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Nursing Identity and the Computer: The Impact of Care Realities on Information Systems Use

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NURSING IDENTITY AND THE COMPUTER: THE IMPACT OF CARE REALITIES ON INFORMATION SYSTEMS USE

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Abstract

Driven by developments in technology and communication, and by social, political and economic issues, the introduction of different information systems in nursing has risen significantly in recent years. However, little is known about the understanding of these systems by the nurses who are intended to use them.

Informed by a Symbolic Interactionist approach, this research explored the experience of nurses interacting with information systems. Using grounded theory methods, the main sources of data were interviews, textual analysis and observation with nurses in three Canadian cities.

The key findings of this research are fourfold. First, the core category developed in this study is the care reality, a multi-faceted understanding of care that is central to the nursing identity, which adds a new level of understanding behaviour beyond the common attributes identified within nursing and information systems research. Second, this research identified a care reality negotiation process, where each individual is continuously introduced to different care realities when they come into contact with co-workers or management who do not share the same care reality. The individual must then go through a negotiation process whereby each individual manages his or her care reality. Third this research identified that an individual's identity impacts on his or her understanding of information systems.

This research produces a theoretical understanding of the experiences of nurses interacting with information systems. It identified a possible link between an individual's care reality and his or her behaviour toward information systems. Seven working propositions were developed for future research.

The findings inform nursing research and practice, as well as contribute to the development, implementation and use of information systems in other areas of the modern healthcare system.

Keywords

Information systems, nurses, identity, symbolic interactionism, grounded theory, post adoption.

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This thesis is dedicated to my father, Dr. Henning Rasmussen, who encouraged me throughout my education to look for interesting questions and to have fun trying to answer them. I wish, more than anything, that you could be here to see that I followed your advice.

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Chapter 1

1 Introduction

Canada has one of the most costly health care systems in the world. In 2007 Canada's per capita health expenditures were $3,895 (Constant, Petersen, Mallory, & Major, 2011). Among seven countries studied in a report by the Commonwealth Fund Commission (Australia, Canada, Germany, the Netherlands, New Zealand, the United Kingdom and the United States) only the United States, at $7,290, spent more (Davis, Schoen, & Stremikis, 2010). Despite this high level of spending, Davis et al (2010) found that Canada ranked between 5th and 7th with regards to patient safety, access to care, coordination, efficiency and equity. While there are several possible reasons for this, a major finding of the report is that countries like Australia, New Zealand and the U.K. "enhance the ability of physicians to identify and monitor patients with chronic conditions" (Davis et al., 2010; vi). The lack of information system (IS) usage was specifically identified as a major issue in Canada's low ranking in patient safety, care coordination, patient-centered care and efficiency (Davis et al., 2010).

Given the above findings, it is not surprising that many healthcare providers in Canada have started to invest in health information systems to improve health care and to attempt to reduce cost (Marchildon, 2005). Davies et al. (2010) focused on the link between IS usage by physicians and improved healthcare. However, it is often nurses that have more contact with patients (Lindseth, Marhaug, Norberg, & Udén, 1994), during which there is a need for timely and accurate patient and treatment information (Shortell et al., 1994). Thus, there is an important link between IS usage by nurses and improved healthcare (McNeil et al., 2003). As a result, information systems, both hardware and software, have been introduced into nursing (Lammintakanen, Saranto, & Kivinen, 2010). Nurses now may use databases, email systems, electronic healthcare records, web portals and spreadsheets, as well as many small applications specific to different types of computer hardware within their workplace (Canadian Nursing Association, 2001). Many nurses adopt and use some or all of the information systems in their workplace to perform a variety of nursing tasks (Lammintakanen et al., 2010; Timmons, 2003). These

information systems may be used to perform many healthcare-related tasks, including diagnosis, treatment and communication (Simmers, Simmers-Nartker, & Simmers-Kobelak, 2009). However, the use of information systems is not uniform throughout nursing. Some nurses quickly and fully adopt a new IS, others adopt it in differing amounts and some resist any adoption (Timmons, 2003). As a result, the expected return on the investments made by governments and hospitals in information systems for nursing is not being realized. In fact, the introduction of an IS into nursing is sometimes met with "absenteeism, staff turnover, complaints and low morale" (Timmons, 2003; 258). Clearly this uneven behavior and interpretation towards the application of information systems IS in nursing must be more fully explored.

The significance of this study arises out of two growing frustrations in the field of nursing. The first is the frustration nurses, researchers, other healthcare professionals and industry representatives articulate regarding the high investment costs in information systems which garner uneven acceptance and use rates. The second is the documented frustration expressed by individuals in nursing regarding what they see as the inappropriate deployment of information systems to change nursing work within their field (Timmons, 2003).

The above frustrations were very much in evidence at the Ivey Global Health Innovation Conference in November 2009, where researchers, healthcare professionals and industry representatives spoke of the frustration resulting from low acceptance and use rates of information systems within healthcare. Many at the conference spoke of the need to invest more money to develop information systems that will be easy to use, useful and will result in adoption and "correct" use. Yet these suggestions risk trivializing the complexity of nurses reactions to information systems outlined above since they emphasize improving the systems over the nurse. They imply that once the systems are improved along these lines nurses will inevitably assess the IS positively and thus adopt it universally. Yet, the varied adoption patterns note in practice must be understood not just as a technological challenge but a social cognitive challenge on the part of the nurses as well.

Thus, broadly speaking this study would like to contribute knowledge to the challenge of ensuring effective use of information systems by nurses. However, addressing this management problem requires many things: the development of information systems which support effective practice, the linking of task and information system, ensuring that the information system is appropriate to nursing, the acceptance of information systems by nurses as well as many other things. But central to all of these is the development of understanding about how nurses make sense of the information systems in their workplace. By understanding the meaning of information systems to a nurse we can begin to understand the rationale for their varied behaviour. For example, in order to answer the broad management problem we must first form an understanding of the reason for a variety of behaviours with regards to IS, including resistance to use, incomplete use, acceptance and use and even damaging an IS, identified in both the IS and nursing literatures (Lapointe & Rivard, 2006; Porter & Ryan, 1996; Timmons, 2003). Understanding the meaning of the information system to an individual is the focus of this research.

As nursing is the biggest profession within healthcare (Borkowski, Amann, Song, & Weiss, 2007), it is hoped that the findings of this research will contribute to information systems use both within nursing specifically and throughout healthcare as a whole. The findings may be of significance for and of interest to not only nursing but other professions that experience different levels and types of IS adoption and use.

1.1 Research Questions

In typical IS adoption research, I would explore this management problem by identifying different attributes of information systems that lead to more effective use and identifying the behaviors that make up effective use of information systems. However, this study focuses on another approach by identifying the personal understanding, or interpretations, of information systems and the individual's post adoption use. This direction was chosen as a way to more fully explore Timmon's statement that a "flexible interpretation of technology can explain what is going on in an organization during and after systems implementation" (Timmons, 2003; 261) by identifying the cause of these personal interpretations. This approach resonates with Stephen Barley's work, which tells us that

"technology, organization, and work co-evolve" (Barley, 1996; 404). His research calls for exploring information systems use by investigating the relationship between technology and work since, applied here, it is through the conduct of nursing work that nurses encounter information systems and formulate personal interpretations. The lens I selected for exploring the relationship between technology, work and personal interpretations is to look at an individual's professional identity and his or her IS behaviours.

In order to identify a possible cause, some observations regarding IS use within nursing need to first be explored. These observations are best illustrated with a story which is based on a synthesis of nursing practice examples involving information systems from a series of informal interviews I conducted.

> *A nurse within the Canadian healthcare system uses a wide variety of diagnostic and IS technologies to perform a great number of professional tasks. One such nurse may use an inventory management system to control medication, a database to perform nutrient analyses for patients, a web portal to perform treatment research, a spreadsheet to update clinical care records as well as a wide variety of other technologies for tasks such as communication, monitoring and surveillance. While he may really like being a nurse, he may not enjoy updating clinical care records; he may feel like a mere secretary when he performs this type of work. So he may only use the spreadsheet when he has to. In addition, he may not fully understand the web portal, so it always takes him a long time to do the research.*

There are six important ideas within the above simple description. The nurse interprets his/her profession, the tasks associated with his/her profession, the technology, his/her use of the technology and the relationships between all of these aspects within his/her workplace. The individual then acts upon this interpretation. These ideas vary in their explicitness. Yet they all show signs of different understandings of the information systems he/she uses that should be explored. An individual's interpretation of his/her profession and the tasks associated with it can be understood as the individual's professional identity. In this way, the above description of a nurse's work with information systems can be understood as the individual attempting to understand how the information systems fits into his/her identity as a nurse.

Thus, the research questions addressed in this study are:

What role does a nursing identity play in a nurse's interpretation of information systems that he/she is called on to use in the practice of nursing?

How are these interpretations formed and changed?

How do the interpretations of information systems differ between nurses?

What are the implications of these differences in information systems use?

1.2 Theory

From a research training perspective, I come from a qualitative-oriented background. Ontologically, I am a critical realist. I believe in the existence of an objective world independent of our perceptions, but I believe this objective world is only known by an individual through his or her interpretations. One of the goals of this research was to take this ontological perspective and apply it to the question of information systems use within healthcare. After much research and deliberation, a classical Symbolic Interactionist (SI) framework was chosen; specifically, the Chicago School with some added understandings from Erving Goffman of the complementary Dramaturgical School (Meltzer, Petras, & Reynolds, 1975) was used.

Symbolic Interactionism grew out of the pragmatist tradition. An important goal of pragmatism is to understand why others define situations in a way that leads to a particular behaviour. Through this goal, research can begin to understand the subjective meanings of behaviour, objects and social interactions (Meltzer et al., 1975). SI develops this goal through three premises.

The first premise is that ***individuals act toward things (physical objects, other people, social institutions, ideas, activities or situations), based on the meanings those things have for the individual*** (Blumer, 1969). In other words, we assign meanings to things and those meanings will determine how we act towards those things. Based on this premise, human behaviours are not the result of various measurable factors such as attributes, motives, attitudes, personality, or role requirements. Instead, an individual's behaviour is the result of the meanings that things have for the individual (Blumer, 1969).

The second premise involves the source of the meaning we give to objects. Blumer states that ***meaning develops through the process of interacting with other people*** (Blumer, 1969). In other words, the meaning we give an object is neither intrinsic nor inherent in the object. Instead, the meaning we give an object develops out of our interactions with others (Blumer, 1969). This can be done through explicit methods such as teaching or telling. However, it can also be done implicitly by watching the behaviour of others. To use a computer example: I was not born knowing that a computer is a tool for data entry, or that the internet is a reference tool. Someone had to either had to consciously show me or tell me these functions, or show me unconsciously through modeling behaviour.

The third and last premise is that ***the meanings are experienced in an interpretive process*** (Blumer, 1969). In other words, through our experiences we may modify and change the meaning we assign to objects. This process involves an internal conversation in which the individual determines, and then re-determines, the meaning of an object to him or herself.

In this research, by investigating the meaning an individual holds for an IS and his or her nursing identity, we can begin to understand the individual's post adoption behaviour.

1.3 Method

The aim of my research is to develop a picture of the individual interpretation of information systems, and not to define and then measure an identity in order to predict the individual's information systems behaviour. Grounded theory was identified as an approach that would complement SI and would allow me to examine the ongoing interpretations and interactions of the individual and the information systems (Charmaz, 2006). The rationale for the methods used in this research can be considered as part of the grounded theory approach informed mostly by Strauss and less by Glaser (Glaser, 1978; Glaser & Strauss, 1967). Glaser provides a guideline of collection and analysis which fits well with the understanding of the Chicago School of SI, which cannot permit the forcing of data into preconceived concepts and understandings (Charmaz, 2000, 2006). However, Strauss' approach to the data aims for interpretative frameworks and abstract

understandings rather than an explanatory and predictive theory (Bryant, 2003; Charmaz, 2000, 2006), and this fit well with the goals of this research.

This research was conducted in 3 cities in Canada: London, Ontario; Vancouver, British Columbia; and Ottawa, Ontario. The study participants were recruited using an initial call for participation and snowballing. The choice of data collection methods is always determined by the research question and the theoretical understanding utilized in a study. In this study I attempted to access people's interpretations of their behaviours, their identity and the information systems within their workplace. Based on this aim and the theoretical understanding of SI, I identified three methods of data collection: participant observation, interviews and textual analysis. Data analysis started after the first participant observation session and continued through all participant observation sessions, textual analyses and interviews. This is in accordance with grounded theory methods.

A constant comparative method is one of the foundations of the grounded theory analysis (Glaser & Strauss, 1967). In this method the researcher moves back and forth between data collection and data analysis, which is indispensible for generating concepts and conceptual growth within grounded theory (Glaser & Strauss, 1967). By using constant comparison, I continuously compared incoming data with previous data and the concepts or categories that had emerged from earlier data analysis. In addition, I continuously revisited and re-analyzed old data as new concepts appeared in newer data. Through this constant comparative method I was able to verify the final categories by continuously integrating new theoretical concepts into the developing categories as new data was considered (Glaser & Strauss, 1967). This process of constant comparison was performed through a series of reiterative coding steps: initial coding, focused coding and theoretical coding (Charmaz, 2000, 2006).

A total of 48 interviews from 31 participants, 20 participant observations in 6 locations and 30 textual analyses were performed over a period of six months.

1.4 Findings and Contributions:

This study came to the following four findings and seven working propositions for future research:

1.4.1 Care Reality

My research identified the existence and importance of an individual care reality, an individual's multi-faceted understanding of care (which is itself the core of nursing work from Barley's perspective) that is central to the nursing identity. It is made up of four elements of care: direct care, informational care, organizational care and emotional care. Each individual's care reality was constructed uniquely with different levels of acceptance and priority for each element of care. This care reality was identified as the base from which springs the creation of meaning of nursing objects, including information systems objects.

In addition to identifying the existence of a care reality and its importance on an individual's understanding of information systems objects, this research also identified a link between this care reality and an individual's behaviour. In this research, an individual's use behaviour of an information systems object was a reflection of the different levels of acceptance and priority for each element of care.

1.4.2 Information Systems Perspectives within the Care Realities

The second result of this research was my identification of the existence and importance of ready-to-hand and unready-to-hand information systems objects within nursing (Mulhall, 1996). While engaging with information systems objects as ready-to-hand through skilled coping is the primary way an individual engages with the world, sometimes the skilled coping is disturbed. If this happens, the object is experienced as *unready-to-hand* (Mulhall, 1996). In an unready-to-hand situation the individual experiences the information systems object and not the tasks.

The participant reflected the ready-to-hand nature of an information systems object when he or she accepted and adopted a care reality in which the use of the information systems

is a part of giving care. This was identified as “Information Systems Driven”. The participant reflected an unready-to-hand nature of an information systems object in two different situations. The first is when he or she had mixed feelings about accepting and adopting a new care reality in which the use of the object was a part of care; in this situation, the participant adopted a care reality that incorporated these mixed feelings. This was identified as “Information Systems Enabled”. The second situation is when the individual was unwilling to accept a care reality in which the use of an object was part of care; in this situation, the participant adopted a care reality that rejected the use of the technology. This was identified as “Information Systems Free”.

1.4.3 Negotiation Process

The third result of my research was the identification of a care reality negotiation process. This is akin to the co-evolutionary development of Barley’s notion of technology, organization and work. In this process each individual is continuously introduced to different care realities when they come into contact with co-workers or management who do not share the same care reality. The individual must then go through a negotiation process whereby each individual manages his or her care reality. The process includes four phases: exposure, developing consciousness, sense-making and acclimatizing.

1.4.4 Identity Shapes Information Systems Interpretations

The final result of this research was the identification the impact of an individual’s identity on his or her understanding of information systems. Identity as a concept within IS research has not been fully developed. Both Nach et al (2009) and Lamb and Kling (2003) theorized that technology may have an impact on an individual’s identity. However, they did not consider that an individual’s identity may have an impact on understanding of an information system and thus its use. My research illustrates, through a study of the individual’s identity, how the symbolic nature of the information system is manifested from the individual’s identity. This is the ongoing result of the negotiation process in which the meaning of the information system is adjusted to fit into the individual’s care reality and the care reality is adjusted to accept or reject an information system. This is an important finding since there are increasingly similar situation where

information systems are changing professional practices/work in ways that create paradoxes, disconnects, and internal struggles through their various symbolic meanings. Based on these findings I developed the following working propositions for future research into a theory of the impact of identity on information systems interpretation and use.

1.5 Definition of Terms

A range of terms is used to describe information systems in healthcare and business, including information technology (IT), information systems (IS), information communication technology (ICT), and nursing information systems (NIS). In addition, within my research, individual nurses referred to computers, machines, technology, databases, programs, software and "geek stuff" when discussing an IS. My recruitment of nurses focused on "computers" within nursing because I was warned by my nursing contacts that the term "information systems" might be confusing to potential participants. Therefore, while I decided to use the term information systems within this document, this was not a commonly used term in my textual analysis and interviews. The term information system(s) was also chosen as it can represent the wide variety of hardware and software objects interpreted by the participants of this research. Additionally, this term was useful within this document to use IS as a symbol and not a physical object, which other terms, such as "computers," may accidentally represent.

The term nurse also has a variety of meanings depending on context. In this research, the word "nurse" refers to a registered nurse (RN) when not specified otherwise. All of the nurses I interviewed were educated as RNs and were asked to reflect as an RN.

1.6 Structure of the thesis

The thesis consists of five chapters and several appendices. The first chapter provides an introduction to this study, which includes the research background, the research question and aims, the significance of the study, the role of the researcher and a definition of terms.

Chapter 2 reviews the literature in IS and nursing to contextualize the phenomenon of IS use by nurses within their workplace by broadly reviewing the relevant areas of inquiry. This is done through a discussion of the professional issues that are related to nursing to situate and justify this research, a discussion of the existing research within both IS and nursing and through the exploration of Symbolic Interactionism as the theoretical perspective of this research. The latter part of the chapter specifically engages with the assumptions underlying the research, which draw on the pragmatist origins of SI and key theoretical concepts in the works of Mead and Blumer.

Chapter 3 presents an exploration of the grounded theory method as it has been applied in this research. Additionally, this chapter addresses recruitment procedures, sampling strategies, data generation and analysis process and issues of rigor.

Chapter 4 presents the findings of the research, which identifies multi-faceted understanding of care as central to the nursing identity. Care was constructed differently for each participant, and this individual understanding of care (his or her care reality) determines the meaning of nursing objects, especially technical objects. This chapter explains the core category (care reality) and addresses the impact of this core category on the meaning of nursing objects. It then addresses the ongoing process of negotiating a personal care reality in a working environment in which the individual is constantly being exposed to alternative care realities held by other nurses. This understanding of care, and the meaning of nursing objects, needs to be maintained and negotiated when the individual nurse interacts with other nurses with different care realities. Additionally, within this chapter the findings are placed into context within the IS and nursing literature.

Finally, Chapter 5 provides the conclusions of this research, a summary of the research and key findings represented and the limitations of the study. The broader implications, future research directions and recommendations for practice that arise from the research findings are also discussed.

Chapter 2

2 Literature Review

The overall goal of a literature review is to present an overview of significant literature published on a topic. Through this overview one can identify the knowledge and ideas that have been established on a specific topic, as well as the strengths and weaknesses within the topics. This will allow for the findings from this study to be placed in the context of the field's existing literature.

In this research, the objective is to understand an individual nurse's interpretation of information systems and to understand his or her nursing identity and how both may relate to his or her post adoption use. As a result, a three-phase review was conducted. In the first phase, a review of healthcare and nursing issues was performed to contextualize the background of the research (Section 2.1). This was done through a discussion of the professional issues that are related to nursing, which serves to situate and justify this research. In the second phase, the relevant literature from both information systems and nursing on IS use and individual differences was analyzed (Section 2.2). Finally, in the third phase, Symbolic Interactionism was explored as it relates to the relevant literature (Section 2.3).

2.1 Context of Information Systems in Nursing

As Orlikowski and Iacono (2001) stated, IT artifacts are context-specific. The meaning of the artifacts is not static and may change if the context of their use changes (Orlikowski & Iacono, 2001). Therefore, the study of work provides a useful context for thinking about the meaning of information systems. Barley's research points to this change when he explores the impact of the introduction of technology on the way work is performed.

> *"Computer technologies are eliminating some forms of work, creating others and transforming a large proportion of what remains"*(Barley, 1996; 404)

Barley illustrates that the introduction of technology does not just make a task easier or faster. Rather, it changes the work processes, the expectations and sometimes the status of the individual and the profession (Barley, 1996).

Barley's work aligns nicely with Orlikowski and Iacono. By approaching information systems using an ensemble view, the call is to investigate the whole work context in which social, cultural, and political factors shape and are shaped by the technologies (Orlikowski & Iacono, 2001). Thus, within the literature review, it is important to understand the rich context in which this research has been performed, as the individual's behaviour and his or her interpretation of the information systems will be affected by the context within which he or she encounters them.

The health care system in Canada is often described as being in crisis (Kennedy, 2012), including long waiting lists, lack of family doctors, crowded hospitals and emergency rooms and ever-increasing costs (Kennedy, 2012; Marchildon, 2005). Canada is also facing a nursing shortage, which many researchers believe is related to this crisis situation. Researchers have identified this shortage as being caused by both a lower number of individuals entering the profession and a higher number of individuals leaving the profession early (Bentley, 2010).

