referral letter for the clinic. Sometimes I print it off and the booking form, and in an organic way, with a real signature. I have to develop a signature on the computer. I still have to work out a template for my letter.
Email was also used for academic pursuits. A midwife doing postgraduate study used email to send assignments and communicate with the educational institute.

*M013* I went down for a few days and you just email them back and forth.

M018 checked her email inbox only every few days, and did not want to have to check anything else regularly. Although she had a smartphone, she was not in the habit of checking emails on the smartphone.

*M018* I don’t use email on it (HTC Titan smartphone). I have email here and email at home and I don’t really want anyone to email me because sometimes it is two days before I have checked it. And actually, I have only ever had two women who have emailed me. And one of them was a Chinese lady. And I mean, you would feel terrible ... sometimes I get these emails and I go ... oh no ... there is an email there. I haven’t checked it for two days and I don’t want something else I have to check.

M033 also has a smartphone, and does not use for reading or replying to emails. The smartphone was used just for functions that could be performed by a mobile phone that does not have smartphone functions.

*M033* I just use it as a normal phone. It does have the capacity to have my emails as well. But the data collection; I just turn it off because I have the internet and wireless at home, and to have the data collection on that is quite expensive. My emails are not that pressing that I could not wait until I get home.

Not checking emails was a good reason for midwives not to receive emails from their clients.

*M002* No, no, no, no, no. I don’t check it regularly enough.

Another professional use of email was to generate from within the MMPO practice management system for claiming remuneration.

*M016* Ummm, I use email a lot. Not so much in my work (midwifery) setting. The only thing I use email for is when I attach documents to MMPO so my ... for my
claiming. I do claiming through the data program, and attach it and send it off. In terms of my other role, I email all the time.

M030 I email my claims through email.

Midwives who claimed electronically found the freedom and timesaving of this method valuable.

Two midwives (M029, M008) still claimed by filling out paper forms and posting them to the Ministry of Health funding body, Sector Services. They valued the 'thoroughness' of this method, and found the control they experienced by using this system satisfying.

M008 I do all my own claiming and do all my own bookwork and stuff. I use the ones already printed out in the book they send you. I do mine manually. I like to keep an eye on my books and my claims and everything. Then I know where I am.

I do those with a HealthPac form. That works out fine. I actually know more in-depth, who I have been paid for, who HealthPac has forgotten to pay me for. Because I have a little system set up where I keep all the overdue payments. Outstanding payments and they tally up when the forms come. Whereas people who act through an intermediate organisation just get a lump sum payment and they say "I don't know if I have been paid for that person" and I think "no" you actually need to know that you are being paid for your work.

Midwives did not allow women to email them. Midwives’ email addresses are not readily available and are not given out by midwives.

M005 Mobile phone only. I don't let them email me, I don't let them call my home phone or anything like that.

M027 I am not doing any emailing stuff or internet stuff, definitely not with my ladies who are booked with me.

Outside of professional midwifery practice, midwives used email ‘a little bit’ for communicating with their families.

M011 Yep. Just for social contact with family.
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**M012** Yes, a little bit? (But not in midwifery practice.)

**M028** Um, yeah, I use it but not so much for work. The New Zealand College of Midwives uses email to pass on information.

Midwives much **preferred to ring** each other rather than communicate via email.

**M004** We don’t tend to email each other. We would rather ring. Emails we get are from the College and from the hospital.

Although M029 did not use the computer, she received outpatient’s emails printed off by her husband then filed them in her hard copy notes.

I Do you write emails yourself?

**M029** No, but if I want them sent (husband) will send them for me. We have a computer in the house and I do get emails from some people but my husband just prints them off and gives them to me, ...(laughs) and I use Google for looking up information.

M009 faxed letters rather than emailing them, as her computer skills were limited, and M017 was **not confident with her computer skills**.

**M009** I will write a letter on the computer, print it off, and fax it. I haven’t emailed anything. My technology, umm, is very limited.

**M017** I have a word document that I have made up. It is probably not that brilliant.

M030 felt that she **might have further uses for email**, but currently it is not used.

**M030** I don’t use it as much as I could.

Some midwives simply **didn’t use emails very often**.

**M014** Minimal. I probably have about one client a year that would access me via email.
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M0013 Intermittently, for personal and work. So, I get emails at the hospital about education and things that are happening. And, I am studying at Victoria University so I get emails through from them.

Summary:
Midwives used email for professional and business requirements. Besides using email to and from hospital outpatients, most midwives used email for claiming financial re-imbursement from Sector Services through the Midwives and Maternity Providers Organisation (MMPO). Payments were made directly into midwives’ bank accounts. This function was highly valued by midwives as it saved them time and effort. Some received emails from the NZCOM and other professional emails, but many did not regularly check emails. Two midwives with administrative roles and another at studying at postgraduate level used email in these capacities.

7.3.2 Demonstrating variable skill sets (action)
Midwives’ technology skill, assets and interest varied widely. Some had no time for, nor interest in, technology, yet another group saw themselves as early adopters. During the interview, midwives were shown an A4 paper with a bell curve diagram of a Rogers’ diffusion of innovations (Rogers, 1995), depicting five levels of uptake—innovator, early adopter, early majority, late majority and laggard. Midwives were asked where they would place themselves on Roger’s diagram. Most midwives placed themselves in the ‘early majority’ bracket, with four assessing their adoption as ‘late majority’. There was a tension between their actions of not, for example, using mobile broadband and the self-perception of their uptake of technology. The midwives’ self-assessments are placed above the normal distribution of the bell curve (figure 7.1).
7.3.3 Using Google in a sub-optimal fashion (action)

All midwives used the internet to access information via Google. Most accounts of searching were descriptions of just putting in a few words. These accounts are in keeping with researched information on information retrieval methods, which show that searchers’ actual search performance contrasted with self-reported skill levels (Ivanitskaya, O’Boyle & Casey, 2006).

*I* If you don’t know something in midwifery, what do you do?

*M030* (laughs)….I am trying to think of an instance. I have probably Googled a few things. But mainly things that are not midwifery related.

Using the Google search engine to ‘google’ information was common, as was using key words. Midwives searched for information in the same way that other women did. Widely different search skill levels were described, with recent graduates and midwives with postgraduate study experience speaking more knowledgably about the internet and searching. Most were satisfied with the way they searched.

7.3.4 Using variable but mostly basic keyboard entry skills

Keyboard skills varied, with some midwives being at ‘two-fingered’ data entry level and a few having advanced keyboard skills.

*I* How would you describe your keyboard skills?

*M007* No, I am a 2-fingered person. I do all of my own. We all do our own. It is very easy.
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M006 Not all can type but I am blessed because I can type fast while I still talk.

Some midwives entered data when women were with them, while others did not want to have a computer in the consulting situation and preferred to write notes.

M035 I don’t like to enter when the woman is here, look at the computer when the woman is with me and so I will just write. I find it better communication with the women when I am writing, rather than turning my face to the computer. I try to update in real time actually. When the woman goes, I will do my computer. If it is a lot of work, I will do it at home.

M002 wrote two identical sets of notes when with the women, and entered information into a home computer.

M002 I do my Napier visits and write them into my notes and then I put them into the computer at home at night.

In discussion, midwives showed interest in voice recognition software, but had no experience.

7.3.5 Using the mobile phone in a basic fashion (action)

All midwives had a 3G mobile phone, although it was used functionally as a 2G mobile phone for voice calls and for receiving and sending text messages. For midwives using a call service, text messages can be received and responded to with a phone call, according to the level of urgency. Two midwives with smartphones had the skills to download and use apps, but the exact level of skill with the smartphone was not probed.

Midwives with smartphones did not read their emails on the phones. They read their emails on laptop computers every 2-3 days. Midwives were not high volume users of text messaging.

7.3.6 Using limited broadband and wireless internet access and use (action)

All midwives had an internet connection and access to broadband. Most had wireless access at home, however not all had access to the internet in the clinic where they consulted. With shared rooms or temporary hired rooms, an internet connection was an unnecessary expense. Midwifes frequently change work
circumstances and move premises or practices, and it is more complex to move if they share an internet connection with colleagues.

There is no wireless network. We did have that option but because all of us are self employed and because my husband and I own the house. We bought it as a clinic room and because everyone wanted to be independent and no one wanted to share the cost of running it.

M029 was reluctant to use a computer, had no patient management system, and claimed manually. Her husband managed any emails that came to the shared home computer.

7.3.7 Limited use of the mobile internet (action)

M001 used a Vodafone vodem\(^\text{16}\), which enabled data roaming on her laptop. It was useful for downloading Healthlink results at the clinic, where there was no internet access, but she found it to be expensive. M001 was excited to think she was at the forefront of using technology, and impressed her colleagues by being able to download emails at a workshop.

M001  And I went to one of my mentor meetings in Auckland and was sitting there afterwards downloading emails and checking lab results and somebody went "oh have a look at this". They were all excited that I could just download my mail. "Wow you can do it anywhere".

M005 consulted without internet access but used a smartphone to access the internet instead of a data-roaming stick. However, it was used only as a diary and to access apps relating to Estimated Date of Delivery.

M005 proudly used an android OS smartphone to access the internet.

M005  My mobile is the Vodafone HTC, so that is why I am using it for my phone, for my diary, I use it for Internet at work when I need it. It is getting so easy now to use internet on them it is not worth going and buying a memory stick. It is a Vodafone HTC magic and has Google on it. All touch [brings up the internet and

\(^\text{16}\) A Vodafone vodem is a portable device which plugs into a laptop computer and enables cellular multimedia data transfer.
M018 enjoyed owning an Android OS smartphone, although she was using a modem on the laptop to access the internet in preference to the smartphone.

### 7.3.8 Intermittent sharing of internet sites with women (action)

Some midwives gave women the names of internet sites, although some discouraged women from accessing information on the internet.

_M018_ I had another girl about a year ago whose baby had almost like a hole that was in the skull and even the paediatrician hadn’t seen it. It had scans to see how far it went through. I said, ‘Don’t go on the internet. Wait until you have had the scan, but don’t go on the internet’ because that is what she would have done and sat at home worrying, instead of doing everything normally. If she had read the internet site and read all the things it could be, she would have got herself worried sick.

### 7.3.9 Limited use of the internet to advertise services (action)

The most common way for midwives to advertise their services is via the Yellow Pages telephone book and internet pages.

_I_ How do women find you?

M029 found the Ministry of Health were slow in changing the records of currently available midwives.

_M029_ How do they find out my phone number? Ummm… there is the Ministry of Health have an 0800 number MumsToBe which has it. The Ministry of Health are very slow at changing their records and sometimes you have to ring 4 and 5 times. I did ring for it to be discontinued before I went away.

Other midwives used the Yellow pages.
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*M004 They get my number from either whoever, one my colleagues GP, yellow pages. They ring me up.*

*M015 Yellow pages. Cards, Hospital.*

*M017 There is that...Council one, that has a list of all midwives. In the area and the yellow pages. They do that on line as well. I don't put in my home number as well. I have my cell phone number.*

Because of frequent changes, the information is not always current. Most group practices are advertised as a group, with one number to ring, but several midwives who practice within a group, have entries under their individual names, with links to Google maps. The New Zealand College of Midwives has a ‘Find a midwife’ section on their website, but most midwives to not use this site to list their services. There was no comprehensive list of Hawke’s Bay midwives available on the internet and most midwives assume women find them through the Yellow Pages.

One midwifery group of two has a simple website with comprehensive links and clear contact directions (Kneghtmans, 2011) with the facility to send an email to the midwives.

It is very difficult indeed (personal experience) to find the contact details of midwives in Hawke’s Bay.

**7.3.10 Resisting social media (Facebook) (action)**

Table 7.12 Midwives’ use and attitude towards social media

<table>
<thead>
<tr>
<th>Midwives use and attitude towards social media</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Active for personal use</td>
<td>(14%)</td>
</tr>
<tr>
<td>Subscribed but not in use</td>
<td>(16%)</td>
</tr>
<tr>
<td>Coerced by family to subscribe</td>
<td>(8%)</td>
</tr>
<tr>
<td>OK for other people</td>
<td>(48%)</td>
</tr>
<tr>
<td>Horrified at the thought</td>
<td>(14%)</td>
</tr>
</tbody>
</table>
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Midwives have not embraced the use of social media either for professional use or for personal use (table 7.12). Some were horrified at the thought of using Facebook.

Midwives were asked about their presence on social media.

Some midwives are just not at all interested.


Midwives commonly ‘did not have time’ to engage with social media.

M016  I actually don’t seem to have a lot of time to do that and I am on Facebook but I don’t engage in it. (laughs)...I have got no photo, I don’t actually engage in any kind of any of that activity really. I am really not quite sure about spreadsheets. But no.

M001  I hate them but my sister got me into that so I have been. I am not very good at it. I don’t have time to do a lot of that. Don’t like them.

Some ‘did not feel the need’ or ‘did not want to be available’.

M031  No I am not. I know about them. You know what ...I am so available 24/7 that I actually want to resist anything that makes me even more available. You know what I mean? And so I am probably fairly resistant to trends in technology.

M003  Facebook. But I don’t use it. No. No need.

Some midwives are ‘on’ Facebook or social media but do not often want to use the sites.

M004  I am on Facebook (laughs).

I  You use Facebook and Skype quite extensively?
M004  (laughs) ...not likely.

M005 has registered for social media but doesn’t want the exposure they would bring.
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M020  I don't like using Facebook. I have got Facebook up. My daughters are using it for me. I don't like Twitter. A couple of my clients have wanted to acknowledge me on Facebook but I have ignored them.

M011  Facebook occasionally because my daughter is on Facebook. Not for photo sharing though.

M017  No, nothing like that. Occasionally I use the internet.

M018 was an exception as she did not mind how women contacted her. Midwifery played a big part in her life and this role and her role as a mother were inextricably inter-twined.

M018  No problems. I guess all my women have my home number as well. I want them to be able to contact me. I don't care how they contact me, as long as they can contact me. Some people are like...noooooooo home life and work life. My midwifery is my life.

Others were signed up but seldom used social media.

M021  I use Facebook a little bit for personal use only.

M033  Not so much in midwifery terms I guess. As a graduating class my other midwives and I do have a private Facebook page so we could keep in touch when we were out on placement. I don't use it now. I forget it is there. I have my email but nobody has emailed me.

Some midwives were quite horrified at the thought of being exposed and participating or sharing in the Web 2.0 environment.

M006  No definitely not. I am still not that clear when it comes to all of that stuff. But I must say mostly for work and for email. My information comes from the midwifery magazine that we get. College of Midwives. A nice magazine with articles.

M014  Yes but not really. I don't use it. Drives me batty, I am not interested. I'm not at all interested in Facebook or internet.
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M012  Heavens no... (laughter) ...I do Google the odd bit, maybe once or twice a month. The women seem to enjoy them. It is really interesting. You can tell the women who are doing it by when they come into the room you will say, “I am 21 weeks and 3 days” and that is directly off the Internet. So often for women, they will often hear only things that didn’t go so well or difficulties, which is not in perspective with the 70% of women who go ahead and have babies and haven’t got time to write on the Internet. That is a useful tool for helping with their healing but not necessarily useful for women having a normal birth.

M022  NO! [LAUGHER] I probably would be horrified if I was on Facebook. The young ones. Yeah they are, ...mmmm the young ones are into the texting or twittering and the Face-booking and the whole sort of thing. I don’t particularly want to get into the social network side of that. I am not into that at all.... No I don’t.

M030  NEVER! NEVER!

M022 is conscious of security and did not want a public profile as a midwife.

M022  I am security conscious. I am aware of being in the public and bits and pieces as a midwife anyway, so tend to try and stay away from those things.

Some midwives just did not like using technology.

M024  No. My family are always asking me to because they are in Britain. ....but.....(laughs) – I am not a screen person you know – it is not my thing. I think for me we have an office and it is at the back of the house and it is small and I don’t know...I am just thinking of Skype at the moment. I don’t feel like sitting in there with my daughter talking to a screen....laughs....I don’t know....a few times I have thought about it and I got around to buying a mini camera...but....(laughs)...it is not my thing.

M026 found social media was impersonal.

M026  No, I don’t. I have been invited to by people. I like face to face. My brother invited me to be his friend on Facebook and you know I am not your friend ... I am your sister
M027 did not want to feel organised by other people, so did not use social media.

*M027*  Only Facebook but I am not on it every day or anything. No, not really, no no, because I know people try and organise me through Facebook and they learn pretty quickly that I may not be on for a week. I don’t want to be tied.

M034 is not confident with her ICT skills.

*M034*  Yes, but I am not that savvy?

**Summary of midwives use of social media**

Fourteen percent of cohort midwives used social media intermittently, and this was exclusively Facebook. No midwives used a microblogging service. Some were emphatically not interested. Lack of time, lack of interest and caution about security were some of the reasons given for not engaging with social media. Some were quite horrified at the thought of using social media. The thought of exposing themselves online was foreign and they felt it was something to be resisted. Midwives were aware that they could not control what was written about them on social media.

Midwives’ uptake of social media (14%) is low compared with national statistics. Nielson’s 2010 report on New Zealand found over 60% of internet users had updated a profile on a social networking site (Boyte, 2012, Boyte, 2010), with a quarter of social network users accessing the site via a mobile device. Age was a factor. Most users were less than 35 years of age, whereas the average age in the midwives’ sample is 47. New Zealand statistics match those found by Pew Research Centre (US), which found 61% of adult internet users used a social networking site in 2010 and 65% in 2011 (Madden and Zickuhr, 2011). By August 2011, 50% of all adults had used a social networking site (ibid).

### 7.3.11  Entering the same data multiple times (action)

Multiple data entry practices were common.

*M035*  At antenatal visit I will write down the women’s hand held notes, and go home and write up her visit [in the Mary Woods notes]. They don’t match up at this stage. I don’t use the computer. I haven’t bought a [laptop] yet. My computer is at
Midwives were required to enter data into their practice management system and to generate hand-held notes for women. It was common to use a small booklet to record information about the consultation for the women. The amount of data entered at a typical consultation consists of recording the time, data and gestation, blood pressure, fundal height, weight protein analysis of the urine, and issues that were discussed.

7.3.12 Being a sporadic technical star (action)

Some midwives were enthusiastic about using technology and did strive use it in their professional practice, although not for practices with women.

M018 had a smartphone and had downloaded an application that calculated the due date of delivery of the baby.

M018 If you are in the car and have to stop and answer a phone call, someone says I had my last period on such and such a date and you can’t go and get your laptop out. I just say, hang on a second and I can go into the ob dating and put in LMP and put in the date and it gives you due date. I can say “sorry I can’t take you” so that is brilliant, so, I do like it.

Other midwives in the cohort regarded M010 as interested and knowledgeable about using technology.

M001 Have you talked to [midwife MW010]? She is a real techno girl.

M010 has been at the forefront of trialling data collection in the home and then transferring data to the patient management system using Bluetooth technology. ‘Early adoption’ according to Rogers’ adoption scale, was evident (Rogers, 1995) although it did not prove to be a satisfying and sustainable method.
M018 used a smartphone for texting women and changed practice management systems while keeping her practice running.

M018  I use it all the time and I actually have....a little PDA. It is a touch screen. I quite like gadgets really.

She directed women to internet sites, only if she had checked the site found it was appropriate.

The midwives who were early adopters of new technologies felt proud of their position and saw it as advantage in their professional role.

7.3.13   Using the internet for professional requirements (action)

The internet was used by midwives for midwives’ personal use but was infrequently used during consultation with women. Consultation was a time for routine physical surveillance and discussion. Midwives normally used the internet for information related to their needs, so they would be better informed and able to convey information to women during the consultation time.

M017  I had somebody recently with herpes and she was really concerned and she was quite late on her pregnancy, so I just wanted to get some information on that before discussing it with her before discussing it with her and she went to the obstetrician.

This information was not passed onto the woman, it was ‘just for me’.

M001 used the internet to look for general obstetric information on a site recommended by junior medical staff.

M035  I use the internet occasionally but not a lot to get information. I mainly go to my books and colleagues.

7.3.14   Freely choosing business processes and tools (action)

Midwives were independent business practitioners, who exercised autonomy over their business purchases and practices. They selected and used appropriate tools, and were prepared to use and change systems if the change offered greater efficiency or more control.
M001 changed from the MMPO provided practice management system to ‘My Practice’ software (My Practice, 2011) supported by SAMCL (SAMCL, 2011), another practice support group in Auckland. There were many difficulties.

M001  *The main difficulty was that it was a GP program not a midwife program.*

She tried to persevere and gave herself a timeline, but she became very frustrated as help was difficult to access and she felt unsupported. In the end, her frustration with the software, and lack of time were so inconvenient she reverted to MMPO software, even though she felt that her professional body was controlling.

M017 and M018 also chose to change practice management systems, although the changeover process was very stressful for each of these midwives and only one (M018) persevered.

M017  *I went with SAMCL so they were doing a new program My Practice last October, they were just bringing it in...it was too complicated. Too medically oriented. The GPS use it and ....it was too much. Enough was enough. I was still doing things, it was not saving things properly and I was wasting a lot of time on the computer and getting nowhere with it.*

M018  *I have only just changed to My Practice in the last two weeks. It will be two weeks on Thursday so it has only been a week and a half really and ummm [laughs]...so last week I was eeeerrrrrrrrr!*

A Maori providers group chose to use MedTech, a patient management system commonly used by general practitioners.

7.3.15  *Freely choosing the place of work (action)*

Midwives can work where they choose. Within the case study area, most midwives saw women in a clinic, which was sometimes located at the midwife’s residence. Two groups of midwives shared the expenses of residential houses that were converted for use as clinic rooms and another groups shared rooms as part of a health centre. Receptionist services were not used.
7.3.16 Choosing an appropriate caseload (action)

Midwives have the professional freedom to choose a caseload according to their family situation, their age, their other interests or work commitments. They can vary the caseload month by month. For example if they are going on holiday in January, they do not accept women who will give birth in January. Midwives, as working mothers, tailor their workload to suit family needs. Most midwives with preschool children had a lower caseload. However, with additional family support, some midwives with small children and large families carried high caseloads. M018 and M009 each managed a caseload of over eighty women, M009 while being a mother to six children. M023 carried a caseload of 120 before she had two children and dropped down to 1-2 a month while the children were young. She was in the process of increasing her workload as she had more support for her young family. M007 chose to have a caseload of 120 women, although these women did not receive the full number of visits provided by other midwives.

M007 I have been birthing 120 babies a year for 16 years. And people ring me up and say “how do you do that” and I have people ring me up and say “I am having a baby” and I have birthed the other four and she walks in here and she is having a baby the next day, and that is why my stats are so high. I am not doing all the 16 – 20 antenatal visits, and half the time I go around after the birth and she doesn’t even live there.

7.3.17 Gatekeepers rather than facilitators of information (action)

Antenatal care involves knowledge transfer or dissemination of health information and education. Knowledge is mainly shared via direct contact with women during the consultation and it involves handing printed matter to women and discussion on a topic relevant to their gestational stage. Midwives were gatekeepers (see the glossary) rather than facilitators of information, as they controlled the information and the principle way of dissemination information was via pamphlets and discussion.

M002 I give them a lot of pamphlets about topics. Then we can discuss it.
M008 gives pamphlets, but recognises that they are not always read.

*M008*  
I find most of the women I look after, yeah, because they are not really interested in reading stuff. They will just throw it in the rubbish.

M011 found that women might feel as though they were getting too many pamphlets and not been given enough time to discuss information.

*M011*  
Sometimes you have to watch because she might complain that ‘all the midwife did was give me pamphlets and links to site and didn’t talk to me’.

There is evidence of controlling tendencies regarding ownership of information. Midwives did not think of themselves as controlling as they strived to give women choice, but they spoke of not trusting women with information, feeling they lacked basic understanding of physiological processes. Midwives felt ‘in charge’ of the information and wanted to be the person who informed women, rather than providing choices.

*M003*  
Some women don’t actually understand why things happen the way they do. Even when you ask for feedback afterwards, you know, “how do you feel about it, is there any questions?” they don’t have any, but they talk to all their friends.” I think lack of understanding or knowledge maybe. Normally it is down the track a bit more rather than....ummm I don’t know.

M004 did not trust women to used the internet and felt the volume of information confused them.

*M004*  
I advise them not to go to the internet for information. There is too much and it is too confusing for them. It is better for me to discuss topics with them.

Lack of trust and reluctance for women to engage with M011 was not often a problem, but she used her authority to not go out of her way for these women.

*M011*  
I have got rid of some of those now. I got tough a few years back, so that was good. I said if you don’t come and see me I am not getting out of bed to come
and see you. Just stay with the hospital. But there are still those women out there who arrive in the maternity unit in labour with no antenatal care at all. And you get the odd one who comes once and you take them off your books and they ring up and say they are in labour. Well too bad, I have never seen you.

M012 felt that the internet was an unnecessary technological intrusion to their treatment.

I: How do you feel about new and mobile internet applications?
M012: The women seem to enjoy them. It is really interesting, you can tell the women who are doing it by when they come into the room you will say, “I am 21 weeks and 3 days” and that is directly off the Internet. There are several pregnancy calculators on there, so they have it sorted and I am not going to make up another date because my dates are two days different. You may as well work with whatever you have. The information they glean, it can be quite tricky. I think there is a huge amount of information on there and a fair percentage is slightly irrelevant. We don’t know whether it is ethically sound. I also think it is never in perspective. Often on its own.

M012 felt that pregnant women could not be trusted to gain a fair perspective from reading internet information.

M012: Both on the internet or having coffee. So often for women, they will often hear only things that didn’t go so well or difficulties, which is not in perspective with the 70% of women who go ahead and have babies and haven’t got time to write on the Internet. That is a useful tool for helping with their healing but not necessarily useful for women having a normal birth.

M012 did not trust text information, as there was no opportunity to pick cues on emotion. She felt it was a dangerous medium for any kind of communication between midwives and women.

M012: I think the text messaging between client and midwife is dangerous. I think that it is too brief. It is too open to interpretation or lack of emotion. I know with my own text messaging within my family we have had numerous differences. I don’t think it is as safe as it should be. I don’t know how safe the format is you
know what happens if there is one digit wrong and you send clinical information. I am still not sure if it is safe. I think it is dangerous.

She wishes women understood the fight for autonomy involved in the history of New Zealand midwives and even felt ‘abused’ by the lack of respect involved in engaging with technologies.

M012 The younger ones don’t have the history of how special it is, they don’t have the history of how women have fought for this service (midwifery) is and they don’t realise the abuse they are doing of their midwives. By this continual texting, phoning. I don’t actually want to talk to my well healthy women every week. You know, I don’t want to know. It is not a conversation you don’t need to ring me about what mattress cover you need to get. This is a well, healthy event. They don’t necessarily need a whole lot of information. You know. It is going to happen whether I am there or not. It’s your baby. The rest of it is going to happen.

M012 estimated that women seemed ‘happy’ with just the information she told them in face-to-face consultation, although they had no choice of other medium.

M012 I guess being a bit older and a bit wiser, I consider myself relatively good at picking up a situation. I am kind of what you see is what you get person, so I talk to them like I talk to you, you now “this is it”. They seem happy with what I tell them.

M013 similarly felt that conversation was ‘good enough’.

M013 I engage them in a conversation, I say “where does that come from” and tell them about the research that I have read whatever it is and come …just providing them with more information so they can make a better decision.

M013 prefers pregnancy and labour to be a private and special time and that being exposed other people’s experiences via YouTube videos of birth and labour is detrimental.

M013 I think that pregnancy and pregnancy labour and birth are private and special time being able to access all of those things on the internet takes away from that.
M013 did not trust women’s ability to evaluate information and prefers to be the one giving women the right information.

M013  I don’t use the Internet enough to feel confident that the right information would get out there. My impression is that people have a limited ability to discern what is good information and what is not good information, so I think that is a grey area.

M014 felt that women who use the internet ‘are a highly anxious bunch’, who access more information than she judged they need.

M014  I find that women accessing information off the internet ummm typically are highly anxious bunch and they need more information than what I am able to give them or whatever, so it takes a while but once they trust that my information is adequate then I find the Internet use subsides. That has been my experience.

Furthermore, M014 sees the role as ‘information giver’ is a key role for her.

I  How do you see yourself as a midwife?

M014  What we do is give them information.

M017 wanted to information for herself so she could control and filter it before passing it onto the woman rather than trusting the woman with the information and sharing the information source.

I  How do you use the internet for women?

M017  What have I done recently? I had somebody recently with herpes, she was concerned, and she was quite late on her pregnancy ...so I just wanted to get some information on that before discussing it with her and she went to the obstetrician.

I  How did you get that information to the woman or was just for yourself.

M017  Oh no, it was just for me

I  How did you pass it on to her?
M017    Just in discussion, no, I didn’t tell her that I had found it on the internet. I didn’t print anything off or that. She was happy with the information that I gave her.

M017 recognised that women use the internet but that they do not have the ability to judge the information for themselves. She did not want them to access the internet.

M017    Oh yes, all women use the Internet. Far too much so sometimes …yes (laughs) because they don’t, depending what site they go do, they don’t know the reason behind what is being said and you get concerns because they look at something, like that woman particularly (herpes case) she had gone to the Internet herself as well and the only thing she saw was the possibility of the baby dying and that they don’t unless is a quite rare…so that is why. Those words would still be there, (about dying, so that is why they don’t see the other parts of it so they don’t necessarily always understand the particular culture …to decipher it if you like.

M017 did not trust women to use the internet as she felt that accessing the internet caused them to worry. She read and kept information to herself.

M017    I had another girl about a year ago whose baby had almost like a hole that was in the skull and even the paediatrician hadn’t seen it. It had scans to see how far it went through. I said don’t go on the Internet. Wait until you have had the scan, but don’t go on the Internet because that is what she would have done and sat at home worrying, instead of doing everything normally. If she had read the Internet site and read all the things it could be, she would have got herself worried sick.

M020 found that women who access internet information caused her a lot more time as she had to ‘go through a lot of stuff, and that they would be better off if they only relied on her for information.

M020    Women access the internet increasingly more. They often come back with the ‘fear factor’ stories. They might say I have read this …we have to go through a
M024 found women were ‘confused’ by the information they accessed via the internet and that they were better off not doing so.

M024  I certainly don’t recommend them to look for a website. I don’t recommend they look it up. There is a lot of information about pregnancy and babies. It is huge. A certain type of women will just look up everything. It’s not so good. In fact it is confusing sometimes. They are better not to.

M034 discouraged women from searching the internet as she felt women could not judge the quality of information.

M034  Most of the time I discourage them from searching. They can’t tell what the quality is like. I probably should trust them more but I think at the end of the day I am going to be giving them advice based on my degree and I think people would google and not really understand research.

7.4 Midwives’ Attitudes

7.4.1 Feeling Insufficiently skilled and having difficulty keeping pace with technological developments (attitude)

Midwives felt insufficiently skilled and had difficulty keeping pace with technological developments. M006 and M008 felt embarrassed by their self-assessed inadequacy in using electronic devices.

I  Do you use any electronic devices?

M006  I really might disappoint you, I think.

I  Can you describe your interest in technology and using it further within your practice?

M008  I am the worst one in the whole of the [name of midwifery group] group.
Do you have an interest in technology?

M012  No ...laughter ...and I feel terribly old saying that. I am probably in late majority. I wait for my peers to work out systems and processes and come along when it is all sorted. Because otherwise. I get totally ...(gestures).

M031  I am definitely no expert on technology. Technology was supposed to make life a lot simpler for us, but when you are writing it down and having to do it...and that is the system that they have. I detest it. It is horrible. It is a HORRIBLE system. It takes 2 hours to enter a birth. We don’t have that time. We have to write it down on paper but we also have to enter it in the system, [keyboard entry] and I find that tedious and I find that irritating. It goes down to Hastings.

M031 describes a Wairoa midwifery colleague who declined to be interviewed as ‘technophobic’. In setting up the interviews, I had travelled twice to a rural Hawke’s Bay hospital and on the day I was interviewing, met the one ‘reluctant’ midwife who described in an embarrassed manner that she was ‘too busy’. After hearing M031’s description of the manner in which they covered for the lack of ability to manage technology, it was clear that this was avoidance and embarrassment. Colleagues entered hospital data, did all the computing work for this midwife or arranged for hospital secretarial staff to assist. When lead maternity care midwives use secondary care hospital facilities for birthing, and in the hospital setting, they are required to comply with data entry procedures within that setting.

7.4.2  Hesitant to access electronic information/knowledge (attitude)

Although not all midwives have internet access at the point of care, midwives do have ready access to the internet, and some know reliable sources where they access information. Medsafe, Cochrane database, Cinahl database and NZCOM
consensus statements were known and trusted sources of information accessed by midwives. Midwives preferred other midwives as their first source of information, although they described the way they google.

1  Can you describe your use of the internet?

M024  No much....a little bit....yes. As I need it but it is not very often ...these days. But, I do go and Google things every now and again.

Other midwives preferred a hard-copy midwifery magazine.

1  Do you use the Internet very much?


1  Do you access the internet for midwifery?

M025  Not really, no. I am part of MIDIRS. I prefer to get a hard copy journal rather than having to go onto the internet for information.

7.4.3  Appreciating an easier way of submitting a biennial review (attitude)

Professional biennial practice review requirements have become easy since the introduction of the MMPO practice management system, which is programmed to print off the documentation required for review. Midwives appreciated the new efficiency of a previously onerous and time-consuming task.

M006  The machine spits it [biennial review] out [laughs]. It took me 40 hours for my review before.
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M014 and M016 also find the biennial review from MMPO saves them a lot of time.

1. How do you use the MMPO?

M014  I have a caseload. I print out the caseload and I share it with my practice partner. So I keep that up to date. I keep notes on that and highlight things out of the ordinary. And yep, that is the main way I use it. My stats for my midwifery service biennial review.

M0016 Getting paperwork ready for the biennial review used to take me ages. Now I just click the buttons and as long as I have the information in there, it comes out so I can use it. It is very helpful.

Midwives chose the timesaving option of using MMPO practice management software for remuneration and review even though they felt under surveillance.

7.4.4 Feeling that women are well women (attitude)
Midwives felt that women were ‘well-women’ and did not need a medical or technical approach to their care.

1. Do you think that the communication level they get is enough?

M012  Absolutely. Absolutely. I think there is a very clear guideline that the women are well healthy women having babies. This is not an illness. This is a well, healthy event

M017  It [documentation] should be all very straight forward, you know, because these women simply experiencing a normal physiological life-event.

M012 did not want to speak to women outside of their appointments, as they were essentially well.

7.4.5 Balancing work-life requirements (attitude)
Midwives felt work-life balance was important, and they had the ability to choose their caseload to achieve this.
M028 felt that excessive recording was an impediment to her work-life balance and she felt angry that text messages had to be recorded and that ‘giving care’ was more important to her.

\[ M028 \text{ Yes, I’ve been told to record text messages. Do they want me to give care or do want me to record everything. I can’t do both. I need a life. Some of that stuff goes out of me. It’s like nnnahhh!} \]

M002 didn’t want to work on the computer at night.

\[ M002 \text{ I have four children. I don’t have time to sit at the computer at home either. I am up doing things. So to sit at that computer for an hour or ten minutes is a major. I probably wouldn’t do it. I like the system I have.} \]

7.4.6 Feeling pressure from professional bodies (attitude)

Professional bodies required midwives to document interactions with women. The NZCOM stressed the importance of correct documentation as a safe way to practice, and gave tutorial sessions to ensure this was undertaken. Midwives were conscious of numerous instances of bad press in national publications and media and were defensive.

Some midwives felt that the information required by professional bodies was unnecessary, and that it was not their job to collect it. M001 felt controlled and felt angry.

\[ M001 \text{ ...to me the professional body is far too closely connected with the people who are running a business that pay us. And I didn’t like that interlink there. MMPO is very controlled by the College of Midwives} \]

Her response was to change patient management systems so ‘her’ information was not sent to the professional body.

\[ M001 \text{ mmmmm umm they are also connected with the College which is the professional body. We got a letter about a year ago from MMPO saying that the College of Midwives have instructed them to ask us information about what diet people had and how tall they were and how heavy they were and whether they} \]
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smoked and whatever and all this information was being dictated to us and in this letter it said something like “if you don’t co-operate and fill in the little boxes then we will decline paying you”. And there was a bit of an uproar here from a couple of colleagues and I kind of looked at it and thought “what do I care” and then afterwards I discussed it with a colleague and said “I agree with that”. She felt that it was a bit dictatorial and I thought afterwards ...so, I went and sussed out SamCl because I had heard and there is one of my colleagues using them.

The level of documentation required by NZCOM was considered unnecessary and midwives did not like the pedantic requirements. One workshop led to a ‘heated discussion’ about what was considered ‘necessary’.

M017 We just have to do a technical skills workshop every three years. And, there was just one recently and one was on communication. A two-day course. They say what we should be doing. Recording this and writing that. We are saying it is just getting ridiculous. I don’t know a GP who would do that. College of midwives says texts should be recorded. This particular time was on communication. The first day was predominantly on communication and it was about documentation. Cross the ‘t’s and dot the ‘i’s’. It led to quite a heated discussion. About what is acceptable for midwives. Sometimes it is too much. The bars are set really high to the point of almost not unachievable but more paper work, more of everything rather than actually the job. Originally, they said...now we are all using that particular programme for claiming and information, so still they said they wanted a hard copy as well. But, that defeats the purpose of having it on a laptop that is saved to another hard drive and backed up.

M007 felt threatened by the MMPO and so chose to use Medtech software and not submit any data to the midwifery body. She felt that the MMPO were monitoring midwives in a way she perceived was ‘quite scary’ and ‘intrusive’. M007 had a very heavy caseload of 120 women per year, and did not want the midwifery body to know her caseload.

M007 The College of Midwives have got them onto MMPO. The other thing too, those stats are ours. Nobody else can get that where as the MMPO goes directly to

17 SamCl is a midwifery service provider.
the New Zealand College of Midwives and what I find quite scary is that they are capable of auditing you personally. They can look at you as a midwife and see how many antenatal checks you have done, how many smears, what you have done outside of midwifery, how much money you are making, how many claims you have made, how many babies you have birthed, how many antenatal visits, how many post natal visits, and I find that really very intrusive. You know.

M018 felt the College was ‘a little bit too controlling for me’, so she was using MyPractice software from an Auckland company that had nothing to do with the MMPO or the NZCOM.

M018  I like technology, but then I like to be a little bit different. I don’t like to be uniform. I think MMPO is a bit controlling for me. They believe it is their information where as I believe all the information I have is the woman’s and they are being privileged.

7.4.7 Threatened by transparency and a diminishing boundary (attitude)

Midwives felt that they needed a boundary between them and women and technology was perceived as a threat to this boundary.

I  How do you feel technology?

M030  You know what? I am so available 24/7 that actually want to resist anything that makes me even more available. You know what I mean?... and so I am probably fairly resistant to trends in technology. Whether that is age ...I hate being so available.

Although all midwives provided continuity of care as a statutory requirement, they varied in their willingness to provide contact between appointments. Some midwives and women transmitted information via text messaging, however, midwives were discouraged from using this medium for clinical information (NZCOM, 2010).
Midwives did not want to be easily accessible by text messaging and deterred women from texting. Midwives preferred to respond with a phone call because they considered it was possible to misinterpret text messages and NZCOM had warned them of the dangers of text messaging for communicating with women. Some midwives were very protective of their mobile phone number and call women from a landline so that women do not learn their number. For many midwives, texting was an unnecessary intrusion.

I How do you view texting with women?

M019 I don’t go there. I am not comfortable with it, although I know a lot of our clients in the younger age group are. I feel that the way we have set our centre up is that we have set up a partnership. There are four of us and we have alternate weekends off. The women don’t necessarily know when I have gone off call for three hours. In that case they will ring the call centre. It has a back-up facility in it. Sometimes they will get your cell phone number somehow and text you in the middle of the night and it might be something really really little.