Identifying the underlying causes of this nursing shortage has become a focus of a great deal of nursing research (O'Brien-Pallas, Baumann, Donner, Tomblin Murphy, Gail Lochhaas-Gerlach, & Luba, 2001; Sochalski, 2001; Spurgeon, 2000). Of interest to this work is Lieter et al's (2009) research that has identified nursing burnout as one of the main causes of an individual's decision to leave nursing. Burnout is a psychological syndrome that results from ongoing exposure to stress within a job (Leiter & Maslach, 2009). Individuals report feelings of overwhelming exhaustion, pessimistic views of their job, disinterest in their job and other job-related negative emotions and thoughts (Leiter & Maslach, 2009). Increased workload has also been identified as a main cause of burnout within nursing (Leiter & Maslach, 2009). Of particular interest to this research,

information systems are often mentioned as both a solution and a cause of this increased workload (Ammenwerth, Mansmann, Iller, & Eichstädter, 2002). Information systems, including electronic medical records, have been suggested as a method to reduce workload by improving both record management and the processing and treatment of patients (McDonald, 1997). However, a dominant theme within the nursing profession and nursing research is that technology use does not allow a nurse the time to actually take care of their patients (Timmermans, 1998). This perspective holds that technology use actually increases the workload on the nurse and can lead to burnout due to the stress associated with simultaneously using IS and trying to provide care (Barnard & Sandelowski, 2001). Of significance to this study are the findings that many nurses view information systems as "incapable of capturing the full essence of nursing care, including emotional and psychosocial aspects of nursing" (Mann, 2008; 1) and that nurses do not necessarily see a link between IS use and "improved clinical outcomes" (Mann, 2008; 2). This is the context in which information systems must be viewed within nursing.

Part of the phenomenon of IS use by nurses is the overall experience of nursing in the Canadian health care system. The goal of this section is to briefly provide the professional context for the next section in which both information systems and nursing literature is discussed. Healthcare in Canada is undergoing a crisis that has affected nurses by increasing their workload to the point of burnout (Leiter & Maslach, 2009). Information Systems, and other forms of technology, are seen to be both the cause and the solution for this increased workload. In the next section of this chapter the relevant literature on Information Systems use and individual differences, from both information systems and nursing that relates to this view of Information Systems is discussed.

2.2 Information Systems Use

Given the focus on the intersection of identity, interpretation, post adoption and healthcare in this study, I reviewed three main areas of research: the role of interpretation within adoption and post adoption research, the role of identity within adoption and post adoption research and the conceptualization of technology and the individual within

adoption and post adoption and IS healthcare research. Based on this review, I identified several important shortcomings of current research, which I detail below.

Since there are many excellent reviews of the adoption and post adoption research field (Jasperson, Carter, & Zmud, 2005), I focus here on those aspects of the field which are particularly influential to this work. I take as the core understanding a definition of post adoption from Jasperson et al (2005), which reflects its complex character. Post adoption is the stage of adoption after the IS has been installed and made accessible; the IS is embedded in the individual's work routine (Cooper & Zmud, 1990; Saga & Zmud, 1994). The behaviors of post adoption are summarized by Jasperson et al. (2005) as "the myriad feature adoption decisions, feature use behaviors, and feature extension behaviors" (Jasperson et al., 2005; 531). Hsieh and Zmud (2006) point out that these behaviours are mostly voluntary; the individual can choose to use the IS in a manner that just meets the mandated behaviour, or the individual can choose to expand their knowledge and behaviour beyond the organizationally mandated behavior (Hsieh & Zmud, 2006).

Information systems researchers have approached the question of individual use of technology in several different ways. A valuable method to approaching IS use and adoption research is to divide the research into two broad categories. The first is research with two focuses: first, identifying, modeling and measuring an individual's attributes that allow a researcher to accurately predict an individual's use of a technology; and second, identifying, modeling and measuring a system's attributes that allow a researcher to accurately predict an individual's use of the system. The second is research with an interest in the interaction between an individual and the technology.

A great deal of IS research is approached from the epistemological view of positivism (DeLuca, Gallivan, & Kock, 2008; Gopal & Prasad, 2000). This approach allows the researcher to focus on identifying, modeling and measuring constructs and variables in order to predict, through generalization, an individual's use of a technology. This contributes to the identification of various individual attributes that may influence an individual's use of the technology. For example, attributes such as an individual's gender, cognitive style and education have all been considered as possible influences on an individual's use, or intention to use, a specific technology.

The second area is interested in identifying perceived attributes of the technology that can be used to predict an individual's use of the technology. Some of these attributes can be understood as perceived attributes of use. For example, The Technology Acceptance Model (TAM) is the most widely used model in information systems. In this model, the constructs of perceived usefulness and perceived ease of use are identified as antecedents (Davis, Bagozzi, & Warshaw, 1989). Other attributes can be understood as perceived attributes of the link between the technology and the task. Specifically, this research attempts to predict an individual's use of the technology based on the individual's belief that the technology use fits with the individual, the concrete tasks of the job or with the job as a social construct. For example, the attribute of job fit and of job relevance have both been considered as possible influences on an individual using a specific technology.

It is clear from these two focuses that researchers have dedicated a great deal of time to theorizing and testing the impact of different attributes of the individual and the technology on technology use. Several researchers have attempted to integrate these different attributes into models to predict individual use. For example, as mentioned above, TAM suggests that an individual's use of a new technology will be caused by the degree to which a person believes that using the technology will be useful to his or her job and the degree to which a person believes that using a particular system will be easy. Many researchers have used TAM in a variety of different situations, with a variety of different users and technologies. Adams et al. (1992) demonstrated the validity and reliability of the model and the measurement scales. These researchers also extended it to different settings and different samples (Adams, Nelson, Todd, & Adams, 2011).

Despite many researchers finding high reliability with TAM and its measurement instruments, other researchers are critical of TAM for being too parsimonious (Segars & Grover, 1993). They argued that TAM was not able to explain all of an individual's behavior through these two attributes because there were other attributes influencing an individual's use of a technology (Venkatesh & Davis, 2000; 191). One reaction to this critique was to extend TAM by attempting to add different attributes to explain use or to explain an individual's perceived usefulness. For example, in TAM2, an extended model

of TAM, social influence and cognitive instrumental processes were included (Venkatesh & Davis, 2000).

Venkatesh et al. (2003) developed The Unified Theory of Acceptance and Use of Technology (UTAUT) model by integrating many of the constructs and variables from the individual technology adoption model literature

(Venkatesh, Morris, Davis, & Davis, 2003). Specifically, eight prominent individual user adoption models were reviewed to develop the UTAUT model (Venkatesh et al., 2003). These were the TAM, the Theory of Planned Behavior (TPB), the Theory of Reasoned Action (TRA), the model of PC utilization, the innovation diffusion theory, the motivational model, TAM2 and the Social Cognitive Theory (SCT) model. From their review, Venkatesh et al. (2003) captured the different antecedents to intention to use in four independent variables. These were performance expectancy, effort expectancy, social influence and facilitating conditions. In addition, gender, age, experience and voluntariness of use were identified as moderators.

Venkatesh et al. (2003) suggested that the field has "approached the practical limits of our ability to explain individual acceptance and usage decisions" (Venkatesh et al., 2003; 471). This claim was based on the adjusted R^2 of 70% for UTAUT. This claim implied that the main work left to do in this research is to refine measurements and understand how the new technology use impacts the organization (Venkatesh et al., 2003). Yet with the use of UTAUT and other models that measure similar variables, the IS field's ability to explain technology use has been limited with common R^2 of 30-40% for use and 50-60% for use intention. Additionally, as many as one in four IS implementation projects end in failure (Keil, Mann, & Rai, 2000), and an estimated 40-75% of implementations are considered failures because the technology is adopted but this adoption is not complete (Griffith, Zammuto et al. 1999). This research is still progressing; some researchers have concentrated on expanding different acceptance models. For example Venkatesh and Bala (2008) have built upon TAM to understand how different interventions may influence determinants of IT adoption and use (Venkatesh & Bala, 2008). Others have focused on applying TAM to different cultures and work environments.

These models and this approach have recently been utilized by the nursing research community. For example, TAM and UTAUT have both been used to predict the adoption and use of electronic health records by healthcare workers (Kijsanayotin, Pannarunothai, & Speedie, 2009; Schaper & Pervan, 2007), as well as many others.

The approach represented by both TAM and UTAUT, has been extremely valuable to our understanding of the adoption and use of technology. However, there are several concerns with limiting research to just this approach. For example, many researchers have called attention to the assumption that measuring intention to use a technology is an inadequate proxy to measuring actual use behaviour (Bagozzi, 2007) . Researchers have also expressed concern with measuring IT acceptance as system use (Jasperson et al., 2005).

There are multiple efforts to address the issues within this approach; for example, there are several efforts to develop other research models and identify other attributes in an effort to understand use (for example, Jasperson et al 2005). However, there are some concerns that are not addressed, and may not be able to be addressed, within this approach. Specific to this research, in both IS and healthcare informatics takes an approach that conceptualizes the individual, the technology, use of the technology and the individual's profession as being made up of different attributes that can be isolated and measured.

Information Systems research within nursing has focused on applying the various use models developed within the Information Systems business literature. For example, both The Technology Acceptance Model (TAM) (Davis et al., 1989) and the Unified Theory of Acceptance and Utilization of Technology (UTAUT) (Venkatesh et al., 2003) have been applied in nursing research to understand adoption and use of nursing information systems. For example, Chen et al (2008) applied TAM in an attempt to understand the use intentions of public health nurses for web-based learning (Chen, Yang, Tang, Chun-Hsi, & Huang, 2008).

This division is inherently artificial; an individual is not simply made up of a series of attributes that can be isolated, and similarly, an individual's profession is not just made up

of a series of tasks to be done with the information systems. Finally, the technology is not simply a program or series of programs to be used by the individual. This critique is not intended to diminish the importance of this work. Research that has focused on identifying and measuring attributes that influence technology use has resulted in an increased understanding of technology use, and this attribute-based research helped inform this research.

This critique echoes Orlikowski and Iacono's (2001) critique of how our field has theorized the "IT artifact" (Orlikowski & Iacono, 2001). By drawing on their critique, my research contributes to the understanding of what an ensemble view means in a specific context and to how to study the ensemble view.

I shall next discuss the different understandings of technology, the individual and concept of identity that have been developed within this attribute-based research discussed above.

2.2.1 Identity within IS and Nursing Literature

The IS literature on individual adoption and post adoption behavior has been studied using various theoretical approaches to focus on different issues within the larger phenomenon (Compeau, Higgins, & Huff, 1999). This research helps us understand "individual reactions to computing technology" (Compeau, Higgins, & Huff, 1999; 145). All of these theories can be used in various ways to explain technology adoption through the combined influence of the attributes associated with the technology, the individual and the environment (Compeau, Marcolin, & Kelley, 2001). Within this research, I found theoretical indications for the relationship between identity and outcomes such as use, self-efficacy, satisfaction and behavioral intentions.

Long before TAM or UTAUT, researchers were interested in studying the influence of individual difference on IS use. One of the first major papers in this area was the Minnesota experiments in which the authors believed that the developers of information systems were at fault in assuming that the user requirements in computer-based systems do not differ based on individual differences. The authors decried the continued development of information support systems without considering these differences

(Dickson, Senn, & Chervany, 1977). While they did not specifically discuss the impact of individual identity on IS use, they certainly opened the door for it to be considered. As mentioned above, in an attempt to gain an understanding of individual adoption of technology, Venkatesh et al. reviewed and consolidated the constructs of eight models of IS adoption and use research and developed UTAUT (Venkatesh et al., 2003), UTAUT also tells us that "individual demographic characteristics moderate the relationship between cognition and intention" (Jasperson et al., 2005; 538).

Drawing on this research, Nach et al (2009) preformed an in-depth review of identity research in the field of IS. In this review, only 25 IS empirical articles were identified that adopted an identity frame and were published in 30 leading IS journals in the 10 years from 1997 to 2007. The authors suggested that the issues surrounding IT's impact on identity has still not been fully explored within the IS field. This systematic review of the literature revealed that identity within IS has been conceptualized as a construct that can be influenced by IT (Nach & Lejeune, 2009). Lamb and Kling identify this perspective in their research on the individual as a social actor. They theorized that "technologies, particularly ICTs, are integral to these interactions and so shape identity" (Lamb & Kling, 2003; 201). While this is very valuable, it is one-sided. Specifically, it does not consider the impact that identity might have on IS use.

Additionally, within the Nach et al. review, and the papers that were considered in the review, identity is assumed to be stable and concrete. Yet research into identity outside IS has shown that identity is complex and fluid. An individual's identity may change depending on the context (Rosario, Schrimshaw, Hunter, & Braun, 2006).

Within the field of nursing, identity is more widely discussed; the development and makeup of the nursing identity is a common discourse within the field (Ohlén & Segesten, 1998). This has been approached both by attempting to distill the identity into a concept that "all nurses have in common" (du Toit, 1995; Öhlén & Segesten, 1998) or to investigate the role of interpretation through which nursing identity is dynamic, personal to the individual nurse and context-specific (MacIntosh, 2003; Snelgrove, 1009; Öhlén & Segesten, 1998). Identity is also viewed as a construct that can be challenged by the introduction and existence of new objects, tasks, skills and expectations (MacIntosh,

2003; Snelgrove, 1009). What does not seem to be considered in the research is that identity can challenge the introduction and existence of these same new objects, tasks, skills and expectations. Taken together, the notions of identity changes, identity being capable of shaping technology use and identity even re-shaping technology, calls for further exploration, which is the goal of my research.

2.2.2 The Role of Interpretation

The understanding of both technology and the individual within IS and nursing research can be divided into two approaches: realist and constructionist (Hersh, 2009). The realist approach (the dominant paradigm) views both technology and the individual as an innate object that exists autonomously from the observer (Burrell & Morgan, 1979). In this approach, technology and the individual are both perceived as having concrete and stable characteristics and properties (Hersh, 2009; Lamb & Kling, 2003; Robey & Boudreau, 1999). There are several issues with this understanding of technology and the individual. Specific to this research, by conceptualizing both technology and the individual as having stable and concrete characteristics, the ability and tendency of individuals to adapt and change and for technology's meaning to change depending on context is denied (Alvesson & Deetz, 2000).

In the constructionist approach, technology does not have inherent meanings. A technology is a social fact whose meaning comes from the individual (Berger & Luckmann, 1967). In order to understand the technology, the researcher must understand the experience of the individual (Alvesson & Deetz, 2000). Various approaches that view technology and the individual as social objects have been used in research that explores how individuals and technology interact with each other. Through my empirical work, my research will draw on Orlikowski and Iacono's IT artifact (2001), Orlikowski and Gash's technological frame (1994) and Lamb and Kling's social actor (2003) to more fully explore the social meanings and ongoing changes to the meaning of both the technology and the nurse (Barley, 1996; Lamb & Kling, 2003; Orlikowski & Gash, 1994; Orlikowski & Iacono, 2001).

2.2.3 Healthcare Research in Information Systems

In 2004, Chiasson and Davidson found that research into the use of IS in healthcare has lagged behind other fields; a review of 17 IS journals from 1985 to 2003 identified only 165 papers on the subject. Through this review, an IS and healthcare context category system was developed (Chiasson & Davidson, 2004), in which the main difference between the categories is the application of theory and a consideration of context. Many authors have responded to Chaisson & Davidson's call for more research into the areas of healthcare and IS, including a consideration of context and the application of theory. However, a great deal of this research has a level of analysis that concentrates on physicians. For example: Jensen and Aanestad (2007), analyzed surgeons' perceptions of a mandated electronic patient record (Jensen & Aanestad, 2007); Reardon and Davidson (2007) investigated physician practices to explore the impact of organizational learning barriers on the adoption of electronic medical records (Reardon & Davidson, 2007); and Bhattacherjee and Hikmet (2007) investigated physician resistance toward healthcare information technology. In their commentary, LeRogue et al. (2007) identified several areas within healthcare IS research that still needs to be explored in more detail. Of interest to this research they called for research into "identifying obstacles to acceptance and continued use of HIS" (LeRouge, Mantzana, & Wilson, 2007).

Despite the number of nurses and the increased introduction of information systems aimed at nursing, there is limited research within IS into nurses' behaviour. Nurses are the biggest population of users and thus, in some ways, control how an administrative innovation will succeed or not. My research will contribute to the filling of this gap.

2.3 Theoretical Perspective

This study was conceived of and developed using a classical Symbolic Interactionist (SI) framework. This was chosen as a method that emphasizes the inter-relationships between identity and information systems. Moreover, because the concept of identity is central to this research a method that supports looking at identity was needed. Finally, the SI method, through the lens of identity, allows access to the ensemble view and the social actor, which are key features of this research.

This section begins with an introduction to SI and its pragmatist beginnings. This is then followed by a discussion of Mead's key concepts of mind, self and society which were developed through pragmatism. This leads directly to an overview of the Chicago School of Symbolic Interactionism through Blumer's interpretations of Mead's concepts. This chapter concludes with consideration of contemporary interpretations of SI and the key concepts that form the theoretical framework of this research.

The main focus of Symbolic Interactionism (SI) is the relationships between symbols and interaction (Charon, 2007). SI originated through a critique of the positivist's biological and physiological explanations of human behaviour (Charon, 2007; Meltzer et al., 1975). SI was derived and named by Herbert Blumer from the ideas and concepts of his teacher, the early 20th century philosopher George Herbert Mead.

The term SI is often used to denote a uniform approach; however, there are several different variations of SI including the Chicago School, the Iowa School, the Dramaturgical School and the Ethnomethodological School. Each of these schools has its own intellectual roots, characteristics, methods and theorists (Edgley, 2003; Maynard & Clayman, 2003; Meltzer et al., 1975). When the term SI is used, it is often referring specifically to the Chicago School, which is the most prominent and influential in the field. This school has continued in the classical tradition of Mead and Blumer (Prasad, 2005). It is this approach to SI, with some added understandings from Erving Goffman from the complementary Dramaturgical School (Meltzer et al., 1975), that will be used in this research and that is discussed below.

2.3.1 The Roots of Symbolic Interactionism

Symbolic Interactionism, in particular the Chicago School, grew out of the pragmatist tradition of the early 19th century, specifically the works of Pierce, James, Mead and Dewey (Reynolds & Herman-Kinney, 2003). These theorists developed the philosophy of pragmatism as they struggled to find their own voice, reasoning and methods that were of value in studying the specific experiences of North American society (Faris 1967; Morgan 1997).

In his work, Pierce argued that consciousness and thinking are only possible through signs which represent reality. Thus, he argued, the meaning of an object is embedded in the perceived effect of an object on humans and in the responses of the humans to the object (Meltzer et al., 1975). For Pierce, the signs are not neutral, but are instead associated with emotions.

William James added to this understanding though his concepts of habit, instinct and self (Meltzer et al., 1975). James stated that habits arise from past experiences that modify and inhibit instincts. As a result, it is habit and not instinct that maintains social order. The self, for James, is a product of interaction with others. Baldwin extended this understanding of habit and self by theorizing that habits are socially learned and that the individual cannot be separated from society (Meltzer et al., 1975). An individual can only develop a self, or series of selves, through imitation and interaction with others. Dewey, in turn, added to this understanding of habit through the definition of habit as "acquired predispositions to ways or modes of responses (Dewey, 1957; 40-41).

Cooley then extended the importance of the relationship between the individual and society through his concept of the looking-glass self (Meltzer et al., 1975; Reynolds & Herman-Kinney, 2003). The looking-glass self depicts the formation of the individual's sense of self through the perceived response of others. There are three components of the looking-glass self: the imagination of our appearance to another person; the imagination of an individual's judgment of that appearance and some sort of self-feeling, such as pride or mortification.

The combination of these views and beliefs created pragmatism. In this doctrine the focus is not on attempting to uncover and name general truths or formal principles of human behaviour (Meltzer et al., 1975). Rather, the motivation is to provide a method to understand human behaviour based on the belief that the meaning of both objects and actions lies in their practical aspects for the individual (Waal 2004). The pragmatist understanding views reality as something that does not exist separately from the individual; reality is created and changed as an individual acts in and toward the world. People base their understanding of the world and their behaviour on what has been useful to them. People will alter what no longer "works" in their lives (Waal 2004). An

important goal of pragmatism is to understand why others define situations in a way that leads to a particular behaviour. Through this goal, research can begin to understand the subjective meanings of behaviour, objects and social interactions (Meltzer et al., 1975).

The concept of water is often used to illustrate the overall understanding of pragmatism (Waal 2004). Within pragmatism, until the individual encounters water, it has no meaning for them. Once the individual encounters water its meaning depends on the individual. For example, water as a concept is different for a chemist (water is a combination of hydrogen and oxygen molecules), an athlete (an avenue for sport), a firefighter (a tool for extinguishing fires) or a gardener (a necessary ingredient that must be regulated in order to grow plants). Additionally, the concept of water differs depending upon the situation in which it is encountered. A firefighter going for a walk in the rain will make sense of water in a very different way than when he or she is fighting a fire. Thus, within pragmatism, the meaning of behaviour, objects or social interaction is never intrinsic, or constant. Instead, it is always rooted in the practical context (Waal 2004; Appelrough and Edles 2008).

The theoretical arguments that developed from this understanding of human behaviour and understanding provided a foundation for Mead in his development of the theory that became known as Symbolic Interactionism.

2.3.2 Mead's Mind, Self and Society

To understand the general position of the SI perspective, it is necessary to address Mead's understanding of the individual's place in society (Blumer, 1969). Mead's posthumous book *Mind, self and society: From the standpoint of a social behaviourist* (Mead, 1934) contains the most complete exposition of SI.

In this work, Mead considered that mind ("the reflective intelligence of humans" [Mead, 1934; 118]), self (a social construction of one's own awareness [Mead, 1934]) and society ("common responses" through which "the modern civilized human individual is and feels himself to be a member not only of a certain local community or state or nation, but also of an entire given race or even civilization as a whole" [Mead, 1934; 273]) were closely

interrelated and that social interaction accounted for the development of the mind and the presence of self (Mead, 1934). For Mead, the mind and self are social constructs that do not exist or develop away from society (Mead, 1934). The mind develops out of the process of social interaction through the use of significant symbols. The meaning an individual associates with an object, action or event is represented by one or many significant symbols (Mead, 1934). These symbols are often language based and are made up of three main features:

1. The meanings of significant symbols are centered on an agreement within a community of symbol users.
2. Significant symbols do not need the thing or event they signify to be present.
3. Significant symbols are a part of a complex system in which symbols can stand for other symbols.