Many midwives place a call centre barrier between women and themselves.

I How do women contact you?

M012 Women ring the call centre and if they want to say what it is about they can if they want to. I also tell them that it is a male who sometimes answers the phone because they haven’t got that far to think that it is a call centre, not a midwife. They leave a message to say “I need to change my appointment next week with [Midwife]” or they leave a message to say “I need to talk to [midwife] now”. At times, the call centre will patch a call through to my cell phone.

Midwives felt they needed a barrier between them and the women. M012 had been a midwife for 25 years and felt threatened by the ability of new technologies to remove this boundary and layer of control.

M012 Mobile technology. Mobile technology within midwifery service delivery has made midwives increasingly accessible. Which as an “old” practitioner now I can see is very difficult for the midwife. These women have absolutely direct
contact with midwives, they have text messaging day and night there is no boundary, there is no system and I think there are big gaps in that.

Text message doesn’t convey a whole lot of stuff. People don’t answer their phone, I don’t think it is good. I did do that for years. We had direct contact with them. My home phone number ...would ring me day and night, all that sort of stuff. Whereas now we have the answer service, so there is this boundary in there. And I also sell it to the women as a safety issue. Actually, all they have is one number to ring and there will be a midwife. They don’t have to ring my cell phone and perhaps get it diverted to someone else, and not hear it. You ring that midwife there is a backup. If I have not got back to them, they will find another midwife. That works really well.

Midwives felt ‘too available’ and threatened from the increased availability digital technologies brings.

M019 I have also seen the way my own teenagers use the cell phone. You can be at dinner and they are texting each other at the same table. And I think that with my clients. They think I am an extra friend in their relationship rather than their midwife. I think you have to be very clear. I would never have imagined that I would text my GP. I have been self-employed for 16 years and when I first started, I had a cell phone and I only used it to ring women on. The ability to text has been there for maybe 10 years. So times are changing but I don’t think the relationship in midwifery has changed at all. Most women are quite happy when you have discussed that. Their midwife ...you have to have boundaries in a relationship. You can be clear that you can’t be everything to everyone all the time. So...you know...I don’t think so.

Digitisation was seen as a threat to the relationship itself and midwives preferred non-digital and ‘hands-on’ ways of communicating.

M019 It [electronic information] undermines the role of the midwife in the relationship. I don’t know if you could have the same relationship electronically. I think you can have with someone sitting in a room. It is not all the listening it is actually being able to touch the baby or to put your hand on a mother’s stomach to
feel that everything is happening the way it should be. I am not comfortable with it [electronic communication]. My role is far more important and there is value in the person in a room with somebody. But, I can see there are situations. My lady that lives in Tutira got snowed in. I would ring her to ask her questions but to be able to have Skyped her…maybe the communication wouldn’t have worked, I just don’t know.

Technology threatened to dissolve the barrier between midwife and women.

M030  You know what. I am so available 24/7 that I actually want to resist anything that makes me even more available. You know what I mean?… and so I am probably fairly resistant to trends in technology. Whether that is age ... I hate being so available.

M012 wanted to control her accessibility and did not want women to contact her unnecessarily and felt she needed a boundary.

M012  Mobile technology within midwifery service delivery has made midwives increasingly accessible. Which as an “old” practitioner now I can see is very difficult for the midwife. These women have absolutely direct contact with midwives, they have text messaging day and night, there is no boundary, there is no system and I think there are big gaps in that. Text message doesn’t convey a whole lot of stuff. People don’t answer their phone. I don’t think it is good. I did do that for years. We had direct contact with them. My home phone number would ring me day and night, all that sort of stuff. Whereas now we have the answer service, so there is this boundary in there.

M034 felt some women were inconsiderate.

M034  I think I find that people contact you without considering that you might be at a birth or have a life outside of midwifery. We are on call 24/7 but some issues can be dealt with during office hours. They are not going to be able to do anything until the morning But … there are a couple of women who you know who are going to take advantage of your availability.

Midwives had the ability to set boundaries at the initial meeting when expectations were outlined.
So the cell phone is here basically for me for the call centre to contact me. If I am not in the office, or next to a land line I will ring them back but I don’t text them. They know at the beginning of the relationship that is how we have set it up.

M028 felt threatened by privacy issues associated with ‘throwing information all over the net’ because it ‘might get lost in cyberspace’ and bring the midwives adverse publicity. She also feels that midwives get treated unfairly and differently from other health professionals in this regard.

The internet was seen as a space that could not be controlled. Women could post at their own discretion and midwives were unable to restrain this practise or the information that was posted.

There is a generational thing here about how we see the Internet and how young people see the Internet. I have talked to a midwife in Palmerston North whose name was put up on a chat room or bulletin board and very derogatory comments were made about her, which the woman didn’t make to her face. The midwife’s daughter found them, forwarded them to her mother. The mother went round to the woman and saw her postnatally and said “is there anything you need to talk about” and the mother said “everything’s fine” and she said that “I have this stuff off the Internet that you have said about me” the mother said “you have invaded my privacy, you have invaded my space”. The mothers thought that it was her site and that she could put the midwife’s name there and not think she was invading the midwife’s space.

A little bit too much exposure

And it takes one thing like that to make people think “bad midwife”. And you have no comeback from that. So all someone needs to do is google my name and I don’t know what is there about me.
M012  *I don't choose to [find out]. If it is out there it's out there, there is not much I can do about it.*

M013 felt nervous about being exposed on the internet. Her husband is a designer and ran the family website and she trusted her husband to post information, although even a family website made her feel uncomfortable as she felt it didn’t quite sit with her profession.

*M013  *I feel pretty nervous actually. There is information on his website so there are photos of me. Which are fine. He [husband] wouldn’t put anything up that wasn’t appropriate. Just even having that much exposure feels uncomfortable at time. Than people come into our family website doesn’t quite fit my profession.*

M012 felt exposed by the use of Skype in the delivery room. Lack of control of viewer's interpretation was worrying.

*M012  *Skype. People having Skype in a delivery room. I have had one. They put their laptop in the corner then their mother or sister or whatever in some other country in the world can be around and see what is happening in the birth room. So, that is ME!. I am then on film recorded.*

*With your permission?*

*M012  *Well, they ask it, I have never said no, because I don’t feel I have anything to hide. You know that little pieces could be taken out of that that in the big picture. It is the same with anything; people focus on the bad stuff.*

M013 saw public consumer feedback as negative and it made her feel uncomfortable and vulnerable.

*M013  *When consumer feedback says, “you weren’t really very good at giving me information” that is what you focus. It is the same on the Internet; people find it difficult.*

M012 felt vulnerable because the internet was a transparent medium that broke down the boundaries between the profession and the public.
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M012 We are talking about situations where we don’t have control. I still think as a professional, you are quite vulnerable. Medical profession do have a boundary between clients and themselves. They have receptionists and different people running their money situation and they have nurses. They are not on call 24 hours per day. Midwives are very available and therefore increasingly vulnerable.

M035 felt threatened by information that differed from hers. She was concerned that women ‘mess their heads’ with the wrong information about the risks associated with home births. The ‘wrong information’ may have been information that differs from the midwifery research on home birthing, as opposed to medical research evidence. The two research streams offer opposing views and research data.

M035 Some women have the wrong sort of knowledge. Or they have been reading too much of the wrong stuff. Often the more wealthier well to do women they have access to the internet and Google everything. Not everything on the internet is correct. They will get information about the risks of home birth. That sort of thing. That information is not research-based. It is not evidence-based, so it is really someone else’s opinion really but they will take it as fact because it is written. So I think it messes their heads a little bit. I find if women don’t know a lot, don’t research a lot, they just let their bodies do what their bodies are meant do to and they are quite happy with that and they seem to have better outcomes. I am talking more with the actual labour. Because their heads aren’t mixed up with all these other medical ideas in their head. Obviously there are some things you need to know. It needs to be the right information.

7.4.9 Protecting the ownership of information (attitude)

Ownership of information and control of information was a concern for midwives. Some midwives did not want to submit data to the MMPO because it was closely associated with NZCOM. Midwives felt that being watched by an administrative body was intrusive. They also objected to providing information they regarded as belonging to midwives. Midwives felt ‘ownership’ of statistics they had generated.
M001 felt that NZCOM and MMPO were dictatorial and had no right to ask her for women's information about height and diet and smoking, so she attempted to switch practice management software provided by an independent source.

M001  
And at one stage I had an issue with the fact that MMPO is very controlled by the College of Midwives. And I am going, to me the professional body is far too closely connected with the people who are running a business that pay us. And I didn't like that interlink there. MMPO is very controlled by the College of Midwives mmmmmmm they are also connected with the College which is the professional body. We got a letter about a year ago from MMPO saying that the College of Midwives have instructed them to ask us information about what diet people had and how tall they were and how heavy they were and whether they smoked and whatever and all this information was being dictated to us and in this letter it said something like “if you don't co-operate and fill in the little boxes then we will decline paying you”. And there was a bit of an uproar here from a couple of colleagues and I kind of looked at it and thought “what do I care” and then afterwards I discussed it with a colleague and said “I agree with that”. She felt that it was a bit dictatorial and I thought afterwards. So, I went and sussed out SamCl (alternative software not associated with the NZCOM) because I had heard and there is one of my colleagues using them.

She was flown to Auckland for training but did not persist with the change, citing difficulties with the changeover and lack of help from the software proprietors.

M001  
(I) started booking clients on it and by the second client I ran into a snag and rang the helpline and they said “I am really busy and with somebody else”

Decision support features in the form of prompts, and the ability to look up allergies and drugs information using the internet within the PMS were considered attractive. The software was installed and patients were entered into the system. However, M001 experienced difficulty and frustration at the lack of support from Auckland and did not persist with the system change. Shortage of time and support were both mentioned as barriers to the uptake of the new system. M007 also found the control of her data by MMPO a threat.
Why aren’t the other midwives using Medtech?

M007 Who knows? Because the College of Midwives have got them onto MMPO. The other thing too, those stats are ours. Nobody else can get that whereas the MMPO goes directly to the New Zealand College of Midwives and what I find quite scary is that they are capable of auditing you personally. They can look at you as a midwife and see how many antenatal checks you have done, how many smears, what you have done outside of midwifery, how much money you are making, how many claims you have made, how many babies you have birthed, how many antenatal visits, how many postnatal visits, and I find that really very intrusive. You know.

M013 felt that her personality was being taken away from her and that she needed protection from being exposed. She was mindful that she needed her own space, and even the mobile phone made her feel vulnerable.

M013 I always feel a bit nervous about the Internet and mobile phones. That our personality and being ourselves is taken away from us when we put ourselves out there. So I am always really careful about what information is in the world about me because I still want to be my own person in my own space as well as being a midwife for other people. An awareness that we are our own people separate to being a midwife and just protecting that a little bit.

7.4.10 Preferring to keep a low profile (attitude)

Midwives were reluctant to advertise their services, preferring to gain clients by ‘word of mouth’. As market forces favour midwives, they did not have to strive to attract clients, and preferred to keep a low profile in the health community.

I How do women find you and come to you?

M030 I think it is being “old”. The word is out there. I worked in the hospital so they know who I am. Nearly 16 years ago, the GPs know my name, so it is word of mouth.

I How do the women find you?

M033 Word of mouth is really big in this business. Just word of mouth.
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Midwives are apprehensive about negative publicity and feel that they are unfairly targeted if there are adverse outcomes. M028 was angry that the media portrays midwives as ‘all useless’ and feels that doctors are not targeted by the media in the same way as midwives.

M028  But they don’t. And they don’t get roped through court for it. The GP makes a mistake do you see him all over the news. A midwife makes a mistake. She is all over the news, all over the papers. I don’t see them [doctors] there. They [Health and Disability Enquiry] rope up what happened in the last 15 years. I feel that midwives are unfairly targeted by the media, yes. Mostly, but I feel the communication can break down quickly if something goes wrong. And someone opens their mouth because of their opinion is the midwife has done wrong. The whole 9 months relationship is crumbled in two seconds. And that is also because of how the media portrays us. That we are all useless. WHICH IS RIDICULOUS And I am sure I am not the only one who finds this. That is where I find like things like texting. After I spoke to the midwife last week who is going through the litigation. That is why I ring now. It’s like, I’m not going to go through litigation. I don’t want to be there

M029 felt that increased monitoring of midwives and the fear of litigation and publicity were drivers for midwives to practice conservatively.

M029  We have monitoring now that we never used to have. People act because they are afraid of litigation, we have a lot more women who have medical problems who in the past would never have got pregnant so women who are diabetic, women who have heart conditions and that sort of thing.

7.4.11  Preserving autonomy

Midwives have been an autonomous profession in New Zealand since 1990. Women had no knowledge of the midwifery profession or its history, but midwives who have been practising for over twenty years felt their status as a health professional was an achievement. The 1990 legislation (Clark, 1989) has improved the practice of midwifery for midwives, and midwives felt it has improved the birthing opportunities for women.
M012 felt that women did not appreciate the ‘hard fought’ service.

M012  I think we are on our second generation of women who are involved with Independent Midwives, and so the younger ones don’t have the history of how special it is, they don’t have the history of how women have fought for this service and they don’t realise the abuse they are doing of their midwives.

I  How are they doing that?

M012  By this continual texting, phoning.

7.4.12  Preferring face-to-face communication over digital methods
Midwives preferred face-to-face and synchronous phone methods of communication to digital or asynchronous communication. The conventional clinic consultation is similar to that of general practitioners, in that the pre-arranged consultation is face-to-face.
M005 felt that being with a person face-to-face was important because if a screen was used, women could ‘be hiding something’.

M005  It is not to the point where it is all about machines and all about the technology and it is no longer people. I don’t want to be doing video conferencing with clients. I would like to be honest because I do feel the relationship of being with a person face to face is important, and I think you can get a lot more speaking with the person than you can with the computer screen. There may be something they are hiding. There could be anything. You might sit there and see the top half of a woman. And if she was sitting there you could say: “gosh you are bloated”. And she says she hasn’t had a bowel motion for three days. That is something you could potentially miss if you were seeing the top half of a woman only. Because they are not going to stand there and do a 360 turn and undress the baby for you. So I do think that would be important.

M014 preferred face-to-face contact because when technology is involved, she felt the intrusion of a ‘third party’, although she would not mind advising women to use a website for information if someone else set it up.
Face-to-face is my preferred mode of communication, one to one. Yep...I can see midwives have a reluctance and resistance to technology because it relies on accessing a third party, also, that is not my area of expertise. My area of expertise is as a clinician. And my communicating directly and I guess that I would be willing to access that if someone was willing to spend the time setting up a website, I could just advise women to access it.

M019 felt that when teenagers communicate by text, they use an unfamiliar language, which makes her uncomfortable. In the face-to-face situation, when the teenager modifies their language she felt more comfortable. However, she did not consider the possibility of the teenager feeling less comfortable in the face-to-face consultation. She felt that technology took away elements that were crucial to her ‘being a midwife’.

I How do you feel about using technology to communicate?

M019 That bothers me a lot because that takes away my core feelings as a midwife that I can actually offer as a health professional. But I certainly say ....initially you can see they think ‘what is she going on about’ but as that relationship changes, they value that input. A lot of our clientele they don’t have mothers and aunties to support them. And so, you become a different kind of figure in their life as well. Someone who has got time to fulfil their needs. I have watched Facebook and seen these kids write in 3-4 words in a sentence. I have seen them. They will text you four words ....I can’t change my language to text back in their language. It is almost like they are speaking Chinese and I am speaking English, so there is a communication barrier there. Get someone face to face. A sixteen year old with time they adapt their communication style too. We are health professionals. It bothers me. It really really bothers me that someone could think that I could do a Skype call to say a group of teenagers in a room.

M026 felt the clinical assessment was very important and that the face-to-face communication provided many cues.

M026 I think the whole meeting even the under 20s who don’t communicate so well face to face I still think it is important to do the assessments. I think the texting or non-face to face method you are missing so many cues. There is so much
that doesn't get said. That I wouldn't feel we are ending up with the same sort of relationship. I think for me it is helpful to know a women really well before hand and then in labour I can make a good assessment that yes, that's all right for them. They are always a little bit hysterical. This is not just because they are in labour. I certainly find it a lot harder and I used to work in the hospital. Just picking up someone in labour when you haven’t met them before, it is a lot harder to get an accurate assessment of where they are at. You can’t necessarily ask. For me it is helpful for me to know that person quite well.

M029 also described language modification and other intangible modifiable aspects of communication when she is face-to-face.

K I think I have probably told you how I operate. There are lots of unspoken things in communication and you only get those on face to face with the women. Getting to know the women. And it is an odd thing, but I often feel you change the way you react to people or deal with people, depending on their culture, their education, their language skills and understanding. Because I have looked after women who don’t understand metric or imperial measurements, who don’t understand the concept of oxygen, when you are talking about smoking cessation. So you have to be able to bring your language down to meet their understanding.

7.4.13 Finding the computer intrusive (attitude)
Midwives' use of the computer during consultation depended on their skill and on whether they regarded the computer as intrusive and their method as more efficient. Some midwives simply did not like using a computer.

I How do you feel about using the computer?

M030 I’m not very interested. I want it to be easy to use and I want it to REALLY work for me otherwise I can’t be bothered. If it makes my life really easy, fantastic. If it is just a gadget, then ...I have a fax and a printer. A fax I like.

I How do you feel about using the computer?

M028 I hate being on the computer.
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I How do you feel about using a computer?

M024 I don’t feel like just sitting there in front of a screen.

Most found the computer was a barrier during the consultation, although they were happy to use a pen and paper during this time.

M027 I hardly ever use my computer when I am with the women. I find it quite distracting. I find it takes away from the one to one relationship because the computer becomes like a third person. So I retro into my data. Is that a good word? [laughs]...

I Do you see a place for mobile laptop in your practice?

M029 For me, probably no. I know a lot of midwives do use them. I don’t like the idea of documenting when I am having a consultation with somebody.

M025 Because I am not actually using the computer that much. Like I am not in it every day when I am with the women. I am not having the computer on at the same time because I find it a bit intrusive.

I How do you use the MMPO?

M024 Just the minimum for claiming and statistics. That’s what I do at the moment. I do think, umm I am sort of in half mind to use it for my notes. But I feel at this stage, I don’t want to use the computer when I am with someone. So...and also because I have a small case load I am fine without it.

M012 I don’t have a computer or laptop in the room.
M030 used to use a laptop but found that having the computer in the consulting room was like ‘having a third person’.

_M030_ I used to take my laptop but I found the laptop interfered with the face to face. So I just talk to them. It was like having a third person in the room, so I stopped. I didn’t like it.

M035 find that entering computer data intrusive and that it interferes with the communication when she is with the women.

_M035_ I don’t like to enter when the woman is here, look at the computer when the woman is with me and so I will just write. I find it better communication with the women when I am writing, rather than turning my face to the computer. I try to update in real time actually. When the women goes, I will do my computer. If it is a lot of work, so I will do it at home.

7.4.14 Appreciating support from family (attitude)

Nearly all of the midwives relied on family support to enable them to be on call and carry out their professional role. Midwives work irregular hours, which impacts on their families. Several midwives appreciated family support in the form of computer support. Some midwives relied on family members to care for children while they were working and still had young children. M009 had six daughters and trained as a nurse, and then as a midwife. She carries a full-time workload supported by family members.

M018 trained to be a midwife in another centre while supporting small children, and now carries a full-time workload as well as being mother to six children.

Family members assisted midwives by sending emails, servicing the computer, backing up the computer, claiming, and advising on the most appropriate computer to purchase.

_M029_ We have a computer in the house and I do get emails from some people but my husband just prints them of and gives them to me ....(laughs) and I use Google for looking up information.
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M001  I have got a computer husband who has got a degree in computers and business studies at the EIT so he does the homework and comes up with the ideas. So, I just let him make the decisions when it comes to what I need.

M013 relies on her husband for dealing with the family Facebook page, as she doesn’t want to sit in front of the computer when she is at home.

M013 I have got a Facebook page and because my husband is on the computer all day, he is my Facebook secretary. So, he does it all. I don’t. He is a graphic artist so he sits on the computer all the time. And I honestly feel like I don’t have enough time to sit and use those things effectively so I don’t.

7.4.15  Reluctant to invest financially in business tools (attitude)
Financial constraints and time restraints were cited as reasons not to use technology. Midwives were reluctant to incur unnecessary business costs and were conscious of expenses. Midwives were reluctant to pay for Healthlink because it was considered an unnecessary and costly business expense is an example of maintaining viability of the business.

M001 We bought it as a clinic room and because everyone wanted to be independent and no one wanted to share the cost of running it. I am reconsidering whether I need to use the Vodem as much as I need the one at work, because I have got one at home as well. The thing is that because the midwives…we all pay rent to cover the cost of running the practice. People don’t want to spend more money on it and I kind of like …OK…I am paying the phone line and so I have provided a service that everything is provided. If something more is provided it costs more money.

Healthlink (Healthlink, 2013) is a secure messaging service, which is an option that was not purchased because of the cost.

M014 Healthlink has a cost associated with it when I last investigated. And I didn’t feel it warranted that expense for me.

M002 prefers to get hard copy results rather than electronic results onto her computer.
Do you get your lab results through Healthlink?

M002  No, it's the cost. I get them posted to me. I don't enter them into the computer; I put them into the handheld notes. You get a little page and I stick them into the hand-held notes. My handheld notes are the main source of the women's details. Whereas some of the midwives put all of that on the computer. I don't yet. My handheld notes are my major.

Midwives also considered the expense of midwifery notes issued by MMPO as a costly and unnecessary way to provide women with handheld notes. They used a small free booklet issued by the DHB as an alternative way to save money.

How do you use hand-held notes?

M027 I make my own ones up and print them. But um ... I told you I am Dutch, so I am very ... I try to be as economic as possible, in the most economic way. I print it myself.

Insufficiently supported technically (attitude)

Midwives who use the MMPO MaternityPlus software were given support in the form of updates and workshops. However, the function of creating a template so that midwives can write and send referral letters to the DHB outpatients' clinic caused frustration for those midwives who may not have the time and/or skills to adjust the software.

Midwives did not have access to electronic knowledge management resources to share with women, and did not have sufficient knowledge management skills to create their own resources.

M019 felt that she needed time off and there were other measures in place so that texting technology was not used in her practice. She lets women know when they first go to her that she will not respond to texts.

Some of the midwives that I have talked to...someone will text them at 3.00am in the morning, so from our point of view it helps our clients to ring the call centre and then make an effort to ring us and then we know that it is urgent at 3.00am in the morning. So the cell phone is here basically for me for the call centre to contact me. If I am not in the office, or next to a landline I will ring them back.
but I don’t text them. They know at the beginning of the relationship that is how we have set it up. We do get people saying, ‘I haven’t any money to text you’ I say, keep $2 on your phone at all times. It takes 30 seconds to ring me. You have got plenty of money. It is a little bit of a sticking point because I am an older midwife. It is for our safety. We need time off too.

7.4.17 Unwilling and unable to share women’s information digitally (action)

Each midwife had an arrangement that enabled her to have time when she is not on call however there was no standard way for the on-call midwife to access women’s information. Some carried handheld notes in the form of a small booklet with their basic monitoring information, and were booked into the hospital birthing unit, which holds a paper copy of birthing plans submitted by the midwives when women are approximately half way through their pregnancy. When midwives are not on duty, women’s pregnancy notes could not be digitally shared with the covering midwife.

7.5 Summary

7.5.1 Description of the midwives’ cohort

While findings do not claim generalisability, a comparison with the national workforce figures shows that participants in this study align with and a typical slice of the national workforce. The data source for comparison was the 2010 midwifery workforce report by the Midwifery Council of New Zealand (Pairman, 2010). Those with young families moderated their caseload, with the average for the cohort at between 60-70 cases per annum. Most midwives had dependent children living at home, so were working mothers. The highest caseload was very high at over 120 women. The recommended caseload is 40-60 cases per annum.

In many respects, this cohort of midwives is typical of the national workforce, although more are registered nurses, more are experienced and there is a higher percentage of Maori midwives.
7.5.2 Summary of midwives’ assets

The midwives in the cohort were **adequately but not overly resourced** in terms of assets. All midwives had a mobile phone. In 2010, smartphones were owned by only 8.5% (3/35) of the cohort. They were mostly equipped with the basic business tools comprising computers, 3G mobile phones and multifunction fax and photocopying machines. They were also supplied with information pamphlets, and booklets sourced from both commercial and governmental suppliers for hand-written recording.

Most midwives had a computer, commonly a laptop computer with practice management software although not all midwives used practice management software. The most common software used was the software developed by a midwifery organisation, which was used for capturing information for midwives to claim remuneration for services and biennial review of cases for professional audit. A few used a service to automate the receiving of laboratory and radiology results, but most chose not to pay for this service. Those who were subscribed to this service also received hard copies of the same information. All midwives had access to broadband although not necessarily in the consulting clinic where they work with women. Mobile broadband was accessible to 3 midwives.

Overall, there was a predominance of non-digital tools; a marked lack of tools for digital engagement with women and standard tools for mobile workers had been overlooked. Midwives’ independent choice of assets tended to be those that saved them, time, energy and demonstrated financial restraint.

There was a focus was on tools for the efficiency of midwifery business practice processes and apart from the non-internet enabled mobile phone there was no women-focused information or communication hardware or software.
As independent business operators, midwives had the **freedom to choose** their caseload of work, place of work and style of practice. The Yellow Pages telephone directory was the dominant form of advertising and this resource was an incomplete picture of available services. Midwives’ choice of practice sites varied from adapted rooms at midwives’ homes and converted houses to clinics within medical practices.

**Midwives were generally lacking in digital skills.** While they did strive to maintain a time-efficient and cost-effective business practice and perceived themselves as early adopters of technology, in modern health business terms, their actions did not match their perception of their own abilities and there was a **lack of engagement with digital technologies.** Considering the group are primary healthcare practitioners, the digital literacy skills were limited.

As midwives **data entry skills were underdeveloped,** and they felt that **technology was intrusive when they were with women.** As a result, data entry was carried out either after the consultation or later at home. **Multiple data entry** of the same information was common. The mobile phone was used in a basic way for synchronous voice communication rather than as a conduit to the internet or as a device to access applications, although a few midwives used the phone for SMS contact with women. Broadband was commonly used in their homes, but not in their clinics and few had access to the mobile internet, although some who had access did not use it.

**Keeping pace with technology and becoming skilful was difficult** for midwives as they were busy with their business, providing time for women and for their families. The mobile phone was used as a mobile voice communication device and not for data transfer or internet access. A small group used text messaging.
The use of email was limited. They were happy to use email for professional contact with their governing bodies but did not check emails regularly, did not have the capacity or skill to use mobile devices to read emails and did not wish to use email contact with women. The skill sets they practised relate mainly to use of their professional software, which saved them time for claiming remuneration and for recording the essential data required for claiming.

They were unable to securely share women's information electronically with other midwives, and so it remained siloed on their individual computers or on hard copy media.

Some midwives used the internet for information, although the most common way was 'Googling' rather than using advanced search techniques.

Outside of professional practice, Skype, TradeMe, internet banking and news reading were activities mentioned by midwives, however there was not widespread use of the computer use for social media. Midwives did not use the internet as a medium for entertainment or games. There was no mention of using the computer for recreation use and sitting in front of the computer was regarded as onerous.

Midwives preferred to receive hard copy magazines rather than read information from a screen and only one midwife mentioned accessing continuing professional development activities online.

Internet use with women in clinical practice was limited to intermittent sharing of URLs.

Midwives’ autonomy allowed them to choose the way they transferred information to women, and how they communicated with women. They did not feel a need to provide further information opportunities for women.

Pamphlets and discussion was the standard way of giving information. Their reliance on giving paper information rather than facilitating information transfer via the internet was seen as the gatekeeping of information. While
midwives valued the concept of women’s choice, they choose the instances and felt no need to provide further communication opportunities for women. These actions were seen as controlling tendencies.

Most were not interested enough in technology to pursue further skills and this is evident in the overall lack of digital engagement of the cohort. A small group of midwives who could be described as being ’sporadic technical stars’ countered the general trend. Despite this expression of interest in technology, their actions revealed that these midwives were still in the early stages of learning the capacity of the mobile internet.

Overall, there was a lack of digital skill set, little enthusiasm for technology, lack of sophisticated use of the internet and of the mobile internet, although midwives actively sought ways to improve their business practice with the use of digital technologies.

7.5.4 Summary of midwives’ attitudes, beliefs and perceptions

Midwives valued their autonomy to choose which technologies to use and how to use them, they could practise with only the mobile phone if this was their style. They could dictate they way they conducted business, decided their caseload, their style of practice and their place of practice. However, there were advantages in being able to claim by using a patient management system, and they appreciated ready access to the patient information required for audit and review. Midwives are in the business of providing service and they made decisions that would increase their business efficiency and save them time and money. Midwives were mostly not interested in the lifestyle use of social media, and some, were horrified at the thought of communicating this way, preferring a ‘face-to-face’ option both within professional practice and as a lifestyle choice. The computer in the clinical encounter was seen as ‘intrusive’.
Many felt threatened by digital technologies. They preferred to keep a low profile and not to advertise their services. 'Word of mouth' was considered the ideal way to attract women. Intermittent media reaction to adverse outcomes involving midwives was considered unbalanced and some considered that the media treated midwives unfairly. As market forces favoured midwives, they did not need to advertise their services, preferring referrals via 'word of mouth'. They revealed an attitude of defensiveness and lack of willingness to be publically transparent.

Midwives felt women had enough information with the resources they provided. They did not trust women to interpret the information they found via the internet and felt that this caused more harm than good.

Their attitude was that women were experiencing a normal physiological life event and were not 'sick'. The women they encountered were 'well women' rather than 'patients'. Balancing work-life requirements was a juggle for midwives as many were working mothers. They felt they were walking a tightrope and balancing these demands and were appreciative of the family support including technical support they were given. Outside of the working day, they did not relish being in front of a screen.

In addition to the work-life balance midwives had pressures from their professional body, which many regarded as a threat. They traded off the ability to be paid efficiently with the need to send details to the governing body, knowing that their practising details, caseload and business remuneration are available to this professional group. Other pressures they felt from their governing body were the level of documentation required, which some regarded as excessive.

Midwives lacked standardised infrastructure and support. As they operated independently, all their use of technology was dependent on their interest and willingness to invest time and money in the ventures. They received periodic
technical skill workshops from the College of Midwives, but these are insufficient to enable optimal use of the practice management software. Lack of technical support caused frustration and irritation.

Midwives associated technology with work and it was valued for the efficiency it brought to them and their business. Midwives perceived a threat from interactive digital technologies and did not feel the need to further engage with digital information and communication technologies for women.
Chapter 8: FINDINGS FROM THE WOMEN’S DATA

This chapter presents and summarises the initial codes and categories derived from interviews with women. The first section contains demographic and descriptive data from the women’s cohort. Units of analysis were the women’s assets in terms of hardware, software and services they chose to have, women’s actions or use of ICT within their pregnancy experience, and for everyday use, and their attitudes, involving ICT. All women lived within the Hawke’s Bay DHB catchment area and had used the local maternity service in the six months prior to their interview.

The women’s cohort was treated as one entity but, as the interview texts were analysed, categories indicated that younger women had ‘new and different skills’. The cohort comprised three sub-cohorts\(^{18}\): Gen X, Gen Y and Gen Z.

### 8.1 Description of women participants

Women were eager to share their experiences, both good and not so good, and many of the experiences they shared related to birthing, even though they were informed that this research was about information, communication and the use of technologies, especially the internet and mobile phones. Selective coding was employed to disregard experiences that were not associated with the topics under question.

Demographic quantifiable attributes were grouped and are presented to portray a general picture of the women who participated in this study and who enriched the qualitative findings. During the initial interviews, it was not known which characteristics if any would have a bearing on women’s use and attitudes towards ICT.

\(^{18}\) Described below under ‘generational status’.
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8.1.1 Women’s age (description)
The childbearing age range for women was approximately 15 to 45. This sample represented a higher number of younger women in the nineteen and under-age group (table 8.1).

Table 8.1 Women's age groupings

<table>
<thead>
<tr>
<th>Women's age groupings n=55</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19 and under</td>
<td>n=35</td>
<td>(64%)</td>
</tr>
<tr>
<td>20-24</td>
<td>n=1</td>
<td>(2%)</td>
</tr>
<tr>
<td>25-29</td>
<td>n=7</td>
<td>(13%)</td>
</tr>
<tr>
<td>30-34</td>
<td>n=8</td>
<td>(14%)</td>
</tr>
<tr>
<td>35-39</td>
<td>n=3</td>
<td>(5%)</td>
</tr>
<tr>
<td>Over 40</td>
<td>n=1</td>
<td>(2%)</td>
</tr>
</tbody>
</table>

8.1.2 Women’s ethnicity (description)
This cohort contained a higher number of Māori women than a national statistical sample (figure 8.2). Hawke’s Bay has 3.4% (147,783) of the total New Zealand population of 4,406,708, with its Māori population ranking eighth in size out of the 16 regions in New Zealand.

Table 8.2 Women's ethnicity

<table>
<thead>
<tr>
<th>Women’s ethnicity n=35</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>European New Zealand</td>
<td>n=31</td>
<td>(56%)</td>
</tr>
<tr>
<td>Māori</td>
<td>n=22</td>
<td>(40%)</td>
</tr>
<tr>
<td>Cook Island</td>
<td>n=2</td>
<td>(4%)</td>
</tr>
</tbody>
</table>

8.1.3 Women’s generational status (description)
During coding, the category ‘new and different skills’ suggested that younger women used ICT differently. McCrindle and Wolfinger (McCrindle and Wolfinger, 2010: pp.2-3) use a sociological rather than a biological description of the term ‘generation’. Their justification is that the biological span has lengthened beyond 25 years, while shaping factors have more clearly defined groups of people. They see a ‘generation’ as:

’a cohort of people born within a similar span of time who share a comparable age and life stage and who were shaped by a particular span of time (events, trends and developments)’ McCrindle and Wolfinger (2010: p.2-3).
For this study, Gen X was taken to be women over 32, Gen X as aged 20-32, and Gen Z as women under 20 years of age at the time of interview. Gen Z are women who were born from approximately 1992 and have had access to readily available personal communication and the integration of digital media into their daily lives. Given the shaping factors of rapidly accelerating change in availability and diversity of widely affordable ICT within the ten years, the age groups fit with McCrindle and Wolfinger’s description. As stated above, the women’s cohort has been treated as one entity, although some attributes have been sectioned out as will become apparent within this chapter. I assigned a generational status to the women’s identities, as I did not know if this was going to be significant. Generational status shows that generation Z participants comprise the women’s group (table 8.3).

<table>
<thead>
<tr>
<th>Women’s generation as status n=55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen X</td>
</tr>
<tr>
<td>Gen Y</td>
</tr>
<tr>
<td>Gen Z</td>
</tr>
</tbody>
</table>

8.1.4 Number of children (description)
Most mothers had one baby less than 6 months of age, and were cared for by a midwife as their lead maternity carer (table 8.4).

<table>
<thead>
<tr>
<th>Number of children per woman n=48</th>
</tr>
</thead>
<tbody>
<tr>
<td>One infant</td>
</tr>
<tr>
<td>Two infants</td>
</tr>
<tr>
<td>Four infants</td>
</tr>
</tbody>
</table>

8.2 Women’s Assets:

8.2.1 Financially constrained but adequately resourced
For the thirty-five participants who were Generation Z, and who were being supported by a government benefit and continuing education, their financial resources were constrained. Most women in the cohort were in the lower socio-
economic sector of the population, with only eight women having had tertiary education.

Buying and using a mobile phone was a significant cost for most women. High users were knowledgeable about the rates that gave best value for money.

_W004(Z)_ I just log on XT when I am at school and when I get back home. It is just a dollar a day. I only put up $20 and it puts on $5 more.

Women commonly knew how many texts they could use and high SMS users dropped their usage if they were nearing the limit. W035(Z) was knowledgeable about the status and conditions of her mobile phone payments and strived to get the maximum benefit from her plan.

_I_ You update your Facebook on your phone?

_W035(Z)_ I update my Facebook for free on my phone. Also I send a lot of texts. Up to 6000. If you top up on the 3rd, your text plan will go until the 3rd. It starts from whenever you top up. A month to a month. Twenty dollars a month and you get $5 credit. Also a dollar a day for the internet. It’s not too bad.

W023(Z) had a different plan that restricted her communication with her midwife because of the cost.

_W023(Z)_ No. Um I couldn’t really text her because she had an 021 and I had an 027. Because it would cost on my plan. My plan was 2000 texts [on the 027 network]. I didn’t think I got enough resources about being pregnant.

W018(X) was vigilant in keeping her costs down by texting, and making sure she did not exceed the limit for each month and then move into a higher rate per text.

_I_ How do you know?
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*W018(X)*  
I always check my balance when I think I have been texting too much and when it comes close to the end of the month, I check.

---

### 8.2.2 Women's mobile phone type (assets)

Table 8.5 Women's mobile phone status

<table>
<thead>
<tr>
<th>Women's mobile phone status</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile phone unknown type</td>
<td>21</td>
<td>(38%)</td>
</tr>
<tr>
<td>2G mobile phone</td>
<td>1</td>
<td>(2%)</td>
</tr>
<tr>
<td>3G mobile phone</td>
<td>26</td>
<td>(47%)</td>
</tr>
<tr>
<td>Mobile phone data plan</td>
<td>3</td>
<td>(5%)</td>
</tr>
<tr>
<td>Used to have a mobile phone</td>
<td>4</td>
<td>(7%)</td>
</tr>
</tbody>
</table>

At the time of interview, none of the women owned a smartphone and most women did not know whether their phones were 2G or 3G. Of the three providers in New Zealand (Vodafone, Telecom, 2Degrees), most women used Telecom as their ‘pay as you go’ mobile phone service provider. Most women had 3G capacities on their mobile phones but used the phone for voice and texting. The 2G mobile phones have been phased out, and now, all phones sold are 3G.

Four women had varied reasons why they did not now use a phone.

The cohort was resourced in terms of mobile communication, as demonstrated by the almost 100% ownership of a mobile phone. Although 12 out of 55 did not have access to the internet where they were living, access was possible at school, at work or through friends or family.

Women without mobile phones gave a variety of reasons for being without:  
W034(Z) used to have a mobile phone, but finds it better now without one, as she can use her partner’s.  
W031(Z) usually has a mobile phone but ‘it broke in the weekend’ and she was planning to buy another.  
W041(Z) has had her phones stolen, lost or broken and finds she can’t save up enough money because ‘I love my takeaways’.  
W045(Z) did not have a phone because she was previously ‘addicted’ and was trying to resist the urge. She used to be a big texter.
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W055(X) has previously used a mobile phone, but now lived in a rural area that does not get a cellular signal.

8.2.3 Women’s computer access (assets)
Most women had home access to either a laptop or desktop computer, or were able to access a computer if they wished (table 8.6). There were differences in ownership of laptop computers with Generation X at 100%, Generation Y at 54% and Generation Z women with 11% having their own laptop computer. Higher numbers of Generation Z had access to a desktop at home but home access to the internet was just 52%. This did not deter women who wished to access the internet. Instead, they accessed the internet at school, a library, a library or at a friend’s house.

W009(Y) went to her parent’s house for internet access, as they were saving money.

W039(Z) went to the library for information via the internet.

W053(Y) used the internet at the library while she was pregnant but since the birth of her child, she finds little time to get information this way.

A few were not interested in using the internet but this was not typical of the cohort.