Gestures and words become significant symbols when their meanings are shared between individuals. The significance of Mead is in explaining social order, which requires cooperative actions based on shared meanings, common understandings and expectations (Charon, 2007; Mead, 1934). Over time, this symbolic interaction created a shared symbolic representation of the perspective of the generalized other, or group consensus, which is used to guide behaviour and judge the behaviour of others (Charon, 2007).

2.3.3 Blumer and Symbolic Interactionism

Following Mead's theorizing, Blumer set down the three premises of SI. In this section these premises are explored in more detail.

The first premise is that ***individuals act toward things (physical objects, other people, social institutions, ideas, activities or situations), based on the meanings those things have for the individual*** (Blumer, 1969). In other words, we assign meanings to things and those meanings will determine how we act towards those things. Based on this premise, human behaviours are not the result of various factors such as attributes, motives, attitudes, personality, or role requirements. Instead, an individual's behaviour is

the result of the meanings that things have for the individual (Blumer, 1969). For instance, if I define a computer as a tool for data entry, I will act towards the computer in this way and use it as an object for data entry. Someone else may define a computer as a threat to his or her method of entering data and respond to it by refusing to use it.

The second premise involves the source of the meaning we give to objects. Blumer states that ***meaning develops through the process of interacting with other people*** (Blumer, 1969). In other words, the meaning we give an object is neither intrinsic nor inherent in the object. Instead, the meaning we give an object develops out of our interactions with others (Blumer, 1969). This can be done through explicit methods such as teaching or telling. However, it can also be done implicitly by watching the behaviour of others. To use a computer example, I was not born knowing that a computer is a tool for data entry, or that the internet was a reference tool. Someone had to either consciously show me or tell me its function, or unconsciously model it through behaviour.

The third and last premise is that ***the meanings are experienced in an interpretive process*** (Blumer, 1969). In other words, through our experiences we may modify and change the meaning we assign to objects. This process involves an internal conversation in which the individual determines the meaning of an object to him or herself. In the computer example, I defined a computer as a data entry object. However, if I later saw someone resisting using the computer, I could re-evaluate my understanding of the possible use of a computer. My options in the face of this new information could be to adopt this new meaning and move to viewing the computer as a threat, to reject this new meaning and continue to believe that a computer is a data entry object or to compromise and adopt some of this new meaning in certain situations.

In addition to setting down these three premises, Blumer also contributed to the development of a research methodology for SI. Blumer felt that traditional methodology and its methods and techniques were not appropriate, as it did not allow the research to understand the meaning that objects had for the individual. While Blumer believed that an object had an independent empirical existence, he proposed that sociologists should seek to understand, rather than predict or control, behaviour.

SI's theory and methods provide a good contrast to the above-mentioned dominant attribute-based approach to studying IT and individuals. The use of SI will allow for a different approach to the questions of information systems use and behaviour.

In summary, from a SI perspective, the world that is being examined is not made up of innate and internal objects, actions or events (Blumer, 1969; 61). Instead, the meaning of these objects, actions and events are assigned by individuals in the course of their social interactions and their own internal conversations (Mead, 1934). An individual's relationship with an object, action or event is established by its meaning to the individual (Prasad 2005). This relationship is reflected in the individual's behaviour toward the object, action or event. James' social self, Cooley's looking-glass self, Dewey's deliberation, Mead's awareness of the role or attitude of others and Blumer's human action based on meaning all suggest it is fundamental to understand the subjective meanings of objects for the actors (Meltzer et al., 1975).

2.3.4 Key Concepts from Symbolic Interactionism

In this research, each participant is considered an active actor with a self. To understand the participant's behaviour, it is necessary for this research to focus on action and interaction during which situations are defined and meanings are interpreted. The key concepts applied in this research are therefore derived from this understanding. Specifically, the key concepts are humans as actors, objects, self, meaning, symbols, interpretation, action and interaction and situation.

Within SI, an individual is an ***actor*** with ***self.*** As a result, the individual is a symbolic object of his or her own actions. As an actor, the individual is able to act towards him or herself as he or she might act towards others (Mead, 1934) This ***self-interaction*** gives the individual's action both reflection and autonomy. The result reflects an active, creative individual who participates in the ongoing construction of his or her social world (Mead, 1934). In this study, I was informed by this concept of human as actors and ensured that attention was given to the methods of both self construction and reconstruction and identity negotiation.

Individuals base their actions on the perceived ***meaning of objects*** (events, people, the self and ideas) (Blumer, 1969). Meaning is not fixed and intrinsic to the object but is rather socially created (Blumer, 1969). This means that objects have many possible meanings, the meanings can change over time and the meanings may differ between groups through ***action and interaction*** with objects (Reynolds & Herman-Kinney, 2003). As a result, a researcher cannot make assumptions about the meaning an object or situation has for the participant (Reynolds & Herman-Kinney, 2003). In this research it was therefore necessary to understand the specific meanings participants gave to objects and how this meaning was constructed, maintained and negotiated over time in order to understand the behaviour of the participants.

The ***situation*** is also determined by the meaning of its objects for individuals and helps determine the meaning of the objects (Blumer, 1969). Individuals may assign different meanings to the same objects. The result can be that individuals in the same physical environment may have quite different mental environments. As Blumer noted, "people may be living side by side yet be living in different worlds" (Blumer, 1969; 11).

In order to understand the behaviour of the participants in this research it was essential to understand the different meanings of objects upon which the individuals base their behaviour. Although working in the same physical context as their colleagues, the participants may exist in a different world of mental objects. To understand this world, the researcher needs to identify the meanings the participants assign the objects.

The meaning of objects (things, events, other people, the self and ideas) can only exist through significant symbols. These ***symbols*** develop through ***social interaction*** and are shared within social groups (Blumer, 1969). These symbols are language based. Through language, an individual is able to look at him or herself as an object and imagine how they are perceived by others and regulate future conduct accordingly (Mead, 1934). To study human behaviour, the researcher needs to attend to the symbols participants use and the meanings of these symbols. In this research, I focused on the words and their meanings expressed by the participants. Contradictions within the meanings were investigated to identify links between the meanings of symbols and behaviour.

Conventional behavioural research is often modeled using a stimulus-response sequence in which certain factors such as motives, attitudes and roles cause human action. Mead maintained that human action should be modeled using a stimulus-interpretation-response sequence (Blumer, 1969; Mead, 1934) because human action is performed and constructed by the individual based on the meaning of stimulus (Blumer, 1969). Additionally, the meanings of objects are formed through an ongoing interpretive process that occurs during interaction with other individuals, groups, self and objects (Blumer, 1969). The implication of this is an ongoing process of construction, negotiation and reconstruction of the meaning of objects. It is this interpretation process that this research seeks to explore. To accomplish this, the researcher must access the defining process of the actors to understand their behaviour. In this study, in order to understand the participants' behaviour, I sought to explore how the participants interpreted the objects they encountered.

Research using SI requires an understandings of behaviour as an ongoing process of action in which decision making about behaviour is consistently influenced by our interaction with others and with the self (Charon, 2007). This is the fundamental tenet of this study — individuals construct and reconstruct their reality as a nurse in a process of interaction with others. To understand this we need to understand how the process of definition and interpretation of the objects redirects and transforms behaviour (Benzies & Allen, 2001).

In summary, SI provides a persuasive theoretical perspective for studying how individuals interpret and reinterpret objects and how this process leads to behaviour (Benzies & Allen, 2001; Blumer, 1969; Mead, 1934).

2.3.4.1 Identity within Symbolic Interactionism

SI theorizes that the self does not exist in a constant and intrinsic sense; it is both emergent and symbolic. The self develops out of this process of social interaction. For Mead there are two parts of the self: (1) the *Me* which *reflects* the attitude of the generalized other and (2) the *I* which *responds to* the attitude of the generalized other (Mead, 1934). Mead defines the "me" as "a conventional, habitual individual," and the

"I" as the "unique reaction" of the individual to the generalized other (Mead, 1934; 203). The "me" is the internalization of roles which derive from symbolic processes and the "I" is a "creative response" to the symbolized structures of the "me." The "me" is, in a sense, a "symbol of who we are and the 'I' is our present consciousness" (Mead, 1934; 203-204). Put differently, the "I" represents a selected line of action and the "me" represents one's awareness of social expectations (Charon, 2007; Mead, 1934). What appears in consciousness is always the self as an object, as a "me." A self exists when one takes on the attitudes of others and can act towards oneself as others might act (Charon, 2007; Mead, 1934). This is the point at which we are "aware of another self as a self" (Mead, 1934; 377). Individuals act with one another in mind, take account of one another as they act and symbolically communicate and interpret one another's acts (Charon, 2007; Mead, 1934). Within SI an individual's ability to utilize symbols allows him or her to accessing his or her own mind, thoughts and responses. This ability results in self-consciousness. The result of self-consciousness is the individual becomes a symbol to him or herself. This symbol is an individual's identity. Erik Erikson, the developmental psychologist, theorized that an individual often has an identity based on his or her choice of profession. This professional identity is usually viewed as a social identity that is structured through the interactions within and between groups in the workplace (Adams, Hean, Sturgis, & Clark, 2006) A professional identity develops over a long period of time through a multifaceted socialization process (Cohen-Scali, 2003). This is an understanding now accepted throughout sociology that was one of the early impacts of SI. Socialization takes places in two stages, first an individual is socialized through family and school to understand work, professions in general and the basics of a specific profession. Then an individual is socialized through their profession to fully adopt a professional identity. When an individual enters a new profession he or she goes through a complex process of socialization in order to acquire the knowledge, skills, and sense of professional identity that are characteristic of a member of that profession. It involves the internalization of the values and norms of the group into the person's own behavior and self – conception (Cohen, 1981). This can be done in a wide variety of ways including group memberships, meeting or event attendance, interactions with other members of the profession, training and accessing professional literature(Ahrens & Chapman, 2000). Through the stage of

socialization by work an individual is fully exposed to and, if successful, fully adopts the professional identity. A successful adoption of the professional identity is made up of the following: the individual has a self image of himself or herself as a member of the profession, behavior that does not fit the professional identity is discontinued; skills and knowledge that are needed in the professional identity are demonstrated and improved; ideological beliefs are fully accepted; and relationship with others with the same identity are positive and valued. The adoption of this culture is typically characterized by ongoing negotiation and accommodation, as new members are exposed to and adopt the methods to defend and support their work-related behaviours (Dolch, 2004). An individual's identity is public and is both perceived and interpreted during interaction with other individuals. All identities share a need for mutual recognition by oneself and at least some others. This understanding of the professional identity is valuable. Through this understanding we can distinguish the impact of other members of the profession on an individual's interpretation of the professional identity. However, this conceptualization of the professional identity as purely a social identity does not allow for the consideration of the impact of other forces, both internal and external, on an individual's identity. An individual's professional identity is extremely complex and is not formed purely by group interactions within the workplace. Finally, an individual's professional identity, along with all other identities, is heavily influenced by the messages provided by family, friends, co-workers and the greater culture. Understanding professional identities requires us to understand more than simply the impact of the social groups on an individual. We also must understand the internal and external structures and how they are involved in the individual's different identities. An individual's professional identity is created by the individual's negotiations between both external and internal structures that influence the composition of the identity. The professional identity is balanced between the internal attributes of the individual and the external attributes of the individual (Öhlén & Segesten, 1998). Identity, introduced as an area of theorizing and research by Mead, is a critical concept of study within modern sociological thought (Cerulo, 1997). Within SI an individual's identity can all be approached as symbols that will affect an individual's behavior through his or her interpretation of the symbols. By approaching IS use through an individual's identity I can begin to explore

the reasons for an individual's behavior related to IS use through an understanding of the individual's actions based on an individual's identity.

Symbolic Interactionists distinguish between 1. a social identity, 2. a personal identity and 3. a situational identity. In this section I shall outline each type of identity and explain how it relates to professional identity. I shall then outline how successful enactment of a professional identity involves each type of identity within the SI framework.

One of the main reasons for distinguishing between different types of identities is that the different identities may not be consistent. An individual's personal identity of rebel may be at odds with a social identity or situational identity. This occurs because some identities are, in part, assigned by others whereas other identities are self designations or avowals(Lindgren & Wåhlin, 2001).

This division of an individual's different identity into that of the situational, social and personal identities is a very useful conceptual tool to explore the different identities an individual has and how the individual enacts these identities. However, many identities are complex and multi-faceted (Vryan & Adler, 2003). These complex identities are not specifically situational, social or personal. Instead these complex identities are made up of all three or any combination of these identities. As a result, within this complex identity all of the identities that make up the complex identity may be "relevant to the meanings and behaviors of the participants" (Vryan & Adler, 2003; 373) . Within nursing an individual has a complex identity in which all three of these forms of identity come together to create an individual's professional nursing identity. The professional identity refers to the commonality of the profession (Öhlén & Segesten, 1998). This professional identity is not uniform and singular throughout the profession. Instead it is composed of multiple strands that can co-exist to create one identity.

Exploring the multiple strands that have come together can allow for the understanding of the identity constructed and the behaviors that arise out of this identity. A great deal of sociology has focused on work. This is because work is not just about earning money in our society. It is one of the main sources of self- identification (Berger & Luckmann,

1967). People are both judged by their work and judge themselves by their work(Hughes, 1958). There are two areas in which SI researchers have been interested in work. First, SI researchers have been interested in the experience of work from the point of view of the worker. SI researchers have looked at the method individuals use to move through the work lifecycle. Second, rather than focusing on the objective characteristics of the work lifecycle SI researchers have looked at how workers subjectively construct meanings; as they decide who they are and what that means to them; what services they should be providing and to whom; and responding to changes in their environment and in their work. This second area of interest is where this thesis is situated. The aim of this section is to describe the broad themes that have interested SI researchers working in this area of interest.

Social Identity

An individual's social identity is a presentation to other members regarding his or her membership in a social group. This presentation is made up of the image an individual has of him or herself and of others within the same and different social groups. These images shape how an individual presents him or herself to others. This presentation allows others to understand what the individual believes about him or herself and others. Without an explicit definition of an individual's social self the individual cannot interact successfully with others (Howard & Hollander, 1996). It is our identification with both socially constructed groups and our position within structured social arrangements.

Because human beings are social animals our social identities are significant to both ourselves and others. They affect both our own behavior and the behavior of others in relation to us. Social identities define who we are based on our similarity to or differences from a group of others. While it is not necessary, an individual will often associate with other members of the same group, in other words individuals who identify themselves with the same social identity (Snow & Anderson, 1996). Additionally, social identities are 'attributed or imputed to others in an attempt to place or situate them as social objects' (Snow & Anderson, 1996; 1347).

The social identity is fairly permanent across different situations. This provides some continuity throughout our situational identities. While it is more permanent, it is varied. An individual can embody many different social identities. For example, an individual may have identities based on gender, sexuality, race, ethnicity, nationality and profession as well as others.

Situational Identity

At the beginning of an interaction with others, all members will jointly construct an understanding, a definition, of the situation (Thomas & Thomas, 1928). The main part of this understanding is the identification of the identities of all of the participants. By defining these identities we understand what behavior is appropriate or inappropriate. These identity definitions make clear our expectations and interpretations of the behavior within the situation. Of importance to understanding this conceptualization of identity is that all meaning (including identities) must be shared by all participants in a social situation(Mead, 1934). In order to establish our situational identities we reveal them using a wide variety of methods, such as our clothing, or our behavior. As we announce our situational identity other individuals place us (Weigert & Teitge, 1986). An individual's actions are based on, in part, his or her constant management of both his or her and other people's situational identities (Goffman, 1961). It is important to understand that there are some constraints to the establishment of situational identities.

Personal Identity

The final type of identity is made up of two features. Goffman (1961) stated that personal identity is made up of the uniqueness of an individual, and the full set of facts specific to the individual. Through these two features an individual constructs and then presents a personal identity via a narrative of self. While, like the social identity, the personal identity is enduring and limiting, we are able to make some changes to it. This can be done though the process of construction. Construction is done through choosing and framing information from the features to be included or excluded (Vryan & Adler, 2003). An individual can present different personal identities to different audiences. Through

this construction an individual can position him or herself “alignment with or opposition to situational and social identities” (Vryan & Adler, 2003; 372).

Professional Identity within the SI Identity Framework

Professional identity can be placed throughout the identity framework. In this section I shall outline how nursing professional identity fits into this framework.

Within nursing the motivations for entering the nursing profession are diverse (Cohen, 1981). Many of the motivations are a part of an individual’s *personal identity*. For example, within Cohen’s study two-thirds of students interviewed chose to study nursing because they thought nursing was nurturing and feminine. They believed that nursing was an appropriate field for them as females. Other studies have identified different motivations for entering nursing. For example, personality traits such as dominance and autonomy were identified as being necessary within nursing (Cohen, 1981), as well as being responsible, motherly, and efficient(Olesen & Whittaker, 1968).

The existence of a *personal identity* is a prerequisite for the development of a professional identity (Öhlén & Segesten, 1998). It is described as having the feeling of being a person who can practice the profession with skill and responsibility. It also implies awareness of personal resources and limitations (Öhlén & Segesten, 1998).

Within nursing, situational identity is extremely important for professional identity. The situation an individual faces can change on a daily basis. Thus, their situational identity also changes. For example, Oncology nurse Theresa Brown outlines in her column in the New York Times how her job can change based on the type of patients on her ward on a given day. Her situational identity changes with these changes to the situation. In one column she discusses shaving a patient’s hair and helping her cope with the emotional trauma of the cancer treatment (Brown, 2009a). In this situation her nursing identity appeared to be that of a caring, compassionate and empathetic nurse. In another column, while working on the same ward, she discusses how she did not have time to acknowledge the sudden death of a patient or talk to the grieving family members because she was so busy dealing with a patient who was experiencing two oncologic emergencies

(Brown, 2009b). In this situation her nursing identity appeared to be that of a nurse skilled in crisis management, organization, and communication.

Within nursing *social identities* are also extremely important for professional identity. An individual's social identities define him or herself, by self and by others, within a socially constructed group or category of people. For example, an individual who has the social identity of "nurse" defines him or herself as a member of this social group. The professional socialization outlined earlier in this document represented boundary creation work through education and social interaction that teach the individual the accepted image of the identity and reinforce this image through social behaviour (Howard & Hollander, 1996). This accepted image becomes the "Me" in the situations in which a professional social identity is called upon (Snow & Anderson, 1996).

2.3.4.2 SI in Information Systems and Nursing Research

SI has been used, although not frequently, within IS research. For example, Gopal and Prasad (2000) used SI to examine the use of a Group Decision Support System (GDSS) by a particular group. SI was chosen to provide a theoretical approach that would allow for "the evaluation of the GDSS experience in a manner that differs from existing modes of GDSS" (Gopal & Prasad, 2000; 510). Their findings highlight the diverse reactions different individuals have to the same technology. Based on this finding, they advocate an approach that emphasizes interaction between individuals and symbols in research on technology use.

Within nursing research SI has been used more commonly to understand relationships between different healthcare objects and the work performed by individuals. For example, Hester-Moore (2005) used SI to investigate the "interrelationship between guidelines and health practitioners' clinical work" (Hester-Moore, 2005; 174). Similarly, the SI perspective is used to understand the influence of meanings and perceptions on communication within nursing. Byrne and Heyman (1997) identified, through a series of interviews, the roles nurses perceived as important within the profession of an accident and emergency department nurse, and how these roles influenced both the communication

and the behaviour that were used to address a patient's anxieties (Byrne & Heyman, 1997).

While the SI perspective is not commonly used within IS research, several researchers within IS (Orlikowski and Iacono, Orlikowski and Gash, and Lamb and Kling) have theoretical orientations that are congruent with an SI approach. Specifically, SI allows the researcher to move from the theory of an ensemble view to its practical reality, it enables a move from the concept of technological frames to its practical reality and finally, because it centres on the I/me notion, it allows research in IS to consider the notion of "social actor" with a degree of richness in any setting, and in this research, in the nursing setting.

2.4 Summary

In this literature review I have detailed the dominant approaches used in understanding the different elements involved in my research question. These approaches, in general, conceptualize the individual, the technology, the use of the technology and the individual's profession as being made of up of different attributes that can be isolated, measured and predicted. While valuable, this approach has not been frequently used. In addition, within the IS literature that focuses on healthcare there is a focus on the adoption and use of IS by physicians and organizations, but little on the experience of nurses.

In their analysis of the theorizing of the IT artifact, Orlikowski and Iacono (2001) point to the need to approach IT use through an individual's interpretation, on the premise that IT artifacts are "embedded in some time, place, discourse and community" (Orlikowski & Iacono, 2001; 131). As a result, the meaning of the IT artifacts is "bound up with the historical and cultural aspects" (Orlikowski & Iacono, 2001; 131). SI, which has been used in both healthcare and IS research, as well as Identity theory are the combined theoretical and methodological perspectives that can help meet the objective of this research: to further our knowledge of how healthcare professionals in the healthcare setting create an understanding of their information systems (as a symbol which interacts

with professional identity) and how they come to develop a varied set of reactions to those information systems.

To the best of my knowledge, little research has been done, in either the healthcare or IS field, to develop an understanding that can incorporate interpretations of identity, technology and use behavior. In this study, I have identified an approach that studies information systems use and individual behavior in a manner that approaches the individual, the technology and the profession in a different way. Through this approach, which focuses on interpretation at the individual level, an understanding incorporating interpretations which cannot be measured as constructs or variables can be used.

Chapter 3

3 Methods

The aim of my research is to develop a picture of the individual interpretation of identity and information systems, not to define and then measure an identity in order to predict the individual's information systems behaviour. As a result, I needed to identify an approach that allowed me to examine the ongoing interpretations and interactions of the individual and the information systems (Meltzer et al., 1975). To do this, I returned to the Chicago School of SI and investigated its methods in conjunction with the philosophy of Mead.