<table>
<thead>
<tr>
<th>Group</th>
<th>Laptop</th>
<th>PC only</th>
<th>No computer</th>
<th>Home internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen X</td>
<td>100%</td>
<td>n/a</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Gen Y</td>
<td>54%</td>
<td>30%</td>
<td>15%</td>
<td>69%</td>
</tr>
<tr>
<td>Gen Z</td>
<td>11%</td>
<td>44.5%</td>
<td>38%</td>
<td>52%</td>
</tr>
</tbody>
</table>

8.2.4 Access to mobile services (assets)
All women, apart from the four who did not currently use a mobile device, had a cellular service plan. The four who did not have a plan were part of the Gen Z group. Two women (Gen X and Gen Y) were unable to use cellular data at home because they lived in a rural district, although when they went to town, they were able to use their mobile devices.
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Plans were chosen because of price and texting rates rather than data download rates.

8.2.5 Access to internet services (assets)

Most women had access to internet services at home, and all had access to internet services if they wanted to use the internet (table 8.7). Many of the Gen Z women used the internet in the family home where they lived, or visited frequently. Women who attended the Teen Parent School had access to the internet at school.

Table 8.7 Generational access to home internet

<table>
<thead>
<tr>
<th>Group</th>
<th>Home internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen X</td>
<td>100%</td>
</tr>
<tr>
<td>Gen Y</td>
<td>69%</td>
</tr>
<tr>
<td>Gen Z</td>
<td>52%</td>
</tr>
</tbody>
</table>

8.2.6 Access to a landline (assets)

All of Gen Y and X had a landline, but some Generation Z women lived in rented accommodation without a landline. This was a dynamic situation because of their transient accommodation.

W022(Z) had access to her father’s phone when she needed to call.

W029(Z) lived in a household where everyone had mobile phones and found they didn't need a landline.

W047(Z) has found that the people she communicates with all use text messaging in preference to a voice call.

Not having a landline was not a perceived disadvantage for Generation Z women as they preferred to communicate on their mobile phones using the text messaging format, or use Facebook chat.

8.3 Women’s Actions

8.3.1 Possessing new and different skills (action)

Women were proud of their texting skills. Women have incorporated particular ICT into their daily lives, but Gen Z’s use and choice of technology differed from
that of the older women. Women in the Generation Z category possessed new and different skills from older women. Texting dexterity was demonstrated during the interview by me asking high-texting candidates if they could simultaneously text and carry on a conversation with me. They successfully texted the colours of a wall print in the room, while I asked them unrelated questions. This skill was not universal, but high volume texters had dexterity, and could text as easily as they could converse.

The mobile internet was used for downloading music, and several women used Bluetooth to share and transfer music files to their friends. Midwives, Gen X or Gen Y women did not use these skills.

W049(Z) I go on [to the internet] for songs. Waptrick.com has free songs. It still costs $1 to go on the internet but everyone 'bluetooths' songs to each other. All the time.

W051(Z) Downloading songs. I Bluetooth them across. It's cool. We all do.

Bluetooth was also used to transfer photos

W009(Y) I use Pxt [photo-sending service] but not too much, because I can Bluetooth them across to my boyfriend's mobile when he comes home.

W036(Z) enjoyed downloading and playing games on the computer. She felt ‘addicted’ to the games, but the enjoyment factor overcame this slight anxiety.

I can get addicted to those games. There is one with big vases and marbles. Some of them are on a chain. You press on the chain and you touch it twice and the ball starts swinging and it slides up into the air ...you can go up. It is all about timing and these springs and they bounce up. And ...eventually it gets harder and harder. You have to put it into a cannon and shoot it off to make it fall into a vase. ..........It is soooo awesome to play. It was on the computer but I used up the times you could play it. I think you could play it four times.
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Extensive use of the mobile internet to update Facebook was exclusive to Generation Z women. This free service was used in a similar way to texting, and was used for direct messaging conversations as well as broadcasting.

W037(Z)  I go onto Facebook. I log into it because it is free on the internet. It is much better free. I use the computer for TradeMe and Huggies and other things.

W039(Z) uses it on her mobile five times a day because it was free.

W039(Z)  When I am not Facebooking on the computer I use my mobile.
About five times a day. It’s free.

W020(Z) finds her mobile Facebook skills keep her in touch with relatives overseas.

W020(Z)  My sister lives in Aussie and that is how I keep in contact with her and all my cousins are all in Aussie and I talk to them every night. Through Chat on Facebook. Private chat. It depends on what [baby] is doing. If he is in bed I will be in there a couple of hours. Pretty much all the time n Facebook and I mean if he is with his Dad I might only be on for 10 minutes.

Use of TradeMe was mentioned only by Generation Z women.

W025(Z)  I do it at Mum’s. Trademe is good. I just buy baby things, not sell them.

W036(Z) was competent on the computer and experienced at using TradeMe and using Voice Over Internet Protocol (VOIP). Her mother wanted to know how to use the sites, and used her daughter’s skills.

W036(Z)  mum...she is not a girl, but she wants to talk to my brother and stuff and every time she has to get me to come on. She knows how to type a page. If she wants to find stuff on TradeMe she wants me do to it. I am trying to teach her easier ways. Like instead of making a big toll call mum just go on and talk to him on the Internet.
W005(Z) was looking for rental accommodation and used the internet.

\[ \text{W005(Z)} \quad \text{At the moment we are looking to rent, so I Google a lot and use TradeMe} \]

TradeMe website was commonly used by many women, especially Generation Z, but was not mentioned by any midwives.

Most Generation Y and Z habitually used SMS and social media. The only women who felt slight anxiety over ‘feeling addicted’ were Generation Z women.

W020(Z) felt more ‘addicted’ to Facebook than her mobile phone, although she texted ‘under 1000’ times per month and regarded this as ‘not that glued’.

1 Can you talk about our mobile phone. How you use your phone.

\[ \text{W020(Z)} \quad \text{Mainly texting. A month, under a thousand. A lot of people send 6,000. I am not that glued. I like my phone, yes just to keep in contact if I need to but I don’t need it. I am not stuck on it. I am more addicted to Facebook than my cell phone.} \]

### 8.3.2 Habitually texting (action)

Table 8.8 Women’s texting habits

<table>
<thead>
<tr>
<th>Women’s texting habits</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not text</td>
<td>0</td>
<td>(0%)</td>
</tr>
<tr>
<td>Texts a few daily</td>
<td>17</td>
<td>(31%)</td>
</tr>
<tr>
<td>Previously a big texter</td>
<td>5</td>
<td>(9%)</td>
</tr>
<tr>
<td>Moderate texter: &lt; 50 per day</td>
<td>13</td>
<td>(24%)</td>
</tr>
<tr>
<td>Big texter: &gt; 50 per day</td>
<td>8</td>
<td>(15%)</td>
</tr>
<tr>
<td>Extreme texter: &gt; 100 per day</td>
<td>9</td>
<td>(16%)</td>
</tr>
</tbody>
</table>

All women participants either currently text or have used text messaging as a medium for communication (table 8.8). A small group were extreme users of SMS from the Gen Z group, some texting over 200 texts in one day.

Women within the Gen X and Y groups felt they texted a lot when they texted over 10 texts per day, although this was not a lot for women within the Gen Z group. Groups had a different perception of ‘texting a lot’.
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W001(Y) (Gen Y) I am a big texter? To friends.

I How many text would you do per day. More than 30?

W001(Y) Oh God no…about 10 maybe.

Generation Z women thought that 20-30 was ‘not a lot’.

I How many texts?

W029(Z) Not a lot. When I had a partner I used to do about 100 but now that I don’t text a lot, 20-30 only.

The cohort majority send less than 50 texts per day, mainly to family and friends. Another small group uses Facebook chat on their mobile phone. For a small group, texting patterns have changed since their birth of their child because they do not have as much free time and their group of friends has changed. Mobile phone carriers have initiated a scheme to allow free access to a mobile light version of Facebook. Some Generation Z participants used Facebook chat as a substitute for text chat.

The blurring of boundaries between Short Message Service communication and free Facebook chat or mobile Instant Messaging to online friends is indicative of changing habits and opportunities. Mobile service providers adjust products, prices and terms regularly. Generation Z women were knowledgeable about plans and share this knowledge. Financial restraints dictated their choices.

8.3.3 Skilfully texting (having SMS skills) (action)

Generation Z women were skilful at using the mobile phone for texting, and several were proud of texting and talking at the same time. Texting with their phone concealed by their sleeve or in the pocket was a technique used when they wanted to text in a situation such as at school or in the doctor’s surgery. For young women who were high frequency SMS users, it was possible to text and
talk, a skill they demonstrated by texting a message while verbally describing something close by they were looking at.

_W036(Z)_ [I can] multitask [laughs]. A lot of people ask how I manage to do it. My dad says 'how do you manage to not look at your phone?' [N can text and still talk to someone else] ... Quite easy [laughs proudly]. Once I got the hang of texting and I figured out where the buttons were and what I needed to write, and everything, I still used my ears and talked at the same time.

Generation Z were proficient in texting, mobile access of Facebook, and downloading and sharing music. Generation X and Y were more likely to use email and the internet for casual searching of pregnancy-related sites, which were commonly sites owned and serviced by large commercial companies providing products, or set up to advertise products relating to pregnancy and baby care. Internet searching skills were not investigated fully, but the interview data showed that key word searching was normal.

Generation X and Y skills included moderate texting, emailing, use of Facebook, sending image (pxt) messages from the mobile phone, internet searching, use of YouTube and joining up with a site to receive weekly emails. W003(Y) used the internet to download movies and music from a Russian site, but this was exceptional. Generation Z skills included greater texting skill and higher usage, use of mobile Facebook for chat, internet searching, subscribing to weekly emails (to a lesser extent) and downloading music to share with another mobile phone by using Bluetooth wireless technology to transfer files to that phone. Using the $1 per day scheme, music was downloaded from a free music site and shared with friends. All groups commonly visited YouTube to watch music videos.

Generation Z more commonly used a laptop or home personal computer for games, downloading music and watching YouTube.

Texting was a fully integrated activity for almost all the women, integrated in the sense that it was not an 'add-on' to their life, but a seamless part of every day and not even an extension. It was as much an instrument of communication as the voice.
8.3.4 Forgoing the landline (action)

A few women did not have a landline at home and used text messaging as their preferred means of communicating with their friends and family. Naked broadband is available without an existing phone line, although this option was not mentioned. Women without a landline at home did not have the internet at home, but relied on their mobile phone to access the internet.

W053(Y) lived with her boyfriend, and they could not afford the cost of a landline as well as their mobile phones.

W033 was about to move to a house with no landline and when contemplating her options found Facebook was her most important communication media.

W033(Z)  

When we move out we won’t have a landline. It is 50 cents for every minute to talk to my parents. Might have to invest in a 2 degrees phone. I just have a new expensive phone. I just think ...my dad and my stepmum are on Vodafone where are others are on Telecom. My real mum is on 2 degrees. Trying to find that balance. It is still $6 a month to have a best mate. I have 5 people I may want to ring. I would probably die without Facebook. It is a big centre of my life. You can get hold of people.

W047(Z) does not miss having a landline because ‘everybody texts’.

W047(Z)  

[I text] mainly at night when my daughter is in bed. Even when I am not texting someone I am constantly checking it if someone is texting me. It is nuts. I am constantly thinking.... I would like to get rid of it but I can’t get fully rid of it because I know that is how people contact me. I don’t have a home line and no one else uses home landline. Everyone texts. I did 5500 last month, mainly at night. Sometimes no-one texts back and sometimes there are a lot of people.

8.3.5 Seeking additional information (action)

Women commonly sought additional information to satisfy their needs. Often, the information was via the internet, although books and other people also filled this need. Women mostly valued their midwife as a trusted source of clinical information and most had experience with just one midwife during maternity care. Some women were dissatisfied with the information given to them by their LMC.
W004(Z) (Gen Z) lived in a household with four generations. When complications arose during the pregnancy, they collectively sought more information on the internet.

\[ W004(Z) \text{ Me and Mum went and had a look because they [specialist] skipped around questions. They weren’t very forthcoming. We wanted to know. We wanted to know everything going on beforehand. } \]

Magazines, books, friends, family, electronic sources and midwives were potential sources of information for women during pregnancy, and all women mentioned some of these ways as the ways they found information. Mostly, they used more than one way, although using the internet and asking their midwives were the two most preferred ways to find information.

Women felt excited and informed by receiving a weekly email from a magazine-style website.

\[ W002(Y) \text{ I was actually getting emails for my first daughter as well. An American one. Baby Weekly I think. Every week it told you what stage your baby was at. And what it would look like ...that was REALLY COOL. Yep. That was good. It made it more...you can kind of...it was it was not just getting bigger. One part comes then another bit comes in and yeah. I was looking at something then it said weekly email alerts. Because you can do rotation of the whole baby ...I found it really good. } \]

W039(Z) was a Gen Z women who did not like talking to people and preferred texting. She also found weekly emails useful when she was pregnant.

\[ I \text{ Do you go on the internet at home?} \]

\[ W039(Z) \text{ Yes. I put my name on and got a weekly email [liked that]. They gave me pictures...(ultrasound).} \]

W011(Y) was a quietly spoken woman with a shy manner, who had a ten-year-old son from a previous relationship, and a new baby. She read discussion forums but was hesitant about joining as she found others answered the questions she was asking.
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W011(Y) Just the ‘I am pregnant’ one. I didn’t actually contribute. Sometimes like half the time my questions were answered by what other people were [wanting to know].

W050(Z) was living in a communal setting with young women who were at the teen parent unit, but had not birthed their baby. Women who already had infants were on hand to provide information and support, as they had already experienced birth.

W001(Y) felt empowered by finding her own information as her midwife was not able to satisfy her information needs.

I If you weren’t quite sure about information, where did you go?

W001(Y) Google. Internet. I had a condition. My pelvis, I can’t think of it, my pelvis bone was soft. I Googled it. Really good. Heaps of information and what I needed. That was my second child. My midwife was not very helpful. She didn’t give a lot of information, so I found a lot on the Internet myself. Yeah. I searched a couple of sites to get, like you know, but it was good. I had to get a belt thing, a belly belt.[laughs].

W002(Y) accessed information but was not confident with the information as some was conflicting. She felt she needed the authority of the midwife to give her confidence and be able to fully trust the information she found, especially the information from ‘nappy websites’.

W002(Y) The whole thing about what can I eat ...we were on honeymoon in Mauritius when I found out that I was pregnant because I was very organised because I took a test with me because I had a feeling...the month before I had been late and then I got my period a week late and then maybe. I had to go on the Internet to find out what I should and shouldn’t be eating. The thing that I think would be really really helpful would be coming from a midwife. Because there is so much information and so much is conflicting. Especially things that they say in the UK you can’t eat, over here they don’t seem to be too bothered about it. Things like feta cheese ...although it is not a hard cheese it is not a soft cheese either. And it is
like some places say it is fine to eat. Some say, no, you shouldn’t really eat it. And things like that. I think something like that that came from a sort of more ...authoritative place would be more helpful because a lot of the stuff I read about what you should and shouldn’t eat came from nappy websites. You know nappy manufacturers and things like that.

W005(Z) did not have any website recommendations from her midwife but ‘DEFINITELY’ used her conveniently placed laptop to access the internet for further information. She had been attending University when she become pregnant and was proud of her skills and of being an ‘early adopter’ of technology.

1 How did you get information?

W005(Z) I looked on the Internet. On the Reach.com website, they send out sample packs and magazines. A New Zealand website. I got an email each week from another site. I can’t remember what it is called. If you are 14 weeks, you get what her development should be, what she is doing, what she knows.

W006(X) enjoyed ‘baby sites’ and found YouTube videos helpful. She feels confident because she ‘has been around the net for a long time’ and rates herself as an early adopter of technology.

1 How did you use the internet during pregnancy?

W006(X) Oh yes [enthusiastically]. I have joined ‘Club Nutricia’ and ‘Huggies.’ I haven’t used the New Zealand ones but when I was pregnant, I sort of went onto the net quite a bit ...for certain things. I have been around the internet for a long time

1 Where would you put yourself on this chart?

W006(X) Probably early majority, yes early adopter.
W008(Y) enjoyed the magazine sites offering competitions and baby products more than use of the internet for information searches. She found sites by buying a baby magazine and visiting the websites recommended by the magazine.

W009(Y) I would just go into a website and week by week get updates on Huggies, bits and pieces. Emails and a, newsletter monthly. Every time there were competitions and things. I would be pretty much stuck to one website. One [email] came me week by week and one didn’t and I was more interested [in the baby]. I didn't do a lot of general searches. I would get the baby magazines and look in the back and there was advertising different services and so I would use that website and go and look at their bits and pieces and baby gear.

W010(Y) was a Gen Y mother who was on the computer many times a day for a variety of purposes. The computer was centrally placed and she would access the internet as she walked past. She used the internet for shopping and became very involved with her pregnancy.

W010(Y) I leave it connected all day and I would check it as I walk past I use TradeMe, the ‘sleep store’ [website], and Crying Over Spilt Milk [website]. I will look at Facebook, Trademe.[laughs]. The Sleep Store has a site on Facebook, which is really good [enthusiastic]. That is how I got onto it. I went onto the sleep store when I had [daughter]. I bought a book off there, so I use Google a lot as a search as well. I put in what ever I am looking for and usually I try and get New Zealand based …when I was pregnant, I signed up for the Oh Baby website and Kidspot. They have pregnancy emails. I went to find things for the baby, and bit of shopping online, and just getting the weekly calendar emailed with what was happening. If I had any concerns about what was happening I would go on and have a read. I just Googled it, and then when I was overdue, I was on there every day...[laughs].... I would go and have a look. I liked the ones I was familiar with. Not so much if it wasn’t a website I wasn’t familiar with.
8.3.6 Transient (action)

Generation Z were transient and more likely to change accommodation than Generation X and Y women. Some had been living with relatives and had found other women with common interests to share rented accommodation and costs. Transience was a factor that increased younger women’s reliance on their mobile devices.

W005(Z) (Gen Z) Yeah, we are looking on Google and TradeMe for flats and houses. Usually Google Real Estate.

Women would move in or out from the parent house. W022(Z) was now living with her partner, but did go back to her parent’s house to ‘get onto her feet’.

W022(Z) He [partner] lives with me ...yeah. But I did but then I moved in with my Mum and Dad for a little while until I got on my feet again.

W023(Z) is not in touch with her biological mother and has moved house many times during her pregnancy and since her baby was born. W023(Z) was worried about the effects that constantly changing accommodation had on her child, and lacked sufficient information about her baby’s colic.

W023(Z) Well, I was living at my Aunty’s for a while. I recently moved out in the weekend. She had Internet so I would go on a regular basis but not constantly, [a couple of times a week]. Now I live at Havelock with my uncle. I have moved a lot in the past two years or year and it is not really good for my daughter because she hasn’t been in a good routine. Since I have moved, [twice in July], I am finding it hard with support. My mother, she is not really around. Nor my Dad.

She is in her own world. My dad is having his struggles. And I don’t really see him much. I have had my Aunty. She has supported me a lot. She is awesome.

W033(Z) and her friend were going to move into a new house together as they have common interests and support each other.
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W033(Z) Yes but my friend and I are getting out. We have only been friends for a few months now but we just click because we are so alike.

W047(Z), W048(Z)(Z), W050(Z) and W052(Z) are typical of young women who live apart from their mother or other relatives, but who are in close contact with their family, and often use the internet at the family home.

W047(Z) I don’t have the internet really. Not in my house now. We did [have it at home at mother’s house].

W048(Z)(Z) We have it here and at my mum’s house.

W050(Z) I was in Nuffield Ave. [Napier] I am in a house with other girls from the school. We have a house mum. I heard about of it through my social worker at the Napier Family Centre. I came in the school holidays. [just mum at home]. [Internet at mother’s house].

W052(Z) These are her first and only grandchildren, so she sees them quite often. [Internet at mother’s house].

W026(Z) had no stable family support as her mother died when she was 12 and she moved ‘from aunty to aunty’ after that.

W026(Z) I signed up [to Facebook] at home at my aunty’s. My aunty stays in Camberly now. She moved back with us. I go to my aunty’s to get on or if I am at school. I go to my unblocker site and type it in. I used to like Bebo a lot. I would have to go on that every day. I had Internet...last year or the year before at home with my aunty. I have never lived with my mum [not in contact with mum]. My nan brought me up until I was 12. She passed away and then I moved from aunty to aunty.
Integration, of social media into daily life (even ‘addiction’\textsuperscript{19} to social media), compared with simply ‘using’ technology, was evident. Nearly all women valued the internet for both information and communication. Convenience, easy access and effective time utilisation were frequently mentioned. Evidence within the cohort demonstrated that women, especially Generations X and Y, valued being able to incorporate information and communication tasks into their daily routines. For example, W005(Z) went into Facebook several times a day, because the laptop was on the coffee table in front of where she fed the baby, and when I visited women’s homes, a computer was often visible in a living room where it was easily accessible. Generation Z women were more often ‘out and about’, carried their phones, and used to ‘anytime’ ‘anywhere’ mobile communication via SMS and Facebook chat. The pay-as-you-go telecommunication plans used by nearly all the women, enabled ubiquitous communication, which was predominantly texting.

8.3.8 Negotiating the mobile internet (Gen Z) (action)

Only women within the Gen Z group used the mobile internet. Many used a free service by Telecom, which enabled them to access a simple version of Facebook for chat, but also, by paying $1 per day, to access games and music.

\textit{W025(Z)} \textit{It depends [connecting with the mobile internet] on whether I have got credit or not on my phone. You can go on Facebook on your phone. You just upload it. You put the Facebook button and then go to upload pictures and it says ‘from phone’. And you find the pictures you want to upload. It hasn’t cost me before. It costs to go on the Internet but not to upload photos.}

W035(Z) was an enthusiastic user of the mobile internet.

\textit{W035(Z)} \textit{I text ...all the time ...photos, videos and music. You can text as much as you want. It is $12 to top up but you can only buy $20 top up card so I use $20 and for a whole month you can send as many texts as you like to 021 027 and 022.}

\textsuperscript{19} Women who used the term ‘addiction’ did not mention that they were receiving help for this condition, and this was not probed.
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Text anybody back as much as you want. I send a lot because I have Facebook on my phone as well, for free. I send a lot. Up to 6000. If you top up on the 3rd, your text plan will go until the 3rd. It starts from whenever you top up. $20 a month, and you get $5 credit. A dollar a day for the internet. I can get free Facebook on my phone. I can get onto the internet and Facebook for free with no credit. A lot of girls know this plan. I can also get Facebook free when I have my computer. You get so much time on the internet for $1 per day. You can download music from Waptrick, yep mp3 you can get cool songs.

W044(Z) paid for downloaded games on her mobile device.

W044(Z) Games, yes. I have only looked for 5. On my phone. I just go onto the Internet on my phone and buy them. The better the game is the dearer it is. The car hero was $4.00 but it is a perfect game.

W041(Z) did not currently have a mobile device as it had ‘actually brought a lot of trouble’, although she had mobile internet skill.

W044(Z) have been through so many phones. I can’t look after them. They either break or get stolen. The majority have broken. I use my mum’s phone and I just can’t save up to buy my own phone. My savings account ...when I am in town I have to go and get something to eat. I have to go and get ...I love my takeaways. You know how you have blue-tooth. I used to top my phone up with all music from my friends phones. It actually brought a lot of trouble. I used to get my phone taken off me a lot when I was younger because it got me into trouble quite a few times.

W049(Z), W050(Z) and W051(Z) also downloaded and shared music on her mobile device.

W049(Z) I upload photo, talk to them [friends]. If they are online, we will talk [live chat] on Facebook. Download music [download on the $1 days...music] [laughs] and we Bluetooth it across] [handed phone it].

W050(Z) Songs. Waptrick.com free songs. It still costs $1 to go on the internet but everyone Bluetooths songs to each other. All the time.
8.3.9 Discovering the mobile Internet (action)

Gen Z women viewed the internet as a social networking, entertainment and communication space rather than a source of information or for searching, and this was often accessed via their mobile device. Generation Z users were more likely to Facebook via their mobile phones, using the free light version for chat and the $1 per day option from their mobile phones which was ‘very handy’.

W024  I can’t do without my phone, because all of my contacts, all of my people, calendar, I have it for my dates and appointments. [For the internet] I just go into Google or whatever. My one is $1 per day. If I use the net that day, it charges me $1 for the day. Whenever I ring up Telecom, it tells me what the new ones [plans] are or I can look on the Internet if I want. On my phone or at my home. It depends of if I am at home or not. I like my phone for texts. I might use my phone for the internet every day …Bebo, Facebook, research, whatever …I know, it is so handy. I can go into chat on Facebook messages.

W024(Z) enjoyed keeping up her Australian links by using her mobile Facebook option, and remained flexible with which application was used and had the option of loading up photos from her camera on a home computer.

W024(Z)  I used to live in Australia and they are on Facebook. Bebo is my NZ friends. I lived in Aussie for about 4 years. I got pregnant here. I have been here for about a year and a half now. I went over there to be with my grandmother.

I  Are you in contact with her?

W024(Z)  Yeah, Facebook, yeah, and my digital camera. [I] just upload photos onto my page from the computer. If it is on my phone, I can upload it on my phone straight to the Internet. My Facebook and Bebo. If I use my digital camera, I have to hook it up and save it onto my computer. Only $1 per day. It’s awesome.

By comparison, none of the Gen X women used the mobile internet option.

8.3.10 Embracing social media (action)

In contrast to midwives’ negative attitude towards the use of social media, women within the total women’s cohort embraced digital social media. Gen X
and Gen Y preferred access via a laptop computer, whereas Gen Z, preferred their mobile device. This was because access to a ‘skinny’ version of Facebook was free. Facebook chat was an alternative to texting as there was no restriction on the number of characters as there is with SMS messaging.

Many women would check their Facebook page multiple times during the day.

W002(Y) Emails are mainly used just for notifications from Facebook. I don’t really use it for emailing people but it is just another source of communication if I need it. The main thing is cell phone.

W002(Y) I check it [Facebook] all the time. I would probably go on it every day at least 3 times per day, so I guess I use it quite a bit (laughs)

W003(Y)(Y) I usually check it at least a couple of times a day.

W007(X) I go there [Facebook] LOTS. Just Facebook, because I am interested in seeing what other people are doing, more than what I am doing, it just keeps me in touch with the outside world a little bit, especially when my friends are overseas and things in different places.

W020(Z) used Facebook to keep in touch with overseas relatives because it was free. She would often be on Facebook for a ‘couple of hours’ after her baby was in bed. It was important for her that her sister in Australia could see her child growing up and by using Facebook, she felt closer to her sister.

W020(Z) Yes, [I use Facebook], because my sister lives in Aussie and that is how I keep in contact with her and all my cousins are all in Aussie and I talk to them every night, through private chat on Facebook. It depends on what Jasper is doing. If he is in bed, I will be in there a couple of hours. Pretty much all the time on Facebook and I mean if he is with his Dad, I might only be on for 10 minutes. It is important to me because I can keep in contact with family and friends. And it is free, so why not. I can text but it is a lot more expensive and ringing and my sister rang me with her cell phone for 20 minutes and it cost her $50 from Aussie. Since
she is my friend, she can access my photos I have uploaded. Only my friends can. She can see development. She can just feel like she is not apart from him so much you know.

W023(Z) had a Bebo account to chat to her brother, but her grandparents in Australia thought Facebook was more appropriate, so she communicates with them on Facebook.

W023(Z) Yes, I use social media to have chat with my brother. Mainly I went on Bebo. I went on Facebook to contact my grandparents. They thought it was a more appropriate website for them to go on. I have deleted my Bebo page because...yeah...I would rather have Facebook.

W030(Z) also finds Facebook useful for posting photos so her friends in Australia can follow her, and Windows Live for chatting.

W029(Z) I do it [keep up with friends in Australia] through Facebook and Windows Live (videocall). Usually in the morning, then after school for more than an hour. I post photos and videos and I make sure it is private.

W024(Z) enjoys her skill and the communication and closeness she can achieve for very little cost.

W024(Z) At home. Mum has it [the internet]. Every day, Facebook, hotmail and if I have any homework to do I will. I used to live in Australia and they [friends and relatives] are on Facebook. Bebo is my NZ friends. I lived in Aussie for about 4 years. I got pregnant here. I have been here for about a year and a half now. I went over there to be with my grandmother. I use Facebook with her. I just upload photos. Just upload them onto my page from the computer. If it is on my phone, I can upload it on my phone straight to the Internet. My Facebook and Bebo. If I use my digital camera, I have to hook it up and save it onto my computer. Only $1 per day [on the mobile phone].

W032(Z) usually accessed Facebook ‘about twice a day’, which she considers ‘a lot’ by her standards.
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W032(Z)  I use Facebook to keep in touch with my friends. A lot. About twice a day.

W033(Z) ‘would probably die’ without Facebook but uses it for chat and not for posting pictures of her baby, although she thinks this would be a good idea.

W033(Z)  I would probably die without Facebook. It is a big centre of my life. You can get hold of people. There is only one photo of my daughter. I don’t know how to put videos on. I have seen videos. I had the opportunity to get a [video] phone but I didn’t know how to jail break it. There was this boy we were not really friends. I went to Facebook to see if he knew how to jailbreak one. I found he had a baby so I thought...probably not in the mood to jailbreak a phone. I just had an idea. Girls here are constantly asking ‘how old is your baby’ ‘when are you due’ so maybe just a Facebook page that has pictures. Their birthday....I don’t know if people are really keen on putting their baby on the internet.

W035(Z) was very conscious of the costs and loves the fact that Facebook is ‘free’ both on her mobile phone and on the computer.

W035(Z)  I can get free Facebook on my phone [very pleased and enthusiastic]. I can get onto the internet and Facebook for free with no credit. A lot of girls know this plan, and I can get Facebook free when I have my computer.

8.3.11  Networking, learning from each other and collaborating (action)

Women attending the Teen Parent Unit valued social support and helpful information from other women and commonly used other experienced women as a source of information.

The Teen Parent Unit allowed young mothers to spend most of each day in the same educational area. Because there were qualified childcare facilities there, they could attend to their baby or child at any time. Breast-feeding was encouraged and the setting was conducive to mutual support. Friends would often live together with their babies, or a larger group would live in a house with a support person. Strong supportive bonds were formed.
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Young women in the teen parent community spoke of support and knowledge sharing. W049(Z) is a teen parent living in a home with other teen parents and a caregiver.

8.3.12 Needing new skills (action)
The general method of information retrieval using the internet was to ‘Google’ for information, which was achieved by typing a word or ‘a few words’ into the search field. Gen X and Y women were more likely to search the internet for information related to the pregnancy than Gen Z. The sites women accessed indicated a lack of search skills and a lack of awareness that to effectively engage in eHealth a skill set or level of eHealth literacy is necessary. Women mostly accessed commercial sites, which are ranked higher than organic results on the search engine results page when few words are entered into the search field. W001(Y) typically used a few key words and was satisfied with the result.

I Where did you get information?

W001(Y) Just Google. Internet. A few words. I had a condition ... my pelvis, I can’t think of it, my pelvis bone was soft. I Googled it.

I Was that helpful?

W001(Y) Yeah, really good. Heaps of information and what I needed. That was my second child. My midwife was not very helpful. She didn’t give a lot of information, so I found a lot on the Internet myself. Yeah.

I You could trust the information?

W001(Y) I searched a couple of sites to get, like you know, but it was good. I had to get a belt thing, a belly belt [laughs].

W002(Y) did not have the ability or skill to evaluate the information she Googled.

W002(Y) I did Google but I couldn’t really believe anything on it. It was just more of a guideline. I just didn’t know.
W005(Z)'s response was typical of many women who just entered a few key words.

\[ W005(Z) \quad \text{If I needed any extra information I would just Google it.} \]

Women would 'go to Google' if they were slightly anxious and didn’t feel like contacting their midwife.

\[ W010(Y) \quad \text{I was overdue, so I was on there (internet), Googling every day.} \]

W011(Y) felt slightly 'bad' about using Google so often.

\[ W011(Y) \quad \text{I Google lots of different things. If I don’t know what something is I quite often google. I am quite bad for that [self deprecating]. I suppose it is not bad is it? My husband says ‘why don’t you go google it’, so I do.} \]

Van Deursen (Van Deursen, 2012) has pointed out that despite the volume of health information on the internet, health search skills and evaluation skills are insufficient for the general population to make good use of the available information. Van Deursen (Vandeursen & Vandijk, 2011) considers this lack of skill to be problematic for members of the younger generation, who are often considered internet-competent. The casual way women said ‘just googled it’ as the way they found information and their lack of skill in finding health information could well support the findings of Van Deursen and Vandijk.

\[ W001(Y) \quad \text{I just google everything.} \]

\[ W052(Z) \quad \text{If I need help I just google.} \]

The majority of women used Google. ‘Just googled it’ was a common response to the question asking how the participant found information. A detailed appraisal of women’s internet search characteristics was outside of the research aims of this study.
8.4 Women’s Attitudes

8.4.1 Feeling proud (attitude)
Women spoke of their digital skills with pride, and enjoyed relating their engagement with the internet. Women were very pleased with their facility to use their mobile phones to chat on Facebook without cost.

W035(Z)(Z) I can get Facebook on my phone [proudly]. I can get onto the internet and Facebook for free with no credit. A lot of girls know this plan.

The range of skills was also a source of pride.

I How do you use the internet?

W054(X)(X) [For] everything [proudly]. Newspapers, the daily headlines. Herald mainly. Weather all the time. Met service. I can find my way around. Trademe. Buy and sell ...both. [Broadband] is good. Email, banking, music photos, Facebook, and my own albums on my computer. I would probably use [Facebook] lot for chat. It is private.

8.4.2 Appreciating text message communication with midwives (attitude)
A strong theme was women’s appreciation of midwives who used text message communication for reassurance, and to adjust appointment times. Women expressed uncertainty that their pregnancy was normal, even though they were free to contact their midwife.

W003(Y)(Y)(Y) I don’t know what to expect, it was my first baby!

W009(Y)(Y) You never know whether you are urgent or non-urgent, so it is like...ahhhhhhh, I used to say ‘I don’t think it is urgent’ [when asked by the call centre operator].

Unsurprisingly, reassurance was very important for younger women. Some lacked close family support and their pregnancy was often unplanned, although older women as well appreciated this level of support. W008(Y) and W006(X) also appreciated the immediate support from text messaging her midwife.
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I The texting?

W008(Y) It was good. If I have a baby and it is crying, if I can pick up my phone and just text or have that communication, otherwise my hands are full, especially when I am trying not to panic. And even when I was in my pregnancy, because I have had complications, surgery and things, sometimes I didn’t want to ring her up and say...if I knew her time was valuable...I needed to know that pains...if they weren’t quite right. Things you can get answers straight away that you didn’t need to have a whole conversation about. I don’t know, interesting.

W006(X) [Midwife] always had her phone with her, she was never away from her phone, so you always knew no matter what time of the day you could get hold of her and she would get back to you very quickly and you didn’t feel like you were disturbing her too much because you weren’t having an actual conversation even though it might have been quite trivial to her. It was quite important to me what I was actually asking her, so it was quite simple just to text her and she could...

Many women welcomed the opportunity to communicate with their midwife by text, as a text message seemed less intrusive than a phone call. W010 did not want to bother her midwife by interrupting, and saw text messaging as a ‘polite’ or ‘considerate’ way to communicate with her midwife.

W010(Y) I found texting great because I never felt intrusive. It was always a quick solution. I wasn’t ringing and hounding...and being intrusive.

W008(Y) had an acknowledged anxiety problem and was receiving treatment. Communication by text message with her midwife was undoubtedly reassuring for her.

I Can you tell me about texting with your midwife?

W008(Y) Absolutely, if it was some quick questions I wanted an answer to rather than bother her. If she was busy, she could just flick me an answer rather than ringing her and taking up her time with somebody else in the delivery suite. It was quite reassuring if it was something simple and it was really good. For appointments, if I was running late I would quickly flick her a text and I found that useful. Sometimes you don’t need a drawn out conversation, if you can just text.
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W041(Z)(Z) also acknowledged a level of high anxiety and was reassured by the text messages of support from her midwife.

W041(Z)(Z) [Midwife] was really good. Every time I texted her she said ‘you are a great girl’ and I said ‘you are a great woman’ thank you so much. She was quite cool. A huge help. A lot of information, a lot of advice. Made me really at ease with pregnancy from what other people described it to be...painful...made me feel real comfortable and being myself in my own body. She texted me and was easy to get hold of. It was no problem. She was always there for me.

W007(X)(X) found that even in labour texting was a useful way to communicate with her midwife when in labour at the hospital because it was easier to text than talk. Texting had become a relaxing way of communicating, so much so that W007(X) resorted to this medium when in pain.

W007(X)(X) When I was in labour I would text her and she would text back. ‘How are you going? Because when you are in hospital you can’t always talk on a cell phone, so she did drop a text and I texted her. Especially in labour, you don’t feel like talking to people so it was quite easy to flick a text off.

W010(Y) found that texting while in labour before she went to the hospital was a very good way of keeping her midwife in the picture as to how her labour was progressing. The notion of constant updating with ‘mini-messages’ was useful in this instance.

W010(Y) [Midwife for W010’s first pregnancy] said...’you mums, you just don’t know when to go to hospital’ and she was ‘whenever you think’ and I felt like I was hassling her to ring here where as with [midwife for the second pregnancy], I was texting her through my labour when I was at home. It was amazing.

8.4.3 Swamped by information (attitude)
Women found a lot of information at one time was not helpful. M015 mentioned that women were not very interested in breastfeeding information during
pregnancy, and might not watch the DVD information distributed as part of Breastfeeding New Zealand’s promotional campaign.

Too much internet information was not always seen as a disadvantage. W008(Y)’s baby had a bladder infection and used the internet for additional information.

W008(Y)  Sometimes it [internet information] would be information overload and you can take in too many things and think ‘oh god’ but I am the sort of person, I like to take information, ideas and try it and do my own way of doing things. Advice is very helpful. From other mums, and I live out in the country, so it is quite a way from anywhere, so using the internet has become quite a good thing.

By contrast, W016(Y) found too much paper information gave her information she felt did not need.

I  How were your Information needs were met during your pregnancy.

W016(Y)  Yes, in a way too much information. Maybe yeah. Lots and lots of paper and things that you may not necessarily need to know….it was good reading material but you read it once…not relevant at the time. You would just forget it. Because it was so much earlier.

I  How do you think you could get information?

W016(Y)  Google. Just because you can jump on the computer and it is right there when you can source the pages you want to.

W018(X) also found too much information at once was confusing and preferred a weekly email. She was initially pregnant in Vietnam and English books about pregnancy were unavailable.

W018(X)  I think you can get too much health information and be a bit overloaded. I got a weekly email from the BabyCenter. A weekly update. [I was first pregnant in Vietnam] I went onto the baby …UK. You can’t get English literature over there. I had that information coming through.

W016(Y) found information from the internet was to be ‘just in time’.
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I to W016(Y)  How do you think you could get information?
W016(Y)  Google. Just because you can jump on the computer and it is right there when you can source the pages you want to.

Having too much information but not having New Zealand information was seen to be problematic for W010(Y).

W010(Y)  I put in whatever I am looking for and usually I try and get New Zealand based. Sometimes you can’t tell mmmmm.

W054(X) also found a lot of information but preferred New Zealand information and sometimes did not know if it was a New Zealand site.

W054(X)  I look at articles. I look at through ...and I get parenting and health sites. Lots. I do natural health as well. Get newsletters. I just go into the internet and look. New Zealand sites are more relevant but I just don’t know if they are.