3.1 Theory into Method

As outlined in Chapter 2, Symbolic Interactionism provides a theoretical perspective to study how individuals interpret and reinterpret objects and how this process leads to a variety of behaviours (Benzies & Allen, 2001; Blumer, 1969; Mead, 1934). Through the methodological concept of *Verstehen* ("*to put yourself into the shoes of another"*), I was able to access the interpretations of the individuals I interviewed. This allowed me to develop an in-depth understanding of the meaning an individual assigned to various information systems (Herman-Kinney et al, 2001).

The concept of *Verstehen* has been a central part of the methodology for SI (Reynolds & Herman-Kinney, 2003)). Textual analysis, interviewing and observation, along with grounded theory analysis, is used in this research to gain *Verstehen* and to understand phenomena through by exploring the experience of the other (Blumer, 1969; Glaser, 1998; Strauss & Corbin, 1998).

3.2 Grounded Theory

A systematic research method of grounded theory was used in this research (Glaser & Strauss, 1967). The rationale for the methods used in this research can be considered as

part of the grounded theory approach, informed mostly by Strauss and less by Glaser (Glaser, 1978, 1992).

Glaser provides a guideline of collection and analysis which fits well with the understanding of the Chicago School of SI. This is because the methods will not allow data to be forced into preconceived concepts and understandings (Charmaz, 2000, 2006). Glaser approached data collection and analysis in an impartial and objective manner (Charmaz, 2006). Of importance to this research, followers of Glaser hold that the categories that emerge from the data would have explanatory and predictive power across different times, spaces and groups (Charmaz, 2000, 2006).

By contrast, Strauss' approach to the data aims for interpretative frameworks and abstract understandings rather than an explanatory and predictive theory (Bryant, 2003; Charmaz, 2000, 2006), which fits well with the goals of this research. This view emphasizes the contextualization of the categories that emerge from the data; specifically, in this approach the categories and understandings developed from the data can be seen as serving as interpretative frameworks and abstract understandings rather than a predictive theory (Bryant, 2003; Charmaz, 2000, 2006).

3.3 Recruitment Procedures

This research was conducted in three Canadian cities: London, Ontario; Vancouver, British Columbia; and Ottawa, Ontario. The study participants were recruited using an initial call for participation and snowballing.

The call for participation was advertised through email to nursing contacts (see Appendix A). The nursing contacts were asked to contact nurses, nursing students and nursing instructors to request volunteers for participation. Interested participants were asked to contact the researcher. Appointments for interviews were arranged with potential participants following initial contact.

After these initial interviews, snowball sampling was undertaken to recruit further participants. This is a sampling technique in which future subjects are recruited from among the acquaintances of the original participants. In this research, this was accomplished by asking existing participants to refer people they knew who might be interested in participating. All participants were recruited through this strategy.

Snowball sampling proved to be especially successful during theoretical sampling in stages 2 and 3. For example, when age was mentioned as a reason for nurses not wanting to use an IS, I asked several participants to refer new participants in different age groups. Recruitment of study participants took place over 9 months, resulting in a total of 31: 22 participants in London, Ontario; 4 participants in Ottawa, Ontario; and 5 participants in Vancouver, British Columbia.

3.4 Ethical Considerations

Ethical approval for the study was granted by the Human Research Ethics Committee of the University of Western Ontario. When a potential participant demonstrated interest in participating in this research, he or she was screened for inclusion criteria and then given the information letter and the consent form (see Appendix B). All prospective participants were given time to read and think about the study before making a final decision to participate.

Prior to the interview, the study was explained to the participant, including the purpose, the potential risks and benefits, the time commitment, the rights of the participant and the strategies taken to protect privacy and anonymity. Additionally, the participant was given the opportunity to ask questions.

Participation in the study was voluntary and participants were reminded they were free to withdraw at any time. Participants were recruited through their professional and personal contacts and not their employers.

In the snowball sampling, the researcher asked the participants to consider if they could recommend participating in the research to others. If they agreed, participants were given

a hard copy and a digital copy of the information letter to pass on to potential participants. The researcher did not seek any information about the potential new participants, instead waiting until they made contact.

Privacy of the participants was assured by the development of a master list that identified participants by a pseudonym. This list was kept separately in a locked filing cabinet away from the transcripts and audio-recordings. Only the researcher had access to the key and the list. The master list and electronic recordings will be destroyed at the completion of this research. No names or other identifiers appeared in any document. All electronic data is stored in a password-protected computer accessible only to the researcher. Finally, the researcher was responsible for transcribing all interviews.

3.5 Sampling Strategy

The sampling strategy used in this research is unlike sampling strategies used in a great deal of research. Specifically, in much quantitative and qualitative research, participants are statistically representative of the broader population under study. By comparison, the sample for this research, like other grounded theory research, was not completely pre-determined. Two sampling strategies were applied in this study: purposive sampling and theoretical sampling.

Purposive sampling, in which subjects are selected based on their suitability to the research (Glaser, 1998), was used at the start of the research to select participants who met the inclusion criteria based on the goals of this study. Each participant was, therefore, a practicing nurse.

Theoretical sampling was later used based on my emerging analysis. This is a sampling method that is common within grounded theory (Strauss, 1987). This method of sampling guides data collection based on evolving understanding and theory (Charon, 2007). In this research, I used theoretical sampling to select participants based on specific needs identified through my data analysis. One example was the revelation, after the initial analysis of the first 5 interviews, that age was considered to be an important influence on IS use, even by older nurses who reacted positively toward IS use in the

workplace. As such, I sought to ensure I interviewed nurses of different ages to further refine my understanding.

Strauss and Corbin (1990) point out that, while the use of theoretical sampling is often considered in the selection of participants, it is also used in the data collected from the participants. This type of theoretical sampling was done throughout this study by refining the interview questions for participants based on earlier analysis.

Within grounded theory, sampling continues until the point of theoretical saturation is attained. This is the point where "no additional data are being found whereby the researcher can develop properties of the category" (Glaser & Strauss, 1967; 65). The moment of theoretical saturation is open to both criticism and different interpretations within grounded theory, as well as within the IS and healthcare fields of research. This is because it is impossible to calculate the required sample size in the same manner as with probabilistic sample sizes. However, there are some general guidelines that can be used to address this criticism. First, since this research is dealing with a relatively heterogeneous group made up of various types of nurses and various types of workplaces, theoretical saturation is unlikely to be reached with a small number of interviews, observations and texts (Gregg & Magilvy, 2001). Therefore, I knew I would have to have access to many interviews, observations and texts. Instead of assigning a minimum or maximum number of interviews, observations and texts, I constantly compared my findings to see if I had arrived at a reasonable degree of theoretical saturation. Specifically, I performed more interviews and observations and read more texts until I had identified that I was not collecting new information in the form of category, sub-category or property. Despite this, I then continued my data collection and analysis in order to ensure that I had gathered enough data to create a strong and persuasive understanding (Glaser & Strauss, 1967). This resulted in a total of 48 interviews from 31 participants, 20 participant observations in six locations and 30 textual analyses.

3.6 Data Collection: Strategies and Sources

The choice of data collection methods is always determined by the research question and theoretical understanding utilized in a study. In this study, I attempted to access people's

interpretations of their behaviours and Information Systems. Based on this aim and the theoretical understanding of SI, I identified three methods of data collection: participant observation, interviews and textual analysis. These data collection methods are described below. A total of 48 interviews from 31 participants, 20 participant observations in 6 locations and 30 textual analyses were performed over a period of six months.

Table 1 Data Sources

Data source	Number	Purpose
Unstructured interviews	31	To explore an individual's: • nurse identity • behaviour • views of information systems Used after participant observation to explore what was seen and not seen,
Semi-structured interviews	16	To probe more deeply into any issues raised by the analysis. Performed after initial analysis.
Participant observation	20	To gain a full understanding of how the participants interpret their interactions with technology and each other
Text	30	To gain a fuller understanding of the meanings of objects

3.6.1 Participant Observation

Participant observation is one of the main qualitative methods of field research within healthcare (Bergland & Kirkevold, 2006). Using this method, I approached participants in their own environment and used a combination of passive and moderate participant observation. Passive participant observation exists when the researcher is in the environment observing directly. However, I acted only as an observer; I did not interact with individuals. I was thus unable to asks questions regarding my observations (Dewalt & Dewalt, 2002). Moderate participant observation occurs when the researcher is present

in the environment and identified as a researcher, and occasionally interacts with the individuals. This interaction can be in the form of informal interviews or in the form of informal group discussions (Dewalt & Dewalt, 2002; Spradley, 1980) .

Moderate participant observation was ideal for this research because this method allows for some interaction, along with observation, within the research setting. In this manner, I was able to gather data using a range of methods, including informal interviews and quick questions, direct observation and group discussion when appropriate (Dewalt & Dewalt, 2002). This type of observation is a common technique within health-related research and the nurses seemed comfortable with this approach. After introducing myself as a researcher who was either performing interviews on the floor, or had already performed interviews on the floor (they had all received an email asking for participation in advance of my arrival and therefore knew who I was), and asking permission to observe, I observed the nurses as they interacted with their Information Systems and each other at the nursing station on the floor, in their break-room or in the hallways.

For privacy reasons, I never entered a patient's room and never looked at the computer screen or any paper documents the nurses attempted to show me. While I could perhaps have developed a deeper understanding by performing observation in a patient's room or by looking at the details on the computer screen or paper documents, I did not have ethics approval for that additional information. While this could be considered a limitation to the research, I tried to mitigate this limitation by asking nurses during their interviews to describe, without compromising their privacy, what they would do in the patient's room and what they would do with the data available on the computer screen or in the paper documents.

While I used moderate participant observation whenever possible, there were times when it was not feasible. For example, sometimes the floor was very busy or there was an atmosphere in which I did not feel comfortable using the methods described above. In situations like these, I used passive participant observation and simply observed without speaking to anyone. Through this type of observation, I did not gain the same type of data as I did with moderate participant observation. For example, I was not able to ask a participant for clarification of what they were doing or why they were doing something.

However, passive participant observation did "provide opportunities for extensive exposure to the social-actors' life-world" (Nandhakumar & Jones, 1997; 115).

Both of these types of participant observation allowed for information to be gathered using a range of methods but did not require participation that may put others in danger, as I am not a professional healthcare provider (Agar, 1996; Dewalt & Dewalt, 2002) . Finally, this method, when added to the interviews and textual analysis, allowed me to follow Mead's advice within SI to develop a holistic understanding of the phenomena under study.

While participant observation was very useful, I was not able to perform participant observation for all my interview subjects. For example, due to understandable privacy concerns for the patients or other employees, I was sometimes not allowed to be on the floor of the hospital. Additionally, some nurses I interviewed did not want their co-workers to know they were participating in this type of research. Finally, some nurses worked in remote locations and, for the sake of convenience, we met in a more centralized location. In any of these situations I tried to reduce any limitations this might have caused by asking nurses during their interviews to describe, without compromising their privacy, what I would have seen had I been allowed on the floor.

3.6.2 Interviews

Interviews were a valuable method of data collection in this research. Through interviews, I was able to access a person's interpretation of his or her nurse identity, Information Systems and his or her behaviour. Interviews are commonly used in SI research in order to access a person's interpretation of their experiences (Gillham, 2005; Prasad, 2005; Solomon, 1983). A mix of semi-structured interviews and unstructured interviews (Babbie, 1983; Denzin, 1989; Fontana & Frey, 1994) was used in this study. Most of these interviews were recorded and transcribed. In some cases, the subject was not comfortable with my recording the interview; in these situations I took very detailed notes throughout and after the interview.

The interviews in this study were conducted face to face. Although telephone interviews were considered as being more convenient, they were eventually rejected for this study due to the loss of possible non-verbal cues (Berg, 2009). In order to ensure each interview was valuable, I performed two practice interviews prior to the start of the formal interviews. These preliminary interviews allowed me to refine both my skills and my approach.

Interviews were conducted in settings that were convenient and comfortable for the participants. Most chose to be interviewed in their workplace (15), a coffee shop (10) or their home (3), with a further three interviews took place in a convenient restaurant.

An interview checklist, which included all the material needed for the interview, was developed (see Appendix C). Prior to the interview, I referenced this checklist to ensure that I had all my needed supplies (a notebook, a pen, a digital recorder, extra batteries and a letter and consent form) and that they were functioning properly. This was done to avoid disruptions and to make sure each interview could be used fully in my research.

Each interview started with casual conversation. This was done for two reasons: to put the participant at ease and to explain the purpose of the study. The voluntary nature of the research was emphasized. After the consent form was signed and permission for recording the interview was secured, the recorder was turned on and the interview proceeded.

Given the importance of interviews in this research it was essential to ensure that the interview data were of high quality. This quality is often influenced by the relationship between the researcher and the participant (Popay, Rogers, & Williams, 1998). As a result, I attempted to build rapport with my participants through the format of the interview, my behaviour and my statements. Specifically, the format of the interviews, both unstructured and semi-structured, was a conversation rather than a list of questions and answers. During the interviews, I also used the active listening techniques of attending behaviours (such as making eye contact), open questioning (Why did he react that way?) and paraphrasing (So, for you, giving care is about listening to the patient) to show the participant that I was interested in what they were saying (Lang, Floyd, &

Biene, 2000). Finally, I reminded participants at the start of the interviews, and throughout when necessary, that there were no right or wrong answers and that any experience, feeling, belief or perspective that they wanted to share was of interest to my research.

The pace of the interviews was adjusted to suit individual participants' available time and interest. I told the participants at the start of an interview that the interview would only last as long as they wanted. Interviews in this study lasted from 30 minutes to 118 minutes, with a mean of 45 minutes. Although Glaser (1998) does not recommend recording interviews in grounded theory research, I decided to record these interviews where possible in order to both ensure the data were captured and the conversation-like feeling of the interview was not ruined by note-taking. However, 12 interview subjects were not comfortable being recorded; in those situations I ensured that I wrote detailed notes both during and after the interview.

3.6.3 Unstructured Interview

Unstructured interviews, common within sociology, were used in this research to explore the interpretations of information systems by individuals. By developing, altering, and generating questions during the interview (Fontana & Frey, 1994), I was able to avoid leading questions that might compromise the findings by asking broad questions in a natural, free-flowing conversation. I attempted to both probe beyond the expected answer and explore any inconsistencies(Herman & Bentley, 1993). Through unstructured interviews, a researcher is able to explore a not fully understood or appreciated phenomenon (Spradley, 1979).

Within this research, unstructured interviews were used first to explore an individual's nurse identity, behaviour and views of information systems. Additionally, they were used after participant observation to explore what was seen, and not seen, in the participant observation session.

Following the guidelines of performing unstructured interviews, I did not create and follow a set of prepared questions. However, I did have a series of broad themes I wished

to explore (Lindlof & Taylor, 2002). While I did not have concrete questions prepared, I did have an initial interview question, broadly posed and designed to encourage a conversation, for example, "Tell me about being a nurse." Given the type of interview I was performing, I was prepared to change the themes being explored based on the specific interview. For example, when interviewing Carolyn, a retired nurse, I had identified the theme of age as being of interest. I was curious to see if she felt that age had an impact on a nurse's behaviours and interpretation of an IS. I identified this theme in other unstructured interviews, as well as in my literature review. However, early in the interview Carolyn spoke of education and her daughter's experience in getting her Bachelor of Science in Nursing, as well as her own experience in nursing education when she was young. Instead of attempting to return to the theme of age, we continued discussing these experiences and how Carolyn felt about them. Based in part on this discussion, I identified the importance Carolyn placed on giving care to a patient, which subsequently became a valuable theme in my analysis. I would not have identified this theme in a more structured interview in which I was not able to adjust the discussion based on the specific interview. Carolyn and I returned to the theme of age later in the interview.

3.6.4 Semi-Structured Interview

The second type of interview I performed is the semi-structured interview. Similar to an unstructured interview, the semi-structured interview involves focusing on themes. However, unlike the unstructured interview, this method focuses on asking a number of predetermined questions related to a specific theme. This method permits the interviewer to deviate from their list of questions to follow the answers of the interviewee. In general, within this type of interview the interviewer has an interview guide, which is an informal "grouping of topics and questions that the interviewer can ask in different ways for different participants" (Lindlof & Taylor, 2002; 195). This guide helps the researcher to focus an interview on the topics at hand without constraining them to a particular format. This freedom can help interviewers tailor their questions to the interview context/situation and to the people they are interviewing (Lindlof & Taylor, 2002). The goal of this

interview is to capture as much as possible of the subject's thoughts about a specific theme instead of a broad theme (Turiel, 1983).

Within this research, I performed semi-structured interviews after my initial analysis of the unstructured interviews, text and participant observation, in order to probe more deeply into any issues raised by the analysis. For example, after my analysis of both my unstructured interview with Carolyn and some textual analysis, I identified “care” as a specific theme to be more fully investigated. Based on my early analysis, I developed an interview guide to use in semi-structured interviews with Carolyn and with later interviewees (see Appendix D). I was thus able to focus these interviews on this theme and ensure I had fully explored it for further analysis. The use of unstructured interviews followed by semi-structured interviews is often used in SI research (Erlandson, Harris, Skipper, & Allen, 1993).

3.6.5 Textual Analysis

I used textual analysis in my research to gain a fuller understanding of the meaning given to nurse identity and technology within the workplace. Several forms of texts were analyzed, including nursing textbooks, the websites of professional associations and other publications, as well as specific workplace publications. I gathered these texts mostly through recommendations from interview subjects. In addition, I gathered texts that were referenced by other texts. For example, many textbooks reference Nightingale’s book Notes on Nursing, so I analyzed this textbook as well. Finally, I gathered a few texts through participant observation. For example, in one of my participant observation sessions I noted that several nurses were using a large book. I asked them what the book was and what they were using it for. I then added the book to my collection of texts to analyze (Appendix E).

These texts allowed me to access interpretations developed and taught through an institution’s curriculum and through the profession’s cultural interactions between new members and older members (Mechanic, 1962). The use of texts is a process of professional socialization within both professional education and the workplace, and this has been investigated by various researchers (Mechanic, 1962) In this socialization

process, the individual acquires the knowledge, skills and the acceptance and internalization of the values and norms of the profession (Cohen, 1981; Jacox, 1973).

This methodology allowed me to develop an understanding of the ways members of various cultures and subcultures make sense of who they are, what objects are and how the individual and the objects fit into the world in which they live (McKee, 2003). This is a post structuralist approach that fits well with the other methods chosen. Within this approach, texts are read and analyzed to gain an understanding of both the intentions of the author and the possible interpretations of the reader. The researcher interprets the texts in order to try and obtain a sense of the ways in which, in a particular culture at particular times, people make sense of the world around them. Specifically, a text is analyzed to look for clues or traces of how the culture being studied is making sense of the world (McKee, 2003). While the term "text" implies a written document, within textual analysis the term refers to anything from which an individual or group can make meaning (McKee, 2003). Thus, a text can be a television show, a poster or a play as well as a written object (McKee, 2003).

There are several things that are important to understand before textual analysis can be performed. The first is that a text cannot be analyzed without a specific question (McKee, 2003). For example, a textual analysis of a healthcare textbook on the subject of nurse identity and technology for this thesis will have a very different result as compared to an analysis of the same textbook with questions regarding how gender is implicated within the profession. The second is that the understandings produced by textual analysis are only useful to the researcher if he or she has knowledge of sense making within the culture or subculture of interest. This knowledge can be gained through interviews and participant observation (McKee, 2003).

The third is that, within every text, it is necessary to identify both the dominant discourse and any discourse from the other. The dominant discourse is a Foucaultian term that refers to a specific way of thinking about, talking about and framing a subject that is the most common or accepted way. The term is often used to refer to the institutionalized way of thinking about a topic (Frohmann, 1994). However, it is important to note that, while in each culture or subculture some discourses will be dominant, there will always

be other discourses that are equally valid and valuable, and this “other” may have a different interpretation of the text. Both the dominant and the other must be considered to gain a better understanding. Not only should what is written in the text be considered, but absences – what is missing from the text – need to be considered too. This is because texts will often systematically exclude certain kinds of representations in order to not draw attention to them.

3.6.5.1 Literature

As stated earlier in this chapter, my methods are based on Strauss’ grounded theory research because I did access the literature before I began data collection and analysis. However, once I began my analysis I found myself needing to return to different literatures to make sense of what I was uncovering. Thus, in accordance with grounded theory, I accessed the literature as an additional source of data to expand understanding of concepts and to fill any conceptual gaps (Cutcliffe & McKenna, 2004). In addition, in accordance with writing grounded theory research, the data gathered from the literature at this time appear in the result chapters and not in the literature review chapters (Cutcliffe & McKenna, 2004) .

3.6.5.2 Quotes and Examples

Throughout the research process I noted quotes and examples from the data (e.g., an interview or field notes) that could be used to illustrate a concept. For the most part, these quotes and examples were echoed in other data. If the quote or example was unique in the data this was noted.

3.6.6 Memos

In addition to coding, I wrote theoretical memos throughout the data collection and coding process (Glaser 1998). These were used to record my ideas, conceptual insights, questions, and directions for further data collection (Strauss & Corbin, 1998). Each memo was dated and contained a heading denoting the concepts or categories to which it pertained. The memos were then used in the theoretical coding stage. Some examples of these memos can be found in Appendix F.

3.7 Data Analysis Approach

Research of this type produces a great deal of data (Pope & Ziebland, 2000). It is therefore necessary to address the organization of the data. As has been discussed earlier, the data came from recording, transcriptions, notes taken before and after the semi-structured and unstructured interviews, notes from participant observation and text and notes from the textual analysis. I transcribed all notes and data immediately into a Microsoft Word document with numbered pages. Additional literature was accessed and placed into Microsoft Word later in the analysis process. Following transcription, I reviewed the notes, text, and transcripts for accuracy. For example, after the completion of an interview, I transcribed the audio-recorded data verbatim. All identifying information was removed and replaced with numbers and/or generic terms to represent that information. Following this transcription, I listened to the recordings and reviewed my transcripts for accuracy. At this time I also added emphasis, pauses and significant non-verbal language from my notes to the transcripts (Appendix G).