8.4.4  Feeling skilful, but lacking eHealth literacy skills (attitude)

Basic skills— using email, searching the web, uploading photographs, using Facebook, using the mobile phone to take and share photos, using the mobile phone to send SMS messages, downloading, listening to and sharing music, videos or films, taking photos and playing games—were common. Generation Z skills were centred on communication and networking, while Generation Y skills more often included information retrieval and email. On the basis of their stated and perceived skills, these women displayed the skills of being ‘networked’ and ‘connected’. In their view, women ‘felt’ skilful in that they could do everything that they wanted to do. However, they may be less skilful than they perceive, in that they know only the skills they know, and were unaware of skills such as the skills needed for eHealth literacy. Women did not enlarge on their ways of searching for health information other than using very basic search technique and were typically satisfied with the results.

W005(Z)  They [ICT] have always been around, and I am OK at using them.
W008(Y)  [Using email and the internet] can help me work smarter. I find I can use them [ICT] easily because I have been doing it for so long now.
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I know how to do a good search, and can always find something useful.

If women were not confident, they had friends or family to help or they were prepared to learn.

I What about viruses?

I didn’t know.....I was talking to [friend] ....about it and she said it was OK. I have a good virus checker on my computer. If anything goes wrong on the computer I just take it to ....my sister set it up. Her and her boyfriend are nerds.

I have a friend who works in IT and if I get stuck, I usually get hold of him. If I didn’t have someone to fall back on I would have to learn it.

8.4.5 Feeling addicted (attitude)

Using the internet to download and play games was common within the Gen Z group although some felt ‘addicted’ or that their phone was causing them trouble. The manner in which W036(Z) (Generation Z) described playing these games indicated that she had an element of addiction to playing them.

It is just SOOOO much FUN. If you keep pressing them with the mouse they go WHoooooo Whoooooo and if you keep pressing them. They burp. I can get addicted to those games.

The mobile device is an extension of the body in terms of being totally integrated into their everyday actions and is ever present and on hand. Younger women often slept with their mobile phone, and anxiety regarding addiction and dependence was evident.

W026(Z) would not want to be without her phone and also described feeling ‘addicted’.

Yep. [laughs] I wouldn’t do without it. I am addicted. The teachers try and take the phone in the morning....but...I don’t want to miss friends. Some of them are girls in the unit, some of them are just mates I have around me I can’t see much.
W027(Z) also feels ‘addicted’.

   W027(Z)  Yeah, I’m addicted. I text at 3 o’clock in the morning and chat with friends. If my brothers are on the internet [on the computer], I go on my phone and use Facebook and Bebo. Most days for about an hour.

W039(Z) is an high volume texter, and used her phone in preference to talking. She had a very soft voice, but explained she did use Facebook both on the phone and on the computer as well as sending about 200 texts per day to friends. Only individuals in the Generation Z group mentioned being ‘addicted’ to their devices or displayed actions that would suggest they were very high users of the devices or services.

W041(Z) felt the mobile phone was ‘getting her into trouble’ and now feels a lot more mature without it.

   W041(Z)  I used to get my phone taken off me a lot when I was younger because it got me into trouble quite a few times.

W045(Z) felt distracted by the mobile phone.

   W045(Z)  I think I am doing better without a phone. I get distracted easily.

For Generation Z, the mobile phone was the prime means of communication, particular for the big texters. Although women used the word ‘addicted’ to describe themselves, none mentioned they were receiving treatment for a pathological addiction.

8.4.6   Constrained by choice of midwife (attitude)

Women could not make an informed choice of midwife when they needed antenatal care. Women relied on the information in the Yellow Pages phone book and on word of mouth information, which was from women who had personal experience with one midwife.

W001(Y) had difficulty finding a midwife from the Yellow Pages.
I How did you find a midwife?

W001(Y) Difficult. Now ...not finding the information. I just used the Yellow Pages. None of them got back to me. I was about 13 weeks pregnant by the time I found my midwife. Difficult yeah. I hadn’t had that problem with my first two children. They were easy. I was with my doctor.

W011(Y) would have found it helpful to know where to look in the first place.

I How did you find your midwife?

W011(Y) Yellow pages. I just looked. I had rung a few. It is quite hard to find a midwife to begin with so if you could, instead of feeling you have to stay with that one person because you might not be able to get another one it would be good to know where to look first.

W013(Y) relied on recommendations as she had no other information.

I How did you find your midwife?

W013(Y) I was recommended a couple. One of the people at work. Their wife is a midwife, [at Clive Hotel] and also his wife’s daughter. She was also a midwife but couldn’t take me at that time because she was booked. And a couple of my friends recommended a few ladies and they seemed to be pretty booked out. I went to the midwives in Williams Street, and was recommended a midwife there who could take me and she recommended another one.

W015(Y) found that midwives did not get back to her.

W015(Y) I found it very difficult to get information for midwives. Then ...because I don’t think there is one central registry for them. And then, when I would have their details, you would end up talking to the call service and they would ...the midwives would not end up getting back to me. And that happened...you know. Perhaps the midwives were not on call at the moment or ...I had a very hard time with getting anyone to get back to me. So I guess that is one of the reasons I ended up going with [midwife], because she was the only one that got back to me. Even if they were full up, I would have thought it was common courtesy to call someone back. But whether they are just full up and don’t bother.
Which is quite typical. Ummm yes. I remember thinking at the time. Well, if...or whether their call service isn’t giving them the details to call the person back, I am not sure. But umm definitely, I guess that was a real communication breakdown.

W010(Y) would have liked to find out more information about the midwives she was considering.

W010(Y) If that [information] was out there it would be better, I had lots of questions. How many births do you have a month? How long have you been practicing? Because those are the things that would eliminate...and might save you time. Because if I knew those things. Those were exactly the things I asked her. Who will be available on your weekends off? So if those things were available. I think I am interested in how many births they do, how long they have been practicing. And how many children they have got at home. I don’t know why. But someone who hasn’t been through the process themselves, I would struggle with. Even though they have got the medical background, they haven’t got the practical experience. A friend had a male midwife. I would struggle with that one.

Women who arrived from overseas were confused by the New Zealand maternity care services when they had recently and felt the need for information and services. Five women (10%) arrived in the region, after living in another country during their pregnancy. Finding a midwife and negotiating the system was stressful for all but one, who had a pregnant sister guiding her through the process of finding a midwife.

W017(X) found the process ‘daunting’.

W017(X) Being new to New Zealand, I found it really stressful trying to find a midwife, knowing who to choose. In the UK it is very different. You are kind of nominated a midwife by your doctor. It is all done for you. So to be to ‘oh you have got to look through the yellow pages’. Was a little bit daunting.

W012(X) was used to finding information on the internet, but found the process of finding out about the New Zealand maternity system was difficult. This
Generation X woman was a lecturer at a tertiary college, who needed help to conceive. Her pregnancy was achieved using in vitro fertilisation, and she wanted a safe but not necessarily natural delivery. She was surprised to find health advocates judgemental.

W012(X) I use the internet for research. For my own personal stuff. The other big thing was that we moved here when I was 30 weeks pregnant. I was living in Australia and maternity services are completely different there. I needed to understand the New Zealand system. Midwifery is not really very prevalent there. I am a bit older [36] and also Lockie is an IVF baby so just as a default I get referred to an obstetrician. When I got here, I didn’t know the New Zealand system when I left I wasn’t married or didn’t have children so I had no idea about the system at all? It was difficult...very very difficult. And I am not bad at research [researcher at a university doing a masters degree] but I think it would be harder for a lot of other people. But, basically I rang...a consumer advocate group based in Auckland. Because that was all I could find about maternity services in New Zealand but they were quite socialist in their approach. I said I am with an obstetrician and she said ‘obstetricians in NZ are for ladies who have more money than sense’ I thought that was quite rude actually. Then I was laughing about my birth plan was and pain relief was and was just trying to make it light and I told her my birth plan was to have an epidural at the first contraction. She was ‘on no, in NZ we advocate ‘pain relief free birth’ and it was very much her agenda. Which was disappointing. However, on the flip side she did give me a lot of information.

The process of finding a midwife also stressed W017(X) and W018(X).

I When you came back to New Zealand how did you find your midwife?

W018(X) I was seven months. I had no idea but I had a couple of friends who were going through it or been through it. She arranged a midwife. There were not many people available. They were all gone, so she was just desperate and rang them. It wasn’t all that easy.

W003(Y)(Y) arrived from the UK and needed help from her pregnant sister, who arranged a midwife.
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W003(Y)(Y) My sister was pregnant at the same time so luckily she got me in with her midwife [midwife]. Ummmm as soon as I found out I was pregnant she basically said you need to get yourself into a midwife now rather than when you get back because you might struggle to get someone so she got me on the books with [midwife] who pencilled me in and I came to see her as soon as I got back.

8.4.7 Constrained by a barrier (attitude)

Women who had midwives in the two practices using the call centre felt constrained by the inability to communicate freely with their midwife, and were critical of the communication between them and their midwives. Women using these practices were given a contact number when they registered. The number took them through to a 24-hour commercial, non-medical call service where they were asked the question: ‘Is it urgent?’ If the call was urgent, a text or transfer was made to the midwife. If the call was not urgent, midwives phoned at the end of the day or at the midwife’s discretion.

W001 Um...I understand they don’t like to give their cell phone numbers out. Even if it was linked to a paging service. My midwife had a call service, ...and they were useless. Really slow. Very slow. I would ring the number and it was an answering service, and then I would have to wait to receive a call back, which would mean I would have to wait at home to receive the call. You know.

W003(Y)(Y) did not know whether to say if the call was urgent or not.

W003(Y)(Y) Having thought about it now and having spoken to some of the others at the coffee group, a lot of them had a cell phone contact and I think I probably would have found that better. Because with the messaging service you...I mean...I don't know how urgent it is...they say you need to prioritize whether it is urgent or not. And although [midwife] said ...if your contractions are 5 minutes apart and you can’t breathe through them and things like that then call me because then we are getting there. You just think how urgent it is and I don’t know what to expect. It was my first baby. I didn’t know what to expect in terms of how fast it would progress and if it went anything like on my Mum when she was having me it was 37 hours but my sister who had her first baby 10 weeks early was very fast. It was all over and done with in about 6 hours, so I kind of didn’t know where
to place myself on that spectrum. So I think...the messaging service I would have felt more confident in having an immediate feedback as to whether she was going to come now or whether it was OK to wait.

During her first pregnancy, W010(Y) found communication with her midwife though a call centre was unsatisfactory. For the second pregnancy, communication with her midwife by text was a better communication experience.

W010(Y) The first time I had [midwife1 ] and I changed because the communication was so poor. I had no way of contacting her. I had to go through a message service and you had to wait for her to return your call. You were never sure if she got the message. One day it took over a day to ring me back. I had spotting, and she took a day to ring me back. First time mother at 8 weeks with spotting and I was nervous. Not return calls. She once I had my baby she...communication was poor. She double booked appointments, she once I was home I had mastitis and said she would come and visit me, and she didn’t turn up, because she had bereavement in her family. She hadn’t written it down or communicated it anywhere. It was just one thing after another. The communication was poor. There was no offer of having her mobile phone ...return phone calls took a long time...there was no emailing, no acknowledgement that she had received the call. I was at home, an anxious mother wondering whether she had got the call through this message service.

And second time round I had [midwife 2]. She was amazing, I can’t fault her. She texted immediately, if she couldn’t...one day she was at a birth and had to change the appointment. She emailed me through things if I wanted things. I talked to her, she gave me links to websites to look at. She was amazing. Completely different. In my little book she would write down websites. If I was worried about this....'here look at this website'. She would email me through things...text all the time. Even when I was going into labour with Abbie, the first one. [Midwife1] said...’you mums, you just don’t know when to go to hospital’ and she was ‘whenever you think’ and I felt like I was hassling her to ring here where as with [midwife 2, I was texting her through my labour when I was at home. It was amazing.
W011(Y) was anxious and would have appreciated easier contact with her midwife.

W011(Y)  I think it could be a bit more personal between you and your midwife. I think...I realise I am no the only patient but your baby is pretty important to you so if they were a bit more accessible. I didn’t have any problems but was always nervous about if I did need to ring her would she be able to get back to me in time if something did go wrong. If I needed her, definitely [strongly]. And it ...nothing happened but it doesn’t make you feel very safe. I am a paranoid person [anxious] though.

W015(Y) found the call service worked for her, but thought that texting would have been better.

W015(Y)  Ummmm it was fine...[laughs] it did work fine...I always got a call back. Personally I find call services frustrating because. For instance at work, when people call through to me it goes straight through to me rather than having to call them back. I don’t consider it the best kind of customer service...like it is better to be able to talk to that person directly. But then again I understand with a midwife’s job that they are ...if they are attending to a delivery or something like that obviously you are not going to be able to speak to them....

You could text the midwife then they could have a look at it. It is quicker for them to have a look at a text than ring messages. So they could have a look at it and assess whether to [attend] now or later.

W016(Y) found that she said all of her messages were ‘urgent’, because that way she got a response.

W016(Y)  At the end I started to get pains at about 34 weeks. And to ring [midwife], I had to ring an answer service and you had to tell them whether or not it was urgent. That was not OK, because you didn’t know if it was urgent or not. I remember ringing up and she said ‘is it urgent’ and I thought ‘urgent’ to me sounds like I am in delivery, am in labour but I wasn’t. But I wanted to see her that day. Well they said if it was non-urgent, they would ring you up after 5.00pm. So, I
ended up saying ‘urgent’ just so she would ring me. So, the system wasn’t really very good that way at all. And then, she would ring back in 5-10 minutes.

W020(Z) would have found text communication much easier, and hesitated to contact her midwife.

W020(Z) I had to phone her. I would have found being able to text her helpful because when we rang her number you got a different lady who then you told her if it was urgent or non-urgent. Non-urgent it could be a day or two before she rang back. You could be in between like you wouldn’t be urgent but you would want to know type of thing. You didn’t want to call her at 3.00am type of thing you would rather just text her so you didn’t....

W036(Z) found the call service ‘annoying’.

W036(Z) She didn’t give me a text number. There was an emergency number that I could call. That called the office and they called her to call me. It was quite annoying. I would prefer to go straight to her. A lot of the time I could not get to the phone to ring her because I didn’t have enough credit on my phone. I didn’t have a home phone. I would have preferred to text. Then I would feel as though I could communicate with her more. But, with it being a call to her office and a call to her ...her calling me it was a bit complicated and it was like ...it was quite annoying. I just wanted to go straight to her at the time. It took an hour to ring back. If I said it was extremely urgent then I would get her to ring me straight away or get another midwife to call. I wasn’t really too fond of it [the system]. It would be better if they had a text line if you could text to. Even if it was not directly to her, it would have been A LOT easier for me to contact her ....whatever. Annoying.

There were considerable differences in the satisfaction level related to communication between women who used midwives using the call service, and midwives who were willing to support women by using text messaging.
Information could vary from midwife to midwife. Women saw this as unwarranted variation. Variation in information on breastfeeding created the most stress.

W014(Y) found it confusing to get conflicting information from different midwives on breastfeeding technique.

W014(Y) Oh my goodness, that was a thorn in my side throughout the whole thing. Every midwife that I had had a different technique. I came home and I was cracked and sore. I cringed every time I had to feed her...my midwife [name] showed me the easiest technique and I did it for the whole 3 ½ months that I was feeding her. And, it didn’t hurt latching, didn’t hurt coming off. Nothing. But every midwife, I had about 3 – 4 over the five days I was in there had a different ...do this, move your boob that way ....do this, do that and it was like...oh my god, being a first time mum it was just daunting. And I couldn’t understand why they don’t have, especially when it comes to breast feeding, as in you can or you can’t because have got milk or you don’t have milk. It is the same across the board. This is the technique of breast-feeding. This is how you do it.

W009(Y) had breast feeding difficulties and confused by being given conflicting information.

W009(Y) I had to stop feeding [daughter] at 3 ½ months because my milk was not really there. I ended up supplementing her feeds anyway from about 2 months onwards with a formula feed, after a breastfeed and she always took it because she was always hungry, so she though ‘I’ll have that’, um and this time I talked to [midwife] about it, and she said you feed off both breasts. You feed and then change then the other side. It will keep both of them coming in evenly. It will keep the milk coming in. I don’t know why you were told to do it the other way, it is not really what you should do. I don’t know [perplexed]. That is a little bit scary because especially for first time mothers ...the second time, you go more on your own instincts and you think no, you don’t care what you have done because you are just comfortable doing it anyway but when you are a first time mum, you are bombarded with different advice and you take on everyone’s advice and you are so confused...and you think 'oh my goodness' you don’t know what is right and not
right. I think the advice I got from my midwife when I had [daughter-1] and the advice I have had with [daughter-2]. Different, all different.

8.4.9 Reflecting critically (attitude)
Women having their first pregnancy were sometimes unhappy in retrospect when comparing experiences, and they chose a different midwife for their subsequent pregnancy.

W010(Y) was a thirty-four-year-old married woman with two daughters aged 3½ and 3½ months. She had a frustrating experience with first midwife but felt entirely different with the second midwife who used email and text messaging. Most women appreciated the care, communication, and information they received from their midwife. Women with midwives who used text communication were very happy with their care, whereas those with midwives who used a call centre were less appreciative, particularly in retrospect, when they had learned that others could text their midwives.

8.4.10 Engaging with the baby (attitude)
Setting up weekly emails describing their baby’s progress and reading baby magazine-style sites was common especially. Women found this ‘exciting’ and ‘cool’ that they knew how their baby was developing. ‘Pregnancy websites’ generally meant sites such as OH Baby.com, Treasures.com, Huggies.com and BabyCenter.com which are commercial sites offering a range of products, services, and information targeted at pregnant women and mothers of young children.

M002(Y) I was actually getting emails for my first daughter as well. An American one. Baby Weekly I think. Every week it told you what stage your baby was at and what it would look like....that was REALLY COOL. It made it more...you can kind of...it was it was not just getting bigger. One part comes then another bit comes in and yeah. Yeah. I was looking at something then it said weekly email alerts. Because you can do rotation of the whole baby. I found it really good.
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M003(Y)  Yeah. You would click on the link and it would say “this week you baby has developed this this and this and is approximately this long and weighs approximately this much” and I found that quite exciting.

M005(Z)  I got an email each week from another site. I can’t remember what it is called. If you are 14 weeks, you get what her development should be, what she is doing, what she knows. Really useful. Yeah.

W010 was fussy about which magazine-site she chose, and as she became familiar with the site, her trust increased. This familiarity helped her to feel more comfortable about the site contents. The decision was based on intuition rather than a formal evaluation.

W010  I usually went to the same sites. I was sent a weekly email from OhBaby.com. I trusted the sites if it was one I was familiar with. Not so much if it wasn’t a website I wasn’t familiar with.

Women also accessed other services and information offered by the magazine-style sites, more so with the first baby.

8.4.11  Accustomed to an increasingly collaborative digital environment (attitude)
Women and families collaborated both online and offline to share digital content, applications and skills.

What about computers?

W053(Y)(Y)  Yep [enthusiastic] I’ve got one [a computer] at home for games, music, download photos and all that. Card games and all sorts of games, really. I usually get them from my family. I am pretty natty with the computer.

W05(Y) has many friends on Facebook which she visits every day. Collaboration and sharing were important features of her visits to Facebook.

W052(Z)(Y)  I have about 150 friends and talk to 75% of them. We share things, and yes, it is great.
A group of Generation Z participants used Bluetooth to share music, which was downloaded from Waprick.com using the $1 per day facility. These supportive relationships provided valued information, lessening the need for information from the Internet.

W051(Z) downloads and shares music with her family and friends, and appreciated the stories shared by other women.

I Music?

W051(Z) Wapricks for downloading songs. Waptricks. {I} Bluetooth them to friends, yep. During my whole pregnancy everybody had a story to tell me. I was working in the supermarket so everyone who had a baby came up to me and told me their stories and...that’s nice... My Mum, she was more of the type to tell me what foods I should be eating and shouldn’t to keep baby healthy. I ate way too much chocolate.

W051(Z) is also in a group of friends who shared songs and indicated that this is normal practice within her network.

I What do you do when you go on the internet on your phone?

W051(Z) Songs. Waprick.com free songs. It still costs $1 to go on the internet but everyone Bluetooths songs to each other. All the time.

W046(Z) was motivated to use digital tools to communicate with her brother in Australia, and is teaching her mother to Skype.

W046(Z) I use email heaps to my brother who lives in Australia. I talk to him in Australia. I use the webcam to Skype him. He hasn’t met my baby. I put my baby in front of the webcam and we Skype.[proud and excited] [very thrilled]. He is also on Facebook.

W044(Z) chose not to use ‘social site things’ although felt that sharing video clips and communicating with family overseas is a valuable purpose for digital tools valuable.
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W044(Z) I am not really into those social site things. But it is just like to talk to your family overseas in Amsterdam. My cousins and my aunty send video clips and put them on whatever that site is whatever...Facebook whatever.

W040(Z) wanted to share photos of her baby on her Bebo site page.

W040(Z) I go on Bebo. About once a day. They keep blocking it but it doesn’t work. [I go on] mainly to get photos. There are some photos on my page. My friend took photos of him and stuck them on her page. I put them on mine. That is cool.

W035(Z) was a high user of her mobile phone for photo sharing, music and Facebook. She spoke very enthusiastically about her abilities and the diverse sharing uses.

I How do you use your mobile phone?

W035(Z) I text...all the time...also share photos, videos and music. I am a very big user. I have Facebook on my phone.

Women at the teen parent school sometimes found a friend who was also a teen parent and their shared interests led them to share accommodation and provide support. A group of young women lived together in a house with a mentor. W049(Z) lives in a shared house with and helped another pregnant woman who was always asking questions about pregnancy. W049 collaborated by helping other women with their questions by using the internet to find answers.

W049(Z) I am living with a girl who is pregnant and she is always asking questions about pregnancy. It would be helpful for her to jump on the site and have a look [for herself].

W029(Z) and W028(Z) were friends who were both very interested in the benefits of technology and were both planning tertiary degrees. W029(Z) aimed for a career as a soil scientist and W028(Z) was planning to do a doctorate degree. These women found accommodation together and supported each other with their technology challenges as they were both very interested in the benefits of the internet. W028 and W027 asked if they could be interviewed.
together as they were friends. W028 was the driver of the ICT collaboration as she was knowledgeable about the capacities of applications and the cost. She was the only woman who mentioned both the free Facebook access and free internet access via her provider’s website. Both sites did not incur data download fees and were available from their mobile phones.

W029 was very interested in helping others and offered suggestions for digital solutions for young mothers. When she was pregnant, she found young pregnant women on Bebo but had since migrated to Facebook. Although she had chats on Bebo, she felt that the moderating authority of a midwife would make the experience better.

\[W028(X)\] We could do with one on Facebook. Like what they had with Bebo. For young mums. It would be good to have a midwife in it then you are getting real proper advice, not just what each person is saying. Updating weekly. Yes and have real qualified people as well. If you have a question you get the other people answering it but also ...If you had a midwife like our recent...I didn’t feel comfortable asking her questions. If I asked her questions she didn’t answer it properly. Going to that, I could go and get an answer. It would be easy if it was Facebook. You could subscribe. I could also be a place “oh I felt my baby kick for the first time” you could have a serious side to it and fun. Teenagers talking to teenagers. Having said that it would have to be professionals. You do get ones who look down at you. We need proper...[non-judgemental]. I definitely think it is a very good idea. I would like to do that.

The value of collaborating online rather than burdening her midwife with questions was appealing. While she does chat online, she favoured the professional input and would love to collaborate and contribute by setting it up. W029(Z) nodded approval throughout this discourse.

\[W028(Z)\] A Facebook page...I like this idea. I definitely have a good idea. With my midwife I felt it was a burden for her. I didn’t want to upset her and I had questions. I went to teen ones. Through Bebo I got replies. But then again, I wanted a professional reply. Because It was couple of years ago I was pregnant. I had to go through a lot of websites to get a reply but also a reply I could understand. I think
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if we had a Facebook page. You could also have links to websites. I like it...[smiles]. I would love to set it up with other people that could help me.

have advice about things to try and it was helpful.

8.4.12 Finding support via social media (attitude)
Facebook was a source of social support for W008(Y), a solo mother who suffered from a self-confessed anxiety disorder. She moved back from a larger centre to her family home in the country and valued Facebook for communication and psychosocial support.

W008(Y) I am on there [Facebook’daily. [I] post pictures and I keep in touch with my brother.

I sometimes go onto Huggies and Treasures websites. If he is having problems with sleeping or whatever. I don’t normally go back and forth.

W020(Z) had a bladder infection during the later weeks of her pregnancy and found social support during Facebook was ‘really helpful’.

I When you were pregnant did you have access to the Internet?

W020(Z) Yep. Just at home on Facebook. At the end, I had quite a hard time with my pregnancy. Bladder infections. A lot of the time I was at home the last couple of weeks so it was really helpful.

W017(X) set up a Facebook support page for women she had met at the antenatal class and who had no immediate family support in the area.

W017(X) I do go onto Facebook once a day at least. Because at the moment I set up the Yummy Mummies Group as part of our antenatal group 12 of us. I set up a group on there for 12 of us to keep in touch. Coffee group. Because I was the administrator for that group I set up weekly coffee dates, where they are going to be, what time and then between us all we communicate issues about wind and feeding .. really useful. Unless one of us has had a bad night and we are not going to make it to the coffee group it is just a way of letting everyone one know.
Because we haven't all swapped phone numbers with each other, everyone is using it [Facebook] loads. I am really surprised how much the girls have been using it to be honest and they have all been saying it is really great.

She valued the privacy settings available on Facebook. The group felt they could share labour stories safely in this environment.

They are all on Facebook, but it was...I thought about setting up the group which is completely private. Nobody else can see it. We can talk about really private things. About the labour, we shared our labour stories on there with each other and it is one of the first places that we have been announcing the arrival of our baby. And then when we were having our babies. [Husband] used his iPod [iPhone] in the labour unit. He would get onto the Internet and announce the arrival of Oliver on there. And so...we have been able to upload photos of each other’s babies and of our babies and some pictures of the birth that you can share with your friends but you don’t want to share with anyone else.

W017(X) felt that Facebook with the privacy settings was more intimate than emails, as the group was ‘close-knit’ and had an understanding such that they even shared pictures of their baby’s birth.

W01(Y) Without your makeup on and the baby has just been born and there is a bit of goo and stuff which you probably wouldn’t normally put on email around but because we are quite a close-knit group. Most of us in our antenatal group have moved to the Bay in the last 12 months or two years so we have all found friendships on that. We are an awesome group. We have all commented on how compatible we are as friends. Even the partners get on fabulously and what a really nice group of people. We click. I didn’t know how it was going to work. Whether it was something the girls were interested in. They were all on Facebook. I am not sure if they knew about it. But once we got it up and going, I was really surprised how much it is being used.

W017 felt especially pleased that she had set up this support group and that it was providing support for herself and her friends who did not have family in the area. She found it was her ‘time out’, and saw her time on Facebook as a treat and
way she could get close to her friends, as having time to get out of the house was difficult with a young baby.

W017(Y)  And the feedback from the rest of the group ... they really loved it and one girl I spoke to on Tuesday said... 'you know what, it is my only time out... when the baby goes down and I get five minutes to myself I really like going on Facebook and seeing what you are all doing' and she said it was her time out. Even though we are all very local, we actually live quite close to each other but there are some days you can't get out of the house, you haven't got time to have a shower and get changed and you are still in your pyjamas at 4.00 or something.

W020(Z) found a magazine-style website useful for the discussion forum for advice and for information on blogs.

W020(Z)  I joined the Treasures because I got a free pack. I joined the website called Iampregnant.com International and it is just pregnant ladies or ladies with babies or trying to conceive and they get together and tell their stories and have a profile of their birth stories. It was good, like a lot of them would ask questions. Like blogs it would come up in your home page if you wanted it to and if you were friends and if they were asking questions and lot of people would answer them like for example if you were having trouble feeding. A lot of people would Finding new social circles (action)

For some women, the social aspects of antenatal classes were more useful than the information. They could make social connections that they could translate to an online environment.

W006(X) found the connections made with other people in the antenatal class useful.

W006(X)  The big thing that has come out of the antenatal classes is the coffee group and the connection with other people. That is the main thing. A lot of it was common sense ... take it or leave it. I know some of them well now and we are 'friends' (on Facebook).

W008(Y) was from out of the district and found it was a good place to meet other women.
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I Did you get information from antenatal classes?

W008(Y) Napier health centre. I didn’t do all of them ...the last one I had already have him. It was good to meet other expectant mums. I am by myself so my mum came with me. And I have actually on Facebook with two of the girls in my antenatal class...the one who was here before (popped her head around the door) and we keep in contact and we have got our on coffee group every ...once every two weeks at each other’s places. And chat on the internet.

8.4.13 Differing information and support needs according to parity (attitude)

Multiparous women demonstrated a more relaxed approach to pregnancy and found their first pregnancy experience by comparison had been more stressful.

W015(Y) Yes. I guess with my first baby I would be frequently looking at the websites that say how your baby is developing. I would look at those quite frequently, but obviously, with your second baby you are not as concerned [laughs].

After the first child, women network and learn and so subsequent pregnancies were approached with prior knowledge. It was easier the second time around. W015(Y) had her third child at home as planned. A midwife (who was not her regular midwife) arrived shortly after the birth, but this mother was relaxed because this was her third delivery and it was a successful outcome.

I Different the third time?

W001(Y) Laughs ....yeah.. I mean, I didn’t even get my midwife at the birth. It was kind of funny. We had Bronson her e...downstairs as any concerns. I thought it was good. I mean, maybe for a first mother you would want more ....laughs. For me, I was a bit laid back about it. Laughs ...yeah ... I mean, I didn’t even get my midwife at the birth. It was kind of funny. We had [baby] here...downstairs. I had him at home...it was good. At the end of the day, I didn’t care. Like I say, it was a third baby. If it had of been my first, I might have freaked ...laughs. But I don’t think first time mums have home births. She came late. I was just holding him in my arms. Oh yeah, first mother...stressed about everything [laughs]. Whereas with [baby], I was a bit more laid back.
8.4.14 Valuing social support (attitude)

Pregnant women and women with young babies need physical, emotional and social support and have a need for new information. Some women were not living with the father of their child, and many of the women were not living with immediate family members. Women commonly informed and supported other women who were pregnant or had infants. Information from women like them was highly valued.

W036(Z) I’ve got Skype. My partner’s sisters live in Invercargill. We Skype them sometimes. We can Skype my parents because they are up in [Australia].

Women valued social interaction when they became part of a new social network. Generation X were least likely to be in contact with many people, whereas Generation Z benefited and valued, the support from peers and from the teen parent unit they were attending. Women were in the process of forming new communities and valued the opportunity to become part of a group.

W017(X) formed a Facebook group and was surprised by the success of the venture and the enthusiasm of members who were already on Facebook. It was a private group, which talked about private matters, shared labour stories, announced the arrival of their babies, and uploaded and shared photos of their babies with group members. The page was only for group members. Most of the group members were recent arrivals to Hawke’s Bay and became a close-knit group for friendship and support.

W017(X) I do try and get on the laptop daily. I am subscribed to a couple of websites about baby and stuff like that. I do go onto Facebook once a day at least. Because at the moment I set up the Yummy Mummies Group as part of our antenatal group 12 of us. I set up a group on there for 12 of us to keep in touch. Coffee group. Because I was the administrator for that group I set up weekly coffee dates, where they are going to be, what time and then between us all we communicate issues about wind and feeding ...really useful. Unless one of us has had a bad night and we are not going to make it to the coffee group it is just a way of letting everyone one know.
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W008(Y) sought support from healthcare providers (Plunket and midwife) and online (discussion forums, Facebook and Skype), and attended local coffee groups in her need for additional support at this time. W022(Z) did not know what was 'normal' until she talked with her friends.

W022(Z)  I just went to [midwife]. She was just as slack as everybody else. I think she was real good with everybody else I was just...I must have seen her about 4 times before I had my baby. The whole time. I didn’t know what was proper and what wasn’t so I thought OK this must be how you do it but when I talked to my friends and such...I though Whooa... and like, I don’t know.

Once a woman has become a mother, she becomes a member of the mothers' community of practice, which has strong representation on the social web. New mothers were amongst the earliest communities to find the participatory web a useful platform for information sharing and social support. Women have historically supported and shared information about pregnancy and babies, long before there was the online opportunity. The phrase ‘community of practice’ was coined by Wenger (Wenger, 2000) and describes a network of individuals who share a common sense of purpose. Women in the study sample valued information from other women although these informal support groups were not yet in place in early pregnancy, or during pregnancy.

8.4.15  Having no idea (attitude)

Women experiencing their first pregnancy were uncertain and assumed their experiences were similar to those of other women, and they did not want to bother their midwife unnecessarily. Women who had experienced two pregnancies were noticeably more relaxed when speaking of their second pregnancy. It was only when comparing other women’s different experiences that they understand midwives differ in service delivery, communication styles and information. W014(Y) was did not know anything about the maternity service and was surprised to learn that it was free.

How did you find a midwife?
W014(Y) I had no idea about anything. I had no idea it was free. I thought I was going to have to pay all these huge bills and everything. That’s how I found out. By word of mouth.

First pregnancies are a period of new information gathering, learning and approaching the unknown. For some women, there was anxiety and fear associated with not knowing. Two women were open about their mental health difficulties related to anxiety and depression.

W022(Z) I didn’t know what was proper and what wasn’t so I thought, OK this must be how you do it. But, when I talked to my friends and such ... I thought whooa ... and, like, I don’t know.

8.5 Summary

8.5.1 Description of the women’s cohort

Women were aged between 15 and 45 years of age. They had used LMCs within the previous six months for the successful birth of their child, and they all lived within the Hawke’s Bay Region. Slightly more than half of the women described themselves as European or Pakeha although there were nearly as many Maori women, with a few Cook Islanders. Nearly 90% lived within one of the two cities within the region. The rural women lived in one of the three small towns to the north and south of the main urban area or in the countryside on a farm. For most (~80%), the last birth was their first experience of childbirth and of using the maternity services in Hawke’s Bay. About one third of the women were in a relationship and living with the father of their child. The younger women were often living with their parents or mother only and sometimes in a flatting situation with other young mothers. Most of the women were full time caring for their baby, with only one women working full time. The pregnancy and birth experience for most of these women signified a time of significant learning and transition to motherhood, with the new responsibility of the health and well
being of their child. For some of the younger women, this was clearly an unplanned step and they needed greater reassurance and support. Age related differences within the women's cohort were apparent. All but one of the Generation Z women attended the teen parent school, where interviews took place.

1.1.1.1 Summary description of the women’s cohort

Women within the cohort were from non-affluent socio-economic groups and the cohort as a whole had a slightly higher percentage of Maori women than most other health districts in New Zealand.

8.5.2 Summary of assets

Women in the data set were financially constrained, although adequately resourced, with all women using or having recently used a mobile device though none of the phones were smartphones and were mostly simple 3G enabled devices, although women were unclear about this classification. No one within this cohort owned a smartphone.

Mobile phone plans were carefully considered for necessity and for value for money. As text messaging was the most cost effective medium, plans were often described in terms of the number of texts permitted. The top-up option, which is a pay as you go, was standard and there was no mention of any women having a data plan to enable mobile data download.

Most women either owned or had access to a computer, although not necessarily in their own home. Most of the computers were had a broadband internet connection although there was one with dialup and one with a computer without internet access. This woman went to her parent’s home for internet access. Not all had access to a landline, although this was not considered a disadvantage, as these women used a mobile device.
8.5.2. Comparison of differing generational assets

Generation X and Y were most likely to have laptop computer or fixed PC computers with a broadband connection as well as a landline, and were focused on these devices in their homes. These groups were at most often at home caring for their young baby and less likely to be out of the home for long periods of the day. By comparison, the women under 20 in the Gen Z group often not have a landline at home and relied on their mobile devices for communication especially the use of SMS messaging. Generation Z were less likely to have the internet where they were living than Generations X and Y women, although access was available at the Teen Parent Unit, family or friends’ homes, or at an internet café.

Although this group were financially restrained, they were adequately resourced. Women have basic digital hardware, software and services to access digital information and communicate digitally and these practices were entwined into their everyday life. If not, they found ways to use the technology and services they required.

8.5.3 Summary of actions (practices)

During pregnancy, women were free to call midwives using synchronous voice communication, although aside from that there was limited opportunity to communicate with midwives apart from the limited use of text messaging. However, women commonly accessed information online to supplement the printed information given by midwives. This was often in the form of weekly emails from magazine sites. The emails were generated according to the woman’s due date of delivery and provided women with date-specific details of their baby’s development. Information retrieval via a search engine, usually Google was also common.
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Women outside midwifery service delivery used a range of interpersonal communication media—face-to-face, home phone, mobile phone, SMS, Facebook chat. Most women in the cohort used their mobile phone on a regular basis and it was usually with them. Many within the cohort were habitual and high users of text messaging.

Use of the mobile internet was another skill area practiced by women but not demonstrated within the midwives cohort. This was used for entertainment and social media. Women also downloaded free music from the internet and this was shared via Bluetooth.

There were other differing generational characteristics. With decreasing age within the cohort, women changed their place of residence more frequently and were less likely to have a landline, which led to their increasing reliance and use of mobile technology.

8.5.4 Differing generational characteristics: actions

In addition, generational differences were apparent in the use of technology. Mobile phones were used by Generation Z to access the internet, by means of a $1 per day product, whereas Generations X and Y preferred to use the internet via a wireless laptop or desktop PC. Generation Z commonly used Mobile Facebook, whereas Generation Y women were more likely to access Facebook via a wireless laptop. Generation Z used mobile phones to download music to share, whereas music was downloaded via the wireless laptop by Generations Y and X.

The following table (table 8.9) compares midwives’ actions with women’s actions across a range of ICT activities and highlights the increasing use of social media and mobile internet within the Generation Z group. It also highlights the low level of recreational computer use outside of the midwives’ professional role.
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In the table below, high usage is denoted as ‘3,’ moderate usage is ‘2,’ low usage is ‘1’ and no usage is ‘0’.

Table 8.9 Differing generational use of ICT

<table>
<thead>
<tr>
<th></th>
<th>Midwives</th>
<th>Generation X &amp; Y</th>
<th>Generation Z</th>
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<tbody>
<tr>
<td>Laptop or PC</td>
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<tr>
<td>Emails</td>
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<td>YouTube</td>
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<tr>
<td>Downloading music or films</td>
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<td>Games</td>
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<td>Search</td>
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<tr>
<td>Internet banking</td>
<td>Claiming</td>
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<tr>
<td>Blogging</td>
<td>*</td>
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<tr>
<td>Twitter (microblogging)</td>
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<tr>
<td>Trademe</td>
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<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Buying from the Internet</td>
<td>*</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Weekly email subscription (women)</td>
<td>Not applicable</td>
<td>****</td>
<td>***</td>
</tr>
<tr>
<td>Public discussion forums</td>
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<td>**</td>
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</tr>
<tr>
<td>Mobile phone</td>
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</tr>
<tr>
<td>Texting</td>
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<tr>
<td>Pxt messaging</td>
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<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Downloading music</td>
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<tr>
<td>Transferring music</td>
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<tr>
<td>Facebook mobile</td>
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<tr>
<td>Bebo</td>
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</tr>
</tbody>
</table>

**** = commonly used, *** = used by a small group, ** = used by only a very few, * = not used

Women in the cohort had embraced new ways of communicating, being entertained, and retrieving information by using digital technologies in multiple ways. Channels were used according their situation and circumstances. The use of social media has been culturally entrenched.

8.5.5 Summary of attitudes, beliefs and perceptions

Women were accustomed to an increasingly collaborative digital environment and felt proud of their digital skills.

Women valued social support and appreciated networking from each other both in person and via social media. They formed new networks and social
circles via social media. This was a favourite way of acquiring new knowledge to prepare them for the new stage in their lives.

Women also **valued the information from other people**. Women having their first pregnancy **do not know what is normal** in most areas of their pregnancy, birth and postnatal experience. This concept was an emerging theme relating more especially to first-time mothers who subsequently learned of the different experiences of other women with their midwives. When they socialised with other women and share experiences that they came to understand their own experiences and their own care by their midwife. Reflection of their pregnancy and birth experiences made them either more satisfied with their experiences or less satisfied in some ways.

Several Gen Z women also admitted to feeling **addicted to games, texting and the use of social media**. They were habitual uses of texting and social media, actively seeking information and valuing social support and social sources of information.

Generation Z **favoured their mobile phone for communication** above all other technology. They favoured it for daily communication and for communication within the maternity setting, apart from face-to-face encounters. Yet, there was little digital communication and no digital information transfer during their pregnancy.

**Women felt they needed information** in addition to the information given by midwives, and sometimes women received untimely information and their needs were related to parity. Their information choices were mostly limited to printed matter distributed at fixed appointment sessions and to face-to-face verbal information. Some midwives suggested websites for women to access. Women were anxious about the **conflicting advice from different midwives**, particularly on the topic of breast-feeding.
Some women set up a weekly email information service telling them about the developmental stage of their baby. With this information, they **felt closer to their developing baby and more engaged.**

Women **found difficulty in finding a midwife** because midwives choose to use very limited ways of advertising their services. Instead, women relied on word of mouth or the *Yellow Pages* to find midwives’ contact details and information about midwives.

Women felt **limited by their choice of communication channels.** Women disliked the call service and frequently felt frustrated by not having direct contact with their midwife.

However, although they were **ready, willing and able to engage with technologies** they were not given the opportunity during their maternity care.

### 1.1.1.2 Differing generation attitudes

Compared with midwives, the women’s cohort incorporated the use of digital media more comfortably into their lifestyle. For them, digital technologies were not new tools for adoption, but tools that have always been familiar. This was not the case for many midwives who have known a time when there was no internet and mobile phones were ‘new’.

The concept of being ‘constrained by paternalism’ was demonstrated as the lack choice of media channels for information and communication needs. In this sense, women were ‘chained to the past’, despite being ready willing and able to engage digitally during their childbearing experience.
Chapter 9: ANALYSIS and DISCUSSION

This chapter is in six sections. The first two sections discuss primary emergent categories constructed from data sets contributed by the two cohorts. The structure for each section follows the previously documented framework of Assets, Actions and Attitudes. Section three is a comparison of how both cohorts constructed ICT and this is followed by section four outlining the influences of context. The fifth section discusses secondary emergent topics arising from the categories, while the sixth and last section presents a substantive theory as ‘unused and underused channels’ and outlines factors that contribute to this understanding.

9.1 Midwives’ emergent categories

My analysis of transcribed interviews by a process of initial coding, focused coding and theoretical coding has identified the following theoretical categories descriptive of midwives in the study sample. Overall, midwives were balancing on a tightrope of demands while being shackled by an historic legacy. Midwives valued their personal and professional autonomy. They felt threatened by ICT, and they needed more sophisticated digital literacy skills. Threats came in the form of increased transparency in their everyday professional duties and business, and a professional profile generated by unsympathetic headlines that have mostly portrayed midwives in a bad light. Midwives also feel threatened by the lack of control they have when information about them is posted on the internet. In addition, ICT technology is eroding their professional identity and personal boundaries and bringing unwelcome transparency. Technology was associated with work rather than used for recreational pursuits such as multimedia entertainment, games and communication.

Other categories that emerged (figure 9.1):

*Participate Profile*
- Older on average compared with women
- Independent businesswomen
SECTION FOUR: ANALYSIS AND CONCLUSIONS

Chapter Nine
Analysis and discussion

Assets
- Adequately resourced

Action: Variable skill sets – needing digital literacy skills
- Influenced by a business model
- Exercising the freedom to choose
- Seeking efficiency (time, energy, financial)
- Walking a tightrope of demands: balancing
- Out on a limb

Attitude: Not feeling the need to change
- Insufficiently supported technically
- Not feeling the need to change
- Keeping a low profile
- Limited channels
- Preserving autonomy
- Keeping a low profile
- Gatekeeping information - paternalistic
- Feeling threatened by transparency
- Technology is work

9.1.1 Participant Profile: independent businesswomen

Participants in this study align with a typical slice of the national workforce. Their ages ranged from early twenties to mid-sixties, with the average age at 47. They were independent businesswomen mostly operating independent practices, although they collaborated with backup midwives for call relief. This group is more experienced that the national midwifery workforce average. Most were registered nurses although they did not all have a current annual practising certificate, and most collaborated with other midwives by sharing clinic facilities.
Most midwives have been practising for over ten years, although three had registered within the last six months.

9.1.2 Assets: Adequately resourced

Midwives were adequately resourced for the functions they felt they required, but by comparison with general primary practitioners, they were under-resourced (Protti et al., 2009). Most of their assets such as fax and photocopy machines reflected their adherence to paper-based documentation. An example of this is midwives’ use of the referral form to general practitioners or well child provider. Midwives send a paper form, when women discharge women back to their general practitioner, generally four weeks after birth. Forms were available from the New Zealand College of Midwives, part of a booklet or they can be printed from the NZCOM website. This printed referral form is manually filled in and posted or faxed to the general practitioner. This is a paper-based form of document management and not a digitised process. When the paper reaches the general practitioner, the document has to be scanned into the practice management system so information is accessible and useful. New Zealand doctors use the computer during consultation and have digital patient information in front of them when they are with the patient.

By contrast, general practitioner’s referral process is a digital process. For example, letters from general practitioners are sent in a digitised format using a secure messaging system. The referral can then be assigned directly to the patient’s notes on the computer. General practitioners also receive secure discharge summaries from hospital patients directly onto their patient management system. Less than 50% of midwives have a secure messaging system on their computer and this was only used for receiving laboratory and radiology reports, which were also received and filed in hard copy. Although some midwives had this resource, it was underused, as midwives were unaware of other benefits. There is the facility to send and receive structured information if interoperable systems are set up but more importantly, this can be achieved only if operators are trained to use the functions.
Midwives owned and used mobile phones, predominantly as mobile telephones. Resources were centred on the business and professional requirements for midwives.

*M001*  *Anything to make life easier is my motto. I was very.... I mean computers are only useful if they do what I want them to do. I didn’t really have a great big interest in computers until...I always knew there was a positive side of computers but ...and I always felt I spent more time writing that I did talking, so I am keyboard literate, so I can use my computers to type. I can type more quickly than I could write so I find it much easier, also keeping the records. That was another worry that I had. Would I lose the information? However, MMPO programme is so well put together that it backs itself up all the time. Every time I put something into the program, it is there permanently. I am not to lose it.*

*M012* believed that women did not need further information, as they were well healthy women without a problem.

*9.1.3 Actions/practices: Needing further digital literacy skills*

Generally, midwives lacked digital literacy skills. Most felt unable and uncomfortable using the computer for data entry during consultation. This could have been because data entry skills were insufficiently developed to be able to record information when women were present, and because they felt the computer was intrusive and they felt uncomfortable in the presence of the technology.

A small number of the midwives were enthusiastic ‘sporadic technical stars’, seeking and using new technology for business efficiency and because they enjoyed the process. Most midwives were too busy with family and clinical roles.
to find and use new systems when they could manage their role using the same methods that had served them well for many years. As most midwives are aged between 50-59, the majority had come to electronic information and communication technologies after training to be a nurse or midwife. Therefore, they found that technology is a dispensable adjunct to birthing women. Midwives who had graduated in the last five years indicated they had experience in finding information on known databases, although accessing these sources of information was uncommon. Midwives are expert in normal births, and this group of midwives includes a high percentage of experienced registered nurses. They did not feel a need to regularly access information. Speaking with medical and midwifery colleagues and intermittent Googling was sufficient.

Midwives choices were influenced by a business model, which meant that, to continue to practice independently, midwives must conduct a viable business. Business costs need to be kept to a minimum and midwives were aware of all costs. Expenses such as Healthlink, which would save time, were balanced against cost. Midwives have a choice on which kind of women’s hand-held notes they use. Four note versions were mentioned. The most commonly used version was a simple booklet issued by the DHB without cost. A major drug company provided another version. The most comprehensive and popular notes midwives referred to as the ‘Mary Woods handheld notes’. This booklet was popular as it cost midwives less than the most expensive version modelled on the practice management system and because midwives found it intuitive.

Duplicate and triplicate carbon copy notes were used by a few midwives but were not popular because of the high cost. This version could be purchased from the Midwifery and Maternity Providers’ Association (MMPO). Some midwives took a small caseload because of other family commitments, while others had a very high caseload by choice.

The caseloding of the cohort midwives is higher than the national average, with one midwife (M007) birthing 120 women per year. The recommended safe
maximum (NZCOM) is 40-50 births per year (New Zealand College of Midwives, 2002: p.38). This model of remuneration rewards midwives with a high caseload.

Midwives have the freedom to make independent choices. They valued their autonomy, as they were able to choose the size of their caseload and the decisions on equipment and spending on resources. Professional standards and adherence to health safety and privacy standards guide their practice. Within these legislative guidelines, the service is far from prescriptive, and midwives practise according to their own interpretations of the midwifery model of care. There were wide variations in styles of practice. M029 was one of the older midwives who had previously been a nurse. Her practice was unaffected by technology, with her only digital input being emails that were printed off the computer by her husband. Her practice clientele were predominantly Pacific Island women whom she visited in their homes. This experienced pakeha (non-Maori) midwife did not do home births, so the women came into the birthing unit, often with family members. M029 had an acute awareness of cultural safety and sensitivity issues. By contrast, most other midwives choose to see women for antenatal visits only in a clinic. The non-influence of technology within the practice of M029 contrasts with M018, who was prepared to experiment with a new practice system.

Incentives identified by midwives to further use information technology were in the areas related to their need for efficiency and timesaving rather than to the women's needs. Midwives sought efficiency in their practices and were conscious of time, energy and financial demands. Family commitments and business demands incentivised midwives to seek efficiency in their provision of primary maternity services. Providing service necessitates travelling to the secondary care facility or a birthing unit, or women's homes in the postnatal period. These demands required careful management to maximise time and energy but were at each midwives' discretion. Although midwives can see women in their own home antenatally, it was uncommon. Only one midwife (M029) spoke of routinely
seeing women in the woman's home. Normally, women attended clinic appointments at a pre-arranged time.

Midwives wanted their businesses to run efficiently, and to this end, nearly all midwives used the MMPO patient management system for claiming and audit. For many, this was the only reason to use a computer. M012, who described herself as in the ‘late majority’ category for technology uptake, had been practising for over twenty years and writes two sets of handwritten notes when women are present. After the visit, minimum data fields in the computer were manually populated solely for claiming and audit purposes.

Midwives walked a tightrope, balancing the aspects of everyday life to successfully provide a safe, financially viable service and ongoing business. Keeping pace with technology and progressing skills is time consuming considering midwives have many calls on their time. Balancing work-life requirements was a juggle as many were working mothers. They were appreciative of the family support including technical support they were given and outside of the working day, they did not relish being in front of a screen. Family demands, business demands, professional demands and women's needs require careful management. Each midwife found her own way of practising to balance the demands.

In addition to the work-life balance, midwives had pressures from their professional body, which many regarded as a threat. They traded off the ability to be paid efficiently with the need to send details to the governing body, knowing that their practising details, caseload and business remuneration are available to this professional group. Other pressures they felt from their governing body were the level of documentation required, which some regarded as excessive.

In the study area, there was a shortage of midwives as there is in many parts of the country. This means women may have difficulty find an available midwife as
there is no shortage of work for midwives and if women do not book early in their pregnancy, it is very difficult to find a midwife.

Both the profession and individual midwives were considered to be ‘out on a limb’. The way midwives practice stems from the previously documented history and model of care integral to their profession. Continuity of care is a dimension of the midwifery model and accordingly, during a woman’s pregnancy and birth journey, there is continuity of care. When women first register with a midwife, this midwife is responsible for overseeing care from registration until handover at 4 to 6 weeks after the birth or for formal handover to another healthcare professional. Prior to registering with a midwife, women are registered with a general practice.

While there was continuity of care within midwifery, there was no continuity care or information exchange from general practice to midwifery care, and no digital interoperability following midwifery care. Midwives took a new full medical and obstetric history from the women when they registered. At discharge, a posted or faxed page of information was sent to general primary care practitioners and Plunket or Well Child services 4 to 6 weeks after the birth. The information collected about women by the midwife remained siloed.

As there was no interoperability between midwives’ computers, and midwives had information only about the women they were following, when a backup midwife was on duty, she may not have information about women who may call. While M006 gave her laptop and password to the backup midwife, and M016 printed off ‘details [of] all the important information about that person …when they are due, date of birth, blood group, address, contact details and any special notes’, there was no standardisation of process.
Midwives felt there was no need for them to provide further information and communication opportunities for women. They fulfilled their service obligations according to Section 88 (Ministry of Health, 2007) and felt satisfied that face-to-face opportunities for women to consult and discuss were sufficient. Furthermore, they needed to balance different kinds of demands on their time, and business costs.

Remuneration from Sector Services takes no account of the format of information or the method of communication other than face-to-face consultations (Ministry of Health, 2007). As well as balancing demands such as family, time and resources, midwives are professionally and legally required to comply with professional midwifery guidelines and models of care and the New Zealand Health and Disability Act and Code (Hill, 2011, The New Zealand Health and Disability Act, 2000) for healthcare practitioners. Midwives were conscious of the need to 'keep their heads below the parapet' to avoid adverse media headlines.

Threats from increased exposure on the internet, needing further digital skills, not having strong infrastructural support, maintaining autonomy and resisting transparency, associating technology with intervention, all contributed to midwives not feeling the need to change the status quo.

Midwives lacked standardised infrastructure and technical support. Most midwives in the area used a practice management system that generated a degree of frustration when basic processes were not achieved. Support was theoretically in place, but feelings of aggravation and irritation at not knowing how to solve technical problems were expressed. As midwives independent businesses, their use of technology was dependent on their interest and willingness to invest time and money in the ventures. They received periodic technical skill workshops from the College of Midwives, but these were insufficient to enable optimal use of the practice management software.
Furthermore, midwives could not refer women to a trusted data source developed or endorsed by the profession. One midwife mentioned the set of consensus statements on the New Zealand College of Midwives website (NZCOM, 2011), however these pdf documents were out of date and were unsuitable for women to use as they do not comply with the HONcode standard (Graf-Litscher, 2012) for health information.

Midwives chose to use a limited number of predominantly non-digital information and communication channels. Paper and multiple data entry were normal methods of documenting to comply with regulations. All midwives used voice communication via landline and mobile phone. For some midwives, the mobile phone was used as a device simply to receive texts from the call centre informing them that a woman wishes to speak with them. They did not text to women, as this would have given women their mobile phone number, which some midwives protect. A few midwives used text messaging to communicate with women. Email was not used when communicating with women, although most midwives send and receive emails containing clinical information to and from the secondary services outpatient service. Midwives with a teenage family were most likely to communicate by text messaging with women. The mobile telephone and some text messaging were the only digital women-centred media.

By restricting and using channels that they could control, midwives could keep a better balance for them in terms of their professional-private lives. They also lacked the skills and infrastructure to make full use of other digital ways such as using mobile apps, extended use of the internet, or any form of social media.

Midwives were anxious about their transparency and wanted to keep a low profile in the community. They perceived a threat from media regarding adverse outcomes, as when there are adverse maternity outcomes, midwives were very conscious that the media often respond with negative headline stories.
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They [doctors] don’t get roped through court for it [adverse outcomes]. The GP makes a mistake do you see him all over the news? A midwife makes a mistake. She is all over the news, all over the papers.

Word of mouth was the preferred way to have women referred and advertising was regarded as unnecessary and unimportant. Telephone numbers in the Yellow Pages phone directory were the most popular way of advertising services, although few women used this resource.

A degree of defensiveness and lack of willingness to be publically transparent was apparent. Midwives mostly resisted the lifestyle use of social media, and some, were horrified at the thought of communicating this way, preferring a ‘face-to-face’ option both within professional practice and as a lifestyle choice.

Midwives felt threatened by digital technology, as they needed a boundary between them and the women. There was a degree of resistance and non-acceptance towards the notion of using any type of digital technology when interacting with women, furthermore, some midwives give instructions that their mobile phone number is not to be given to women.20

The internet posed a threat and the idea of any exposure at all on the internet was abhorrent (1) and made midwives feel vulnerable and uncomfortable. M013 felt nervous that she had a family website and although she trusted her husband who managed the website, she still felt overexposed.

M012 felt uncomfortable about having Skype in the delivery room as she felt exposed, and lacked control of the situation. The internet was seen to dispense with boundaries that midwives needed, and create the possibility of members of the public misinterpreting what they see. The exposure and loss of control of

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20 These instructions were written on a midwives contact sheet at the Napier Wellesley Road Birthing Centre.
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information posted on the internet was a very real threat, which made midwives feel vulnerable and unsettled.

M013 I had a women who I suggested that she have a home birth and she had gone into a discussion board on Trade me about pregnancy and birth and things and asked people’s opinion about what they thought she should do when actually I gave her the information and expected her to make the decision and not put it out there. Some people asked who my midwife was and she put my name on. My sister from Palmerston North found my name on this site as she was pregnant at the same time, so felt nervous about being exposed and out in the world, and everybody was quite supportive of her having a home birth and said that they had home births and things, but there was one women who attacked this woman and said “you are not putting your baby’s safety first” and “you shouldn’t be doing this” and “you are not even thinking about what is important for your baby if you are thinking about having a home birth, and so that made me feel guilty, not guilty but nervous. I was really unsettled about having my name about giving this woman a choice about where she had her baby. And she did end up birthing in the hospital. But just that exposure about what I was offering to an individual woman was presented to the whole world. [It] was really unsettling and not kind of how I wanted that information to be.

Even having a mobile phone was seen as a threatening tool as midwives felt it diminished or breached the boundary they constructed between midwives and women. M012 has found that since having a mobile phone, she is increasingly accessible which is too accessible for her liking.

M12 Mobile technology ...mobile technology within midwifery service delivery has made midwives increasingly accessible. Which as an “old” practitioner now I can see is very difficult for the midwife. These women have absolutely direct contact with midwives, they have text-messaging day and night there is no boundary, there is no system and I think there are big gaps in that. Text message doesn’t convey a whole lot of stuff.

Midwives felt they needed this boundary, which is becoming threatened by digital technologies (2).
Lack of control (3) over what people post in discussion forums and chat rooms, and being publically named were threatening for midwives. They felt that the anonymity was a shield for the person posting and the shield enabled them to say things that could not be said face-to-face.

M012 There is a generational thing here about how we see the Internet and how young people see the Internet. I have talked to a midwife in Palmerston North whose name was put up on a chat room or bulletin board and very derogatory comments were made about her that the woman didn’t make to her face. The midwife’s daughter found them, forwarded them to her mother. The mother went round to the woman and saw her postnatally and said “is there anything you need to talk about” and the mother said “everything’s fine” and she said that “I have this stuff off the Internet that you have said about me” the mother said “you have invaded my privacy, you have invaded my space”. The mother thought that it was her site and that she could put the midwife’s name there and not think she was invading the midwife’s space.

The call centre boundary was one way to give them relief from women being able to call them as this restricted their availability.

Midwives were gatekeepers of information in that they controlled the information, as it was ‘given’ to women in paper format. Although the information on pamphlets was discussed, most midwives felt no need to provide digital information opportunities for women. Some midwives told women about websites, although this was not universal.

Midwives’ autonomy allowed them to choose the way they transferred information to women, and how they communicated with women. Pamphlets and discussion were the standard way of giving information. Their reliance on giving paper information rather than facilitating information transfer via the internet was seen as gatekeeping or controlling information. While midwives valued the concept of women’s choice, they choose the instances and felt no need to augment current information practices. Midwives did not trust women’s
ability to retrieve information for themselves, as they felt the information may be misinterpreted. These actions were seen as gatekeeping or controlling.

Cohort midwives strongly preferred face-to-face communication to interact with women. Although there are digital channels able to accommodate multimedia applications, interactive format, customised options and rich layering (using hypertext) of information and communication, digital media channels were unused. Apart from the mobile phone or landline, text messaging was sporadic and treated with extreme caution, as midwives have been warned to record all communication. This posed a problem for midwives, as they did not know of software to record their text messages, though mostly the text messages related to appointments.

To M005, Skype was unacceptable because she felt that midwives could not pick up cues and symptoms such as swollen ankles and women could be ‘hiding something’:

M005  I do feel the relationship of being with a person face to face is important. And I think you can get a lot speaking with the person than you can with the computer screen. There may be something they are hiding. There could be anything. You might sit there and see the top half of a woman.

M014 held the view that using ICT was ‘third party’ and intrusive, and that her expertise as a clinician did not require any technology. There was a feeling that technology diminished her role.

M014  Face-to-face is my preferred mode of communication, one to one. Yep ... I can see midwives have a reluctance and resistance to technology because it relies on accessing a third party. Also, that is not my area of expertise. My area of expertise is as a clinician.

M019 was bothered that the language used in text messages threatened her ‘core feelings as a midwife’. To her, texting language was a foreign language and her
professionalism was diminished when she was spoken to (texted) like that. She did not use text messaging and only communicated in the clinic setting.

Midwives envisaged technology as work-related tools, rather as tools for entertainment, communication and recreation. For them the computer was associated with documentation, a task viewed as onerous. Outside of work, there was very little use of the computer or information and communication technologies. Midwives did not want to 'sit in front of a screen' at night or possibly at all, and had other demands, such as family, on their time.

Overall, midwives did not feel the need to change the status quo (figure 9.2).

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**Figure 9.2** Midwives felt threatened by digital technologies and don’t feel the need to engage digitally with women

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### 9.2 Women’s emergent categories

Analysis of women’s data using the same process of initial coding, focused coding and theoretical coding has identified the following theoretical categories to describe women in the cohort. Women are ready to engage in a digital
conversation with midwives, however they did not have a choice of information and communication channels during their recent maternity experience. For them, ICT were enabling and fun, although their eHealth skills were limited. Primiparous women initially come to the maternity service with no experience and notably ‘not knowing normal’. It is only after the first birth, when they form new social circles, and compare different experiences and variations in service experienced by other women.

Categories (figure 9.3) were seen as:

**Participant profile**
- Needing new eHealth literacy skills
- Transient

**Assets**
- Financially constrained but adequately resourced

**Actions**
- Knowledge thirsty
- Embracing new ways – increasingly digital characteristics

**Attitude**
- Feeling skilful, yet lacking eHealth literacy skills
- Valuing social support – social media has been culturally entrenched
- Not knowing normal
- Constrained by paternalism: limited by choice
- ICT are fun and enabling

![Figure 9.3 Detailed view of women’s emergent categories](image)

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Participants represented every socioeconomic sector. Some had a professional background, but most were setting out on a new phase in their lives and with modest resources. In all cases where there were partners, only one person in the partnership was working. The Gen Z group of women comprised unmarried mothers on a benefit who were financially constrained. None of the women who were interviewed appeared to be affluent judging by the interview setting in women’s homes.

Women needed guidance as they lacked eHealth literacy skills. Although women accessed the internet for supplementary information, the description of the way they searched was indicative of elementary eHealth literary skills. They needed guidance.

\[W001\] I just google everything.

\[W002\] Yeah, google a lot.

\[W005\] Nothing really went wrong. If I needed anything extra I would just google it.

\[W010\] So I use google a lot as a search. I just went to google. I would google it.

\[\text{Just put in the name...[what it was called]}\]

The commercial sites they described were the first results and some were paid search engine results rather sites with more trusted information. Although search skills were rudimentary, women were happy with their results, and the only measure of trust was their familiarity with the site.

They were transient as they often changed their place of residence, Gen Z more so than the other participants. Many women spoke of changing accommodation, city or country during their pregnancy. Gen Z participants lived in small groups in rented accommodation as they were on a benefit and living in groups was a cost-effective measure. Being transient has implications for owning large and
difficult-to-move computers compared with small mobile communication devices. Their choice of device suited their constrained and transient lifestyle, and helped them to meet their need to be socially connected and supported.

9.2.2 Assets: Financially constrained though adequately resourced

Women had resources sufficient for their current simple usage. Needs amounted to being able to retrieve internet information and communicate with their friends and family. All had prioritised the need for a mobile phone and all Generation Y and X women had prioritised the need for a computer of some sort. SMS messaging resources were available to nearly all women. While women mostly had mobile phones and access to the internet, access to the internet was not always convenient, as they did not have data download services for the mobile internet, as at present in New Zealand this service is costly, and beyond the means of almost all women in the cohort. At the time of interviewing, no women had a smartphone, although the mobile phones were 3G enabled. 2G services were discontinued during the time of this study.

9.2.3 Actions/practices: knowledge thirsty and embracing new ways

Women were knowledge thirsty as within all age groups, they sought additional information other than that provided by midwives. Women used books, other women, family and the internet. Few were active participants in online discussion forums, although some were lurkers\(^{21}\) rather than active participants in magazine-style sites. Whether a site was viewed as a chat room, discussion forum or social network was not clear, for example, W001(Y) thought about Facebook as a forum, but decided that it was a social network.

\(^{21}\) A ‘lurker’ is a silent participant in online discussion groups. They can transfer online information to other people in offline situations Cranefield, J., Yoong, P. & Huff, S. Year. Beyond lurking: the invisible follower-feeder in an online community ecosystem. In: Proceedings of PACIS Paper 50, 2011 Brisbane, Queensland. 1-16.
I Do you use discussion forums?

W001 Facebook...oh that is not really a discussion forum. That is a social network. Yes, I chat on Facebook. I don’t update much.

W024(Z) was Māori, aged 17 and expecting her first child. She had a Telecom plan of unlimited texts for $12 per month and used 50 to 100 texts per day to communicate with family, friends and the school. She also used her mobile phone as a calendar for appointments and dates and contacts. For $1 per day, she could connect to the internet, and she used Google, Facebook and Bebo. For information about the best plans, she phoned Telecom. Chatting and submitting status updates on Facebook and Bebo were daily activities. The mobile phone was also used to upload photos to both sides and to research about her pregnancy. The phone was mainly used for communication with family and friends. While these behaviours and use were typical of Generation Z, they are not typical of Generation Y.

Generation Y typically used fewer texts and emails more. W001(Y) felt that ten texts per day was a high number although, for Generation Z this was very few. In the study, Generation Y usually had access to a laptop computer, whereas this was unusual for Generation Z. For Generation Y, the laptop and email were more important, while for Generation Z, the mobile phone was more useful as Generation Z were more likely to be out and about rather than based at home.

W001(Y) was a Māori woman aged 32 with three children and a husband. The family lived in a family home and one child attended the local school. W001(Y) had a laptop computer, mobile phone and wireless broadband, and uses Flickr, email, Twitter, Facebook and Google. She checked emails 2–3 times per day and regarded herself as a big texter, sending about 10 per day. Facebook was used for chat and status updates with privacy settings set to ‘closed’. She used the internet for banking and buying online. W001 had a home birth for her third birth and used Google to find about other mothers’ experiences of home birth. Twitter was not useful as her friends were on Facebook rather than Twitter. She
favour ed text messaging as a technology and felt strongly that it would improve her communication with her midwife. The midwives she had for her first two pregnancies were unhelpful. It was only on reflection after her third pregnancy that she felt the midwives’ provision of information during her first two pregnancies was unsatisfactory. In retrospect, W001(Y) also found 4-weekly appointments for her first pregnancy unsatisfactory. She felt she needed frequent appointments in early pregnancy, and would have appreciated more contact with her midwife.

The internet was seen as a source of entertainment including games, music and movies. It seen as a place of fun and a means to communication and socialisation and not in any way associated with work.

Women were embracing new ways as they had different skills compared with midwives, in that as they texted so often, communication using this method was as easy, if not easier and preferable to speaking face-to-face or using synchronous voice calls.

Women were embracing new ways of communicating as illustrated by W024, who is typical of Generation Z. The mobile phone was fundamental to her social life and was used secondarily as an information tool.

Overall, there was a trend with decreasing age, towards the adoption and use of Web.2 technologies (figure 9.4).
New and different skills were evident in the women's cohort overall. Gen Z routinely used text messaging and social media more than Gen X and Gen Y. Gen Z possessed new and different skills using their mobile phones. This group of women predominantly communicated using text messaging and used telecommunication plans that provided thousands of texts at a low price. Using voice calling on the mobile was comparatively costly. Gen Z women took text-messaging skill to a high level, being able to text without looking and to write a text message while carrying on a conversation.

9.2.4 Attitudes and perceptions

9.2.4. Feeling skilful, yet lacking eHealth literacy skills

Although equipped with digital skills, it was apparent that women's ability to search for health information was limited, and they did not know which sites to trust. They were generally lacking in eHealth literacy skills. Women in the cohort were proud of their abilities with technology. They demonstrated their texting skills, and most sought information related to their pregnancy, however this information was not evaluated and according to
midwife M012, much of the information women access is ‘slightly irrelevant’, ‘not in perspective’, and may not be ‘ethically sound’.

M012  The information they glean; it can be quite tricky. I think there is a huge amount of information on there and a fair percentage is slightly irrelevant. We don’t know whether it is ethically sound. I also think it is never in perspective.

Judging by the description of the information women accessed, most came from magazine-style websites as the result of random retrieval, rather than from non-commercial trustworthy sites. The method of accessing information on the internet was to google for information which is an ad hoc method and not always effective or efficient. Generally, commercial sites, which have been optimised to appear in at the top of organic retrieval results, or commercial sites, which have paid to appear above these organic results, are the ones women accessed.

9.2.4.  Valuing social support

Women able to use SMS greatly appreciated the closeness, easy access and support they felt with their midwife from being able to communicate using this medium. Whereas women saw text messaging (SMS) as a preferred medium for communication, all but a few midwives were unenthusiastic and many refused to use this communication medium. Face-to-face communication occurred mostly during appointed consultations with their midwife, although some midwives are open to SMS communication with women. Synchronous voice communication, both mobile and landline was also common.

9.2.4.  Not knowing normal

Women experiencing their first pregnancy do not know what is normal, and assumed their experiences are similar to those of other women. Women experiencing their first pregnancy did not want to bother their midwife unnecessarily, but did not know if their experiences were normal or not.

W003(Y) Having thought about it now and having spoken to some of the others at the coffee group, a lot of them had a cell phone contact and I think I probably would have found that better. Because with the messaging service you…I mean…I don’t know how urgent it is...they say you need to prioritise whether it is urgent or
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not. And although [midwife] said ...she gave us a thing. ‘If your contractions are 5 minutes apart and you can’t breathe through them and things like that then call me because then we are getting there’. You just think how urgent it is and I don’t know what to expect. It was my first baby. I didn’t know what to expect in terms of how fast it would progress and if it went anything like on my Mum when she was having me it was 37 hours but my sister who had her first baby 10 weeks early was very fast. It was all over and done with in about 6 hours, so I kind of didn’t know where to place myself on that spectrum. So I think...the messaging service I would have felt more confident in having an immediate feedback as to whether she was going to come now or whether it was OK to wait.

Women who had experienced two pregnancies were noticeably more relaxed when speaking of their second pregnancy. It was only by comparing other women’s different experiences with other midwives that they understood midwives differ in service provision, communication styles and information. ‘Not knowing what was proper’ was a response from W022(Z), which reflected an uncertainty of the norms.

1  How did you find a midwife?
W022(Z)  I just went to [midwife]. She was just as slack as everybody else. I think she was real good with everybody else I was just...I must have seen her about 4 times before I had my baby. The whole time.

W014(Y) did not know anything about the maternity service and was surprised to learn that it was free.

1  How did you find a midwife?
W014(Y)  I had no idea about anything. I had no idea it was free. I thought I was going to have to pay all these huge bills and everything. That’s how I found out. By word of mouth.

First pregnancies are a period of new information gathering, learning and approaching the unknown. For some women, there was anxiety and fear
associated with not knowing. Two women were open about their mental health difficulties related to anxiety and depression.

  W022(Z) I didn’t know what was proper and what wasn’t so I thought, OK this must be how you do it. But when I talked to my friends and such ... I thought whooa ... and, like, I don’t know.

W001(Y) felt she needed more consultation with her midwife than she had experienced.

  W001(Y) I would have appreciated being in touch with the midwife more [during my first pregnancy]. It would be helpful to me ...incredibly helpful. More for things like when I was worried. It would have been good for me. Definitely. It would be so much easier. Especially right at the start. I had Tia [daughter] I was 25 and pregnant with her. Once every four weeks was not enough [laughs]. It was hard. There was a lot of changes and things I just didn’t know what was happening. So, I think for a first time mum. My midwife wasn’t very open, so...ummm, yes.

W003(Y) needed more reassurance as it was her first child and she did not know what to expect.

  9.2.4.  Constrained by paternalism: limited by choice

Many women, particularly women who had come from overseas or other areas, found it difficult to gain sufficient information, so they were unable to make a properly informed choice of midwife. Information about midwives was limited to their names, telephone numbers and addresses, yet, women had to make the choice of choosing an LMC based only on this information.

Women in the cohort had the choice of birthplace, pain relief, and choice on other procedures during birth and after. Although women were offered the choice to birth in the secondary hospital birthing unit, a birthing unit with secondary facilities 30 minutes away, or a home birth, most women chose to birth in the hospital maternity unit.
W012(X) was a designer and tertiary education lecture, who was used to using computers in her work, although she used her mobile phone simply as a phone. This woman had come to the district from Australia and she described the ‘difficult’ process of finding a midwife.

W012(X) I rang...a consumer advocate group based in Auckland. Because that was all I could find about maternity services in New Zealand but they were quite socialist in their approach. She had her agenda...in terms of ...I said I am with an obstetrician and she said ‘obstetricians in NZ are for ladies who have more money than sense’ I thought that was quite rude actually. Then I was laughing about what my birth plan was and pain relief was and was just trying to make it light and I told her my birth plan was to have an epidural at the first contraction. She was ‘on no, in NZ we advocate pain relief free birth’ and it was very much her agenda. Which was disappointing.

As W012(X) had used In Vitro Fertilisation (IVF), her attitude to intervention and technology associated with birthing was that for her, there was nothing natural about her maternity experiences to date, and she was very happy to have had a caesarean birth, if the outcome was a healthy baby. W012(X) welcomed technological intervention, and did not regard it as extraordinary.

W012(X) With him, especially, there was nothing natural. His conception, his birth...nothing has been natural. That’s fine. He’s healthy. So I guess I have been in terms of medical technology I have taken everything. We have done IVF, everything you can do. Not cutting edge.

Despite women being offered the choice of place of birth and other areas during their maternity care, choices relating to information and communication preferences and channels of communication were absent. Face-to-face was the preferred way for midwives to communicate with women, although this may not have been the first option for all women, and the option of augmenting their face-to-face communication with digital ways, was not offered. Women were obliged to conform with their midwife’s preferences for communication media, which might include using the 24-hour telephone call
service, direct mobile phone contact or direct text messaging to contact the midwife.

Although women had midwife-designated areas of choice that are part of routine care, the choices relating to communication, information and medium were made by the midwife. No women reported they had been asked about their preferences for information and communication although many accessed information including digital information outside of the maternity journey. Some were dissatisfied with their inter-personal communication experiences particularly women who had experienced the call centre barrier between them and their midwife.

9.2.4. ICT are fun and enabling
Women saw ICT technologies as extensions of themselves rather than devices. They valued their devices for their functionalities of communicating with their friends and family and for having fun. There was no suggestion from any women that ICT were associated with work and they were not perceived as onerous. Rather some felt guilty because they might be slightly addicted because of their high use.

Given that digital ways were entwined into the lives of women in the cohort, Figure 9.5 illustrates the theoretical finding that women are ready, willing and mostly able to use new media in primary maternity service provision although there were no opportunities during their recent maternity experience.

Overall, women were ready, willing and mostly able to engage (figure 9.5).
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9.3 A comparison of how the cohorts constructed ICT

This section summarises two different perceptions of ICT constructed from the two cohorts. The research explored midwives’ and women’s attitudes and perceptions of ICT, within the maternity context, and in their everyday life.

*In terms of ICT what are the perceptions, needs, attitudes and views of LMC midwives and women who use the LMC primary maternity service?

The midwives regarded ICT as business tools for work, and separated the technologies from their private lives and recreational time. As most midwives were aged between 50-59, they would be able to remember working life without a computer, and have had to adapt their ways to accommodate technology. By contrast, women perceived ICT as tools for communication, recreation and fun. They were inextricably intertwined into their lives, and only the oldest women in the cohort would have remembered a time without computers and mobile phones.
9.3.1 Midwives socially constructed ICT as:

**Threatening:**

They needed a boundary between them and women and felt this boundary is being breached by ICT.

- **M013** I always feel a bit nervous about the Internet and mobile phones. That our personality and being ourselves is taken away from us when we put ourselves out there.

- **M013** No. I think it [social media] is too personal. Those websites tend to be quite personal information and I try and protect my personal life from my work.

They felt exposed to the public and uncomfortable. This was unwelcome, as they perceive midwives always get a ‘bad press’.

- **M016** Midwifery has a shockingly bad press right now.

- **M028** [That’s] how the media portrays us ...that we are all useless. WHICH IS RIDICULOUS And I am sure I am not the only one who finds this.

- **M013** Just even having that much exposure [on a family website] feels uncomfortable at times. That people come into our family website doesn’t quite fit my profession.

They found it frustrating to have no control over information that may be posted about them on the internet.

- **M012** I have talked to a midwife in Palmerston North whose name was put up on a chat room or bulletin board and very derogatory comments were made about her, which the woman didn’t make to her face. The midwife’s’ daughter found them, forwarded them to her mother. And it takes one thing like that to make people think “bad midwife”. And, you have no comeback from that.

**Dangerous:**

Midwives felt that text messaging can be misconstrued and can be dangerous.
M012  I think the text messaging between client and midwife is dangerous. I think that it is too brief. It is too open to interpretation or lack of emotion. I know with my own text messaging within my family we have had numerous differences. That was a question...and he said it was a statement. And you start putting that in on the health of the baby. "The baby has a bit of a snotty nose today" well, that's fine if the baby is breast feeding, but for issues like. "Is it feeding" “the temperature” you know all the clinical stuff that doesn’t go along with the text messaging society. And yes. So there is that as well, I don’t think it is as safe as it should be. I don’t know how safe the format is, you know what happens if there is one digit wrong and you send clinical information. I am still not sure if it is safe.

Work:

Midwives associated ICT with work, rather than as entertainment, pleasure, social engagement and fun.

M024  ....I am not a screen person you know... it is not my thing.

M028  I just don’t want to be attached to my computer.

M002  I don’t want to go home in the evening and spend two hours on the computer when I have worked eight hours. That is my home time with the family.

Unsuitable for engaging with women:

Face-to-face communication was the medium that made them feel in control, as text messaging employs a ‘foreign language’.

M019  They will text you four words,... I can’t change my language to text back in their language. It is almost like they are speaking Chinese and I am speaking English, so there is a communication barrier there.

Unnecessary:

Midwives felt that technology is interventionist and unwarranted, as birth is a natural physiological event.

M035  It [a scan] is not necessary. It is not something they have to have. I present the women with the options about having a scan and don’t know about the scan,
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particularly the 20-week scan because then they find the sex out. If the baby is obliging, I have only had one woman so far that has said not.

Useful:

Technology was useful for business efficiency in terms of claiming remuneration and biennial review.

M006 The machine spits it out (laughs). It took me 40 hours for my review ...before. An amazing system. That changed my life completely. Absolutely. That changed my life. You just click on the little tab and it gives you all your incomplete women you have not clicked off. It gives you reminders. Sometimes you can miss a person.

It was also useful for midwifery-centred activities including receiving emails from the professional body and for learning as in post-graduate distance study.