These documents were then uploaded to NVivo 8. This program was chosen because it allows for the classifying, sorting and arranging of data during the exploration of the data in true grounded theory fashion.

3.7.1 Review of Data

Data analysis began after the first participant observation session and continued through all participant observation sessions, textual analyses and interviews. This is in accordance with grounded theory methods.

Analysis began with a review of the data. Any notes were read several times, with notes taken in a separate, but linked, document. If the source was an interview, I listened to the recording several times. Special attention was paid to the nuances of meaning carried by voice inflection and voice tone, which were not readily available in my notes or the transcription, and these nuances were noted. The transcription was also read several times to allow additional immersion in the data and to gain a holistic sense of the interview. Again, notes were taken in a separate, but linked, document.

3.7.2 Constant Comparative Method

A constant comparative method is one of the foundations of grounded theory analysis (Glaser & Strauss, 1967) In this method, the researcher moves back and forth between data collection and data analysis. This method is indispensible for generating concepts and conceptual growth within grounded theory (Glaser & Strauss, 1967). By using constant comparison, I continuously compared incoming data with previous data and the concepts or categories that had emerged during earlier data analysis. In addition, I continuously revisited and re-analyzed old data as new concepts appeared in newer data.

Through this constant comparative method I was able to verify the final categories by continuously integrating new theoretical concepts into the developing categories as new data was considered (Glaser & Strauss, 1967). This process of constant comparison was performed through a series of reiterative coding steps: initial coding, focused coding and theoretical coding (Charmaz, 2006), described below.

3.7.3 Initial Coding

The first coding step in the constant comparative method is initial coding. This coding involves breaking down the data into the basic incidents (an observation, statement or item of text) and assigning a code to these concepts (Charmaz, 2006). By assigning a name or a label to an incident, the researcher can begin to make concrete and isolated incidents abstract (Locke, 2001). By making these incidents abstract, I was able to remain open to new and unanticipated theoretical directions (Charmaz, 2006). For example, I coded Mike's statement: "What's care? I don't know . . . It's what I do." (Mike, interview #2) using the code "definition of care". I also coded Beth's description of her work: "I take care of people when they're in the ICU." (Beth, interview #1) as "take care".

In accordance with SI, I was particularly interested in preserving the participants' understandings. In order to accomplish this, as I coded the data I used in vivo codes (direct words for phrases used by participants) wherever possible. After I used in vivo

codes, I constructed specific codes to represent the meaning elicited from the in vivo codes (Charmaz, 2006).

All data, from field notes, textual analysis notes and transcripts were coded line by line. At the beginning of this study, I coded everything; I often coded the same data incident many times, with many different codes. This was done in order to fully explore the different ways in which each incident could be explored and understood. By the end of my initial coding I had more than 800 different codes. By naming these incidents in many different ways, I was able to think "broadly about the possible meaning of the incident" (Locke, 2001; 48). I then compared codes and merged them into new concepts, and eventually renamed, if necessary, and modified them. All of these codes were conditional at this stage (Charmaz, 2006). Table 3 outlines illustrative examples of five in vivo codes and the data that these codes developed from. These codes all helped form the core category of care developed in the next stages.

Table 2 Initial Coding Examples

In vivo code	Evidence
80/20 rule	"Like, they're thinking about the here and now and we've gotta get this stuff done, we've gotta get today done. So, I think, I went to a conference once and it talked about the 80/20 rule, I think it was called the 80/20 rule, and it was about having 80% of your time for your patient care and what-not and then 20% for learning initiatives." (Tom, interview #1)
Actual care	A staff nurse would work on the unit, so um, they're the ones who provide the actual care to the patients. Where myself, some of the nurse clinicians would do more what we call paperwork or desk work. So, as new initiatives are coming out, new information we try to encourage staff to learn about it, we teach them. However, um, depending on what it is, we would look at that and then sort of decide is it just something, information that needs to be disseminated or is there actual teaching that needs to go on. So, um, but the staff nurses do all the hands-on care. (Carol interview #1)
Desk work	A staff nurse would work on the unit, so um, they're the ones who provide the actual care to the patients. Where myself, some of the nurse clinicians would do more what we call paperwork or desk work. So, as new initiatives are coming out, new information we try to encourage staff to

	learn about it, we teach them. However, um, depending on what it is, we would look at that and then sort of decide is it just something, information that needs to be disseminated or is there actual teaching that needs to go on. So, um, but the staff nurses do all the hands-on care. (Carol interview #1)
Administration - positive	Yeah, I'm, I'm running a really complicated clinic. I have, right now we have a thousand people on our list. I have 300 active patients whose care I'm coordinating. And its, and at the end of the day, if something doesn't get done for them and they're not ready for surgery, I'm, I'm where the buck stops. So, it's, it's fun, and challenging and, Um, but it's all coordination. It's all traffic directing, it's all .....unfortunately it doesn't have any of the, really doesn't have any of the hands on care, but that's overshadowed by the amount of responsibility and autonomy . . . (Becky, interview #2)

As can be seen from this table a wide variety of codes were developed as I first explored the data. A variety of perspectives were used to ensure that the codes developed from the data. This stage of coding was not a linear method. Coding and modifications were made throughout the period of analysis. Although a lengthy and labour-intensive process, initial coding performed in this manner was an absolutely necessary first step to ensure the understanding developed was grounded in the data.

3.7.4 Focused Coding

The second phase of data analysis was focused coding. This occurred after I had gained some analytic direction through initial coding. This direction was gained by tentatively identifying the core variable (Charmaz, 2006), or the main issue within the data. The core explains the story of the behavior of the individuals (Charmaz, 2006). After the core is identified, the data that relates to the core and the other concepts are set aside. This method allows for the limits of the study to be placed.

During focused coding, I was able to use the most significant codes I had developed during initial coding to quickly sift through large segments of data. This coding was more directed, selective and conceptual (Charmaz, 2006). During focused coding, I

compared the different initial codes to newly obtained data in order to develop the focused codes. I also compared the focused codes to new data in order to further refine them (Charmaz, 2006). These refined focused codes were then compared to each other and grouped into concepts according to their shared meanings. These concepts were then condensed, collapsed or hidden in order to develop more abstract categories and sub-categories and to focus the understanding on a reduced number of codes and data incidents (Charmaz, 2006).

While I performed these tasks I also paid attention to the data that did not relate to the most significant codes, in order to ensure that I did not miss any significant incidents that required new codes. Table 4 outlines illustrative examples of original in vivo coding that began the development of the core category and the parts of care that were either merged or renamed during the focused coding process.

Table 3 Merged/Renamed Coding Example

Code	Evidence	Merged/renamed Codes
Approaches to caring – emotional labour Spiritual care Advocacy Emotional support	Students' images were concerned with human aspects of nursing, such as giving emotional support, helping patients or their carers cope with illness, filling them with encouragement, being their advocate and being their ally in the face of adversity. These approaches to caring have been described by various authors as spiritual care, intimate care and emotional labour. (professional learning in nursing)	Emotional care
Desk work	"A staff nurse would work on the unit, so um, they're the ones who provide the actual care to the patients. Where myself, some of the nurse clinicians would do more what we call paperwork or desk work. So, as new initiatives are coming out, new information we try to encourage staff to learn about it, we teach them. However, um, depending on what it is, we would look at that and then sort of decide is it just something, information that needs to be disseminated or is there actual teaching that needs to go on. So, um, but the staff nurses do all the hands-on care. "	Informational Care
Takes you away from the bedside	having to do all that feels often like it takes you away from the bedside and for someone who's been a bedside nurse for a long time, that's always a struggle. But I think that's a struggle we dealt with even before we had so much technology (Gail, interview #2)	Interferes with care
80/20 rule	"Like, they're thinking about the here and now and we've gotta get this stuff done, we've gotta get today done. So, I think, I went to a conference once and it talked about the 80/20 rule, I think it was called the 80/20 rule, and it was about having 80% of your time for your patient care and what-not and then 20% for learning initiatives." (Tom, interview #1)	Not all care
Administration - positive	Yeah, I'm, I'm running a really complicated clinic. I have, right now we have a thousand people on our list. I have 300 active patients whose care I'm coordinating. And its, and at the end of the day, if something doesn't get done for them and they're not ready for surgery, I'm, I'm where the buck stops. So, it's, it's fun, and challenging and, Um, but it's all	

	coordination. It's all traffic directing, it's all .....unfortunately it doesn't have any of the, really doesn't have any of the hands on care, but that's overshadowed by the amount of responsibility and autonomy . . . (Becky, interview #2)	
Actual care	A staff nurse would work on the unit, so um, they're the ones who provide the actual care to the patients. Where myself, some of the nurse clinicians would do more what we call paperwork or desk work. So, as new initiatives are coming out, new information we try to encourage staff to learn about it, we teach them. However, um, depending on what it is, we would look at that and then sort of decide is it just something, information that needs to be disseminated or is there actual teaching that needs to go on. So, um, but the staff nurses do all the hands-on care. (Carol interview #1)	Direct care Informational care Organizational care

Table 5 illustrates examples of some of the original in vivo coding and how they were refined during this process.

Table 4 Refined Coding

Original Code	**Refined Code**
Indirect care	Informational care
	Organizational care
Against care	Against care
	Interferes with care
Hands on care	Direct care
Presence	Emotional care
Organization task	Organizational care
Care giver	Care

3.7.5 Theoretical Coding

After focused coding, I used theoretical, or axial coding to develop an understanding of the possible links between the different categories developed and refined through initial and focused coding (Locke, 2001). In this manner I attempted to advance my coding and analysis beyond simple description of my data and into themes (Charmaz, 2006). These codes are then used to bring together the separate categories in a way that allows the data and analysis to tell a coherent story (Charmaz, 2006).

It was very important during this type of coding to avoid trying to force relationships between the categories (Charmaz, 2006). I therefore moved away from my electronic data; I found that by hand sorting theoretical ideas without access to my data and earlier codes, I was able to look at my data from a different perspective and with an open mind.

My hand sorting of theoretical ideas took place over several months. In this coding stage I spread out theoretical memos that had been written throughout my data collection and coding on a large surface. I then systematically reviewed these memos through constant comparison. I made notes, organized the memos into different groups and layouts to see how different categories could theoretically relate to other categories and properties. I then used diagrams to try to visually understand the relationships among the categories and facilitate the creation of subcategories. I rewrote memos into smaller memos when parts of the memo appeared to fit in different places. I continued sorting, comparing, rewriting and resorting until I developed an integration of categories and sub categories.

During this coding stage, I was able to identify more concretely the core category of this understanding. A core category accounts for most differences within the individual's understanding of the nurse identity, his or her behaviour and views of information systems in the workplace. The other categories identified within the research are then integrated around this core and become sub categories (Strauss & Corbin, 1990). The terms "category" and "categories" are used in a unique way in grounded theory. They are defined by Corbin and Strauss in this way:

> *"Categories are higher in level and more abstract than the concepts they represent. They are generated through the same analytic process of making comparisons to highlight similarities and differences that is used to produce lower level concepts. Categories are the "cornerstones" of developing theory. "*
>
> (Strauss & Corbin, 1990; 7)

After the analysis of the first 10 interviews, 2 participant observation sessions and 10 texts, an initial core category for this study was identified as "care-giver." The term "care" was literally used by participants to describe what they did as nurses, who they were and how they related to information systems. The temporary core category was later changed to "care realities" to better reflect the extent to which even the term "care"

is exposed to an individual's understanding. The core category then became a guide for further data collection and theoretical sampling. However, the coding I subsequently performed was not limited to those categories that related to the core category, in order to ensure that the core category was not assigned prematurely.

Table 6 outlines some of the codes refined and developed around the core category of care. The column Refined Coding 1 outlines four codes that were developed in the stage of focused coding to represent views held by different nurses of tasks they performed as nurses. The column Refined Coding 2 outlines four codes that were developed in the stage of focused coding to represent four types of care that were identified within the data. The column Theoretical Code outlines a theoretical code that developed through an iterative process from these two sets of coding.

Table 5 Theoretical Coding

Refined coding 1	Refined coding 2	Theoretical Code
Against care	Direct	Care reality
Mixed	Emotional	
Interfers with	Informational	
Care	Organizational	

3.8 Criteria for Evaluation

Within this research, I used the traditional set of criteria for determining the methodological rigor and empirical grounding within grounded theory research.

3.8.1 Grounded Theory Criteria

Four criteria were proposed by Glaser and Strauss to judge the quality of a proposed relationship or theory. These criteria were fit, relevance, workability and modifiability (Glaser, 1978, 1998; Glaser & Strauss, 1967).

The criteria ***fit*** relates to how closely the proposed concepts and relationships represent the data incidents. If a proposed concept or relationship is discovered within the data and the data was not made to be placed into a pre-established concept or relationship, the relationship or concept is said to "fit" (Glaser, 1978; Glaser & Strauss, 1967). The criteria

relevance relates to how well the study addresses the issues and concerns of the participants (Glaser, 1978; Lomborg & Kirkevold, 2003). The criteria ***workability*** relates to how well the theory explains the issues under study (Glaser, 1978; Lomborg & Kirkevold, 2003). The criteria ***modifiability*** relates to how well a theory can be altered when new data is introduced (Glaser, 1978; Glaser & Strauss, 1967). Grounded theory research is never said to be right or wrong, it just has more or less fit, relevance, workability and modifiability.

Based on these criteria, the Grounded Theory method should produce a data-driven, dynamic theory that will work in practice (Lomborg & Kirkevold, 2003). However, while it is a valuable place to start, it does not explain how to ensure that grounded theory research has as much fit, relevance, workability and modifiability as possible.

Lomborg et al (2003) stated that, because the understanding developed emerges from the data, it must preserve experiences and understandings of the subjects and compose a recognizable story. The test for these criteria in the story developed from this research is that when retold to other nurses, nursing students and nursing instructors, the story would make sense and would resonate with their experiences.

To ensure that grounded theory research has the best fit, relevance, workability and modifiability as possible, Strauss named three main elements that are required: theoretical sensitivity, theoretical sampling and comparison (Strauss & Corbin, 1998). Theoretical sampling and comparison have been discussed earlier. Theoretical sensitivity is also important to consider.

3.8.2 Theoretical Sensitivity

By being aware of the analytic depths and the subtleties of the data, a researcher is said to have theoretical sensitivity (Strauss & Corbin, 1998). This sensitivity is developed through initial reading and experience within an area, and is often developed further during the research process (Strauss & Corbin, 1998). While Glaser (1978) believed that the best way to develop theoretical sensitivity was to enter the research setting with as few preconceived ideas as possible, Strauss and Corbin (1998) point out that entering a

research setting in this way may limit the researcher because he or she may not be able to recognize and respond to the data. Thus, a need for a balance is needed to research theoretical sensitivity (Strauss & Corbin, 1998).

In this research I attempted to meet the criteria of theoretical sensitivity by performing my literature review in two stages and by keeping my first round of interviews unstructured, in order to ensure that I did not prematurely close any path in the conversation. In addition, I developed more theoretical sensitivity when I interacted with my data by remaining open and reflective. All coding performed early in my research were treated as provisional, and I continuously checked my coding against the new data (Strauss & Corbin, 1990).

3.8.3 Rigor

Another method to ensure the criteria are met is rigor. In grounded theory research, rigor is viewed in terms of theoretical rigor and procedural rigor.

Theoretical rigor was met by ensuring that the research question, theoretical approach and research methodology were all congruent (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Procedural rigor was met by ensuring data collection procedures were followed correctly. In addition, self-criticism was performed to avoid any distortions or incorrect interpretation (Morse et al., 2002). Both procedural and theoretical rigor were furthered through the use of a detailed reflective journal and notes.

3.8.4 Notes

When using participant observation, it is very important to keep several different types of notes to ensure that the research does not have to rely on faulty memory during analysis. During participant observation, I kept jot notes, field notes and inference notes as recommended by Dewalt and Dewalt (2002).

Jot notes are handwritten, short notes about informal interviews and observation taken as soon as possible. When I was making these notes I quickly recorded phrases, people and events as soon as possible after I had observed them. These are not formal notes and did

not get uploaded into my analysis program. Instead, I used the information in the jot note as I wrote my field note. A total of 68 jot notes were taken (Appendix H).

The field notes are more formal than the jot notes and are used in my analysis. Field notes are the primary method of capturing data from participant observation. In the field notes I recorded my observations; during my analysis, I used these notes to develop a descriptive narrative. Despite their importance, very little has been written about how to make useful field notes (Dewalt & Dewalt, 2002). Most writing on field notes is made up of not of methods to create field notes, but of examples of valuable field notes. Dewalt and Dewart highlighted the fact that each participant observation research is different and the researcher will have to adjust their note keeping to these unique circumstances (Dewalt & Dewalt, 2002). A total of 68 field notes were taken.

During a participant observation session, I took short jot notes, if it was possible for me to do so without drawing attention to myself. Immediately after a participant observation session, I found somewhere quiet (often the hospital coffee shop or a coffee shop near the hospital) and write more jot notes. That evening, at my computer, I would write my more formal field notes and upload them to my analysis software. These field notes included descriptions of the people I saw and/or spoke to (including their age, type of nursing, appearance, etc.), an in-depth description of the location (including the set up of the nursing station, break room, the hospital and floor layout, etc.), an in-depth description of the behavior of the individuals observed and the individual's verbal and non-verbal communication. I also recorded my impressions, thoughts, concerns and explanations in the field notes. I made it clear that these observations were coming from me and not directly from the observation. I developed these techniques from Spradley (1980) and Dewalt and Dewalt (2002), as well as from trial and error.

In addition to jot notes and field notes, Dewalt and Dewalt (2002) suggest keeping inference notes for each participant observation session. In these notes I drew together collected data and made connections between concepts, interpreted new concepts and developed or identified new concepts from my data. These notes made up of inferred meaning are kept separate from the field notes so that I could create new interpretations, concepts and connections while revisiting field notes without being influenced by earlier

inferences (Dewalt & Dewalt, 2002; Puddephatt & Shaffir, 2009; Spradley, 1980). A total of 20 inference notes were taken.

Despite the fact that most of the interviews for this research were recorded, I still kept notes. This was for two reasons: first, I kept notes during the interview so I would still have the data to analyze if there was a technical problem with my recording device; second, I kept notes to ensure that I could capture relevant data that was not recorded. To accomplish this I kept observation notes. These are detailed notes about what the researcher sees, hears and feels that may not be reflected in the recording.

For example, in one of my interviews I noticed that the subject looked very uncomfortable and started to answer the questions very quietly and quickly when a group of five nurses walked into the cafeteria where we were sitting. Once they left, the subject became much more talkative and returned to earlier questions and expanded on the answers she gave. I wrote down this experience in my observation notes. I used this note in two different ways. First, when I returned to the interview for analysis, the observation note reminded me why the tone of the interview changed briefly. If I had not had the note I might have wondered if the earlier question about the use of computers at a patient's bedside had upset the subject. This analysis could have led me down a very different and possibly inaccurate path in my analysis and findings. Second, I used this note when I considered the impact of peers and co-workers on an individual's understanding and behaviour.

I made my observation notes both subtly during the interview and immediately afterwards in a private spot. Dewalt and Dewalt comment in their method text that they have both often made notes in elevators, washrooms and broom closets following interviews (Dewalt & Dewalt, 2002). I often made these notes in a coffee shop or in my car. A total of 48 observation notes were taken.

All of these notes were used within the analysis to add depth and clarification to the development of my themes and the illustration of my themes in this document.

3.8.5 Reflexive Journal

I kept a daily reflexive journal throughout this research. In this journal I recorded any emotional reactions, learning, attitudes and ideas. This journal also critically reflected on the entire process and was used to maintain transparency (Mays & Pope, 2000). This was also used in my analysis (Erlandson et al., 1993). Appendix I contains some examples of my journal entries. My journal contains 200 entries that were made as I collected data and performed the data analysis.

3.9 Summary

This chapter outlined the grounded theory method used in this study. This chapter addressed the core aspects of grounded theory, including sampling, data generation strategies and sources, constant comparative analysis/coding strategies and steps, memo writing, theoretical sensitivity and rigor. Recruitment procedures and ethical considerations were also outlined.

In the next chapter, the understandings produced in the analytical process are examined and theoretically developed.

Chapter 4

4 Understandings Developed

The purpose of this research was to generate a theoretical understanding of the behaviours of nurses working with information systems in the workplace. By doing this I hope to begin the process of understanding how an individual's identity may impact his or her IS use. I attempted to understand how the individual nurse interprets different IS objects within his or her workplace and within his or her nursing identity and how this understanding may affect his or her behavior with respect to the IS objects they encounter.

This research identified a multi-faceted understanding of care as central to the nursing identity, as care was constructed differently for each participant. Care reality is the central motif by which nursing "work" is represented (Barley, 1996). An individual's care reality, helps shape the meaning of nursing objects, especially information systems. This understanding of care, and the meaning of nursing objects, needs to be maintained and negotiated when the individual nurse interacts with other nurses with different care realities. This chapter explains the core category (care reality) and addresses the impact of the core category on the meaning of nursing objects. It then addresses the ongoing process of negotiating the care reality of an individual and this process' impact on the meaning of different information systems.

4.1 Participant Demographics

Basic demographic information was not collected from participants using a pre-designed questionnaire. Instead, demographic data was acquired through the interview process. 26 participants were female and 5 participants were male. This division is not surprising since nursing is a female-dominated profession (Boughn, 2001). Four nurses were in their 20s, eight were in their 30s, four were in their 40s, seven were in their 50s and seven were in their 60s. Finally, fifteen nurses were bedside nurse and seventeen nurses were specialists. The term bedside nurse was chosen, from the data, to describe nurses whose

primary duties involved direct care to the patient in a hospital setting. The term specialist nurse was chosen from the interview data to represent nurses with expanded practice roles. This includes, but is not limited to, operating room nurses, clinical nurses and family health nurses. In order to ensure the anonymity of the participants the demographic further described.