M013 [I use the internet] intermittently, for personal and work, so I get emails at the hospital about education and things that are happening and I am studying at Victoria University so I get emails through from them and I use the Internet a little bit. But checking up on discussion boards

The internet was considered useful for information retrieval, however colleagues are also very helpful in this regard.

W002(Y) Well usually, this would not happen very often but if it did, first of all I would ask my colleagues, then I would go to the hospital and look it up on the Cochrane database, because we have access in there, and I would look up.

Intrusive:

ICT makes midwives too easily available.

M012 Mobile technology within midwifery service delivery has made midwives increasingly accessible. Which as an "old" practitioner now I can see is very difficult for the midwife. These women have absolutely direct contact with midwives, they have text messaging day and night, there is no boundary, there is no system and I think there are big gaps in that.
Necessary:

Mobile phones were necessary for work, as midwives are mobile workers.

*M033* I am on call 24/7. I take every second weekend off. I alternate with my backup.

Frustrating:

Frustration was associated with not knowing functions of the Patient Management System or changing and learning new software.

*M006* I still use everything except the letter. I need to learn. That will make life much better. Yes, I would very much like to be able to use the MMPO template for referral letters.

*M018* I have only just changed to My Practice in the last two weeks. It will be two weeks on Thursday so it has only been a week and a half really. And ummm because Packtrac wasn’t being used by Samcl anymore and I was a member and I was paying separate money over and above what everyone else was paying...to use a different program ...so I thought...ahhhh I will just bite the bullet. So it will be worth it now...[laughs]....so last week I was eeeerrrrrrrrrr.

9.3.2 Women socially constructed ICT as:

Informative:

ICT were useful for pregnancy information, and particularly for setting up regular informative emails about the baby’s development.

*W014(Y)* From Huggies, yes I did I got the weekly updates. What she was doing. That was really helpful. Really neat. I felt like I was weeks behind. Having been through the pregnancy, especially my first pregnancy, I didn’t know the questions to ask but Huggies came forward with the information and it was good to read it and take in the bits I needed.

Collaborative and communicative devices:

ICT are very useful for ‘keeping in touch’ and social networking, especially social media sites such as Facebook and Bebo.
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W007(X) I go there [to the internet] lots. Just Facebook, because I am interested in seeing what other people are doing, more than what I am doing, it just keeps me in touch with the outside world a little bit, especially when my friends are overseas and things in different places.

Fun-entertaining:

Downloading films, music and playing games were enjoyable recreational activities.

W049(Z) Music at Music.com download or go to waptrick.com like download and Bluetooth. Cool.

W036(Z) There are some I downloaded but there is a limited time you can play them. There are other games...deluxe. I absolutely love it. I can’t play it anymore because I have used up the number you can play free. Otherwise, I have to buy it. It is about $30. It is so fun. It has little fluffy balls and you have to match them. One at the top and two at the bottom. It is just SOOOO much FUN. If you keep pressing them with the mouse they go WHoooooo Whooooo and if you keep pressing them. They burp. I can get addicted to those games. There is one with big vases and marbles. Some of them are on a chain. You press on the chain and and you touch it twice and the ball starts swinging and it slides up into the air,you can go up. It is all about timing and these springs and they bounce up. And...eventually it gets harder and harder. You have to put it into a canon and shoot it off to make it fall into a vase. ..........it is soooo awesome to play. It was on the computer but I used up the times you could play it. I think you could play it 4 times.

W020(Z) [I] just join joke groups like for example when I was little I used to write yes and no on my rubber and used to ask it questions. I joined that because it is so true. I joined that. Fun groups. I am a fan of Greys Anatomy so I will be part of that group. It will send you updates of when it is on.

For emergencies and for safety:

Mobile phones were useful for emergencies.

W019(Z) I would go crazy. Because I always need my phone. For emergencies or if I get bored.
Useful for watching videos:

W029(Z) Videos, mostly music videos and cats being silly and if I am decided that my mother needs a night off cooking, I use it to find out how to cook things.

Devices for sharing multimedia:

Sharing music was also seen as fun and it also saved them money. Enjoyable activities included posting photos of the baby on Facebook to keep family up to date with baby’s progress.

W033(Z) I love music. ITunes and YouTube. [I] download them for free. Through limewire.com. If you know how to use it and get through all the crap ones with viruses and stiff but you can pick through them. I am not a bad person.....

W035(Z) I text...all the time...photos, videos and music.

W050(Z) I go to Waptrick.com free songs. It still costs $1 to go on the internet but everyone Bluetooths songs to each other. All the time.

Inexpensive for text messaging:

Text messaging and free instant messaging was an affordable way of having on-going conversations with friends and family.

W042(Z) An ordinary one [mobile phone]. I am on the unlimited text. Telecom. Unlimited. $12 a month for unlimited and that is for any network. I know, very handy. [I would do ] maybe 50 – 100

Expensive for data download:

Mobile data download is expensive and was restricted by the limit imposed by the $1 per day internet provider’s offer.

W049(Z) ...only music. Music.com download or go to waptrick.com like download stuff for free. Cool. It takes your money away after a time [data limit].

Time-saving:

The mobile phone was seen as a timesaving and efficient way of both retrieving information and communicating.
W018(X) I suppose the biggest thing [with text messaging] is that you are not interrupting what the person might be doing. Especially with children. And for me, I do it when I am breast-feeding so that I am not only breast-feeding, I am trying to multi task, the way mothers do. What is another advantage? I suppose the convenience for me is that it saves me time. I haven’t always got time to make a phone call. It always ends up going off onto a tangent about other things. You ring about one thing and end up talking about ....it keeps to the point. Because even with my landline, if I make a phone call or get a phone call, I will find something else at the same time. Folding washing is a ‘goodfa’ one. You don’t have time to sit around on the phone....[laughs] sadly.

An extension of the body:

Texting was sometimes preferable and more relaxing than speaking directly with someone.

W007(X) When I was in labour I would text her and she would text back. She was the hospital and like that. How are you going...because when you are in hospital you can’t always talk on a cell phone, so she did drop a text and I texted her. Especially in labour, you don’t feel like talking to people so it was quite easy to flick a text off.

Some Gen Z women were proud of their skills associated with their mobile phone.

W035(Z) I can text without looking....depending on how important the text is. If it is an important text, I will move in and out. If it is easy, I can do it. [I can] ...in the doctor's office, yeah [laughs] and in class.

A convenient lifestyle device:

Shopping, and buying and selling on TradeMe were convenient sites for tasks now that they had to find baby equipment.

W041(Z) [When I was pregnant] I looked up Trademe to buy things...clothes, cots and prams and what not.
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W018(X)  If we need to buy anything we generally look on TradeMe. That is something that has changed for us. Booking flights or holidays. Holiday houses.

Able to be used anywhere:

The mobile phone was at the centre of their life.

W018(X) Most people can’t do without their phones.

W047(Z) I sleep with it on my pillow and it lives in my pocket. I never have it off me. I can’t live without it [laughs] ...mainly at night when my daughter is in bed. Even when I am not texting someone I am constantly checking it if someone is texting me. It is nuts. I am constantly thinking ....I would like to get rid of it but I can’t get fully rid of it because I know that is how people contact me. I don’t have a home line and no one else uses home landline. Everyone texts.

Addictive and trouble making:

ICT could be a waste of time if it was used excessively.

W041(Z) Yeah, I used to go around. You know how you have blue-tooth and infrared. I used to top my phone up with all music from my friends phones. It actually brought a lot of trouble. Texting. People would text hate.

W046(Z) A lot of it gets a bit addictive....like....going on Facebook and stuff. I have my cell phone. I think I don’t text so much because I am busy.

Good for photos

Taking and sharing photos of the baby was considered fun.

While we were in antenatal group, and then when we were having our babies [we shared photos]. Steve used his iPod [iPhone] in the labour unit. He would get onto the Internet and announce the arrival of Oliver on there. And so ...we have been able to upload photos of each other’s babies and of our babies and some pictures of the birth that you can share with your friends but you don’t want to share with anyone else. Without your makeup on and the baby has just been born and there is a bit of goo and stuff which you probably wouldn’t normally put on email around but because we are quite a close-knit group
ICT are not life changing:

Mobile phones and computers have always been incorporated into women’s lives. They were not considered novel.

\[ W005(Z) \quad \text{Forever, they have always been around.} \]

Unintrusive:

Texting was considered an unintrusive way to converse.

\[ W010(Y) \quad \text{I found texting great because I never felt intrusive. It was always a quick solution. I wasn't ringing and hounding...and being intrusive.} \]

These views represent the predominating views of each cohort, although within each cohort, there were individuals whose attitudes and perceptions did not align with the above findings. The midwives had a group I named ‘sporadic technical superstars’ as they were enthusiastic about ICT but again, only for midwifery centred activities. Within the women’s cohort, a small number simply did not like computers and did not want to use them, although this was not true of their mobile phones. Not all women in the cohort had ready access to the internet, as it was not available where they lived, although it was still available and accessible by all.

A diagrammatic summary of midwives and women different constructions is depicted in figure 9.6).
9.4 The influences of context

Factors outside of the two cohorts were the infrastructure supporting provision of services: the professional midwifery culture and the current ICT landscape.

9.4.1 Midwifery infrastructure

The midwifery profession is 'disconnected' in relation to other primary healthcare services in terms of ICT connectivity and the midwifery model of care (figure 9.7).

Midwifery has a professional historical legacy of recently regained autonomy and separatism from the nursing and medical professions. A model of care driven by feminist discourse (Surtees, 2003, Davis-Floyd, 1993) and a business model of service provision (Ministry of Health, 2007), are witnessed as contributing to midwives’ reluctance to engage digitally with women. The average age of the midwifery workforce is considerably higher than the average age of childbearing women, which may account for the differing generational view of technology, as older workers are more strongly influenced by the ease or difficulty associated with using technology (Morris and Venkatesh, 2006: p.377, Hill et al., 2008: p.249). Information management systems and use of these systems were underdeveloped, possibly because the historical professional legacy has been
focused on professional autonomy (Abel, 1997) and this has distanced the profession from mainstream primary health services. They are professionally ‘out on a limb’ and so disconnected from other primary health providers that they are often at odds (Guilliland and Wilcox, 2012, Miller and Mason, 2013, Dearnaley, 2001, Curry, 2007).

Until recently, professional midwifery organisations have not engaged with or provided digital resources for women. However, during 2013 a website (New Zealand College of Midwives) has been developed to assist women to find a midwife. Although it does not list all LMC midwives in Hawke’s Bay, this website is an indication that the midwifery organisation is becoming more aware of women’s digital needs. Women in the study cohort commonly expressed their frustration and difficulty in finding a midwife in Hawke’s Bay.

Digital literacy includes all the skills users need to perform effectively in digital environments, which in the case of midwifery organisations means providing services for maternity care, including empowering women by providing eHealth resources (Wright et al., 2013). Digitally available health information has been shown to increase confidence and levels of empowerment (ibid). Literature suggests that health professionals may not acknowledge the importance of internet information for users of health services and its potential to influence how services are delivered (Janes et al., 2004, Estabrooks et al., 2002, Scott et al., 2008).
The Midwifery Council of New Zealand are agents of the New Zealand Government. The Midwifery Council, legislation such as section 88 of the Primary Maternity Services Notice 2007, the NZCOM and statutory bodies of the government regulates midwives. From the use of a grounded theory method to ground concepts from each dataset, it is evident that there is a mismatch between the capacity of consumers and the willingness of healthcare providers to enable potential advantages brought by digital management of knowledge and communication. There is no evidence that this service is heeding the opportunity afforded by new information and communication technologies and services for women. This is evidenced by the Consensus Statements for midwives and women (NZCOM, 2011). These online pdf documents were designed for but infrequently accessed by cohort participants, and do not meet international standards for good quality information (HONCode, 2011).

9.4.2 Technological framework (Figure 9.8)

Convergence and personalisation of mobile computing and cellular devices, combined with increased global penetration and expansion of
telecommunication services and networks, have established a new media landscape (figure 9.8).

Contextual analysis revealed recent, strong, unprecedented evolution of devices, telecommunication services, information and communication technologies and the subsequent rise of social media. These have led to a mobile participatory framework, which has diffused and been incorporated into people’s everyday lives, especially the lives of younger women of childbearing age.

Figure 9.8 The technology landscape: unused and underused channels

9.5 Secondary themes

Cohort midwives were reluctant to use digital media to facilitate knowledge or communicate with women. The following section examines factors which may contribute to different stakeholders’ understandings of ICT, and midwives’ unwillingness to engage digitally with women.
9.5.1 The midwifery professions hegemonic power over maternity services

Since 1990, there has been midwifery hegemony over maternity services in New Zealand (Clark, 2004, Miller and Mason, 2013). ICT has the potential to provide ‘the technological basis for a new form of society that is potentially liberating for women’ (Wajcman, 2010: p.148), yet evidence suggested that the women in this study were not empowered by ICT within the midwife-woman relationship. By contrast, midwives felt empowered by ICT for professional and business purposes, yet ICT were painted as ‘dangerous’, ‘intrusive’ and unsuitable for using in their relationship with women. This reluctance to engage could be seen as a way to distance or subordinate women (Wamala, 2013), who were more conversant than midwives with the capacities of ICT. Gender literature outlines the role of technology in reproducing patriarchy and goes on to offer solutions (Wajcman, 2010: p.144). It assumes that power relationships are male-female power relationships rather than same-gender groups (Balka et al., 2009) although evidence from this study suggests that a provider-user patriarchal relationship may be played out in this instance.

9.5.2 Sub-optimal digital literacy skills

The digital ICT tools used by midwives, and the ways they were and were not used, suggested that cohort midwives had sub-optimal literacy skills for interacting with the array of digital devices and applications that can be potentially used in healthcare provider-user experiences. Midwifery writers have recommended that midwives need to develop their digital literacy skills to manage the virtual environment and could benefit from different ways of learning via social networks (Vilain and Stewart, 2013, Sinclair, 2013: p.3). This thesis concurs with Sinclair’s view that midwives need to prepare for the effective use of ICT for forthcoming generations. Lagan considered midwives inability to respond to women who retrieve information via the internet and calls for midwives to develop skills to be effective so they can be ‘effective and competent in supporting postmodern women’ (Lagan et al., 2009: p.8). Only a few midwives in the cohort were familiar with websites and directed women to these sites. Lagan considered that midwives might feel vulnerable due to their
lack of skills, although this was not evident in the cohort midwives’ interview data. Midwives in the cohort did not portray or report any skills for evaluating web-based information, although there are fast formal evaluation techniques available (Eysenbach and Thomson, 2007).

My findings concur with midwifery literature, which is that midwives need better digital literacy skills to provide for the needs of women who are conversant with digital information and communication use. Study findings suggest that while women had digital literacy skills, they had sub-optimal eHealth literacy skills and needed health professional support in this area.

9.5.3 Gendered dimensions of ICT


The medical (male) model is a risk adverse model and is more likely to call on preventive measures such as epidurals, fetal monitoring, caesarean section or assisted delivery using forceps or ventouse extraction of the baby (Rooks, 2011, Davis-Floyd, 2001 p.S16). The framing of a medicalised technocratic paternalistic model of birth in which doctors make decisions rather than giving choices is everything midwives rail against and revile (Davis-Floyd, 1993), although New Zealand women e.g. W012(X), often choose to use technology in pregnancy.

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'Unwarranted interventions' include scans, induced labour, epidurals or other types of pain relief, fetal monitoring, episiotomies or any restrictive positioning of the woman. One midwife within the cohort felt unable to comply with a woman’s wish to have an elective caesarean section, so referred her to another midwife.

M025 So we have had one lady who was absolutely determined to have a caesarean. She came from another midwife who said I can’t really look after you. Through talking to me and my colleague, we could basically talk her around and she would try an epidural. And she did. We said it was not an option really and she was really really happy with it. Somehow, you have to invest a lot of hard work. She had gone to somebody else. The midwife said that is not really an option to have an elective caesarean.

The theme of non-intervention during maternity care is relative. New Zealand women are now routinely monitored with the use of technology throughout their whole pregnancy. Women are advised to take folic acid supplements early in their pregnancy (Ministry of Health, 2012), and monitored by having regular checks on urine (for protein), routine blood tests. The use of technologies continues on to after the birth when the baby has, (with the mother’s permission), a prophylactic Vitamin K injection to prevent bleeding. There are technological influences throughout, and New Zealand women, ‘particularly middle class, well-informed, career women well into their thirties’ want control’ (Surtees, 2004: p.166).

Women are offered an ultrasound, although it may not be strictly necessary, and most New Zealand women choose this option:

M035 We don’t like to call it routine. Because it’s not necessary. It is not something they have to have. I present the women with the options about having a scan and don’t know about the scan, particularly the 20-week scan because then they find the sex out if the baby is obliging. I have only had one woman so far that has said not.
W012 within the women’s cohort was happy to have had an assisted pregnancy and was simply seeking a safe birth, ‘My birth plan was to have pain relief at the first contraction [in jest]’. Midwives were able to accommodate women’s choices for technology such as scans and epidurals during birthing, although, while midwives skilfully accommodate these choices during birthing, my study of two cohorts reveals that midwives did not give women information and communication choices.

Society’s increasing dependence on technology suggests we are all cyborgs, as we interact with tools that function as an extension of our individual abilities (Case, 2010, Introna, 2009: p.25, Orlikowski, 2009b: p.12). As contemporary forms of technology are ‘multiple, fluid, temporary, interconnected and dispersed’, Orlikowski calls this ‘entanglement’ (p.15). Lupton (2012: p.4) has pointed out that the wide range of commonplace technologies the human body interacts with on a daily basis include technologies for vision correction, devices for hearing, telephones, bicycles and cars which all enhance human capacities. ICT such as computers and mobile phones enhance and extend human capabilities, impacting not only on the body, but extending capabilities of the mind such as extending memory functions and communication.

Donna Haraway has commented on the relationship between humans and technology. She describes cybernetic organisms as ‘a hybrid of machine and organism’ (Haraway, 1991: p.149). She supports socialist feminist politics and cyberfeminism as a way for women to engage with technology, and to network, collaborate, advance feminist causes and disrupt the perception of technology as a male only domain. Further, Haraway advocates being in control of technology and recognising its boundaries so that it is not dominating or threatening (Haraway, 1990:222).

Although ICT can be constructed as symbolically gendered and intrusive, the use of communication technology has been seen as ‘humanising’ (Case, 2009). Case describes a cyborg as ‘an organism ‘to which exogenous components have been
added for the purpose of adapting to new ambient spaces', and argues that through interaction, 'humans and technology co-create each other through a network of techno-social interaction' (Case, 2009, Case, 2010). Our new ability to connect over time and space makes us more human, and despite using technology, the interaction is still a human connection, just using a different method.

Data from the women's cohort supports this view. W041, a 17-year old Maori woman did not currently have a mobile phone as 'I have been through so many phones, I can't look after them'. She can't afford to buy another one because:

'I just can't save up to buy my own phone. My savings account ....when I am in town I have to go and get something to eat. I have to go and get ...I love my takeaways'.

In addition, her mobile phone used to get taken away from her at school, all of which suggests a degree of disorganisation. Yet, her midwife effectively used text messaging to support this young woman during pregnancy.

W041  [Midwife] was really good. Every time I texted her she said 'you are a great girl' and I said 'you are a great woman' thank you so much. She was quite cool. A huge help, a lot of information, a lot of advice. Made me really at ease with pregnancy from what other people described it to be...painful...made me feel real comfortable and being myself in my own body. She was always there for me. No problem.

The effect of this ambient surveillance and highly supportive care using text messaging was recalled, related and appreciated long after the pregnancy.

Distinctions between what is natural or artificial in human-technology relationships are blurry (Wajcman, 2006b: p.12, Wajcman, 2006a). For example, numerous technological devices including pacemakers, hips, contact lens, grafts are incorporated into the lived lives of individuals. Generation Z within the cohort have demonstrated their facility with mobile phone technology, and the relationship some have is very close. They appear to be so connected to the
degree that their mobile phone and their mind are intertwined. They sleep with them, they can multitask while texting, and their skill level is such that they can think beyond the task, so the device is intertwined with their bodies and minds. When women in the cohort connect and interact with computers or mobile devices as extensions of their bodies and minds, they become cyborgs, and the fusion is a blurring of the virtual reality and reality boundaries.

Cohort midwives were not fused to their ICT in the same way. Data from the midwives’ cohort suggested that midwives had insufficient digital skills and felt threatened by new media. Donna Haraway (2004) has proposed that technologies could be seen as tools for women (and midwives as women) to enjoy and take control of, rather than to shy away from and fear.

_The machine is not to be animated, worshipped, and dominated. The machine is us, our processes, an aspect of our embodiment. We can be responsible for machines; they do not dominate or threaten us. We are responsible for boundaries; we are they_ (Haraway, 2004: p.38).

Haraway (1991) and Surtees (2003) have remarked on ways for women to become more accepting and understanding of technology and both suggest acknowledging rather than opposing, and having facility with technologies, bring empowerment and control.

Women and midwives have been through a long period of obstetric hegemony (ibid: p.287) although for the last twenty years New Zealand women have experienced midwifery hegemonic understandings of childbirth with its backlash against technology. Remnants of midwives’ backlash against technology during the maternity experience were evident in both midwives’ and women’s data.

_9.5.4 Threatened boundaries and loss of control_

ICT were threatening to cohort midwives’ private-professional boundaries. The potential loss of transparency, and a shifting balance of power towards women were also threats.
9.5.4. Threatened private professional boundaries

Midwives partnership model of care and business system did not accommodate easy handover of care and allow midwives to have satisfactory time off duty and for women to have continuity of care. Midwives felt they were frequently on duty, and protected their private time. A few midwives supported women using text messaging but many used a protective call system which women found frustrating. ICT were seen as having the potential to place further demands on midwives' private lives. There was a tension of interests with no standardised system for continuity of care, and allowance for midwives' off-duty privacy.

9.5.4. Loss of transparency

Some midwives felt so threatened by the surveillance of their professional body, that they changed to software that was not connected with the midwifery infrastructure.

M001 and at one stage, I had an issue with the fact that MMPO is very controlled by the College of Midwives. And I am going – to me the professional body is far too closely connected with the people who are running a business that pay us.

In addition, MMPO also requested women's personal health data that midwives did not feel comfortable providing.

M001 We got a letter about a year ago from MMPO saying that the College of Midwives have instructed them to ask us information about what diet people had and how tall they were and how heavy they were and whether they smoked and whatever and all this information was being dictated to us and in this letter it said something like “if you don’t co-operate and fill in the little boxes then we will decline paying you”.

M007 felt that she owned the women's data and objected to the NZCOM being able to audit her practice, so she used alternative software to distance herself from the national midwifery body.

M007 The other thing too, those stats are ours. Nobody else can get that where as the MMPO goes directly to the New Zealand College of Midwives and what I find
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quite scary is that they are capable of auditing you personally. They can look at you as a midwife and see how many antenatal checks you have done, how many smears, what you have done outside of midwifery, how much money you are making, how many claims you have made, how many babies you have birthed, how many antenatal visits, how many post natal visits, and I find that really very intrusive. You know.

Midwives viewed the shifting balance of power, loss of control of information and loss of transparency associated with ICT as potentially threatening to their autonomy.

9.5.4. The shifting balance of power

People’s ability to access information has disrupted and shifted the traditional balance of power existing between them and the health professional (Cohen and Raymond, 2011, Jacob, 2002, Donnelly et al., 2008, Kreps and Neuhauser, 2010). Donnelly et al. (ibid) and others e.g. (Gao et al., 2013) noted that the decline in expert authority and the empowerment brought by the pervasiveness of health information on the internet has ramifications for health management generally. The LMC midwives in this study did not acknowledge the potential impact of new technologies on the reconfiguration of their role and responsibilities as they were in a position not to effect changes and did not feel the need to change whereas women ‘did not know normal’.

Health consumers are encouraged to be actively involved in their health care, though some midwives in the cohort felt threatened by the availability of information and were reluctant to fully engage with women using the information available on the internet. They preferred to distribute literature for face-to-face discussion and considered information women gathered on the internet as unnecessary, not to be trusted and even dangerous. They sometimes referred women to trusted sites, although this was less common. McMullan (McMullan, 2006) suggests that rather than being intimidated by increased volumes of information from dubious sources, health professionals need to acknowledge the problem and work with the patient to evaluate content and
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discuss the relevance to the individual. There is a recently growing body of literature that supports that this requires a digitally literate midwife, as a health professional who is prepared to guide people to reliable and accurate information (Murray et al., 2003, De Santis et al., 2010, McKenna and McLelland, 2009, Gao et al., 2013, Lagan et al., 2009, Lagan and Kernohan, 2010, Larsson, 2009). The challenge requires:

...developing discerning and critical usership among consumers, persuading health care professionals of the importance of collaborating in that facilitation and use, and providing both parties with the strategies, skills, programs, and systems to do so (Cline and Haynes, 2001).

9.5.4. Loss of control

It is very easy for individuals to post any kind of information on the internet, and very difficult for others to control this behaviour. Midwives in the cohort felt powerless to control women’s chat and opinions about midwives on the internet, especially in public chat forums or virtual communities. They felt exposed by damaging opinions that women expressed and felt that a public forum where women discussed midwives was very threatening (M012).

Participants in internet chat forums can express opinions behind a cloak of anonymity, expressing views they may not express under their own name. Each virtual space develops a unique culture based around trust, ways of behaving, and communication nuances which depend on the purpose for the site. Sites may or may not be moderated which means that postings and names are likely to be on the internet to appear in search engines, long after interest in a topic has waned. Irresponsible use of the internet and the power and potential of the internet to be harnessed for eHealth could be balanced and managed by more widespread digital literacy skills.

9.5.5 Virtual (computer mediated communication) versus physical communication

Virtual methods of communication using ICT were challenging to the midwifery perceptions of gold standard communication practice, which is the physical
reality of face-to-face communication. Cohort midwives said repeatedly that face-to-face was the only acceptable way to communicate with women within the cohort, however women were happy to communicate using the internet via their mobile devices. Midwives needed the physical presence of the women, as for them, computer mediated communication and the virtual world were foreign. Again, the blurred boundaries of sociomateriality attest to the entanglement of individuals and virtual spaces (Schöni, 2011, Biocca and Levy, 1995, Monteiro et al., 2012, Orlikowski and Scott, 2009). I described two women in the cohort, one who found texting more relaxing that talking in labour (W010), and the other who much preferred to text rather than talk (W039). These findings concur with the Pew Research Centre survey finding that 31% of American mobile phone users would rather text than talk (Smith, 2011a). As evidenced in this study, computer mediated communication is preferable in some situations for some people.

Computer mediated communication is not only suitable for short messages. Perry found that the use of the internet and technology experiences are perceived in a variety of ways depending on the experience of the users, and are satisfactory for discussing complex or sensitive issues (Perry, 2010: p.69). Furthermore, Perry found that couples communicating this way preferred a computer-mediated channel of communication to face-to-face communication.

Study findings point to midwives using the 3G mobile phone (not smartphone) as a mobile telephone rather than as a device for text messaging, Gen X preferring email communication, Gen Y preferring social media via laptop and Gen Z using social media via their mobile devices. Each had different motivations depending on their individual circumstances. Communication theories acknowledge media choice. The Duffy and Thorson Health Communication Media Choice Model (Duffy and Thorson, 2009: p.102) incorporates Katz’s Uses and Gratification Theory (Katz et al., 1973) to depict that people choose methods and tools to satisfy their individual needs at a particular time. They believe that ‘effective
Cohort midwives were cautious about using Voice Over Internet Protocol (VOIP) (e.g. Skype). Skype is currently used in clinical settings for clinician-patient consultations in Western Australia, and in London for

I asked midwives who were familiar with the (VOIP) platform Skype, whether they considered it was suitable as an adjunct to real visits during post-natal care. Reactions ranged from enthusiastic:

M011 That might be fine. I quite like Skype. I Skype my daughter. It’s great, what more do you want. I could Skype my women; I think that would be great for rural women.

To apprehension about the legality:

M017 I haven’t really thought about it to be honest. Don’t know about legally that would be the only thing.

To apprehension about privacy:

M034 Ummmm I would wonder how secure in terms of privacy. I am not really technology savvy. Confidential line. I guess it is the same as on the phone. It could be good to have a video link. I don’t think it is like a face-to-face visit.

To dismissal:

I Do you feel as though Skype could augment post-natal visits?

M019 No...no, it is about the midwifery partnership. It is about one on one with women. Not...I think it would work well. Maybe in India. I have got plenty of time. We allow an hour and a half for postnatal visits and that is the informality. If a visit takes an hour and a half to two hours that is fine. I don’t want to treat women all the same. They have individual needs. I think we are very spoilt in New Zealand. All of the women who have grown up here have no idea. That is their expectation. One on one midwifery care.
To ‘weird’ and alien:

M026 I never use Skype. Never. No. Probably not, I find the whole thing a bit weird.

M019 spoke of the need for the partnership model of care, insinuating that this partnership would be destroyed if computer mediated communication was used.

M019 It (Skype) undermines the role of the midwife in the relationship. I don’t know if you could have the same relationship electronically. Thank you can have with someone sitting in a room. It is not all the listening it is actually being able to touch the baby or to put your hand on a mother’s stomach to feel that everything is happening the way it should be. I am not comfortable with it. My role is far more important in value in person in a room with somebody. But I can see there are situations where it would be ideal. My lady that lives in Tutira got snowed in. I would ring her to ask her questions but to be able to have Skyped her...maybe the communication wouldn’t have worked, I don’t know.

M019 felt very uncomfortable about the virtual communication and felt that being able to lay her hands on the woman’s stomach was important. Physically being there in person was the only acceptable medium for her. This perception flies in the face of evidence from Perry (2010).

M022 felt rural women miss out on aspects of care, and that Skype might be possible. Her concern was for bandwidth, but New Zealand Government initiatives are prioritising better connectivity for rural New Zealand.

M022 Do you think there is any use for Skype or telecommunications postnatally?

M022 Yes, I do, I think rural women miss out on everything. Unfortunately, a lot of them are on exchanges that don’t support the Internet very well anyway.

M030 felt that a telephone conversation was as good as Skype.

M030 Do you think there is a place for using Skype in place or instead of visits?

M030 I hope not. I think if there is a big problem, no...I wouldn’t ever use Skype. You get so much out of seeing somebody. No, I can’t think I would benefit from
M035 acknowledged her lack of experience using this technology, and felt that the experience would be uncomfortable for her.

M035  I have used Skype once. It wasn’t particularly successful. I would feel pretty uncomfortable using it in lieu of having a physical visit. I wouldn’t want to go down that track. No. You would just lose so much. I think.

Lack of skills, fear of privacy issues, lack of confidence and experience using computer mediated communication as well as losing a hands-on face-to-face opportunity were grounds for midwives lack of enthusiasm and discomfort for using VOIP to augment postnatal visits. VOIP and Skype were seen as an unnecessary technology, and a way of communicating that was inferior to the face-to-face encounter. Cohort midwives were accepting of technology as tools to make their professional practice more efficient, and tended to associate them with work rather than viewing them as objects of fun and to be used for recreational pursuits. When technology was associated with women, they felt it was possibly irrelevant, unnecessary or intrusive.

9.5.6 Gatekeeping (information and media control)

Midwives in the cohort controlled the number and type of information and communication channels available to women, controlled the information given to women, did not make use of internet resources and created barriers to interpersonal communication.

A gatekeeper refers to ‘an attendant employed to control who goes through a gate’ and ‘a person or thing that controls access to something’ (Oxford Dictionaries, 2012). The concepts of ‘controlling’, ‘overseeing’ and ‘monitoring’ are associated with the term ‘gatekeeping’ and the ‘filtering’ of information. By contrast, Levy used the term ‘protective gatekeeping’ to describe the process of guarding information in order to ‘protect women and themselves’ (Levy, 2006:
In this study, midwives felt they steered women in a safe direction by controlling content and all aspects of information around pregnancy and birthing. Although midwives in the study cohort were anxious to comply with women’s wishes, their actions, exhibited a bias indicative of their own feelings. The actions included: their hesitancy in accessing and sharing digital knowledge, only using the internet for personal and professional requirements, resisting the use of social media, perceiving a threat from digital tools and needing to maintain a boundary between themselves and the women.

A Health Informatics perspective on facilitating information casts an alternative to controlling information. Eysenbach has introduced the term ‘apomediation’ with health professionals as apomediaries or someone who stands by and guides and enables (Eysenbach, 2008). Health professionals are positioned as facilitators of information and services rather than gatekeepers and are detached rather than controlling of information (ibid). This means women/people have more direct access to both their personal data and high quality relevant health information on the web. Midwives in this role could act as guides and facilitators rather than mediators or gatekeepers. The Web 2.0 environment exemplifies a participatory collaborative environment typified by social media and is already fertile soil for this scenario. The influences of Web 2.0 have not yet begun to filter into New Zealand maternity service provision as evidenced by the cohorts in the current study.

### 9.5.6. Midwives as ‘wise women’

Midwives spoke of themselves as ‘wise women’.

**M012**  
As a senior wise homebirth midwife, I do get invited to other midwives home births but as a I say with the younger midwives, not younger age, I will come and be your second so they get the wise women stuff and the backup at the same time.
The ‘wise women’ concept refers to tacit knowledge held by midwives, and is a common theme within midwifery text (Guilliland, 1999, Banks, 2009, McIntosh, 2007). Within this study, ICT and ubiquitous information were challenging to the perception of midwives as ‘wise women’. While ‘tacit knowledge’ can be played out as midwives’ actions during the birthing situation, the type of information women needed to make informed choices is explicit knowledge, which is able to be expressed, and is freely available as information on the internet.

9.5.6. Retrieving health information is empowering for women

It was common for women within the cohort to feel more empowered and satisfied by setting up weekly up-data emails related to their gestational age.

W003   When you get pregnant it is all very exciting and you really want to know what your baby is going to be up to each week and I found it quite exciting looking on the Internet and looking at this particular website because it would send out weekly updates. Yeah. You would click on the link and it would say “this week you baby has developed this this and this and is approximately this long and weighs approximately this much” and I found that quite exciting. Because a lot of it...especially around the beginning of your pregnancy. I had to go on the Internet to find out what I should and shouldn’t be eating. The thing that I think would be really really helpful coming from a midwife. Because there is so much information and so much is conflicting. Especially things that they say in the UK you can’t eat; over here, they don’t seem to be too bothered about it.

Again, there was no mention was made of discussing this with the midwife.

In the past, it was difficult for people to access relevant information about their healthcare options, however the evolution of ICT within the last 15-20 years has changed ways of being informed and communicating. The internet is an empowering tool for health consumers (Eysenbach, 2000), and a disruptive influence on the established channels, control and distribution of healthcare (Huang, 2008). The ability for people to be informed and network has empowered health consumers by being better able to make choices about their own health and wellness.

23 Defined in the glossary.
9.5.6. Retrieving health information has economic advantages

The increasing gap between the availability of new solutions and the ability of services to deliver these solutions, coupled with the aging population and lifestyle-related conditions make empowering persons an attractive proposition for providers of healthcare resources. With the pressure of the health dollar, there are incentives for providers to provision preventative care as well as treatment care. Preventative care in this setting is seen as encouraging pregnant women to make healthy lifestyle choices to ensure their baby has long-term health benefits.

This view sees actively participating women as consumers of healthcare as a commodity, however, not everyone welcomes the opportunity to become further empowered during the decision-making process and some may have no wish to make the transition from a passive or dependent person (Lupton, 1997) (Greenhalgh, 2013a). Lupton was commenting on this situation in 1997 although, this may no longer be as marked as it was then, when access to the internet was in its infancy.

9.5.6. Women as information retrievers

Women in the cohort, especially within the sub-cohorts Gen X and Y, frequently accessed the internet for additional information about matters concerning their pregnancy. These findings concur with Lagan’s (2006, 2009, 2010, 2011) findings with other groups of pregnant women, and other studies, which reiterate that the practise of seeking health information in the internet is now commonplace (Eysenbach and Kohler, 2004), (Eysenbach and Kohler, 2003), (Bakardjieva, 2010). Lagan et al (2010) found 97% in her study used the internet to access pregnancy related information and that 34% were dissatisfied by information provided by health providers.

W001(Y) used the internet because she had a ‘soft pelvic bone’ and her midwife was ‘not really very helpful’. She found a lot of information on the internet and bought a ‘belly-belt’, which was personally very helpful, but this did not lead to a better partnership and dialogue with her midwife, as it was not discussed.
There was no evidence that information cohort women retrieved from internet searches enhanced their dialogue with midwives. Cohort midwives were concerned about the volume, relevance and trustworthiness of information women accessed on the internet. Lagan also found women did not discuss internet information with midwives and considers that midwives have a responsibility to acknowledge that women access the internet for information and support. She feels that health professionals must learn skills to guide them towards better quality sites and be prepared to discuss the ensuing information (Lagan et al., 2011).

9.5.6. **Suboptimal health information retrieval behaviours**

Women in the cohort described sub-optimal pregnancy information retrieval behaviours, and their lack of eHealth literacy skills suggested they needed guidance. This finding concurs with extant literature findings on health information retrieval behaviours which include exploring only the first few links on general search engine organic results, not checking to find out who the information providers are and forgetting where they found the information (Eysenbach and Kohler, 2002). Other barriers to the optimal use of health information include poorly organised information, accessing trustworthy information and the inability of persons to evaluate the information they have accessed (ibid). Suboptimal retrieval strategies and poor evaluation skills used by health information seekers has led healthcare providers to believe that people may not have the eHealth literacy skills to understand information they have accessed (Wilson, 1999). This study supports those findings.

9.5.6. **Information retrieved from the web may be misinterpreted**

A few midwives in the cohort considered that women are likely to misinterpret information, and may be unable to distinguish information that is relevant to them.

M013 felt women do not have the skills required to evaluate information and this makes her nervous.
M013 I think that pregnancy and pregnancy labour and birth are private and special time being able to access all of those things on the Internet takes away from that. I don’t use the Internet enough to feel confident that the right information would get out there. My impression is that people have a limited ability to discern what is good information and what is not good information, so I think that is a grey area. Whether it can be beneficial or harmful...don’t know. I always feel a bit nervous about the internet.

Although women may misinterpret information, misinterpretation of internet accessed health information is not harmful according to a systematic review analysing cases of harm associated with using health information on the internet. This study found that of 186 papers discussing harm, there were only two papers reporting human harm. The review concluded that the internet’s capacity for good far and exceeds its capacity for causing harm (Crocco et al., 2002). Notably, this report was before the advent of Web 2.0 and the burgeoning of social media and at a time when there was less emphasis on encouraging people to be active participants in their healthcare.

The following case reported by a woman in the cohort is testimony to the ‘misinterpreted but no harm done’ finding.

W004(Z)’s pregnancy was complicated, in that her baby having cytomegalovirus (CMV virus)24. The family (woman, her mother and her grandmother) were very focused on becoming informed and collectively used the internet to search. However, their limited search ability and the scanty information given by the specialists resulted in them becoming confused with the toxoplasmosis parasite, which is transmitted via faecal contamination from cats. The lack of detailed information from the specialist and lack of eHealth literacy skills resulted in a search that satisfied the family, although they were unaware that the information they accessed did not relate to the woman’s condition and the access and

availability of the internet resulted in their misinformation. There was no
 collaborative discussion based on the family’s internet search findings, however,
 no known harm or adverse outcomes were associated with this misinformation.

9.5.6. Information retrieval and informed choice
Midwives in the cohort felt it was unnecessary for women to use ICT tools to
become informed or to communicate with midwives. Yet, research has shown
that when women are well informed, they are better equipped to participate in
making a meaningful choice (Goldberg, 2009). The overriding debate focuses on
the person’s right to choose, whether to participate and if so, how or how not to
participate (Greenhalgh, 2013a: p.37), and whether elements of paternalism are
appropriate at different times. Peoples’ values and preferences are dynamic as
well as being individually and differently constructed. What is important to
achieve and the way this is done depends on those values. The onus is on the
healthcare provider to interpret and accommodate whatever these might be
within the other pillars while having due concern for their own safety.