4.2 The Importance of Care

In order to approach an understanding of how an individual's identity shapes his or her interpretations of and behaviour with information systems, it is first necessary to understand the nursing identity. This is based on the first premise of symbolic interactionism: actors are assigning meaning to the IS based on their identity as a nurse.

One of the most striking things gathered from the interviews was that, despite the age, gender and background differences of the nurses, they all used the word "care" to describe being a nurse:

> *"What I do in nursing is I do primary care for my patients, I do all my, all the care for my patients" (Patricia, interview #1).*
>
> *"I do a lot of basically direct patient care" (Vanessa, interview #1)*
>
> *"I just want to care for people" (Sarah, interview #1)*
>
> *"I never met a nurse who wanted to go into nursing to give needles, they all wanted to care for people" (Emily, interview #1)*

This section discusses the importance of the concept of "care" within the nursing identity. It begins by confirming, through data analysis, a previous finding in nursing research that care is the core, cohesive force that unites individual nursing identities. It then returns to Symbolic Interactionism to explore the importance of this finding. The view of care in the nursing literature is then contrasted with the view of care developed from these data.

A complex understanding of the concept of care, articulated by the participants within this study, is introduced. Within this understanding, care is not a uniform construct; instead, it

is a complex and varied concept that is constantly being questioned, reinforced or changed. This understanding is based on the first part of the second premise of Symbolic Interactionism, in which the meaning of an object (care) develops and changes (Blumer, 1969). It is made up of four different elements, each of which has different significance for different individuals: direct care, emotional care, informational care and organizational care. Each element will be explored in this chapter.

To finish this section, the significance of each element of care for the individual nurse is established. This is then linked to the meaning individuals assign to nursing objects through the core category of a care reality, a concept developed from the analysis of this data. I then return once more to Symbolic Interactionism to develop an understanding of the impact of an individual's care reality on the individual nurse's interaction with technology.

4.2.1 Care and the Nursing Identity

Through my data analysis and initial coding, I identified that the nursing identity is framed through the concept of care. The major element identified within the theoretical coding that led to this affirmation was the description of the nursing identity by participants and within nursing texts. Specifically, all nurses, when asked to describe their job, their role as nurse, or to talk about being a nurse, used the word "care" at least once in the interview:

> *"I'm on a veterans' unit, so it's patient care, of physically disabled people" (Mark, interview #1).*
>
> *"What's care? I don't know . . . It's what I do." (Mike, interview #2)*
>
> *"I take care of people when they're in the ICU." (Beth, interview #1)*

This focus on care to frame the nursing identity was also apparent in texts analyzed for this research. For example, in Fundamentals of Nursing (Taylor, Lillis, & LeMone, 2001) a textbook recommended by one nurse, and part of a grouping recommended by many nurses), the first chapter traces the history of nursing from early civilizations to the

present day. In this chapter, nurses' experiences and motivations throughout history are linked through care to the identity of caregiver. Specifically, the chapter begins by stating:

> "*from the beginning, the nurse has been regarded as a caregiver"* (Taylor et al., 2001; 7).

It then outlines the role of the nurse in early civilizations as being:

> "*the mother who cared for her family during sickness by providing physical care"* (Taylor et al., 2001; 7).

The reader is then told that:

> "*this caring role of the nurse continued to grow to the present"* (Taylor et al., 2001; 9).

This framing of the nursing identity through the concept of care was repeated throughout the texts I analyzed. Within texts recommended to me by my participants, I found many direct statements linking the nursing identity to care:

> "*a natural inclination for caring"* (Trant & Usher, 2010; 74).

> "*The caring elements of nursing remain the bedrock of practice"*(Hallett, 2010; 168).

The understanding that "caring" is the "essence of nursing" is often the starting point for nursing research on nursing practice. For example, Crowden (1994) stated that "caring is a central and core element. Indeed, it may well be the essence of nursing" (Crowden, 1994; 1106). This theme is repeated throughout the nursing literature. In her meta-synthesis of caring within nursing, Finfgeld-Connett (2006) noted that many "nursing scholars contend that caring is the essence of nursing practice" (Finfgeld-Connett, 2006; 197) . Similarly, Forrest (1989) identified caring as being "synonymous with nursing" (Forrest, 1989; 818). And Basset (2002) stated that many nurses and researchers within nursing "would argue that to try to 'nurse' without care is not, in fact, nursing" (Bassett,

2002; 8). It is through this framing that researchers have attempted to explore and explain a wide variety of nursing beliefs, attitudes and behaviours.

Using SI, one can begin to understand the impact on the individual and his or her behaviour of this framing of the nursing identity through the concept of care. Symbolic Interactionism theorizes that the meanings of objects, individuals, actions and events within the individual's environment are neither innate nor concrete (Blumer, 1969). Instead, the meanings are assigned by the individual with input from the group (Blumer, 1969; 61). The meaning is then reflected in the individual's behaviour toward the object (Blumer, 1969).

This framing of the nursing identity through care leads to an intriguing starting point for interpretation of the data. SI tells us that an individual will act toward an object based on the meaning it has for him or her (Blumer, 1969). Within this research, it appears that the meaning of an object is developed through the idea of care; specifically, the nurses used the concept of "care" to develop the meaning of different objects within their environment. By using this theorizing as the starting point to interpret the data, we can begin to understand the behaviours of the nurses based on the meaning they assign to objects.

Many nurses assigned meaning to a task and behaved toward the task based on whether or not the task was a part of giving care. If the task was not seen as part of giving care to a patient, the task was performed after other tasks, was not performed at all or was performed but not happily. For example, I observed Anya leaving work an hour after her shift one day because she'd been filling out the patient records. Anya stated:

> *"Being a good nurse is about giving good care to your patient" (Anya, interview #1).*

When I asked why she had not filled out the patient records during the day, she told me:

> *"I was too busy taking care of the patients to do paper work" (Anya, interview #2).*

Similarly, many participant nurses framed the meaning of physical objects within the nursing environment through the concept of care. The use of physical objects was described as either supporting care or in contrast to care. For example, Andrea, a clinical nurse, described using a database in her job as:

"*Using it takes me away from giving care*." *(Andrea, interview #1).*

By contrast, Mike described using a similar database in his job as follows:

> *"It helps me organize everything and make sure I've provided care" (Mike, interview #2)*

The constructionist approach to technology within Information Systems can help us understand these differences. Pinch and Bijker (1987) theorized that different social groups will develop different meanings of a technology based on their interactions with it (Pinch & Bijker, 1987). Orlikowski and Gash developed this understanding into the idea of technological frames (Orlikowski & Gash, 1994). A technological frame can be understood as a cognitive device that allows individuals to make sense of the technology and themselves in relationship to the world around them (Lin & Silva, 2005). Individuals rely on frames to make sense of their world. IS research theorizes that "the successful adoption of an information system depends to a great extent on users' perceptions of the information system" (Lin & Silva, 2005; 49). These perceptions are often informed through the technology frame of the individual (Orlikowski & Gash, 1994). Thus, the individual's behaviour is often informed by how they see the technology. Orlikowski and Gash (1994) theorized that different groups have shared technological frames, and that differences between different groups' frames may result in different behaviour. Drawing upon this theorizing, this research identifies that a nurse's care reality can be understood as influencing the individual's technological frame. Within this research, it became clear that nurses do not have congruence in their technological frame. Orlikowski and Gash (1994) defined congruence in technological frames as "the alignment of frames on key elements or categories" (Orlikowski & Gash, 1994; 180). Instead, this

research showed that individual nurses have very different technological frames because they have very different care realities.

Agarwal et al. (2010) investigated the different adoption patterns of electronic prescribing in different physician practices and found a similar difference. They found that "different frames can exist in the same practice at any point in time" (Agarwal, Angst, DesRoches, & Fischer, 2009; 429).

This leads to the first working proposition:

P1: An individual's care reality determines the meaning of nursing objects, especially information systems.

4.2.2 A Variety of Cares

During the focused and theoretical coding of the data, it became clear that, despite a shared framing of the nursing identity through the concept of care, the individual nurses had very different meanings of objects, both information systems objects and other technological and non-technological objects within nursing. This was identified through the different descriptions of objects, different behaviour toward objects and different reactions when asked about nursing objects. For example, during my observation Patricia had a new nurse shadowing her for the day. The goal of this shadowing was for the new nurse to understand the different tasks that he was expected to perform in the ward. Patricia told him one of his tasks would be to make beds. She had him make a bed in an empty room and then told him what he had done wrong and had him watch her make the bed. She then had him practice making the bed again. At this point, the new nurse informed her that he would not spend a lot of time making beds because:

> *"he did not become a nurse to do housekeeping." (Patricia, interview #1).*

This nurse's reaction illustrated that, unlike Patricia, he did not believe that making a bed was a part of giving care.

A deeper analysis of the data points to a way to make sense of this incident; specifically that while all the participant nurses appear to share the nurse identity as framed through

the concept of care, their behaviour and interpretations of different objects varied greatly. For example, both Elizabeth and Anya stated that the job of a nurse was to provide care. However, while Anya told me she was too busy caring for patients to fill out paperwork, Elizabeth stated:

> *"recording that information is important. If you don't record it right away, and . . . and properly, the next nurse won't know what you've done and what's happening with the patient"*
>
> *Is it a part of care? (interviewer)*
>
> *Yeah I guess so. I mean I never thought of it like that but yeah I guess it is" (Elizabeth interview #2).*

The final coding scheme is presented in Appendix K. For Elizabeth, filling out paperwork was a way to provide care for her patients. In order to understand the reason for the difference between these two views of the same task, it is necessary to return to SI and its understanding of objects. Specifically, in SI, individuals may assign different meanings to the same objects (Blumer, 1969). Both Elizabeth and Anya have assigned a meaning to the task of filling out paperwork. However, this meaning differs and the behaviour related to the task also differs. Anya does not fill out paperwork until her other care tasks are done. Elizabeth, by comparison, fills out her paperwork from one patient before visiting another patient. Through this example we can begin to understand what is happening within the data; instead of sharing identical meanings of care, individuals have personal meanings of the concept of care. Their behaviour reflects these personal meanings. This understanding can help us theorize the reason for the differences in behaviour toward nursing objects by individuals who, on the surface, seem to share a common understanding of their identity.

There is a long tradition within nursing research which theorizes the composition of care within the field of nursing. In general, this theorizing can be divided based on care tasks and care philosophy. Some researchers have focused on the existential ideals that make up the concept of care. For example, Watson's (1979) theory of human care considers

caring as the moral ideal of nursing (Watson, 1979) and the ultimate goal of the nurse. According to this understanding, all tasks performed by a nurse must relate to providing care to the patient.

By contrast, researchers who focus on tasks attempt to determine if a specific task is a part of the construct of care. For example, Lea et al. (1998) performed a multivariate analysis of caring to determine its makeup. In this research, the authors asked nurses if specific tasks were a part of care (Lea, Watson, & Deary, 1998). Based on the results, Lea et al (1998) concluded that caring is made up of the task dimensions of "psychosocial" and "professional and technical." Similarly, James (1992) found that care is made up of tasks associated with physical labour, emotional labour and organization (James, 1992). James' categories were not used in my research because, while James acknowledges a multi-layered understanding of care that also emerged from my data, his work does not incorporate the term "care," which was central to how nurses in my research interpreted their work. Therefore, his categories do not embrace the understanding that emerged from my research.

Therefore, I developed a new understanding that corresponds to the task-centric theorizing of care in the nursing literature, but which also embraces the apparent contradictions within the data as individual nurses identified different understandings of care. This understanding draws upon both SI and Fealy's (1995) theorizing that caring is not simply a series of actions, but rather a way of acting that is bounded by the meaning given to the acting by the actor (Fealy, 1995).

4.2.3 Care Tasks

While some nursing research has focused on the existential ideals that make up the concept of care, what emerged during this research was a task-centric understanding of care. This is reflective of the nursing literature, in which "care usually refers to the tasks and activities of the nurse" (DalPezzo, 2009; 258). Individuals focused on different tasks that they performed:

"I make sure the equipment is ready, it's clean and all there" (Liz, interview #1).

"I organize their test results so when they are ready for the procedure it's not postponed" (Vanessa, interview #2).

"I give them baths, adjust their beds and stuff" (Sarah, interview #2).

Through these tasks, the individual performed care. Similarly, the individuals described various tasks that did not allow them to perform care:

"When I'm putting in data I'm not helping them breathe" (Andrea, interview #1).

As a result, this research will focus on the meaning of specific tasks and not a more abstract meaning of care.

There are many tasks associated with nursing. Table 7 outlines some of the many tasks that were either performed during observation or described during interviews. This finding is reflected in the nursing literature on care:

Table 6 Nursing Care Tasks

Cleaning patient's room	Touching a patient (hold hand, etc.)
Changing adult diapers	Talking with a family member
Changing/cleaning bedpans	Making patient comfortable
Making patient's bed	Getting to know a patient
Monitoring vital signs	Cleaning non patient areas
Cleaning patient – bathing, cleaning teeth, changing clothing	Updating databases
	Paperwork
Making patient comfortable	Professional development
Helping patient breath	Supply stocking
Giving medication	Scheduling
Giving patient information	Care options
Assessing patient	Co-ordination of care
Talking with a patient	
Listening to a patient	

The definition of care as being comprised of different types of tasks, as well as the meaning being based on individual understanding, are each discussed in nursing

literature. However, these two facts are not linked within the nursing literature. This link is extremely valuable to this research. Specifically, while some researchers have investigated the different understandings of care and the implications of these meanings on a nurse's behaviors, there has been little, if any, research investigating how these understandings of care differ between nurses and what happens when individuals with differing understandings of care interact with each other. In order to explore these issues it is first necessary to more fully understand the idea of care as it is understood by the participants.

4.3 The Elements of Care

The individuals I interviewed approached nursing from the identity of giving care. However, the meaning of care lacked consistency in the data. As discussed above, some individuals and texts described care in terms of direct nursing tasks, such as bathing and feeding, whereas others described care in terms of administrative tasks such as writing reports and tracking lab reports. For example, some descriptions of care were focused on manual tasks:

> *"I'm very, very fussy when it comes to patient care, how to make beds and everything, cause my room, if you walked into my room you would think, oh, this is a nice tidy room." (Patricia, interview #2).*

Other descriptions focused on interpersonal tasks, such as teaching, giving emotional support and touching. For example, Vanessa described care in terms of giving the patients

> *"training about modifying their diets and modifying their behaviours" (Vanessa, interview #1).*

Similarly, Emily described care in terms of

> *"helping parents express and come to terms with taking home a disabled or sick baby" (Emily, interview #2).*

Still other descriptions focused on organizational tasks. For example, Mike described tasks associated with giving patient care in terms of

> *"Professional development, paper work, supply stocking, scheduling, coordination of care between care givers just to name a few" (Mike, interview #2).*

Through my initial and theoretical coding, I identified four categories of care: *direct care*, *emotional care*, *informational care* and *organizational care.* This categorization is based on my data, and is also reflected in earlier nursing literature (Table 8), in which tasks are routinely divided into different types of care. The terms direct care, emotional care, informational care and organizational care were preferred because they more accurately reflect the views of my participants than the terms used in earlier literature. Specifically, several researchers in the nursing literature only identified tasks associated with one type of care and either did not identify or negatively identified other care tasks (see, for example, Forest, 1998). Similarly, other researchers combined tasks into one category that my participants identified separately (see, for example, James 1992).

Table 7 Task-Centric Care Categories in Nursing Literature

Literature	Terms	Authors	Care Category
Technologically related	Technologically mediated	(O'Keefe-McCarthy, 2009a)	Informational care Direct care
	Technological Competence	(Locsin, 1998)	Informational care Direct care
	Technical and professional	(Lea et al., 1998)	Direct care
	Instrumental element	(Clifford, 1995)	Direct care
Physically related	Physical labour tasks	(James, 1992)	Direct care Organizational care
	Nursing care	(Brilowski & Wendler, 2005)	Direct care
	Instrumental care	(Morrison, 1992)	Direct care
	Doing to	(Campbel, 1984)	Direct care
Emotion related	Emotional labour tasks	(James, 1992)	Emotional Care
	Presence	(Brilowski & Wendler, 2005; Engqvist, Ferszt, & Nilsson, 2010)	Emotional Care
	Expressive care	(Morrison, 1992)	Emotional care
	Being with	(Forrest, 1989)	Emotional care
	Expressive element	(Clifford, 1995)	Emotional care
	Psychosocial aspects	(Lea et al., 1998)	Emotional care
Administration related	Organization tasks	(James, 1992)	Informational care Organizational care
Skill related	Competence	(Brilowski & Wendler, 2005)	Informational care Organizational care
	Technological Competence	(Locsin, 1998)	Informational care Direct care

In this section, I will first explore each of the four categories that emerged from my analysis, followed by a discussion of how these four categories come together, in different amounts and importance, for different nurses.

In order to fully investigate the role of IS in the care realities, I have chosen to first discuss the categories that make up the care realities and then discuss how IS fits into these categories and thus into the care reality. It is important to note that this is an artificial separation since the use of information systems are intertwined and embedded in two of these four categories and thus in an individual's care reality. I am merely using it as a device to organize the discussion below.

4.3.1 Direct care

Direct care conceptualizes a set of nursing behaviours and the variety of meanings behind these behaviours. In this section, I will explore how direct care is described both by the nurses I interviewed and in the texts I analyzed.

Direct care, also called "hands on," was a term used throughout my research, both by individuals I interviewed and in texts, to describe an element of care.

Patricia, a bedside nurse, told me that:

> *"What I do in nursing is I do primary care for my patients, I do all my, all the care for my patients. Most of my patients I have to feed them, I have to give them bowel care which makes them go to the bathroom, I have to shower or bath them, dress them, get them up, feed them lunch, lay 'em down, get them up, feed them supper. It's, it's just their whole, total care in the day. Very hands-on". (Patricia, Interview #1).*

Carol, a nurse specialist, described bedside nursing as:

> *The hands-on interaction with the patient. So when you're in the room at the bedside that to me would be the bedside nursing." (Carol, interview #1).*

Anya discussed the tasks associated with giving hands-on care to patients in the role of a bedside nurse:

> *"to me it's the personal patient care that you deliver in the room at the patient's bedside, so that's to me beside nursing is the accessing, bathing, feeding, grooming, giving, you know, doing dressings, you know any of the treatments that needed to be done" (Anya, interview #1).*

This understanding of nursing is emphasized in early nursing education. Most nurses have been introduced to the history of nursing through introductory nursing textbooks and lectures; in many of these textbooks nursing and its history is described in terms of the different elements of hands-on care given by nurses to the sick. For example, in a textbook recommended by a participant that discussed nursing in the Roman Empire and during Early Christianity, described a saint who was an early nurse who had the desire to:

> *"nurse the sickest individuals herself, making a point of dressing the most hideous infected sores and wounds"* (Taylor et al., 2001; 15).

While the terms and specific tasks associated with the terms differ slightly, there are several common themes throughout these descriptions of hands-on care. First, within each of these descriptions, at least one task is directly associated with the patient's body. Second, within each of the descriptions of direct care, the nurse is physically present in the same room as the patient. In fact, the nurse often touches the patient. Thus, within this research, direct care is nursing care made up of hands-on care in which the nurse is physically with the patient.

Within my data analysis, direct care was subdivided into tasks that were performed with technology and tasks that were manual in nature. Technology-based direct care involved performing direct-care tasks with the use of technology. Manual direct care involved performing direct-care tasks without the use of technology. Table 9 outlines the tasks that the participants associated with these two types of direct care.

Table 8 Direct Care Tasks

Task	Technology-based direct care	Manual direct care
Cleaning patient's room		X
Changing adult diapers		X
Changing/cleaning bedpans		X
Making patient's bed		X
Monitoring vital signs	X	X
Cleaning patient – bathing, cleaning teeth, changing clothing		X
Making patient comfortable	X	X
Helping patient breathe	X	
Giving medication		X
Giving patient information	X	X
Assessing patient	X	X

As Table 9 illustrates, there were several tasks that could be classified both as technology-based and manual direct care. There are several reasons for this. First, depending on the individual involved, some tasks can be performed a variety of ways. For example, a nurse can assess a patient through the use of technology such as a heart rate monitor; however, another nurse could choose to perform this assessment through a manual procedure. Second, depending on the individual, some technologies are not seen as technology. For example, making a patient comfortable often involves adjusting his or her bed. For some nurses, the bed is considered technology, whereas for other nurses, it is not. This is also true with regards to assessing a patient; some nurses do not consider the heart rate monitor to be technology. The implications of this will be further investigated and discussed later in this chapter through accessing Heidegger's concepts of *ready-to-hand* and *unready-to-hand*.

4.3.2 Emotional Care

Emotional care conceptualizes a set of nursing behaviors and the variety of meanings behind these behaviors.

The nurses I interviewed often described care they give patients in terms of interpersonal contact. For example, Anya described part of caring for patients as

"sitting and talking to them" (Anya, interview 2).

Patricia described caring for her patients though an imagined comment from her most recent patient:

"they're gonna say; oh she was so nice she came and asked me how I was" (Patricia, interview #1).

Finally, Beth and Emily both described caring for a patient by supporting the family after the patient had been admitted to the hospital. This support, for Beth, involved holding the crying mother of a baby who had just died. For Emily, this support involved listening to the father of a disabled baby express his feelings of anger and helplessness at the situation. Table 10 outlines the tasks that were associated with emotional care by the participants.

Table 9 Emotional Care Tasks

Talking with a patient
Listening to a patient
Touching a patient (hold hand, etc.)
Talking with a family member
Making patient comfortable
Getting to know a patient
Advocating for a patient

As with direct care, nurses are introduced to this element of care early in their education:

"all of our classes in first year seemed to focus on how the patient felt emotionally and not about their physical problem"(Mike interview #3).