9.5.7 Paternalism
Paternalism in health is a restrictive practice that usurps a person’s right to
choose (Sandman and Munthe, 2009: p.2). It is the antithesis to autonomy.
Paternalism within the women’s cohort was a theoretical category associated
with women not knowing normal, being limited by choice of channel and finding
the need to use additional sources including the internet to find information
about pregnancy and childbirth.

Midwives have autonomy over maternity care and birthing practices in New
Zealand (paternalism). Women in Hawke’s Bay have little choice but to use
midwifery services, as few general health practitioners are available as LMC
providers. Tensions between gatekeeping, paternalism and choice stem back to
the four pillars of Beauchamp and Childress’s principles of biomedical ethics
(Beauchamp and Childress, 2001). Respect for autonomy and personal choice are
highly valued within the midwifery model of care and midwives need to balance
women’s autonomy with their obligations and compliance with the ethical principles of nonmaleficence,\textsuperscript{25} and beneficence\textsuperscript{26}.

The hegemony of the medical profession is a commonly expressed theme throughout midwifery literature. For example, Fahy (Fahy et al., 2008: p.7-8) uses Foucault’s discourse (Foucault, 1980) to show the synonymous relationship of knowledge and power. The cohort women’s data, suggested that midwives, used their knowledge and power in ways that women in the cohort felt were ‘inappropriate’. These instances were only with primiparous Gen Z women who did not understand normal and who, on reflection, were indignant with their treatment.

Data from both cohorts was re-examined when the category suggesting that elements of paternalism were present. During their first pregnancy, women did not know what was normal until they compared experiences with other women. Women’s data also suggests that some midwives might have displayed controlling and paternalistic behaviour, including controlling women’s information and communication choices, examples of which have already been documented in the findings section. Instances of paternalism within the women’s cohort reflect midwives’ hegemony in the partnership during maternity care.

W004(Z) had pregnancy complications and needed to birth in a tertiary centre (Wellington). She was very unhappy because her midwife chose not to respond to her calls when she returned home, had found she had no midwifery follow-up. In this case, the midwife made the decision that W004 needed no further care.

\begin{quote}
W004(Z) I had an infection and the next day the midwife didn’t come to see me and she like three weeks later asking if I had had baby. Haven’t seen her. Saw her once. She said you can bring baby in to be weighed if you like. She just wanted to know the details and when we had him.
\end{quote}

\textsuperscript{25} Avoiding harm.
\textsuperscript{26} Actively promoting good.
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W010(Y) felt that as a first time mother, the midwife controlled her, and she had insufficient support as communication barriers prevented her from contacting her midwife.

W010  I had no way of contacting her. I had to go through a message service and you had to wait for her to return your call. You were never sure if she got the message. One day it took over a day to ring me back. I had spotting. And she took a day to ring me back. First time mother at 8 weeks with spotting and I was nervous. Not return calls. Once I had my baby she...communication was poor. She double booked appointments, she once I was home I had mastitis and said she would come and visit me, and she didn’t turn up. She hadn’t written it down or communicated it anywhere. It was just one thing after another. The communication was poor. There was no offer of having her mobile phone...return phone calls took a long time...there was no emailing.

W017(Y) felt apprehensive and considered she did not have enough time with her midwife before the birth. Although she had contacted the midwife at 12 weeks gestation, she only saw her midwife three times before the birth. The midwife controls the number of visits although the maternity service provides for ~10 antenatal appointments.

W017  I went to the doctor and had the pregnancy confirmed and they said the same thing. Just go through the yellow pages. Go to meet them so you can make a decision. I did that. I went to meet a lady ...and a couple of others and then decided on [midwifery clinic] mostly because they were so local and nearby and I wanted them to be close. And I know because I was 3 months gone, I wasn’t going to be able to build strong relationships with this midwife. I knew I was only going to see her once a month for the next 3-4 months and when he was born. I went and saw her one month. I think I only saw her 3 times ...before the birth. I was pregnant in the July. August and September at 12 weeks, I didn’t see her because I wanted to get past that safe stage before I went and got involved with the midwife and talked about birth and everything. I didn’t want to become too attached in case I lost the baby, because my sister lost a baby herself and I kind of wanted not to get attached initially until we were past the 12 weeks. So then I saw her once in October, then she went on annual leave in November and December so I saw a different midwife...
for that and then I saw her in January and then in February. So at that point I had seen her 3 times and he was due in March. In March I saw her once in the early part of March and then he was born. So really for me half an hour 3 times wasn’t enough to build a relationship with her. And I found that quite difficult. I was here in a country effectively on my own without any family support, with friends, but for me it was very important to... I don’t know.... I wanted her to be a friend really because she was about to be part of the most important thing in my life. And I did struggle with that a lot. I only saw her a few [3] times.

W022(Z) woman went to see the midwife at 14 weeks gestation and upon reflection, felt her care was unsatisfying, as she did not know what was normal and only saw her midwife four times before the birth of her baby, whereas ten visits are allowed for.

W022(Z) We went to the doctors and they made me do another pregnancy test. I told him I was already pregnant, and it was just a waste of time that they were doing that. [Both laugh a lot]. I know. I told him I was pregnant and they made me...[laughs] I am just ...and then I asked about midwives and they just told me Hastings. I just went to [midwife]. She was just as slack as everybody else. I think she was real good with everybody else I was just ...I must have seen her about 4 times before I had my baby. The whole time. I didn’t know what was proper and what wasn’t so I thought OK this must be how you do it but, when I talked to my friends and such...I though Whooooa... and like, I don’t know.

In retrospect, and on reflection, W028(Z) was very critical of her midwife as visits were short and she considered that her monitoring had been unsatisfactory. The midwife failed to diagnose pre-eclampsia and this left the woman feeling that her midwife ‘was shockingly bad’ and that she felt disempowered. W028(Z) did not trust her midwife. Her pre-eclampsia condition was picked up because her mother was a caregiver in a rest home where a nurse suggested that her high blood pressure needed urgent attention.

W028(Z) My mum was a caregiver in a rest home and I was feeling really sick one day and didn’t want to phone her [midwife], because I didn’t trust her. So, we just went to the rest home and saw the nurse, and he picked up that my blood
pressure was 200/150 and he sent me straight to the hospital. I had already had complaints to her. I had been telling her since about… that got picked up about three weeks before I was due. I had already telling her about the cramps I was having down my legs and the pains and the headaches and they were all early warning signs for pre-eclampsia. She just said I needed more salt. So, I don’t like salt. I got told to go straight to the hospital as well. They noticed my blood pressure was high. After that, she was checking me more often. She knew. From three months, you could see my blood pressure going up. I started up at 110/70 and each week you could just see it going up. One week it was 120/80. She just said ‘oh your blood pressure is pretty high maybe we should keep an eye on it’ but…so I went on the Internet or went and bought books.

W029(Z) also felt controlled by the midwife as she felt that during visits that the midwife did not want to talk to her and when she was in labour, she was told she could not walk around and could not go to the toilet.

W029 Every time I turned up to my appointment I felt as if she did not want to talk to me. Just record everything down so I could leave. I told her my birth/labour (I wrote it out) plan and she didn’t follow anything what I wanted “she didn’t care what you wanted eh” ---NO [woman’s name]. I wasn’t allowed to walk around. I just had to stay on the bed. There was nothing wrong with me. She wouldn’t let me go to the toilet at all. She told me…when she walked out I went[ to the toilet]. And she walked in. I didn’t tell her [laughs].

W044(Z) did not know that midwifery care included post-natal follow-up. Both W044(Z) and her mother felt disappointed, frustrated and disempowered by the midwife’s lack of interest in the post-natal period.

W044 She didn’t see me again after I had my baby. She didn’t even come around. [There was] no one to look after my baby. So, I did it by myself. My mum was getting frustrated. She said they are not supposed to do this. I was like …somebody’s got to do it.

The above behaviours were interpreted as paternalistic instances when women at the time, had no expectations of normal.
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Although midwives theoretically practice a ‘partnership’ model of healthcare service provision, evidence from the women’s cohort suggested that there are elements of paternalism within midwifery practices.

9.6 Unused and underused channels

‘Unused and underused channels’ describes the information and communication experience that exists between the two cohorts. Participants provided insights about their constructions of ICT as they used and didn’t use them in the maternity setting and in their private lives.

Considering that women within the cohort were basically equipped and were ready to use ICT to communicate while midwives had no incentive, felt threatened and did not feel the need to engage more fully with digital architecture, the digital void is expressed as the theoretical construct: ‘unused and underused channels’.

Figure 9.9 diagrams midwives process of non-engagement with ICT and depicts the kernel of this study’s research findings. The concept of unused and underused digital channels constitutes a digital void. The contributing factors are seen as the sub-optimal digital literacy skills evidenced within the midwifery cohort and supported in midwifery literature. In addition, ICT technologies were intrusive to the midwifery model of care and were threatening to private-professional life boundaries that currently favour midwives. Phone and face-to-face were the only acceptable media for communication and digital ways to augment this channel were rejected as midwives have autonomy over the way they practice and midwives did not feel the need to change. Further, they were seen to be ‘gatekeepers’ of information as they controlled rather than facilitated information choices for women. Midwives’ unwillingness to provide ICT opportunities for women may be the result of above-mentioned factors but is played out as a lost opportunity for women.
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Figure 9.9 Factors contributing towards midwives not feeling the need to use ICT for women’s needs

Figure 9.10 situates midwives as having a hegemonic relationship with women, and the process of non-engagement resulting lack of digital opportunities and engagement and unused and underused channels. It outlines the contributing factors to midwives feeling threatened, their response and the outcome.
Figure 9.10 shows the structure of the maternity service and situates midwives and women in the larger context. Midwives represent the midwifery council which is an agent of the New Zealand Government and charged with providing safe maternity services for women (The Midwifery Council Of New Zealand, 2013). It also controls midwifery education and monitors midwives who are funded by the Ministry of Health who also provide facilities.

Possible stakeholders depicted as possible triggers for change to midwifery services are seen as consumer, governmental and midwifery bodies.

The midwives model of care considers women’s choice to be paramount, although evidence from the women’s cohort suggests that this is currently not as yet the case with digital information and communication choice.
Figure 9.11 Unused and underused channels as a disconnect between providers and consumers
This finding has significance in that health communication academics consider that ‘effective health communication today must acknowledge the emergence of the powerful and technologically connected consumer’ (Duffy and Thorson, 2009: p.100). Furthermore, the New Zealand Government has outlined digital strategy goals that are not being realised in this sector of health service provision (Williamson, 2005). Government policy dictates how midwives deliver primary maternity services that at present are not enabling women (consumers) to reap digital advantages and make use of mobile opportunities afforded by new mobile media.

The forces against using ICT for women within maternity service provision (midwives and infrastructure), the existing and forthcoming skills and expectations of future generations are at odds. These opposing forces are in the shadow of a dynamic ICT setting in an already digital world (figure 9.12).

Figure 9.12 Conflicting expectations between the maternity infrastructure and consumers
Chapter 10: NEW MODELS FOR DIGITAL ENGAGEMENT

The fourth aim of this study was to reflect on the role of new technologies in primary maternity service provision. New models for digital engagement are presented since digital technologies are closely intertwined with women's lives and women-centred care in health is paramount. During women’s maternity experience, there was minimal opportunity and choice for digital interaction with midwives, although women have shown strong acceptance and uptake of ICT in particular instances, with their digital engagement and channel choice taking many forms.

This thesis is that midwives wish to preserve their autonomy, feel threatened by aspects of ICT, and their digital literacy skills are less than optimal. In addition, women have incorporated ICT into their lifestyle and ICT offers the opportunity to engage and be supported using ways they find familiar. They are ready, willing and able to engage and already use ICT during their pregnancy but need assistance as their eHealth skills are suboptimal. This thesis also found that women in different generational strata have different information and communication preferences, with Gen Z favouring the use of social media via the mobile internet. Effective health communication today must acknowledge the emergence of powerful and technologically connected health consumers (Duffy and Thorson, 2009: p.100) whose choice of media will vary. Women’s channel choices will depend on each woman’s choice for participation, mobility, format and temporal aspects, which may vary at any given instance in time (Katz et al., 1973).

The participatory environment of Web 2.0 provides a platform for learning in a collaborative social environment. Vygotsky’s activity theory of learning emphasises the inherent social collaborative nature of learning (Laurenço, 2012). Another theorist, Siemens (Siemens, 2004) theory of connectivism finds social networks are the basis of the learning process. Knowledge can be acquired by belonging to digital or virtual communities in which knowledge and interests
are shared. In this environment, learning is constant and ongoing, as communities provide diverse opinions and up to date knowledge. Individual choice about what to learn is another principle of connectivism (Pettenati and Cigognini, 2007) and the temporal and ubiquitous nature of the internet can accommodate these choices. Basic skills, motivation, meaningful objectives, perception, group culture and an informal spontaneous social climate foster knowledge transfer in this digital environment. An active example of this in New Zealand is the BreastfeedingNZ Facebook page (Ministry of Health, 2011a), and in the United States, the Text4Baby programme (National Healthy Mothers Healthy Babies Coalition, 2012).

The question of ‘how’ relates to the uptake of ICT, not by women but by midwives and midwifery bodies, as women are recipients of maternity provision and their ability to use ICT for information and communication exchange lies with midwives and midwifery bodies. Empirical evidence within this study has outlined that the practice management technology used by midwives has been shaped by the midwifery organisation for midwives. There is no facility for women's digital participation and knowledge participation. The design and use of the Midwives and Maternity Providers’ management software distributed by the professional midwifery body is for the benefit of midwives’ business and professional use rather than for women, as it is mainly used for financial remuneration, documentation and midwifery review with no digital interoperability between midwives and other health professionals.

Uptake and diffusion of ICT is a ‘significant challenge for governments, health managers, healthcare practitioners and developers’ (Hordern et al., 2011). Theories of adoption of technologies, behavioural change, user engagement and communication provide some understanding of the complexities associated with uptake of technologies. There are numerous accepted theories relating to uptake and use of technology. Rogers’s theory of diffusion of technology within cultural groups, (Rogers, 1995), Venkatesh’s unified theory of user acceptance of technology (Venkatesh et al., 2003), and Davis’s technology acceptance model
SECTION FOUR: Analysis and conclusions

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(Davis, 1989) all identify different factors contributing to individual uptake of technologies. Within health, ICT implementations are disruptive of the established relationships between power, knowledge and identity (Halford et al., 2013: p.446), so these need to be understood. Greenhalgh (Greenhalgh et al., 2008), identifies pre-requisites to health technology adoption as organisational readiness, implementation complexity and the political climate, and so to complex path to offering women choices for ICT will depend on negotiations between stakeholders at the micro, macro and meso levels.

10.1 Enabling changes

Whether midwifery organisational culture is open to change in this regard is unknown. Within the midwifery provision, individual midwives in the cohort did not feel the need to change, as they carried out their duties within a business environment. They also experienced pressures from their professional bodies, women and their own families. Historically midwives have pursued a separatist policy, which has put them out on a limb from mainstream health providers. The NZ midwifery organisational culture would need to evolve to a position of encouragement and support for women’s ICT choices, for there to be future uptake of technologies within maternity service provision. For this to happen, midwives and midwifery organisations would need to examine and understand their defensive stance and lack of willingness for digital interaction with women. Technology would need to be acceptable and sit within the relationship of their partnership model of care, although this model of care is currently being examined and criticised as this model isolates the LMC and shared care is difficult (Miller and Mason, 2013). Midwives would need to accept that following initial trust-building face-to-face communication, the relationship could be augmented with other digital ways of communicating. They would need training and a supportive infrastructure to use digital ways of facilitating knowledge transfer to augment the printed information already used. The perception of technology as intrusive symbolically male-gendered artefacts interfering with concept of caring midwives being ‘with women’ during the womanly task of
birthing would also need to be explored. They would need to see by that using technology to connect with women on their own turf, technology could both save them time and enhance the relationship midwives have with women who feel comfortable in virtual digital spaces. To date women have been denied the opportunity to make use of ICT during their maternity experience. This could be constructed as having more to do with the threat midwives feel from a potentially renegotiated power relationship.

For midwives, ICT may have been transformative, but for women ‘they have always been around’ and are more like a mother tongue. Midwives would need to heed Case (Case, 2010), Haraway (Haraway, 1991) and Lupton to accept they are already cyborgs (Lupton, 2012), and then learn new ways to give women digital choices for information and communication.

### 10.2 A vision for change

The following section is a vision of changes which could bring women choice of ICT channels during their pregnancy and birthing experiences. Joint participation from stakeholder groups: identified as consumers, researchers, developers, healthcare practitioners, and maternity and governmental policy makers at a national level, would need to negotiated and work together to offer more choices for digital engagement (Figure 10.1). Stakeholders are the intervening triggers\(^\text{27}\) for an adjustment in service provision practices.

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\(^{27}\) B. F. Fogg Fogg, B. F. Year. A behavior model for persuasive design. In: The 4th International Conference on Persuasive Technology 2010. ACM, New York. of the Persuasive Technology Lab at Stanford University has used the term ‘hot triggers’ in conjunction with behavioural change.
10.3 A theoretical model for women-centred digital engagement

The transition from minimal digital engagement towards greater digital engagement will not eventuate without triggers – given the barriers are: government policy, apprehension and lack of expertise within midwifery organisations and insufficient eHealth literacy skills in the consumer population.

The intervening triggers for change are seen as consumer demand, governmental policy changes to section 88, national funding and support for ICT literacy training. Consumer needs have successfully changed New Zealand governmental policy within maternity care in the past (Clark, 1990), and set a precedent. Figure 10.2 diagrams a theoretical framework towards the digital engagement of women with midwives.
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Figure 10.2 A theoretical model for moving towards a blended digital provision model of primary maternity care
The planned consequences are empowered, digitally engaged, eHealth-literate women who are health advocates for themselves and their growing family. The strategy to achieve the shift is an object called a ‘virtual palette’. This conceptual object is a virtual space to be populated with useful digital tools and services. Governmental, professional and private supporting bodies will contract, develop, pilot and evaluate tools and services, which will be available for healthcare practitioners and consumers to use in their health experience. Barriers to digital engagement in healthcare service provision have been recognised. They include the structure of healthcare organisations and within these, the negotiated tasks, policies, incentives, and information and decision processes (Lluch, 2011).

10.4 A ‘virtual palette’

This thesis proposes that digital and mobile engagement offers a richer choice of channels for both synchronous and asynchronous information and communication encounters. Primary maternity providers could then respond to generational differences and women’s perceived new media needs. The first step towards digital engagement is an acknowledgement that ICT has converged, resulting in the emergence of new media. The second step is a response to generation differences and women's perceived need for digital engagement. The third is an assessment of digital solutions in areas of knowledge management, decision support, communication and psychosocial support, as depicted in Figure 10.3.

Figure 10.3 Steps towards a digital engagement
A virtual object, as depicted in Figure 10.4, is central to this end. Examples of categories of applications already in use include RSS feeds, email, podcasts, virtual community applications, wikis, microblogging applications, SMS messaging, blogging applications, video-sharing applications and synchronous video communication applications. Examples of tools and services currently used outside primary maternity service provision are given in a separate table. Knowledge-sharing and communication tools in common use within the primary maternity service provision includes face-to-face communication, pamphlets and printed matter, phone calls and limited SMS messaging.

To provide further channel choice, the virtual palette could be populated with suitable tools, applications and services. Supporting and shaping organisations would contribute to this task by providing tools, applications and services. Disparate communities using a common interstice as a digital palette could be viewed as two communities (midwives and women), or three communities, (midwives, women, plus the supporting and shaping agencies).

A palette with multiple digital channels would enable providers and consumers to choose an appropriate channel. Appropriateness is dependent on perceived needs (geographical, cultural and temporal), privacy, connectivity, skill, and financial, psychosocial, and temporal considerations. New media can provide communication channels additional to face-to-face communication, which is considered by women and midwives to be the gold standard. Additional channels could be considered in the light of differing generational expectations.
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Figure 10.4 The virtual object: influencing factors
Figure 10.5 shows the shaping and supporting infrastructure and their relationship with women as healthcare consumers. This patient-centred care model depicts an informed participatory patient (Institute of Medicine, 2001) at the hub of multidisciplinary care, with respect for their choices and information and communication needs.

Players who have a role in the provision of service will have a role in the process as depicted in Figure 10.5.

Primarily New Zealand policy makers and the other intervening triggers will play a part in initiating the change and shaping the consumer's experience. Other organisations would need to interpret and support the policy (Figure 10.6).
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Section 88 (Ministry of Health, 2007) determines how many visits are provided to women and how LMCs are remunerated. As LMCs practice within a DHB area, birthing facilities within Hawke's Bay are provided by the DHB with secondary facilities on hand within the hospital, and a birthing unit without secondary facilities on the site. Within this region, LMCs practise independently, each interpreting section 88 in her own way. The ability to practise without the need to collaborate with other government agencies and services, has sometimes led to dissension. For example, midwives have been reluctant to collaborate with social services in the mid central DHB (Kirk, 2011). The outcome of fragmented family support is increased risk of adverse health and safety for babies (ibid).

10.4.2 The role of different actors in leveraging digital solutions

Figures 10.7 and 10.8 outline the roles of key stakeholders in the pathway towards a Facebook page and a smartphone app, set up for women whose link is that they will birth in a particular period of time. These figures using Facebook and smartphones serve as examples within a basic structure.
Figure 10.7 Knowledge transfer and psychosocial support using Facebook: Roles of different players to investigate leveraging advantages of a 'due date' Facebook page
10.4.3 Pathway to increased empowerment using mobile apps

Figure 10.8 Roles of different players to investigate leveraging advantages of smartphone and touchscreen tablets
10.4.4 Flexible blended service provision

As midwifery education is a blended model of digital and non-digital provision, the primary maternity service could follow this example. The banking and airline service industries offer consumers a choice of autonomous digital or personally assisted provision of service with the non-digital choice incurring an additional cost. Healthcare and wellness maintenance have been afforded opportunities to use new digital advantages using:

- Social media tools
- Multimedia
- SMS
- Smartphones
- Smartphone applications
- Tablet computers
- Channel choice
- Personal health and wellness monitoring tools

Figure 10.9 provides steps based on research findings that could facilitate digital knowledge transfer and communication. The process involves the midwife assessing the most suitable channels according to the woman’s characteristics, needs and preferences, and then choosing the most appropriate tools.

Table 10.1 elaborates on these steps.
Figure 10.9 Potential steps towards reaping digital and mobile advantages
### Table 10.1 Recommendations for midwives to reap the digital advantages and achieve a blended provision of care

<table>
<thead>
<tr>
<th>STEPS TO ACHIEVE A BLENDED PROVISION OF PRIMARY MATERNITY CARE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identify the needs, habits, behaviours and preferences of women as soon as possible.</strong></td>
</tr>
<tr>
<td>Incorporate these preferences into information and communication instances for service provision.</td>
</tr>
<tr>
<td><strong>Use a blended service provision</strong></td>
</tr>
<tr>
<td>Consider a blended approach to service provision, including digital choices using tools and services. Teach, promote and give choices within the range of media and tools.</td>
</tr>
<tr>
<td><strong>Provide the opportunity for safe social networking</strong></td>
</tr>
<tr>
<td>Communities can serve as information channels to facilitate knowledge transfer, thus providing opportunities for pregnant women to become communities of practice. This may be achieved by providing and promoting moderated safe sites where women can participate, share, network or lurk. Lurking, or being an invisible participant’ has been recognised as way individuals partake knowledge (Cranefield, 2010; Cranefield, 2011). Women value the social support provided by being part of a social network. Thousands of women participate, in BreastFeedingNZ Facebook. Communities of practice permit women to contribute knowledge, and gain satisfaction from the act of contributing.</td>
</tr>
<tr>
<td><strong>Consider individual communication style by providing a choice of media</strong></td>
</tr>
<tr>
<td>Women/patients vary in their communication style. Within the study, there was evidence of marked generational differences in preference and communication styles.</td>
</tr>
<tr>
<td><strong>Provide information in a timely way</strong></td>
</tr>
<tr>
<td>Women are not interested in detailed breast-feeding information during their pregnancy. Women did not watch a DVD distributed to inform them about breastfeeding, because that information was not relevant to the gestational stage, and would have been appropriately facilitated when breastfeeding commenced. This was ‘pushed’ information compared with ‘pulled information’. Women could watch the YouTube equivalent but midwives were not aware the DVDs were online.</td>
</tr>
<tr>
<td><strong>Customise the message</strong></td>
</tr>
<tr>
<td>Cultural considerations, age, education, literacy skills need consideration.</td>
</tr>
<tr>
<td><strong>Consider the channel choice</strong></td>
</tr>
<tr>
<td>Appropriateness of media and fit of format would assist engagement with the content. The message will be more powerful if the media and content are customised. Format now has the opportunity to be voice, text, audio, image or multimedia.</td>
</tr>
<tr>
<td><strong>Consider literacy skills, and choose format appropriately</strong></td>
</tr>
<tr>
<td>Women vary in the eHealth literacy skills, and subsets, which make up this multifaceted skill. General literacy, computer literacy, health literacy,</td>
</tr>
<tr>
<td><strong>Ensure recency of information</strong></td>
</tr>
<tr>
<td>RSS feeds aggregate information.</td>
</tr>
<tr>
<td><strong>Consider generational cultural preferences</strong></td>
</tr>
<tr>
<td>Differing generation styles and choice of channel need consideration. Generation Z is transient and move accommodation more than generation X and Y. Giving them pamphlets may be inappropriate where as providing information via a Facebook page may ensure engagement.</td>
</tr>
<tr>
<td><strong>Consider availability of resources and connectivity</strong></td>
</tr>
<tr>
<td>Socioeconomic and social circumstances and personal choices dictate availability and accessibility of hardware, software and services. Sensitivity to individual resources is necessary.</td>
</tr>
<tr>
<td><strong>Consider individual skill sets</strong></td>
</tr>
<tr>
<td>Women vary considerably in their interest and ability to engage with digital technology. Some women do not possess skills to use digital methods, while others are eager to engage digitally.</td>
</tr>
<tr>
<td><strong>Guide women to trusted sources of information because women lack sophisticated search skills</strong></td>
</tr>
<tr>
<td>There is a plethora of information regarding pregnancy and childbirth on the web. Because of the commercial opportunities associated with babies and young families, many sites have commercial motives and it is difficult for women to find and evaluate trustworthy information. They do not have sufficient skills in most cases. Providing women with links to previously evaluated and trusted sites would ensure women have access to trusted sources.</td>
</tr>
<tr>
<td><strong>Consider privacy, security and recording of the interaction</strong></td>
</tr>
<tr>
<td>Sensitivity of information varies. Clinical information requires adherence to statutory regulations.</td>
</tr>
<tr>
<td><strong>Consider the mobile opportunity</strong></td>
</tr>
<tr>
<td>Women have mobile phones, and possess new and different skill sets. There is no evidence that this opportunity is being exploited. Midwives could consider SMS messaging and engagement via the web to take advantage of being able to reach previously hard to reach and high needs women.</td>
</tr>
</tbody>
</table>
10.4.5 Responding to cultural change

Blending new digital ways with time-honoured traditions is already happening. Birth traditions, ceremonies and beliefs reflect cultural mores, values and customs. As digital ICT have developed relatively recently, there are no traditions to reflect cultural changes. However, digital ways are embedding, as evidenced by the use of Facebook for birth announcements. Traditionally birth announcements would have been published in a local newspaper. Women may not be near family during the pregnancy and birth, and medicalisation, scientific knowledge and W029 noted that hospitalisation of birth may have weakened or changed traditional practices. New Zealand midwives take care to respect ‘cultural and spiritual dimensions’ and the ‘physical, social and cultural environment’ (standard three) (NZCOM, 2002). For example, Māori women often place the placenta (whenua) in an unfired clay vessel, return it to the earth on ancestral land, and then plant a tree to mark the birth. Figure 10.10 shows two pottery vessels made in the Wairoa area of Hawke’s Bay and designed to hold the placenta.

Figure 10.10 Traditional clay pots used to hold the whenua (placenta)

Many women including women in the cohort were eager to use technology to seek the advantages of assisted fertility techniques. As W012 had used assisted fertility methods and did not prioritise a natural birth, she was surprised to be told this was unacceptable.
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W012  I told her my birth plan was to have an epidural at the first contraction.
She was ‘Oh, no. In New Zealand we advocate pain relief-free birth’ and it was very much her agenda.

Technology and culture intertwine as a dynamic duo. The ways people listen to and play music, become pregnant, conduct business, use information, shop, are entertained and communicate have changed cultural practice in recent history. Individuals decide which technologies to adopt, and to date the midwifery profession has mainly resisted incorporating new media into their service provision. Women in the cohort adopted ICT, while retaining their cultural roots, although so far, women’s choices for ICT have not permeated primary maternity service provision.

10.5 Incentives and motivations

‘Demands for health system modernisation are so compelling that we have no choice but implement nation-scale IT’, is the keynote advice delivered at the New Zealand Health Informatics Conference in 2011 (Coiera, 2011). Coiera identified system inertia in health services and looked for reasons for a reluctance to change. Organisational complexity and reluctance to relinquish old processes were contributing factors (ibid). New ways of interacting with patients via new media will require the willingness of providers and clinicians to creatively engage in service provision with consumers.

Stakeholders need incentives and support to accept and use eHealth, including mHealth. Patients are connected in everyday life but need the opportunity and further instruction to use new digital health services. Clinicians will need to learn new practices and may feel their authority and their business are threatened. Initiatives need to focus on motivations for users of technology rather than technology. Motivations include education and training, organisational infrastructure development and financial assistance (Miller and West, 2009). Without incentives, change will not happen. Patient-centred care is a motivator, with initiatives needed to improve information and communication channels between clinicians and patients. For eHealth initiatives to succeed, providers,
payers and legislators will need to develop a reference architecture for connectivity, a business model for connectivity beyond the hospital’s walls, and a proven testing and certification process for devices and processes. Mobile health tools need to be accessible, relevant, inexpensive and culturally sensitive. User-centred design of new interfaces will need to align with user characteristics to have a greater chance of uptake. Mobile apps have the potential to enable patients to communicate with the clinician or a network of specialists, and to others in similar circumstances.

10.6 A safety-catch on the trigger
The introduction of ICT, particularly large systems, into new health situations is a complex process, which has a history of not achieving its intended outcomes (Greenhalgh and Stones, 2010). Hence, the views of health informatics researchers who urge deep consideration and caution against the unbridled implementation of new ICT are considered. Whetton and Georgiou (Whetton and Georgiou, 2010) argue the case for looking beyond the technical and considering the wider context when considering ICT solutions. They call for health informaticians to understand and heed principles, concepts and theories from social and behavioural sciences, as theoretical underpinnings within the health informatics discipline are ‘fragmented and unelaborated’ (ibid: p.223). Greenhalgh et al (Greenhalgh et al., 2011: p.558) contend it is prudent to understand the complex social and behavioural practices relevant to different stakeholder groups, and relate these to the context of each case. Ethnographic research methods are favoured to uncover these situational practices (Greenhalgh and Swinglehurst, 2011).

Westbrook et al (Westbrook et al., 2007b) also suggest a sociotechnical approach to uncover detail within the complexity. Enthusiastic stakeholders outside of the health situation may argue that ICT can bring greater efficiency and financial savings, however they can change traditional patterns of work. Possible role changes for service providers at the micro level of provision can be threatening and affect the resultant outcome. The technology may not perform as predicted.
Likewise, Coiera advocates a sociotechnical approach. His answer is for users to get alongside technologists to ‘shape technology, as well as the processes, organisations and cultures within which they will be embedded’ (Coiera, 2007: p.1).

Gauld and Goldfinch have also recognised ‘dangerous enthusiasms’ exhibited by stakeholders who may lack a full understanding of the complexities of the implementation of ICT in health (Gauld and Goldfinch, 2006, Gauld, 2011). There is wide consensus that cultural-socio-technical challenges in the implementation of ICT within the health system must be considered.

### 10.7 Summary

1. A theoretical model for women-centred engagement comprised a virtual palette.
2. Intervening triggers are proposed as a way to initiate engagement, which will involve all stakeholders.
3. Organisational infrastructure, training, incentives and motivation will be necessary for stakeholders who are government policy makers, health professional bodies, healthcare professionals who interface with consumers, and health informatics bodies and personnel, such as the New Zealand IT Health Board.
Chapter 11: CONCLUSION and CONTRIBUTIONS

Chapter eleven reviews the research process before considering limitations, contributions and suggestions for further research.

11.1 Review of the research process

In the process of understanding the role of ICT, and what mattered to midwives and women, this thesis constructed a theoretical understanding of stakeholders’ engagement with, and understanding of ICT, to them during maternity service provision, and in their lives. This previously unexplored setting was within a defined health district and targeted primary maternity service provision. No previous research had considered the role of ICT for this health sector. The focus for health informatics in New Zealand has been towards the introduction of an electronic health record and on standards enabling interoperability of data sharing and exchange rather than looking at smaller incidents of digital engagement within service sectors.

The study was situated in the Hawke’s Bay region, which represents an average New Zealand health district. Other contextual considerations were the midwifery infrastructure and ICT hardware, software and services. The conceptual framework was seen as the assets, actions, and attitudes of two cohorts. One cohort comprised women who had recently experienced primary midwifery care and the second cohort comprised, LMC midwifery providers. Methodology followed a constructivist grounded theory approach and generated the theoretical concept of ‘unused and underused channels’.

After primary and contextual data were analysed, a wider literature search was conducted, based on topics that arose within the data. As digital engagement and channel choice were seen to provide timely trusted information and communication opportunities, two further models a ‘virtual palette’ and a model for ‘intervening triggers’ were constructed. These are described in chapter ten. The rationale for developing these models was that they could offer a way to
articulate choices and contribute to closing the gap theorised in the first stage of this research.

As with any study, the limitations of this study must be reflected upon.

11.2 Limitations

This study could pose a challenge to readers who value objective experimental study designs and who hold to ‘the traditional rationalist view of an objectively discoverable social world, instead acknowledging that social worlds are subjectively understood and experienced’ (Shaw and Bailey, 2009) in (Greenhalgh et al., 2012: p.10). I see this as a potential limitation.

The role of the researcher was carefully considered. A constructivist grounded theory method approach incorporates a subjectivist epistemology and with that comes with a responsibility for transparency. Myself as the researcher and both participant cohorts were co-creators as we all drew on individual lived experiences and subjectivity, as does any reader of this research. My position was declared at the onset of this thesis, and I have heeded the requirement for sensitivity and reflexivity.

A potential limitation was that data was only collected from midwives and women in one health district of New Zealand, however substantive theory concerns a particular limited domain of enquiry and gives insight and understanding within the substantive area.

11.2.1 Fathers, family and whānau

No consideration was given to the role that fathers and wider family/whānau play in the pregnancy and birth of their baby. As that role is of great importance, this was considered a limitation. However, there was no opportunity to include men in this study sample. The role of the family/whānau has not been considered for the same reasons; however, limiting the number of participant groups allowed a greater focus on the women as principle users.
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11.3 Credibility

The research aim, the research questions and the philosophical approach determine the appropriateness of the research design and methodology (Hancock, 1998). Charmaz’s criteria for grounded theory studies: credibility, originality, resonance and usefulness (Charmaz, 2006: pp. 182-183), (Appendix I) were consulted when considering the methodology and when reviewing this research.

Charmaz claims that to achieve credibility, there must be sufficient data and strong links between the collected data and the thesis argument (ibid: p.182). In addition, the categories should demonstrate a range of different observations and insights. I aimed to collect good quality data and by interviewing midwives in their clinics, homes and in the social setting of a café, I was able to achieve a relaxed situation and get close to participants experiences and views of ICT. Women generally had their baby with them or not far away, and I felt this contributed a situation where they could relax and trust me as the researcher. Digital recordings of interviews and transcribed text facilitated reliability of data. I strove to provide sufficient evidence for my claims to achieve credibility and allow the reader to form a credible assessment of my claims (Charmaz, 2006: p.182).

Midwives represent a profession with strong enculturation, which has strived to distance itself from the medical, and nursing professions (Abel, 1997). As midwives conduct most research around midwives and midwifery, a consumer health informatics’ perspective offers a different lens for insight into the participants’ understanding of ICT within the specified setting. This frame of reference, and the concepts developed during the study offer insights, originality and new knowledge to both the fields of midwifery and consumer health informatics research.
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Resonance was achieved by considering interview data within the context of wider healthcare services, midwifery professional and historical context and the current dynamic technological panorama.

The usefulness of understanding the shaping influences behind midwives not feeling the need to change, gives midwifery organisations and midwives the opportunity to more deeply consider women’s choices for information and communication during their maternity care, and the ways they could be implemented.

11.4 Contribution/s

My original contribution to knowledge is the substantive theory of unused and underused digital channels created by midwives not feeling the need to augment the existing ways they engage with women, and an understanding of the shaping influences contributing to this phenomenon. This deeper knowledge and understanding of ICT non-engagement, is grounded in empirical data collected from interviews with a cohort of Hawke’s Bay LMC midwives and a cohort of women who have experienced the service within a tightly specified setting. Primary data was drawn from the micro-level of service provision, but macro- and meso-level input has a direct influence on the way LMC care is provided. It was determined that new digital media and technologies have a role to play, and applications that could be analysed and piloted within the primary maternity service setting were given as examples.

11.4.1 Unused and underused new media channels

This study outlines the process by which midwives’ perceptions shaped their unwillingness to engage digitally with women and valued ICT for their own professional and business purposes.

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28 In this study, micro level is taken to mean interactions at the midwife-women level; meso refers to the professional organisational level (NZCOM, Midwifery Council) and macro level at national governmental (Ministry of Health) level.
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The substantive theory of ‘unused and underused channels’, was an outcome of the process of midwives not feeling the need to change, and having the autonomy not to engage digitally with women.

Secondly, this study has contributed knowledge and an understanding of why midwives were eager to use ICT for professional and business purposes, although they did not feel the need to engage digitally with women. This was a response to the perceived threats outlined in chapter nine. Midwives did not feel the need to change, as they valued and took steps to preserve their autonomy. This thesis provides some understanding of midwives’ resistance to the transformation of the healthcare provider relationship, why they felt threatened by symbolically gendered technologies, adverse media, ubiquitous information, unwelcome transparency and their lack of control associated with information on the internet.

This observation is significant within a climate of increasing penetration of personalised digital devices and services. For example, in July 2013, 60% of the total New Zealand population now have a smartphone (TNS Mobile Life Report, 2013), although at the time of my interviews, (2010), only ~4% participants owned this device.

Implications

These findings provide new insights to inform the development of effective strategies to improve information and communication processes between midwives and women. There is the opportunity for dialogue amongst stakeholders to re-examine existing assumptions and values, as well as legislative change, which has previously made changes to the provision of maternity services. It could again provide a comprehensive framework that would safely and effectively provide the opportunity for new media channels, applications and education to enhance eHealth engagement (Hordern et al., 2011).
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Finding

The potential for digital engagement is limited by lack of resources and digital literacy. Midwifery organisations did not use or provide a digital knowledge management system that was meaningful and accessible to midwives and women. Cohort midwives had few educational resources and there was no evidence of a digital mechanisms efficiently and effectively facilitating knowledge transfer.

This study has identified a shortage of digital knowledge management tools and practices that would benefit both the primary maternity service providers and users.

Implications: The shortfall gives an opportunity for governmental and midwifery agencies to address this issue by providing resources and digital literacy training to leverage ICT in this situation. To this end, a conceptual object was constructed.

11.4.2 A virtual palette

An object was conceptualised as ‘a virtual palette’ to provide evaluated ICT choices.

Implications: With a choice of resources, both women and midwives would then have the opportunity to selectively engage with new media. Stakeholders in this process have been identified and a process for change has been conceptualised (chapter ten).

11.4.3 Intervening triggers

For women to be offered choices for new media channels, changes to the current business model dictated by section 88 would be needed, as midwives are incentivised by a business model to register more women, rather than provide more support to fewer women. A conceptual model using ‘intervening triggers’ (Figure 10.4) has been proposed.

29 The ‘virtual palette’ is Figure 10.4, and is described in chapter ten, section 10.4.
30 The ‘intervening triggers’ is conceptualised as Figure 10.2 and is described in chapter 10, section 10.3.
SECTION FOUR: Analysis and conclusions

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Implications Intervening triggers have the capacity to ignite the process for safe evaluated digital engagement between the healthcare provider and consumer.

11.5 Further research

This research is primarily in the professional discipline of Health Informatics, a multidisciplinary field touching on sociology, community informatics, behavioural science, Web 2.0, Medicine 2.0, mobile technologies and health communication.

Future research is needed to identify, pilot and evaluate applications to populate the ‘virtual palette’. Ongoing monitoring and evaluation of digital engagement, consumer satisfaction and clinical outcomes would need to accompany changes.

11.5.1 Disruptive technologies

Digital technologies have disrupted established ways of providing health services. Further research is needed to improve the provision of health services using newly available information and communication technologies. Healthcare service provision is focused on healthy populations, including helping people to make healthy lifestyle choices, manage chronic disease, and take advantage of preventative measures such as maintaining an immunisation programme.

Combinations of face-to-face, informal, and social learning situations may be blended, and previously unconsidered ways of reaching and providing services are recently possible. Further evaluation and new methods of evaluation are needed as ICTs are an important source of information and social support for some groups, and in particular, young people seeking specific information on health issues (Wyn et al., 2005).

The mobile internet and mobile devices in the form of tablets and smartphones are such a recent phenomenon that research is only beginning to understand their value in healthcare service provision. New methods to identify pilot and evaluate new mobile applications for midwives and women, separately and jointly using mobile applications for communication and knowledge transfer are needed.
This research identified new opportunities for healthcare providers to research and exploit uses of mobile technologies in primary maternity services. Email, telecare, the use of mobile applications, online video chat and other forms of web-based communication between healthcare providers and health consumers is increasing, yet in New Zealand it is not widespread and is unused in primary maternity services. Web-based communication could be used to augment, rather than as an alternative to face-to-face communication, as once a trusting relationship has been established, computer mediated communication can be effective (Perry, 2010, Gee et al., 2012, Smithson et al., 2012). There is potential to use, and evaluate the use of, web-based communication in healthcare.

11.5.2 Large organisations

Large healthcare organisations such as the Mayo Clinic in the United States successfully use social media in healthcare, although in New Zealand, this practice is yet to be adopted. The uptake of social media by the New Zealand population indicates the potential for large organisations or the Ministry of Health to investigate piloting social media services to encourage and assist patient participation in their own health outcomes. Organisational changes are the key to digital engagement in healthcare service provision (Lluch, 2011, Shortliffe, 2005).

In New Zealand, both the airline and banking sectors use web-based and mobile options. They are also cognizant of privacy and security issues. Consumers have digital options or not and personal support is provided at each step. Healthcare industries lag behind these industries in the uptake and diffusion of ICT, and this remains a significant challenge for governments, health managers, healthcare practitioners and system developers (Hordern et al., 2011). The use of online tools including social media to enhance large healthcare organisation's services is an area of healthcare that needs further understanding.

11.5.3 Participatory opportunities

Individual responsibility and active participation are helpful for maintaining a healthy lifestyle. Applications available on mobile devices, along with ubiquitous
SECTION FOUR: Analysis and conclusions

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information, have generated opportunities for health promotion and they require a deeper understanding. Future research is needed to investigate how new information and communication technologies can assist individuals in their endeavour to become empowered.

11.5.4 The internet is now the social web

Web 2.0 is a social environment. Peer-to-peer environments have implications for patient communities. Therefore, further understanding of the sociotechnical, cultural, psychosocial and a behavioural aspect of the use of this internet technology are warranted. Virtual communities, microblogging and other social media are a rapidly growing research area. Examples of Facebook in health settings have been described and are being researched. The use and usefulness of, and the uptake and satisfaction from using, virtual communities such as Facebook are ripe fields for research. Ubiquitous rich media for antenatal education within primary maternity care is not used and has further potential. Pilot studies to investigate the use of videos to educate pregnant women would be timely now that devices, services and applications are accessible to most women.

11.5.5 Knowledge transfer

Knowledge transfer in virtual communities, especially in education has been researched, although less in health communities. Transfer of tacit knowledge as described in OhBaby.co.nz, the use of anonymity in asking questions of experts online, and the role of silent participants who make up 90% of online communities are also areas for further enquiry.

Within online communities, it is common to endorse by liking, saving, sending and commenting, and by sharing knowledge, comments, links and images. All of these online behaviours, which enable the participatory patient, need further understanding.

11.5.6 Social mobile devices

Mobile devices are ubiquitous and social. Research is needed to explore how people can take advantage of the affordable and personalised social support.
Penetration of mobile devices has never been so extensive. In May 2012, it was reported that New Zealand, smartphone ownership has jumped to 44 percent of households, up from 13 percent in 2011 (Saunders, 2012). In July 2013 it had reached 60% (TNS Mobile Life Report, 2013). Smartphones are a dynamic new phenomenon. The use of mobile devices in maternity services, and more especially their use in enhancing the four identified domains of knowledge transfer, decision support, communication and psychosocial support, is yet to be fully explored.

11.5.7 Applications for mobile devices
Applications on smart mobile devices are now commonplace tools. Their possibilities in health are only just beginning to be understood. Evaluation methods are not yet established.

Access to and use of cloud computing is widespread and increasing. Cloud computing provides a new mobile way of working. Individuals and providers need only a terminal and telecommunication services to access and interact with health services. Health records are now online, permitting remote consultation and support. The location of the healthcare provider or recipient has become less important.

Global saturation of simple mobile devices is nearly complete. People from all socioeconomic circumstances are connected to one another and new ways to provide health services to underprivileged people are being found (Mechael, 2009a). More research is needed into ways of using simple mobile devices to assist previously difficult-to-reach sectors of society such as young Māori people.

11.5.8 Generational differences
There are differences in behaviours, preferences and skill sets between generations. Young people are transient, and do not necessarily value face-to-face communication in the same way as current healthcare providers. Further research is needed to determine how young people use technologies and then to find ways to support this sector and forthcoming generations of young people. Cellular mobile applications for the high-needs Generation Z demographic groups need identifying, piloting, implementing and evaluating by health
informatics researchers sympathetic to the social implications. Simple cellular
devices have improved accessibility to health in developing countries but, apart
from push SMS, are underused in New Zealand healthcare settings, particularly
in primary maternity care. Generation Z use mobile devices many times daily.
This group considers mobile devices to be indispensable communication tools,
and they use them to access the web.
The generation after Generation Z are called ‘Generation Alpha.’
As a way of shedding light on the values of this generation, I have included the
following email written by the mother of a soon-to-be 5-year-old girl. Names
have been changed. The email was written on January 10, 2012 and was a
personal email to a friend who is also a mother. It is included as data because it
reinforces and reiterates skills and trends uncovered in this thesis.

‘On Thursday Sophie is turning 5!! It is such a big deal for her and she has asked for
an iphone... an i-phone, really???? Well Rich did go online to look at the i-phone
touch (or whatever it’s called) but I told him absolutely not! Honestly what are we
suppose to get her the rest of her life if we get her an iphone now? Crazy! What’s
wrong with Guess who? and a Barbie or something?’

The interesting point is that Sophie, as an astute observer, understands how
important iPhones are to ‘grownups’, and doesn’t want a tea set, which is no
longer as socially and culturally important as it was two generations ago. Sophie
is heralding the perceived needs of a new generation of women, who will be of
childbearing age in 10 years. Furthermore, exposure to digital devices at a
young age will embed new neurophysiological connections and skills that
are not present in previous generations.

11.5.9 Channel choice

Channel choice to suit individuals and the situation is technically possible.
Unconsidered channels have been identified, but traditional channels will
continue to play an important place. Augmentation rather than replacement is
possible, allowing devices, applications and services to integrate seamlessly into
work patterns. Knowledge sharing and communication, using — cellular voice,
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Voice Over Internet (VOIP), SMS messaging, live text chat via a social network site, video chat, mobile email, and mobile sharing of information either synchronously or asynchronously via wireless or cellular telecommunication signals, is a new area for further research. Microblogging in a secure environment could be considered and secure portals are envisaged. New telecommunication signals will provide faster combinations of wireless and cellular signals, heralding new possibilities for multimedia communication and access to ubiquitous video. Mobile synchronous video chat and screen sharing video have implications for distance, personalised education and support. Telecare medicine opportunities need to be further understood.

11.5.10 The cultural-sociomaterial aspect of health informatics

The implementation of health technologies is complex. This area of health has been extensively researched and understood, but the cultural, social and behavioural aspects of using technology in health services require further understanding (Greenhalgh and Swinglehurst, 2011). Understanding and coming to terms with new information and communication technologies for health consumers requires the creation of new knowledge. A multidisciplinary approach to research, drawing on social, behavioural and technical sciences, will be necessary to understand, ask questions and embark on research. The field is broad. The possibilities of information and communication technologies are recent, diverse and vast. It is realistic to research specific technologies or applications in specific situations, as exemplified in Greenhalgh’s tweet that when it comes to implementing telecommunication technologies in health, ‘the devil is in the detail’.

‘Telehealth’ [is] no more useful a concept than ‘face to face health’. The Devil is in [the] detail (Greenhalgh and Stones, 2010).

Immersion in detail is required to understand complex cases such as those associated with ICT in health (Greenhalgh and Stones, 2010).
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11.5.11 Cultural implications

Equity of service framed as distributive justice, is one of Beauchamp and Childress’s (Beauchamp and Childress, 2011) four pillars of ethics, yet there is sometimes a gap between prescription and reality in service provision (Gauld, 2011). In 2008, Māori births made up 45.3% of all Hawke’s Bay births (Hawke’s Bay District Health Board, 2010: p.381), with a relatively high proportion of Māori babies having a low birth weight. The stark urgency to address adverse outcomes in this cultural group is spelt out in a Ministry of Justice report, which outlines the vulnerability of children born to young teenage mothers, who are over-represented by women of Māori ethnicity (Ministry of Justice, 2010). There has been an overall rise in the teenage birth rate during 2002 to 2007 (ibid). Services to address this social and health problem are provided by the William Colenso Teen Parent School in Napier. However, midwife interviews and other health data revealed that this ‘wicked’ problem (Callen et al., 2012, Westbrook et al., 2007a) while recognised, is not addressed. Young Māori women are ‘difficult to engage’; yet, Māori women in the study sample were equipped with devices and services to engage digitally with friends and family. Young Māori women were within the group who were most likely to demonstrate sophisticated use of mobile technologies; yet, statistically, this is a high needs health group. All participants in this study, had access to the internet, and throughout New Zealand, 98% of all people under 30 have access to the internet (Smith et al., 2011). Further investigation is needed to understand their unique information and communication challenges, and requirements, before building solutions. The mobile internet, via smartphones and web-enabled digital devices, is recently available to previously disadvantaged health groups. SMS services are widely available to low-income, high-need health consumers and their successful use in developing countries has proven that cellular technology is an inexpensive way to reach low-income sectors (Mechael, 2009a).

11.6 The future—a fusion of online and offline service provision

‘A bit has no colour, size or weight, and it can travel at the speed of light’ (Negroponte, 1995: p.14). Digital data is flexible and can be manipulated because
it is made up of bits, bytes, kilobytes, and gigabytes. Digitised data can represent multimedia, images, sound and text data. It can be: stored, searched, compressed, duplicated, analysed, encoded, encrypted, transmitted via different media, read by different media, and manipulated. There are also cost and sustainability advantages. Maternity healthcare provision is a service to women that could be provided as a customised fusion of online-offline-mobile ICT strategies to suit each situation.

In 1995, Nicholas Negroponte correctly predicted that personalised, on-demand, multimedia information would dominate digital life (ibid: p.159). Furthermore, in 1997 Esther Dyson recognised the digital world as a source of individual empowerment and productivity (Dyson, 1997: p.6). Since these insights, the web has become participatory, social and mobile. Nevertheless, the question of how to implement useful ICT in health is seen as a ‘wicked problem’. The pathway to improved healthcare service provision is strewn with surprises, so cautious, realistic expectations of ICT and a tempered approach to implementation is appropriate. However impressive the instrument, other elements impede or facilitate.

11.6.1 A vision of entanglement

Within contemporary primary maternity services, the potential visualised by Dyson still exists. My perspective renounces the tidy presumption of stability with social, technological, cultural and organisational separateness. Instead, my study has revealed a complex dynamic, heterogeneous, interconnected landscape, which needs to be further understood and negotiated in a climate that increasingly demands transparency and accountability from public service organisations. Consultation and collaboration with all players is assumed, coupled with an understanding in Darwinian terms that the importance of adaptability to change at meso, micro, and macro levels of service provision is paramount.
11.7 Summary

In attempting to investigate and explain the role of ICT, I found out what was important to stakeholder. It was found that the stakeholder cohorts' engagement and constructions of ICT were at odds, and that midwives have the autonomy to maintain the status quo. This study found that the cultural hegemony of midwifery maternity provision rather than technical issues were responsible for the digital void that exists between women and LMC midwives, even although mobile ICT were woven into the fabric of women’s everyday lives. New media channels present opportunities for midwives to augment existing channels, negotiate choice and engage more efficiently and effectively with women. Tailoring solutions provides an opportunity for the technology to dissolve as each woman’s most human information and communication requirements are seamlessly satisfied.

Change would require different interest groups such as health and midwifery regulatory bodies and consumers, to hui31 and reach a consensus to provide infrastructure, education and support. New media could assist women ‘on their turf’, to be supported by engaged providers, friends, family and like communities.


Boulos, K., Wheeler, S., Tavares, C. & Jones, R. 2011. *How smartphones are changing the face of mobile and participatory healthcare: an overview, with example from eCAALYX* [Online]. Available: [http://www.biomedical-engineering-online.com/content/10/1/24](http://www.biomedical-engineering-online.com/content/10/1/24) [Accessed 24 10].


Listening to Mothers: Report of the second national U.S. survey of women’s childbearing experiences www.childbirthconnection.org/listeningtomothers/


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Transforming health care to dispense knowledge for decision-making. 
*Annals of Internal Medicine* 143, 293-300.

Available: 


APPENDICES

Appendix A: Ethics Committee approval

30 March 2010

Dallas Knight
2 Milton Terrace
Hospital Hill
Napier 4110

Dear Dallas Knight

CEN/09/09/066 - A Case Study Exploring Elements within the Use of Mobile Technologies for Health Service Delivery

Amendment approved
- Amend decision "that a general practitioner approach the women" to "that a healthcare worker (GP, Nurse etc) approach the women".

Thank you for submitting the above amendment, which was considered by the Acting Chairperson of the Central Regional Ethics Committee and approved under delegated authority and approved.

Please quote the above ethics committee reference number in all correspondence.

Yours sincerely

Sonia Scott
Administrator
Central Regional Ethics Committee
Email: sonia_scott@moh.govt.nz
Appendix B. Participants’ consent form

Title: A case study exploring elements within the use of mobile technologies for health service provision

I know that:
1. My participation in this project is entirely voluntary.
2. I am free to withdraw from the project at any time without giving a reason or without any disadvantage.
3. The audio file data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.
4. No risks or discomfort associated with participating in this interview have been identified.
5. No remuneration will be given, nor will there be any commercial gain of the data.
6. I have been given and have understood an explanation of this research project.
7. The results of the project may be published and available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.
8. I have had an opportunity to ask questions and have them answered.
9. This project involves an open-questioning technique where the precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview develops and that in the event that the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind.

I agree to take part in this project and
I agree to the interview being audiotaped.

.........................................................................................................................
Signature of participant                     Date
.........................................................................................................................
Name of participant

Date

This project has been reviewed and approved by the University of Otago Human Ethics Committee.
The Central Region Ethics Committee has approved this study. Reference: CEN/09/09/066
### Appendix C. Examples of existing sites used in healthcare situations

<table>
<thead>
<tr>
<th>Object/Example</th>
<th>Format</th>
<th>Potential benefit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BFNZ Facebook page</td>
<td>Social network site, virtual community, Peer-to-peer tool.</td>
<td>Facilitating knowledge transfer, decision support, with the opportunity to share experiences, for a CoP and contribute to the community.</td>
<td>Provides support and knowledge transfer. Sharing stories with other breastfeeding women, moderated by professional health care administrators who are also mothers. Potential for data mining, decision support and social support for women.</td>
</tr>
<tr>
<td>BFNZ Blog (NZMoH)</td>
<td>Blog</td>
<td>This tool enables knowledge transfer and the opportunity to comment or provide feedback.</td>
<td>Women are invited to comment, endorse and share their stories related to breastfeeding.</td>
</tr>
<tr>
<td>BFNZ Twitter account</td>
<td>Microblogging site</td>
<td>One set up then thereafter automated customised feeds, gives control and filtering options for information streams.</td>
<td>RSS feed for Facebook page.</td>
</tr>
<tr>
<td>BFNZ YouTube account</td>
<td>Social video site</td>
<td>Multimedia on-demand provides easily assimilated content. Knowledge transfer plus notification of updates and the opportunity to subscribe to a channel and contribute channel.</td>
<td>Provides on-demand viewing of content also released in DVD format for breastfeeding mothers.</td>
</tr>
</tbody>
</table>

[http://breastfeedingnz.wordpress.com/](http://breastfeedingnz.wordpress.com/)
[http://twitter.com/#!/breastfeedingnz](http://twitter.com/#!/breastfeedingnz)
[http://twitter.com/#!/breastfeedingnz](http://twitter.com/#!/breastfeedingnz)
### Text4Baby (USA only)

**SMS Push in different languages**
- Control over the service, multi-lingual format and a format with the ability to reach otherwise disadvantaged high needs groups.


Opt-in or opt-out push SMS messages related to gestational date. The service continues until the infant is one year old.

### Mayo Clinic connect SNS

**Suite of applications**
- Knowledge transfer, social support, discussion forums, story sharing, meeting others with similar interests or conditions, photo sharing.
- Opportunity to make online appointments.

[http://dev.podcasts.mayoclinic.org/](http://dev.podcasts.mayoclinic.org/)
[http://www.youtube.com/view_play_list?p=17765924A33BEADB](http://www.youtube.com/view_play_list?p=17765924A33BEADB)
[http://dev.advancingthescience.mayo.edu/](http://dev.advancingthescience.mayo.edu/)
[http://www.mayoclinic.org/connect/](http://www.mayoclinic.org/connect/)

### English virtual communities and social networking applications for patients and consumers

**Virtual community**
- Carefully selected lived experiences of real people in multimedia format bring the opportunity to identify with others and humanise shared conditions.

This site presents real, lived personal accounts backed and organised by in-depth research at the University of Oxford Department of Primary Health Care.

Researchers carefully compile personal lived experiences for different conditions. Youthhealthtalk draws on experiences of young people and covers a range of conditions. Talks are contributed from a variety of social and ethnic backgrounds.
These sites have associated virtual communities.

(Ziebland & Shaw, 2011)

www.healthtalkonline.org/
www.youthhealthtalk.org/
www.myhealthtalk.org/
www.myyouthhealthtalk.org/

Danish web-based PMS

Web portal in the developmental phase

Cloud-based ubiquitous personal maternity record with access to owned information and the ability to comment and learn about the health care providers who will be directly involved in the woman’s care.

(Habben, 2011)

A web-based patient portal providing an interactive patient record with controlled access to groups related to smoking cessation, due date of delivery, and breastfeeding.

http://www.youtube.com/watch_popup?v=iYvnW7JZ6o/

Obstetric specialty website

Website

Connects medical specialists and user of the fetal medicine service

A website created for users of the New Zealand fetal medicine service provides a national electronic network.


Regional midwives’ website

Website

Pregnant women have access to information about midwives and can then make a better-informed choice of midwife.

Website with phone contact details and email communication for LMC midwives in one New Zealand region. This is the first comprehensive regional midwifery generated, women-centred website.

http://www.otagomidwives.co.nz/midwives

ICON

Closed Facebook page

Facilitating knowledge transfer, and social support within a virtual community. Patients have access to

(Ahmed et al., 2011)

A “closed” Facebook group initiated and facilitated by experienced healthcare professionals with real-time support
<table>
<thead>
<tr>
<th><strong>Individual midwife’s Facebook page</strong></th>
<th><strong>Facebook wall</strong></th>
<th><strong>Midwifery practice Facebook page</strong></th>
<th><strong>Commercial website by private company</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Providers and shared information from other community participants.</strong></td>
<td>Women can access links personally posted by this midwife. Women, who receive service from this midwife, have the opportunity to find links relevant to them, although their names need not be associated with the posting.</td>
<td>This site fosters a CoP, which women can ‘belong to’ and contribute.</td>
<td>Expert answers to clinical questions. Free advice.</td>
</tr>
<tr>
<td><strong>Provides best practice knowledge in real time.</strong></td>
<td><strong><a href="http://www.facebook.com/pages/Fiona-Goldfinch-Registered-Midwife-at-Maternal-Instinct-Midwives/194983877206205">http://www.facebook.com/pages/Fiona-Goldfinch-Registered-Midwife-at-Maternal-Instinct-Midwives/194983877206205</a></strong></td>
<td><strong><a href="http://www.facebook.com/pages/Ataahua-Midwifery/136170183121570">http://www.facebook.com/pages/Ataahua-Midwifery/136170183121570</a></strong></td>
<td>A commercial website for pregnant women and families with competitions, products and advice. This site also provides opportunity for social support and experts to answer questions asynchronously. Acknowledged medical fertility and obstetric experts answer individual questions with the answers posted online for sharing. This permits the answers to frequently asked questions to be answered expertly once and shared. A knowledge base is built for future use.</td>
</tr>
<tr>
<td><strong>Women can access links personally posted by this midwife. Women, who receive service from this midwife, have the opportunity to find links relevant to them, although their names need not be associated with the posting.</strong></td>
<td><strong><a href="http://www.facebook.com/pages/Fiona-Goldfinch-Registered-Midwife-at-Maternal-Instinct-Midwives/194983877206205">http://www.facebook.com/pages/Fiona-Goldfinch-Registered-Midwife-at-Maternal-Instinct-Midwives/194983877206205</a></strong></td>
<td><strong><a href="http://www.facebook.com/pages/Ataahua-Midwifery/136170183121570">http://www.facebook.com/pages/Ataahua-Midwifery/136170183121570</a></strong></td>
<td><strong><a href="http://www.facebook.com/pages/Ataahua-Midwifery/136170183121570">http://www.facebook.com/pages/Ataahua-Midwifery/136170183121570</a></strong></td>
</tr>
</tbody>
</table>
### Appendices

**Website with access to a Virtual community**

A support group provides information and interaction. The site links directly to a Facebook page.


A website supporting parents of babies with gastric reflux with access to information specific to their needs. Information is available 24/7 with contact details of individuals providing the information. The site is endorsed by displaying an HONcode logo demonstrating an international standard for health information on a website.

See [http://www.cryingoverspiltmilk.co.nz/](http://www.cryingoverspiltmilk.co.nz/)

**NHS Choices**

Suite of social, decision support and knowledge management options

NHS Choices is the portal for NHS consumers. A comprehensive suite with online expert advice via chat. Tweets provide phone numbers for help and alerts. NHS provides a mobile site, which can be accessed via a mobile device, as well as downloadable applications.


**NHS Direct**

Anytime health

Online health answers including a symptom checker, decision

### Appendixes

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Direct</td>
<td>Provides information via a phone helpline and through a website.</td>
</tr>
<tr>
<td>PatientsLikeMe</td>
<td>Virtual community for patients with specific medical conditions to share information and tips. Login is required.</td>
</tr>
<tr>
<td>Skype</td>
<td>Free video chat application allowing any person with an internet connection to download software and video chat in real time to other people who are online. Constant upgrades to this software have seen synchronous free tool, providing chat and VOIP.</td>
</tr>
</tbody>
</table>

NHS Direct also has a presence on Facebook and Twitter:

- http://twitter.com/#!/nhsdirect
- http://www.facebook.com/NHSDirect.uk?ref=mf

Patients can learn about symptoms and treatment, so they can help themselves more effectively. Mood charting, side effects of drugs, exploring treatment options others have found useful, sharing experiences, self-monitoring are available. Login is required.

This site has associated Facebook, YouTube, Twitter, Flickr, blog, podcast and Wikipedia presence. Research findings from this site have been published. The company has an openness policy and is profit making, selling non-identifiable information to commercial companies.
ever-improving features.


<table>
<thead>
<tr>
<th>Jay Parkinson</th>
<th>Suite of Mobile Office</th>
<th>Mobile web-based practice applications administration</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://jayparkinsonmd.com/">http://jayparkinsonmd.com/</a></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Primary care use of microblogging tool services @tweetspreek uur

Twitter short messages (140 characters), which are either publically, broadcast or privately sent and received. Tweets provide hyperlinks to expanded content. (Brandenburg & Jansen, 2011)

This initiative by Dutch health care professional, offers a free twitter account where users can ask health, related questions (24/7). Users have used the service to ask queries regarding ‘significant’ health problems, and satisfaction is good. Users took the opportunity to send direct messages. General questions, plus questions related to skin, and ‘locomotion’ were the most common question groups. Participants needed advice, reassurance and triage. There was opportunity for face-to-face contact with a practitioner if necessary. Users could also send pictures. This site provided easy, low-cost, time-efficient access with good user satisfaction This is an experimental project, still in progress.

http://twitter.com/#!/tweetspreekuur
http://www.slideshare.net/bartbrandenburg/tweetspreekuur-medicine20-maastricht

Yammer Professional microblogging Provides opportunity for professional one-to-one or one-to-many

Yammer is microblogging to for use within organisations, reducing the use of email and enabling sharing of content.
<table>
<thead>
<tr>
<th>Application</th>
<th>microblogging within a closed community.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email tools</td>
<td>Because this tool has widespread usage and acceptance, there is the opportunity to provide asynchronous communication with no learning of software and in a format in daily use.</td>
</tr>
<tr>
<td>Gmail</td>
<td>Gmail is a web-based email service incorporating calendar, storage and links to related services such as chat, and video chat.</td>
</tr>
<tr>
<td>Other email tools</td>
<td>Other email tools include: Outlook, Hotmail, Mail etc</td>
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<td>Smartphone apps</td>
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<td>Due date pregnancy application</td>
<td>Simple to use tool on an “always on hand” mobile device.</td>
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<td>Mood monitoring application</td>
<td>Self-monitoring or shared mood charting to provide insight into patterns, situations and places, which may be related to moods.</td>
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<tr>
<td>Medscape app</td>
<td>Drug reference, drug interaction checker</td>
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<td>Look-up application for health care practitioners. Reference for drugs and drug interactions.</td>
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SMS messaging

SMS provides a universal commonly used cellular format. The value is this format is the most commonly used communication format, particularly for low socio-economic groups. (Chhanabhai, Holt & Benwall, 2011)

Young people are easy to reach using this format, as it is their format of choice for one to one communication.
**Appendix D. Response letter from the New Zealand College of Midwives**

19 May 2010

Dallas Knight  
2 Milton Terrace  
Hospital Hill  
Napier 4110  
Dear Dallas

**Re: Your letter requesting information on relevant legislation and NZCOM guidelines or strategic directives regarding midwives use of communication technologies**

Thank you for your letter seeking information for your PhD study on midwives use of communication technologies.

The New Zealand College of Midwives (NZCOM) is the professional organisation for midwives, representing some 90% of practicing midwives in New Zealand. The College’s national office is in Christchurch and it has a small office facility in Auckland. There are ten regional branches, which are autonomous and run by voluntary committees of midwives and consumers. The College’s governance structure is the National Committee, which consists of twenty-two representatives made up of the ten regional chairpersons, Maori and midwifery students and representatives from four consumer groups. Currently these groups are Plunket Society, Parents Centres NZ, Home Birth Aotearoa and La Leche League. The College’s governance structure allows for consultative processes with practicing midwives and a variety of other stakeholders.

The majority of pregnant women in New Zealand are choosing a midwife as their Lead Maternity Carer. NZCOM offer information, education and advice to women, midwives, District Health Boards and the Ministry of Health regarding midwifery issues.

Your letter to us posed two questions. One was in relation to midwives use of current and emerging technologies and the other in relation to midwives documentation, storage and transfer of information. The two issues cannot be viewed in isolation of each other. I hope that this letter
clarifies the NZCOM response in relation to these issues, which we have already discussed on the phone.

NZCOM is cognizant of the rapidity with which information communication technologies are changing and the challenges that this can pose to midwives in maintaining clinical documentation to expected standards. Midwives providing primary maternity care in the community are not office based. They can provide midwifery care in a variety of settings within any given day, including women's homes, community based clinics and hospital settings. The 24 hour 7 day a week nature of maternity care requires that midwives may need to postpone or change scheduled appointments at short notice if they are required to attend a woman in labour at short notice. As such, midwives may use communication methods such as text messaging or perhaps emails to change appointments and for other administrative purposes, but our advice to midwives is that these methods are not preferred for communication about clinical issues or symptoms that women may be seeking advice about. A telephone conversation or face-to-face discussion or assessment is preferable on these occasions. Some midwives may use web-based forums for information sharing on general pregnancy related topics, or to promote or provide information about midwifery and the services that they provide. However these mediums are generally not appropriate for individual client interactions as their use could raise issues of confidentiality and also do not allow for full assessment of presenting concerns, if being used to assess or discuss specific clinical issues.

Clinical documentation which meets professional and legislative requirements is an important part of midwifery practice. Not only does documentation fulfil the purpose of providing a clinical record for health care providers, it is also the women’s own record of her maternity care. NZCOM promotes the use of women held maternity notes and as the majority of women in New Zealand receive primary maternity care from a midwife, the majority of women hold their own maternity notes. This clinical record provides a means to ensure that all decisions and actions agreed by the woman and her midwife are communicated in writing in a place that they can both access. As discussed with you, the Midwifery and Maternity Provider Organisation (MMPO) notes provide an ideal means to do this as the pre-carbonated format allows the midwife and women to hold their own copy of the same notes. If a midwife is using electronic record keeping there is an expectation that the woman will have full access to a copy of the notes. This may be in an electronic format (such as encrypted electronic storage device which cannot be altered – this is currently being trialled) or as a printed copy of the electronic version.

Information transfer between midwives and other health providers occur frequently as midwives refer to a variety of other services and providers, (both during midwifery care and at discharge to Well Child and General Practice services) with written or electronic referrals or transfer of information. This information transfer is always undertaken with the woman’s permission.
NZCOM’s strategic direction and advice to midwives is embedded within the documents (such as our NZCOM Handbook for Practice) and processes (such as education workshops) which we undertake to promote high standards of midwifery practice. We also publish a membership newsletter the Midwifery News, which has included articles and information about electronic record keeping and how midwives can maintain the expected documentation standard.

NZCOM provides 2 education workshops, which include information about documentation. Technical Skills workshops are compulsory education workshops, which midwives must attend once every 3 years. The content of these workshops is set by the Midwifery Council and reviewed every 3 years. Within the current 3 yearly cycles, documentation is included in the content. NZCOM also provides a workshop named “Dotting the I’s and crossing the Ts”. The content of this workshop is focused on professional documentation for midwives and covers issues such as electronic record keeping.

Legislation and statutes that are relevant to documentation for midwives include:

- Health information Privacy code 1994
- Section 88 Maternity Notice
- Midwifery Council Competencies for Entry to the Register of Midwives
- Code of Health and Disability Services Consumers rights, HDC 1996

We hope that this information is useful for you in completing your research project. As discussed with you we are always interested in receiving publications, which have relevance to New Zealand midwifery practice for our Journal.

Please feel free to contact me again if you need to clarify any of this information.

Yours sincerely

Alison Eddy
Professional Projects Advisor
NZCOM
Appendix E: Interview guides

Midwives interview guide

Greetings.

I would like to explain the purpose of this interview. Information and communication technologies have come a long way in the last few years, and I am interested in seeing how you feel about them in health settings. I appreciate your time to help us understand this from your point of view. I would like to ask a few initial questions.

1. Age range
2. Caseload
3. Use of Maternity Plus
4. Use of Maternity Notes
5. Type of Practice (group/single).
6. Now I would like you to discuss some other aspects of your midwifery practice.
7. What mobile ICT are you currently using?
8. How do you use the computer? Do you use social media on the Internet?
9. How do you feel about using mobile devices for communicating with the mother?
10. There is technology that would allow a mother to send SMS to a website that you could read and respond to. These are simply short status updates from the mother to you. You would be able to read them on a web page on your computer.
11. Do you think these short status updates would be helpful to you? How? Why?
12. Would they be helpful to the mother?
13. Could they influence your ways of being watchful and committed to the mother?
14. Treating the mother as an individual?
15. Making the mother feel as though you are going the extra mile with her care?
16. What would the influence be on your partnership with the mother?
17. What are your attitudes/feelings/views on communication and the emotional connection with the mother?
18. What are your attitudes/feelings/views on surveillance in your journey with the mother? What are the benefits/risks/constraints with the use of technology?
19. What are your attitudes/feelings/views on education/knowledge and assisting the mother to make informed choices?
20. How do you learn of the mother’s needs and choices? Could there be a place for using technology? What are the benefits/risks/constraints?
21. What are your feelings on using new technologies in your midwifery practice?

Thanks and appreciation.
Women's interview guide

Greetings.

Thank you for agreeing to be interviewed I would like to find out your thoughts and impressions about your use of information and communication technologies, during your pregnancy. (Demographics: Age range, ethnicity, number of children).

1. What ICT do you use?
2. How do you use them in everyday life?
3. How do you feel about using mobile phones for communication with your midwife?
4. There are technologies available that would allow you to SMS short status updates to the midwife. What are your feelings and views? Would this be useful? Why? Could you expand on this?
5. How did you find the midwife’s ways of sharing knowledge and information? Would there be a place for using the Internet?
6. What about your feelings/views on the midwife using the SMS status updates for your surveillance in your journey with the Midwife?
7. What are your opinions on using SMS for appointment reminders and the Internet for making your own appointments?
8. What are your thoughts/views/attitudes about privacy and security and sharing of the information this way?
9. Do you think using SMS after the baby is born would make you feel more ‘connected’ and supported? Why? How?
10. What other thoughts or contributions do you have to the possibility of using information and communication technologies in this setting?

Appreciation etc.

Probes
Liberal use of probes will be employed
· Silent probe
· Why?
· Do you know about?
· Please describe...
· What do you think of/about?
· What do you think of ...
· Were you ...
· Why did you ...
· What makes...
· Why not?
· How have you...
· How did you?
· How did you find...
· What kind of information...
· Have you tried?
· Were there other things?
· When?
· Where?
· How?
· Would you give me an example?
· Can you elaborate on that idea?
· Would you explain that further?
· I'm not sure I understand what you're saying.
· Is there anything else you would like to say?
Appendix F. Information sheet for Plunket Nurses and mothers

Information and communication technologies
IN THE DELIVERY OF MIDWIFERY SERVICES
Information sheet for Plunket nurses and mothers

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate, we thank you. If you decide not to take part, there will be no disadvantage to you of any kind and we thank you for considering our request.

What is the Aim of the Project?
This project is seeking the views and needs of midwives and the women they care for regarding the value of using information and communication technologies in midwifery service delivery. The research is being undertaken as part of the requirements for a doctoral thesis at the University of Otago.

Who is being sought?
Women who have experienced independent midwifery care within the last two years will be asked to contribute to this project by agreeing to be interviewed and being interviewed. You are invited to bring a support person to the interview if you wish. Women are also welcome to bring their baby.

Only people who agree to have the interview recorded will be eligible.

Should you agree to take part in this project, you will be asked to:

- Complete an informed consent form
- Take part in individual interviews lasting about 45 minutes concerning your view of using mobile devices for women receiving midwifery care.
- You will be offered the transcribed interview, to add or delete any part of.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind.
Can you change your mind and withdraw from the project?
Yes. You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind.

What data or information will be collected and what use will be made of it.

The interviews will be recorded and transcribed. The interview data that I collect in this project will be used for my dissertation. I will transcribe the recorded interviews, and remove your identity. The digital audio files and transcriptions will be sent to Mr Alec Holt at the University of Otago, for safekeeping.

The questions you will be asked will involve discussing topics to do with the use of mobile technology and its usefulness to midwives and mothers. I am interested in exploring the perceived risks, benefits and perceptions of trust, and learning your wider views on these topics.

Mr Alec Holt (supervisor) and I will have access to this material.

The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve your anonymity.

You are most welcome to request a copy of the results of the project should you wish.

The interview data that I collect in this project will be used for my dissertation. The data collected will be securely stored in such a way that only those mentioned below will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.

There are no known risks associated with your participation in this research beyond those of everyday life. You have full rights to not answer any of the questions that you would prefer not to answer. You will be offered the transcribed file for approval.

Although you will receive no direct benefits, this research may help planners understand the communication needs of women and midwives during their journey together towards and shortly after the safe delivery of their child. The researcher and supervisor will have no financial benefit or gain from this project. No data will be used for commercial use.

What if Participants have any Questions?
If you have any questions about our project, either now or in the future, please feel free to contact either:-
Mrs Dallas Knight
C/o Department of Health Informatics
University of Otago
Dunedin
Phone 03 479 5032

Mr Alec Holt
Director of Health Informatics
University of Otago
Dunedin
Ph: 03 479 5032

The University of Otago Human Ethics Committee has approved this study. If you have any concerns about the ethical conduct of the research, you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479 8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

The Royal New Zealand Plunket Society’s involvement is acknowledged.
The Central Region Ethics Committee has approved this study. Reference: CEN/09/09/066
Appendix G. Poster for recruiting women

I am seeking to interview women who have used midwives during their pregnancy. My study is aiming to understand the information and communication needs of women during their pregnancy. Understanding your needs is the first step in improving services.

If you would like more information please speak to your Nurse or Midwife

Dallas Knight
Mobile: 021 105 9866 Home: 06 835 5939
Assistance with recruiting women to assist this research is appreciated.
Appendix H. Charmaz’s Criteria for Grounded Theory Studies

Credibility

Has your research achieved intimate familiarity with the setting or topic?
Are the data sufficient to merit your claims? Consider the range, number, and depth of observation contained in the data.
Have you made systematic comparisons between observations and between categories?
Do the categories cover a wide range of empirical observations?
Are there strong logical links between the gathered data and your argument and analysis?
Has your research provided enough evidence for your claims to allow the reader to form an independent assessment—and agree with your claims?

Originality

Are your categories fresh? Do they offer new insights?
Does your analysis provide a new conceptual rendering of the data?
What is the social and theoretical significance of this work?
How does your grounded theory challenge, extend, or refine current ideas, concepts, and practices?

Resonance

Do the categories portray the fullness of the studied experience?
Have you revealed both liminal and unstable taken-for-granted meanings?
Have you drawn links between larger collectivities or institutions and individual lives, when the data so indicate?
Does your grounded theory make sense to your participants or people who share their circumstances?
Does your analysis offer them deeper insights about their lives and worlds?

Usefulness

Does your analysis offer interpretations that people can uses in their everyday worlds?
Do your analytic categories suggest any generic processes?
If so, have you examined these generic processes for tacit implications?
Can the analysis spark further research in other substantive areas?
How does your work contribute to knowledge?
How does it contribute to making a better world?

(Charmaz, 2006: pp.182-183)