While the terms and the specific tasks associated with the terms differ slightly, there are several common themes throughout these descriptions of emotional care.

First, unlike in the descriptions of direct care, the tasks are not directly associated with the patient's body. Instead, the tasks are associated with emotions and relationships. However, emotional care shares with direct care a need for the nurse to relate a task directly to the patient. Thus, within this research, emotional care is defined as nursing care made up of tasks associated with emotions and the building of a relationship between a nurse and a patient or patients.

This type of care has been identified by several researchers within the nursing literature. This type of care is often referred to as "presence," and is identified as the most important type of care (Engqvist et al., 2010; Finfgeld-Connett, 2008). Presence within the nursing literature means "closeness in a physical, psychological, emotional and spiritual sense" (Engqvist et al., 2010; 314). In her 2008 review of the concepts of nursing presence and caring, Finfgeld-Connett found that "presence and caring are substantively similar processes" (Finfgeld-Connett, 2008; 113).

The term "nursing presence" has been utilized within nursing since the times of Florence Nightingale and the beginning of modern nursing (Fontaine, Briggs, & Pope-Smith, 2001); nursing presence has been considered a part of the "unique knowledge base" of nursing (Zyblock, 2010; 121). Touching, holding and "being there" are all a part of this view of care (Forrest, 1989; 819).

4.3.3 Organizational Care

Organizational care conceptualizes a set of nursing behaviors and the variety of meanings behind these behaviors. It was developed from James' (1992) concept of Organization Tasks (James, 1992) and is supported by my data analysis. Table 11 outlines the tasks that were associated with organizational care in my research

For example, Patricia described the tasks she had just completed before I interviewed her:

> *"tidying up your nursing station, I just emptied a whole box full of diapers and put them on the shelves to clean the utility room. I'm always puttering, stocking linen shelves, the linen carts I mean." (Patricia, interview #1).*

Table 10 Organizational Care Tasks

Cleaning non-patient areas
Supply stocking

4.3.4 Informational Care

In contrast to direct care and emotional care, informational care was not an expression I came across in my data collection or analysis. Instead, it is a term I adopted to express several different concepts and descriptions identified in my initial coding but missing from the nursing literature. The concepts Organization Tasks (James, 1992), Competence (Brilowski & Wendler, 2005), Technological Competence (Locsin, 1998) and Technologically mediated (O'Keefe-McCarthy, 2009b) make up a part of informational care. However, informational care synthesizes the combination of these concepts, as well as other nursing behaviours and the variety of meanings behind these behaviours identified in this research. In this section, I will explore how informational care was described by the nurses I interviewed and within the texts I analyzed.

Table 12 outlines the tasks that were associated with informational care. Mike described informational care when he described tasks that he did not think fell into the categories of direct care, emotional care or organizational care, but were still about giving care. He identified the following tasks :

> *". . .scheduling, co-ordination of care between care givers just to name a few." (Mike, interview #2)*

Table 11 Informational Care Tasks

Updating databases
Paperwork
Scheduling
Care options
Co-ordination of care

In another example, Vanessa, a nurse practitioner in a surgical clinic, described informational care through tasks such as:

> *"assessing the patients' files and figuring out what testing they need done and basically getting them on track in the system so that they can have*

> *their surgery. . . I do a lot of ordering blood work tests and making referrals and that kind of thing." (Vanessa, interview #1).*

Similarly, Carol described informational care in terms of co-ordination of care:

> "*they (nurses) also do a lot of coordination. So, if you have a patient in the N.I.C.U. for example, it's the bedside nurse that keeps track of when the tests were done, who, what specialty came and saw and so they kind of coordinate at that level" (Carol, interview #1).*

She also described other tasks:

> *"more what we call paperwork or desk work. So, as new initiatives are coming out, new information we try to encourage staff to learn about it, we teach them." (Carol, interview #1)*

Informational care is echoed throughout the texts I analyzed. Tasks such as developing nursing care plans based on nursing assessments and diagnoses make up this element of care. These tasks can be performed using technology or in a non-technological way. Within this research, informational care is nursing care made up of tasks associated with the processes of nursing patients in a modern healthcare system. Within my research, informational care is where the largest amount of IS use may occur.

4.4 The Understanding of the Elements of Care

As discussed, in this research the nursing identity is conceptualized as, in part, being made up of a care reality based on four categories of care: *direct care, emotional care, informational care* and *organizational care.* Through my data analysis, I identified an understanding of the different importance individuals place on these categories that make up their personal care reality. While it could not be deemed a true hierarchy, it was clear that individuals valued the four elements of care differently. Using this understanding, an individual determined if a task they had to perform was "care," "mixed about care," 'interfered with care" or "against care." For example, if the element of care was

designated as “care” by the individual, it has a more important understanding in the care reality than an element of care designated as “mixed about care.”

During data analysis, I coded the elements of care for each participant as either care, mixed, interfered with or against care in descending order. This understanding was determined through the participants’ statements during interviews and through their actions during observation. Nurses were seen as believing an element of care as constituting “care” if they viewed the objects associated with the element of care as being central to their care reality. For example, Kathy believed that providing emotional care (care given through interpersonal contact) to her patients was her main job as a nurse. To her, emotional care alone was providing care to the patient. By comparison, she linked direct care with emotional care, but did not consider it care if it was provided separately from emotional care:

> *“I mean I can give him a shot but unless I talk with him first and tell him what the shot’s for and make sure he’s ok with getting the shot and knowing that this will help in his treatment I’m not giving him care. I’m just giving him a shot. (Kathy, interview #2).*

Thus, when a nurse expressed the primacy of an element of care, the care fell into the category of “care” in my system of understanding. Other elements of care are only performed after this “care” has been completely provided. As a result, the tasks designated as “care” are often done immediately, with enthusiasm or attention to detail. In addition, this element of care came automatically to the nurse. Mike, for example, performed informational care that he identified as “care,” such as updating a database, as soon as necessary during his nursing day.

Nurses were identified as being “mixed” towards an element of care if they view the objects associated with the element of care as being on the edge of their care reality. For example, Rachel expressed this view toward emotional care. She acknowledged that emotional care helped care for a patient by helping her understand how they were feeling. However, she thought emotional care alone was not providing care to the patient. By

comparison, tasks associated with direct care and informational care were, from her perspective, central parts of care.

> *"I'm actually taking care of them when I do that stuff" (Rachel, interview #1).*

Nurses that are mixed about an element of care expressed a belief that this type of care is not as important as other elements of care. As a result, the tasks might not be done immediately, and with less enthusiasm or attention to detail. In addition, nurses who were mixed about an element of care reported that they were less likely to automatically turn to this element of care when in the nursing environment. Rachel, for example, noted that she felt that she needed to remind herself to talk to the patient while she checked the patient's blood pressure and heart rate. The term "mixed" also represents a feeling of confusion about the element of care. For example, Rob contradicted himself through his interview. While at one point he stated that informational care was not a part of care, he later stated that certain tasks associated with informational care, such as recording a patient's blood pressure on the computerized chart, was a part of care.

Nurses were identified as believing an element of care was "interfering with care" if they viewed the objects associated with the element of care as taking away from more important elements within their care reality. Patricia expressed this view toward informational care; she believed that providing informational care was taking away from direct and emotional care. To her, taking the time to provide informational care meant the nurse would not have time to provide "real care." In addition, she believed that a nurse interested in providing informational care was either unable or unwilling to properly provide direct and/or emotional care. Informational care was, therefore, not a part of "care."

In this research, when an element of care fell into the "interfered with care" category for a nurse, he or she commonly expressed a very negative view of the element of care, and other elements of care were performed first. A nurse would often not perform this element of care at all or, if that was not possible, would perform this element of care unwillingly and poorly. For example, Emily described organizing the drug cabinet as an

element of organizational care that often did not get done by nurses on her ward because they did not consider it a part of care; it was merely "housekeeping." She described how messy the drug cabinet was as a result, and how angry the head nurse was about it. Emily only organized the drug cabinet when she was "forced to" by the head nurse. In fact, she stopped organizing the drug cabinet when a new nurse offered to do it in her place.

Nurses were identified as believing an element of care was "against care" if they viewed the objects associated with the element of care as being in contradiction to their care reality. Gail expressed this view toward informational care performed using an information system; she believed that providing informational care using a computer was harming the patient. To her, using a computer to provide informational care (her specific example was using an expert system for treatment options) harmed the patient by not allowing the nurse to use his or her own knowledge and experience. In addition, she believed that a nurse interested in providing informational care using a computer was not a "real" nurse and would harm the patient.

In this research, when an element of care fell into the "against care" category for a nurse, he or she commonly expressed a very negative view of the element of care, and other elements of care were performed first. A nurse would not perform this element of care. For example, Sarah told me she would refuse to work in a hospital that required her to perform informational care using a computer. Table 13 outlines the final coding that led to an understanding of each type of care. Table 14 applies this final coding to 18 of the individual's interviewed in this research. The other individuals were excluded from this research part of the analysis because they did not respond or were not willing to be interviewed again once this level of analysis had been reached.

Table 12 Understandings of Care Elements

Understanding	*Rationale*	*Example Evidence*
Care	Assigned if tasks associated with element were independently described as giving care, was observed performing a task ahead of other tasks or if when specifically[1] asked the individual firmly agreed that they were care.	Carolyn spoke of discussing treatment options and the patient's feelings about the options when I asked her about care.
Mixed	Assigned if tasks associated with element were either independently described as partly care or when specifically asked the individual hesitated, otherwise expressed a feeling of being unsure or referred to the task as an aid to are.	Carolyn was observed tidying up the nursing station during a quiet time of the evening. When I asked her if that was part of providing care her response was: "It helps"
Interfered with care	Assigned if tasks associated with element were either independently or specifically asked described as stopping a nurse from giving care, being a distraction from giving care or interrupting the giving of care.	Mike was the first person to mention IC tasks performed using IS as care. He was observed being frustrated performing an IC task without an IS. When I asked why he was frustrated he told me the time it look to perform the task manually made him angry because it meant he was behind seeing his other patients. He didn't believe it was against care because the tasks still had to be performed to take care of the patient.
Against care	Assigned if tasks associated with element were either independently or specifically asked described as hurting a patient or causing the nurse to hurt the patient.	Patricia described arranging with other nurses for them to perform manual IC tasks because she felt they took her away from giving care. She described performing IC tasks using an IS as "hurting them (the patient)" by distracting the nurse (Patricia, interview #1)

[1] Was not performed in a way to lead the participant to a specific answer. For example, the probes "is that care?" or "Is that a way to provide care?" were often employed.

Table 14.Care Elements and Individual Nurses

Participant	**Direct Care**		**Emotional Care**	**Organizational Care**	**Informational Care**		**Care Reality**
	Manual	*Technology - assisted*			*Manual*	*Information Systems Based*	
Carol	Care	Mixed	Care	Interferes with Care	Care	Interferes with Care	Information systems free
Carolyn	Care	Mixed	Care	Mixed	Mixed	Interferes with Care	Information systems free
Patricia	Care	Interferes with Care	Care	Care	Interferes with Care	Against Care	Information systems free
Mike	Care	Care	Mixed	Mixed	Interferes with Care	Care	Information systems driven
Vanessa	Care	Care	Mixed	Mixed	Interferes with Care	Mixed	Information systems enabled
Katy	Care	Mixed	Care	Interferes with Care	Interferes with Care	Interferes with Care	Information systems free
Gail	Care	Against Care	Care	Interferes with Care	Interferes with Care	Against Care	Information systems free
Elizabeth	Care	Care	Interferes with Care	Mixed	Interferes with Care	Care	Information systems driven
Emily	Mixed	Mixed	Care	Interferes with Care	Interferes with Care	Interferes with Care	Information systems free
Sarah	Care	Interferes with Care	Care	Interferes with Care	Interferes with Care	Against Care	Information systems free
Beth	Care	Mixed	Mixed	Interferes with Care	Interferes with Care	Interferes with Care	Information systems free
Becky	Care	Care	Care	Interferes with Care	Mixed	Care	Information systems driven
Andrea	Mixed	Care	Care	Interferes with	Mixed	Interferes with	Information systems free

				Care		Care	
Rachel	Care	Care	Interferes with Care	Interferes with Care	Care	Care	Information systems driven
Matt	Mixed	Mixed	Care	Interferes with Care	Mixed	Mixed	Information systems enabled
Liz	Mixed	Care	Care	Mixed	Interferes with Care	Against Care	Information systems free
Anya	Care	Mixed	Mixed	Interferes with Care	Mixed	Interferes with Care	Information systems free
Alice	Care	Care	Care	Interferes with Care	Mixed	Interferes with Care	Information systems free

This section focused on identifying and exploring the multi-faceted understanding of care that is central to the nursing identity. Following this exploration, the different constructions of care and the differing care realities for participants were examined. Through this examination, the meaning of information systems within the workplace could be understood. In the next section the implications of these understandings will be explored.

4.4.1 Care Realities and Information Systems

There is an ongoing debate within nursing research which theorizes the place of technology within caring. This debate is often reduced to the categories of "technological optimism," in which technology is viewed as a positive part of nursing and caring, and "technological romanticism," in which technology is viewed as "disruptive and even dangerous" to nursing and caring (Sandelowski, 1997; 169). What is not debated is the fact that technology and caring are linked within nursing (Barnard & Gerber, 1999).

During the first stage of data analysis, I analyzed the data to determine how individual nurses view the different elements of care. The result is a disparity between individual nurses' views of the reality of nursing. In this section, I shall explore these different views as they relate specifically to information systems use within nursing.

This first stage of coding illustrated several interesting findings. First, it became clear that the individuals' combinations of the different types of care varied greatly, meaning there are many different care realities among the participants. By understanding the different types of care creates a personal understanding of "care."

By using SI, we know that this understanding of care is actively created by the individual. The result of this understanding is that the individual nurse will act toward objects, events and actions within the nursing environment based on the meanings the individual assigns to them (Blumer, 1969). Thus, the importance assigned to each element of care can be seen as creating the "care reality" in which the nurse functions. The element or elements of care with more importance constitute the "care reality" of the individual. The impact

of differences between nurses in their understanding of the importance of elements of care results in discrepancies between the nurses' care realities.

In the second stage of coding, I analyzed the data to determine more clearly how the care reality and information systems were intertwined. During this analysis, it became clear that three quarters of the participants that expressed a belief that information systems use was "against care" or "interfered with care" in their care reality. However, the same tasks, when linked with a manual method, were designated as either "mixed" or "care." This is intriguing, because it illustrates that the issue for the individual may not be the task associated with the type of care, but rather the link between the task and the information system. For example, Anya told me she did not believe that performing a search in the expert system for a new care recommendation was care; in fact, this task was actually "against care." However, she considered going to the nursing station and asking her co-workers for recommendations, or looking up the treatment recommendations in a reference book, as "mixed."

During this stage of data analysis, the question arose; why did some nurses accept a task when performed manually, but did not accept the same task when performed by an information system? In order to answer this question I turned to an introductory question in my interviews: "tell me about the technologies you use in nursing." Table 15 outlines the technologies that were identified.

Table 13 Nursing Technologies Named by Participants

Computer on Wheels (COW)
Expert systems
Electronic health record
Nursing station computer
Charting software
Scheduling software

Two very interesting things can be seen in this data. First, this list is quite small. Second, many of the technologies discussed by the participants during this stage of the interview were information systems hardware and software. Based on this finding, I began to consider that there may be a limited number of technologies within nursing and that the few technologies in use in nursing care are information systems. However, after

returning to my observation notes and reviewing the number of non-information systems technologies the participants were in contact with, I determined that this understanding did not reflect reality (see Appendix J). This data analysis illustrates that the participants did use a great deal of technology throughout their work; even participants who stated that they did not use technology as a nurse were observed using a variety of technologies. This data analysis also illustrates that the technology in use by the participants was not limited to information systems, but rather included a wide variety of technologies.

What became clear during this coding process was that many of the participants appeared to only identify information systems as "technology." In fact, throughout the interviews, many of the participants had to be gently probed to discuss "technology other than computers." As it became clear that some of the participants were in contact with many technologies that were not identified they did not identify as "technology," a different understanding was sought. I began to consider that perhaps this result in the data was not due to the number. I began to consider that perhaps this result in the data was not due to the number of technologies, but instead due to the perception the participant had of the technologies.

To explore this possibility, I coded the interview data and observation data for four participants based on the number of technologies they discussed and the number of technologies I observed during my observations. These participants were chosen as representative of the variety of care realities identified earlier in the research for which observational data existed and a second interview could be arranged.

From this process, I concluded that nurses do, in fact, use a lot of technology but that they do not identify many types of technology as "technology." In order to explore the reason for and implication of this finding on the understanding of an information system and thus its use, I returned to Symbolic Interactionism.

In SI, the meaning an individual associates with an object, action or event is represented by one or many symbols (Blumer, 1969; Prasad, 2005). These symbols are often language based, and the meaning of a symbol is centered on an agreement within a community of symbol users (Blumer, 1969). Thus, the term "technology" had different

meanings for different participants. In both the data involving technology and the care reality data analyzed earlier, it becomes clear that, for some of the participants, only specific objects are identified as "technology." Other objects were discussed but not identified as technology. Table 16 outlines the different objects that Sarah, Mike, Vanessa and Carol identified as technology and the objects that they did not identify as technology.

From this coding, I developed terms to represent the personal care reality the participants appeared to embrace. At this point I moved from coding of concepts to broader categories which ultimately helped build the working propositions. By accessing the information in Table 14 I was able to synthesize the realities in to workable categories.

"Information systems free" was developed to represent a care reality that embraced care given individually and directly to the patient through their identification of technology objects. Information systems enabled was developed to represent a care reality that embraced care given through some information systems. Information systems driven represents a care reality that made giving care through the use of information systems a priority.

Table 14 Care Reality and Identification of Objects

	"Care Reality"	**Objects Identified as Technology**	**Objects Not Identified as Technology**
Sarah	Information systems free	Computers Expert system Database Smart phone	Bed
Mike	Information systems driven		Bed Database COW Smart phone
Vanessa	Information systems enabled	Expert system Database	Smart phone Bed
Carol	Information systems free	Smart phone Database Expert system	Bed

The four participants represented in this table are very different. Sarah identified both IS and non-IS technologies as "technology" and identified very few objects as not constituting "technology." Carol identified several IS technologies as technology. At first, Mike did not identify many objects as "technology." When I asked him what types of technology he used in nursing, he quickly asked what I meant by "technology." It was only after I gave him examples that he started to identify different objects as technology. Before that, he only identified an expert system introduced in the hospital. Vanessa identified certain information systems as technology but did not identify non-IS technologies as technology, and did not identify a database that she had been using for several years as technology. During the second interviews, I described what I had found in the original data (both the first interview and the observations), and I explored with each participant his or her understanding of technology. All 31 of the participants expressed some surprise at the comparison between the technologies they named and the technologies I identified during observation. First, they were surprised that I identified so many technologies:

"I had no idea I used so much" (Vanessa, interview #2).

Second, they were surprised that they had forgotten several technologies when they first listed the technologies they used:

"I can't believe I forgot that." (Sarah, interview #2)

And finally, they were surprised at the inclusion of some of the technologies in the list. For example, when I asked Carol about the IV pump she responded:

"Really? You consider that technology?" (Carol, interview #2)

By analyzing this data, we can see that each participant used (or didn't use) the term "technology" as a symbol for very different objects. This builds on Orlikowski and Iacono's (2001) premise that "IT artifacts, by definition, are not natural, neutral, universal or given" (Orlikowski & Iacono, 2001; 131). Instead, the meaning of the term "technology" depends on the care reality held by the participant. Thus, the term

"technology" is used by many of the participants as a symbol for objects that do not fit into the individual's care reality.

Reverting back to the terms used in this thesis, and given the discussion above, I developed the following working propositions:

P2: There exist three care realities to consider when exploring the understanding of an information system by a nurse. These realities are called information systems driven, information systems enabled, and information systems free.

A nurse develops (and re-develops) their care reality. Enmeshed within that care reality is the nurse's interpretation of information systems. Subsequently:

P3: How an individual understands an information system will impact how he or she will use it.

There is not an innate relationship between the term "technology" and objects that do not fit into an individual's care reality. It is only a symbol that individuals agree to use to designate these technical objects (Hewitt, 1988). If we are to understand why nurses view technology (as a symbol) negatively, and to subsequently identify ways to change this view, we need to explore the development of this shared meaning. In order to accomplish this, we must return to the literature on identity development and then to an examination of nursing education to see how technology is presented in these formative experiences.

The meaning of the word "technology" is a social convention. The use of a symbol, such as a word, affects the response of both the user and others within his or her social world. An individual is socialized into placing specific technical objects into the category of "technology." When an individual enters a new profession, he or she goes through a complex process of socialization in order to acquire the knowledge, skills, and sense of professional identity that are characteristic of a member of that profession. It involves the internalization of the values and norms of the group into the person's own behavior and self-conception (Jacox, 1973).

Within this research, several nurses commented on the socialization of "technology" not being considered a part of the care reality.

> *"I mean in class they keep telling us we'll have to learn how to use computers to do certain things but they want to teach us the real way first." (Sarah, interview #1)*

In addition, during textual analysis, I noted early on that very little time was spent discussing the use of technology in nursing. Within this research several forms of texts were analyzed. I gathered these texts mostly through recommendations from interview subjects. During my analysis, I read and analyzed the texts to look for clues or traces of how the culture being studied is making sense of the world (McKee, 2003).

In First Year Nurse (Arnoldussen, 2009), a book written to help new nurses in their first year of nursing, there was a chapter on "Organization 101" that outlined different real-life approaches to "deliver safe, quality care" and communicate with other nurses and doctors (Arnoldussen, 2009; 33). The chapter is 25 pages long and contains several different approaches to organizing information. Examples include "a three-ring binder and a pencil," cue cards, paper charts, textbooks for reference, a paper planner and post-it notes (Arnoldussen, 2009; 36). Interestingly, not once in the chapter are any technical objects mentioned. In an earlier chapter, "handheld computers" and PDA software products are mentioned as new ways to reference and record information. Other options for the "less technologically inclined" are also mentioned. (Arnoldussen, 2009; 27). These options are mentioned over three pages, but only following several pages dedicated to the need for good shoes and a personal stethoscope.

Similarly, in Fundamentals of Nursing (Taylor et al., 2001), a first-year textbook, certain technical objects are discussed in detail, whereas others are not mentioned, are mentioned in passing or are mentioned negatively. For example, the following statement can be found in Chapter 15: assessing "competence in particular skills may be needed, such as computerized documentation systems." And yet, hand-written assessment reports are pictured throughout both the chapter and the textbook (Taylor et al., 2001; 1121). In

comparison, two pages, with pictures, are dedicated to learning the procedure of using a blood glucose meter to monitor a patient's blood glucose level.

In order to fully understand the above, it is necessary to turn to Heidegger's concepts of *ready-to-hand* and *unready-to-hand.* When an object becomes accepted into the care reality of an individual, it becomes, in Barnard's terms, "hidden." The opposite of this, while not considered directly by Barnard, can be considered "exposed" (Barnard, Ba, & Mrcna, 2002). In addition, within this research, an object can become partially hidden. The above concepts are similar to Heidegger's concepts *of ready-to-hand* and *unready-to-hand*, an understanding based on the "analytic" interpretation of Heidegger's work (Dryfus, 1991) discussed earlier in this paper. While the IS literature has historically used the concepts ready-to-hand and present-at-hand, the use of the term unready-to-hand is less common. However, In *Sein und Zeit*, Heidegger did differentiate between three states of experiencing the world: *ready-to-hand, present-at-hand* and *unready-to-hand* (Mulhall, 1996).

During most activity, the individual is absorbed and skillfully engaged with the objects in their environment, and the individual experiences the objects in the environment as *ready-to-hand*. Heidegger's famous example is the use of a hammer (Mulhall, 1996): when a hammer is encountered by an individual as ready-to-hand, it is an object that is used to drive in nails. The important aspect of ready-to-hand is that the individual is not explicitly aware of the aspects of the hammer. Instead, the individual "sees through" them to the task; if the individual is easily using the hammer to drive in nails, his or her focus is on the item being built, not on the size, shape or meaning of the hammer (Dryfus, 1991). This is known as skilled coping.

Heidegger believed that readiness-to-hand is the majority of our experience with the world, and is "primary while the other modes are derivative of it" (Dotov, Nie, & Chemero, 2010). A hammer is first something used to build and is second an object that we are having trouble using or something with a particular shape and color (Dryfus, 1991). If an object is ready-to-hand, its status as "technology" is therefore often lost. It becomes hidden and, as a result, is used without explicit awareness of it being "technology."

While engaging with objects as ready-to-hand through skilled coping is the primary way an individual engages with the world, sometimes the skilled coping is disturbed. If this happens, the object is experienced as *unready-to-hand* (Mulhall, 1996). During unready-to-hand, the individual experiences the object and not the tasks. For example, if the individual moves from easily using the hammer to having problems using the hammer, the hammer moves from being ready-to-hand to being unready-to-hand. The individual does not focus on the task, but instead focuses on the failure of the object. As a result, the individual must focus on the use of the object (Dotov et al., 2010), and he or she experiences it as frustrating the way he or she deals with the world. The individual still uses the object, but the experience has changed. Heidegger outlines three manners of unready-to-hand: Conspicuous (when an object is damaged), Obtrusive (when a part of the object that allows it to fully function is missing) and Obstinate (when the object is a barrier to the goal) (Dryfus, 1991).

The third and final way of experiencing the world is *present-at-hand*. During present-at-hand, an object is not used and is simply considered. For example, the individual considers the hammer's various properties (described by Heidegger as looking at it and thinking about it) instead of using it. (Mulhall, 1996) Within this research, *present-at-hand* can be considered not the rejection of technology, but a consideration of the technology on a conceptual level that is outside the realm of practice. As a result, present-at-hand is not a useful category for this discussion, since it has more to do with the intellectual consideration of the object than the pragmatic aspects of the technology that ground this research.

Symbols associated with a care reality become ready-to-hand when the care reality that makes use of the technical object is accepted by the individual. For example, many of the nurses within this research were not conscious of all of the technology they use in nursing. In fact, many nurses expressed surprise at how many different types of technologies they used in nursing when they were asked to tell the interviewer about them, such as blood pressure machines and heart rate monitors. Michelle commented that she could:

> "*go on for days listing the technology I use that I never thought about." (Michelle, interview #1)*

Carol summed up this point with the following statement:

> *"I'm of the time that we used to take blood pressure, you know, with the stethoscope and that cuff, now we roll the little machine in put the cuff on and it takes the pulse and the BP and the oxygen, you know, the whole thing. . . . and even for someone who hasn't always had that technology there, it becomes so much a part of your day-to-day routine that you don't even think that as being technology as such." (Carol, interview #1)*

In his theorizing on the meaning of technology within nursing, Barnard (2002) conceptualized hidden technologies — technologies that are so commonly used and accepted within nursing that they go unnoticed by the user (Barnard et al., 2002). Crocker and Timmons (2009) focused on the process through which a technology becomes hidden, when the technology becomes "an embodied approach to care, seen not as an adjunct to care, or as a means of bridging a gap between technology and care, but as a total process including the knowledge, skills and equipment that encompass the nursing care of the individual" (Crocker & Timmons, 2009; 58). While the authors did not access Heidegger, their findings map very well into Heidegger's ideas of "ready-to-hand." The individual "sees through" the technology to the care-giving task. The individual is easily using the technology and his or her focus can thus be on the patient and the care giving (Dryfus, 1991).

The above understanding is reflected in my research. The participants reflected a ready-to-hand nature of an object when it was not named as technology in the interviews. This occurs when the user accepts and adopts a care reality in which the use of the object is a part of giving care, and when the need for the technology is compatible with the individual's care reality. In this state, using the technology becomes *a way of giving care.* The focus for the nurse is on the care task and not the technology he or she is using.

Mike demonstrated a ready-to-hand technology when he spoke of using his iPhone to calculate a patient's BMI at the patient's bedside. There were many ways that Mike could have calculated his patient's BMI: he could have returned to the nursing station and performed the calculations on the computer, he could have used a traditional calculator either at the nursing station or at the patient's bedside, he could have looked it up in a textbook that is stored at the nursing station or he could have performed the calculations by hand at the nursing station or at the patient's bedside. However, he chose to perform the calculation on his iPhone with an application he had downloaded.

> *"it shows the patient right away what the results are.. . We can do it together and I can show them how to do it by themselves – if they have an iPhone I'll download the app for them . . . also this way I don't make a mistake" (Mike, interview #2).*

In fact, during participant observation, Mike was observed to use his iPhone many times: he used it to calculate a patient's new BMI, to check a calendar while booking appointments for patients and to play a video for a patient to explain the test a patient was scheduled for. Mike did not appear to search for other methods to perform these tasks. The iPhone is therefore ready-to-hand for Mike.Barnard (2002) also briefly theorized the opposite of a hidden technology, in which the technology demonstrates a "lack of utility and/or failure to respond in a desired manner" (Barnard et al., 2002; 19). However, he did not explore this opposite in any detail or name it. Within this research, a more nuanced view of this type of technology can be theorized. By examining the description of objects that were identified as "technology," an understanding can be developed of technology in the state of *unreadiness-to-hand* as either conspicuous (when an object is damaged), obtrusive (when a part of the object that allows it to fully function is missing) or obstinate (when the object a barrier to the goal) (Dryfus, 1991), as discussed above.

Carol identified a *conspicuous* object when she spoke of a new nurse using a database to calculate a medication dosage for a patient. The nurse prepared the wrong amount of a medication because the mouse was not working properly. The nurse thought she had entered a new set of figures but she had not, therefore instead of calculating a new dosage the database had simply repeated a dosage for a different drug with a set of figures

entered earlier. A conspicuous object will return to a state of ready-to-hand when repaired or fixed.

In contrast, Becky identified an *obtrusive* object when she spoke of a specific software program she had to use to update a patient's chart when I asked her about nursing technology. Becky spoke of the amount of time it took to perform the task on the IS:

> *". . it just takes forever to do it on the computer because I have to open it, wait for it to load and then scroll through a bunch of things to find what I need when I could just write it down quickly on the chart." (Becky, interview #2)*

This technology was obtrusive to Becky because she found it lacked the simplicity and immediacy that it needed to fully function. An obtrusive object should return to or take up a state of ready-to-hand if the missing parts that allow it to fully function is added.

Finally, if the object is a barrier to a goal, but not because it is broken or incomplete, then it is *obstinate* (Dryfus, 1991). In this research, if an object is obstinate it is considered a barrier to care. In Barnard's brief theorizing, the focus was on the attributes of the technology; specifically, the focus was on the "lack of utility and/or failure to respond in a desired manner" (Barnard et al., 2002; 19). Thus, Barnard was, briefly, focusing on either conspicuous or obtrusive objects. However, in my research it became clear that a technology is also unready-to-hand when it is obstinate. In this situation, the object is a symbol of tasks, skills and views that are the opposite of care.

For example, Gail told me:

> *"we should take the word care out of healthcare, all we do now is hook them up to machines" (Gail interview #1).*

When I asked her to describe these machines, she told me about hooking people up to ventilators, and "machines that just keep them alive." Gail rejected the use of ventilators because, to her, the use of the ventilator did not symbolize her care reality. Instead, it

symbolized what she felt was the opposite of care. For her, “just” keeping people alive was not a part of giving care:

> *“Caring is about helping people feel better, making them comfortable and things like that.” (Gail interview #1).*

What Gail is describing is a modification of tasks that seem to replace some of the nurse’s job with objects. To her, this modification removes one of the elements of care. Since this element was so central to her care reality, its removal ruins care.

In contrast to ready-at-hand technology, unready-to-hand technologies were mentioned quickly by participants. The individual nurses were conscious of these technologies in a way that they were not conscious of the ready-to-hand technology.

At this point it is important to return to the theorizing of professional identity discussed earlier. As stated earlier the successful adoption of an identity is made up of a process of the individual accepting ideological beliefs and discontinuing behaviour that does not fit the professional identity (Dolch, 2004). As an individual accepts ideological beliefs he or she becomes less aware of his or her behaviours (Dolch, 2004). Through this understanding we can begin to see a link between ready-to-hand views of technology and the individual’s care reality of information systems driven and unready-to-hand views of technology and an individual’s care reality of information systems enabled and information systems free.

This leads to the following working proposition:

P4: An individual’s whose care reality is information systems driven will use more information systems and features to provide care.

P5: An individual’s whose care reality is information systems free will try to refuse to use or resist the use of most information systems and features to provide care.

P6: An individual’s whose care reality is information systems enabled will partly accept the use of information systems but will not extend their use.

4.4.2 Summary

This section focused on identifying and exploring the multi-faceted understanding of care that is central to the nursing identity. Following this exploration, the different constructions of care and the differing care realities for participants were examined. Through this examination, the meaning of technology within the workplace could be understood.

Individual nurses are constantly being introduced to alternative care realities and corresponding meanings of technology. What follows is a theoretical exploration of the process participants go through when they are exposed to these alternative care realities. This exploration was developed from the data and academic literature.

4.5 Negotiation

Negotiating different care realities was identified as the process whereby each individual manages his or her care reality. The process includes four phases: exposure, developing consciousness, sense-making and acclimatizing (see Figure 1). A process model was developed to theorize the interaction process that was observed during data collection. This interaction process involves a negotiating process during which individuals manages his or her care reality.

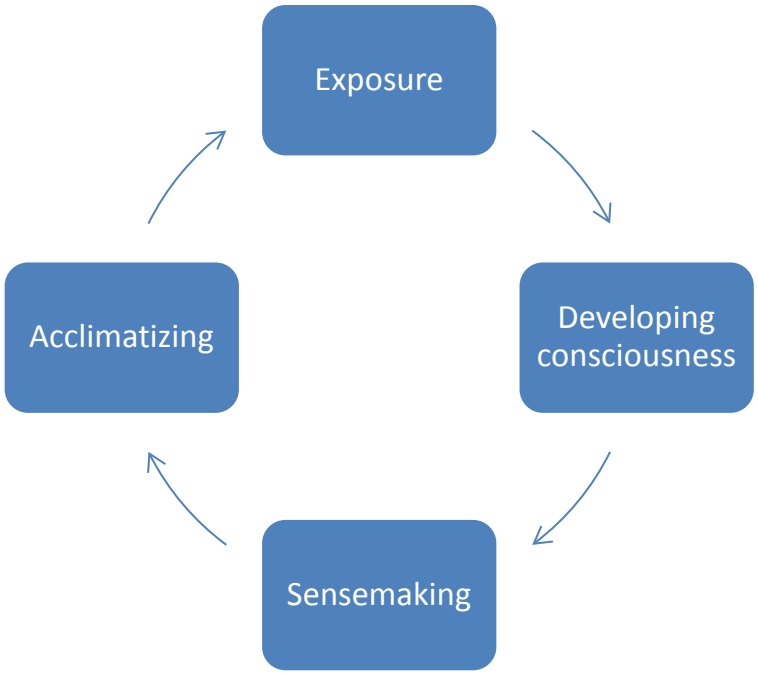
During data collection the interaction of individuals with differing care realities was observed. For example, Mike whose care reality reflected an information system driven perspective often interacted with Katy whose care reality reflected an information systems free perspective. Despite these different care realities Mike and Katy often had to work together. Mike often showed Katy methods and tasks that reflected information systems driven. For example, Mike showed Katy his iPhone app that allowed him to calculate BMI without leaving the bedside of the patient. In addition, during data collection and analysis changes in an individual's care realities were observed. By coding for this interaction and change, a process model of Care Reality Negotiation can be theorized. This was developed as a process model because it does not hold that the introduction of a different care reality (stage 1) is necessary and sufficient (Markus and

Robey, 1988). Stage 1 is considered necessary for the process to occur but does not "cause" a change. In addition, I do not aim to predict an outcome. Instead I am concerned with explaining how an individual's care reality may change and develop over time (Markus and Robey, 1988; Newman & Robey, 1992). This process model was constructed using observed and described interactions of nurses with differing care realities.

This process was identified and developed based on the literature which is explored below. In this context, "exposure" refers to an individual being introduced to an alternative care reality, "developing consciousness" refers to the individual becoming aware of the discrepancies between care realities, "sense-making" refers to the individual attempting to understand the differences between care realities and the implications of both these differences and of taking on or rejecting a care reality, and "acclimatizing" refers to the individual beginning to function within a new care reality developed during the process of negotiation.

Blumer tells us that the meanings of symbols are experienced and developed through an interpretative process (Blumer, 1969). Individuals can modify and change the meanings that are assigned to technology and to their care reality. This process involves the individual being introduced to new meanings and then undergoing an internal conversation in which the individual determines the meaning of an object to him or herself.

Figure 1 Negotiation of Care Realities



4.5.1 Conceptualization of "Negotiation"

The understanding the process of negotiation is necessary, and it is the understanding of this process developed in the fields of psychology and sociology that is particularly relevant to this research. The negotiation of care realities and the phases discussed above are concepts based on a change in meaning for an individual. There are four areas of theorizing that were accessed to develop an understanding of negotiation of realities in this research: the coping model of user adaption, identity as a dynamic construct, cognitive dissonance theory and role conflict.

Beaudry and Pinsonneault (2005) drew on the coping process to identify and understand adaptation strategies to deal with the introduction of new technology. These strategies (benefits maximizing, benefits satisfying, disturbance handing and self preservation) result in the individual restoring stability, improving user effectiveness and efficiency and minimizing perceived threats. Within the coping process, individuals perform both problem-focused and emotion-focused actions to deal with disruptions (Beaudry & Pinsonneault, 2005).

Researchers argue that an individual's identity is a dynamic construct that is adjusted within social relationships (Goffman, 1959; Lamb & Kling, 2003; McNulty & Swann, 1994). Symbolic Interactionism agrees, theorizing that individuals develop their identity by adjusting based on the judgment of others (Mead, 1934). The implications for this research is that an individual's understanding of technology can be adjusted through interaction with others.

The successful adoption of an identity is made up of the following process: the individual has a self image of himself or herself as a member of the profession; behavior that does not fit the professional identity is discontinued; skills and knowledge that are needed in the professional identity are demonstrated and improved; ideological beliefs are fully accepted; and relationships with others with the same identity are perceived as positive and valued. The adoption of this culture is typically characterized by ongoing negotiation and accommodation, as new members are exposed to and adopt the methods to defend and support their work-related behaviors (Dolch, 2004).

Festinger's cognitive dissonance theory tells us that social interaction is a process of the creation and the reduction of conflict. Individuals who do not share one's opinions are seen as potential sources of dissonance (Festinger, 1957). Most individuals will attempt to reduce or eliminate this dissonance. This is often done by finding others within the social group to with whom agreement can be established. When others cannot be found to agree with, it is difficult to eliminate this dissonance (Festinger, 1957).

Finally, negotiating care realties also draws upon sociological research on family dynamics through their focus on role conflict and negotiation (Hochschild & Machung, 1989). In role negotiation, the family roles of individuals are often questioned and changed during various internal and external events (LaRossa & Reitzes, 1993).

Negotiation of a care reality is not the abandonment of one care reality for another, but is instead an alteration in which much of the original care reality remains intact with some new understandings and perspectives incorporated. This should be considered negotiation because some of these understandings and perspectives may at first be inconsistent with the original reality (Thumma, 1991). This negotiation is "part of the

natural process in which people engage to create a more stable and coherent self-concept" (Thumma, 1991; 334).

In order to understand how an individual creates and recreates their care reality, it is important to fully understand the concept of negotiation. The behaviors associated with the process of negotiation include becoming aware of an alternative care reality, comparing care realities and negotiating the knowledge of this alternative care reality into the individual's personal care reality. The term was also chosen to reflect the feeling of an acceptance of some imperfections within the new reality due to the integration of the alternative care reality.

4.5.2 The Properties of Negotiation

The properties of negotiation identified in this research are as follows: first, there is tension or conflict between different care realities; second, for negotiation to occur, the potential for change to a different care reality must be introduced to the participant; third, for integration to occur, both the original care reality and the proposed care reality must undergo change; finally, a full resolution may never occur, as negotiation between different realities is ongoing and situational.

In this research, the first property, tension, is related to a conflict between wanting a care reality to stay the same and experiencing a possible change in the care reality. Bevan (2002), among others, identified this tension in his research on the incorporation of technology into nursing; he identified that nurses felt tension when they were required to incorporate the use of technology into their own methods of initiating dialysis. This tension was framed as a result of the conflict between "care" and "the dehumanizing effects of technology" (Bevan, 1998; 730). Within my research, this tension is introduced in several ways, including interacting with coworkers with different and conflicted care realities and the introduction of new technology into the organization.

Patricia experienced this tension when she wanted to keep her care reality in which the tasks associated with the use of information systems were not a part of care. However, other nurses in the rehabilitation hospital where Patricia worked had different care realities that included this type of care. For example, Patricia worked with several nurses

that routinely used their hospital-issued iPods to calculate medication dosages. Patricia felt pressure by the other nurses and the administration to accept that these tasks were a part of giving care; she felt pressure to change her care reality to reflect the care reality of the other nurses on her floor. Emily felt a similar pressure when nurses on her floor attempted to change her care reality to reflect the priority on direct care and not on emotional care that made up her care reality.

The second property, the introduction of a potential change to an individual care reality, is also related to the tension experienced by nurses. This change reflects the introduction of a different interpretation of an object that does not fit the individual's existing care reality. This can either be gradual, where the nurse only notices the change after it has occurred, or profound, where the nurse consciously acts to alter or resist the change to a new care reality.

The third property, the need for a new reality, is due to the individual's ability to actively create their own care reality (Gelman & Taylor, 2000). Negotiating is not about conforming to a new care reality; rather, it is about transforming the old care reality based on the information received from the introduced care reality.

Finally, the last property, the ongoing nature of negotiating, is due to the fact that each nurse is continuously coming into contact with individuals and objects that reflect different care realities. Thus, the process is never ending, as a nurse needs to constantly act and react toward the introduction of these new care realities.

Understanding the concept of negotiating is essential when it comes to fully grasping the meaning of negotiating on the care realities of the individual and their subsequent behaviors.

4.5.2.1 Exposure

In order for an individual to go through the process of negotiating different care realities, the individual must first be exposed to a different care reality. This exposure varies in terms of formality, history and who is involved.

First, a new care reality can be formally or informally introduced. For example, an individual may be exposed formally to a different care reality by the management of a hospital introducing a new IS or new series of IS-related tasks. Andrea experienced this type of exposure when she was assigned the task of updating a database. She spoke of a meeting in which all of the nurses were told that they would be expected to update a database and record the time spent with each patient, the nursing tasks performed, the nursing diagnosis and the recommended next steps. She also spoke of several training sessions in which she was trained how to use the database. During these training sessions, she was told both how and why to use the program.

> "*They kept telling us over and over again why we needed to use the program."*
>
> *"What did they say?" (Interviewer)*
>
> *"Just stuff like it will help you take care of the patient."*
>
> *"Did you believe them?" (Interviewer)*
>
> *"No. I mean they should have just been honest and said this will help us get more money from the government." (Andrea, interview #1)*

Similarly, Gail experienced this type of exposure when a new expert system was introduced to allow her to search for nursing treatment suggestions. She also had formal training that included a description of the benefits of using the machine.

By comparison an individual may be exposed informally to a different care reality by a co-worker using an IS or talking about an IS in reference to their own personal care reality. For example, Mike frequently exposed other nurses to a new care reality when he used his iPhone to provide care for his patients.

Second, exposure to a new care reality can vary depending on the newness of the care reality. Within this research, it appeared that introducing new technology in organizations is a key moment when nurses may be exposed to new care realities.

However, while a new care reality can be introduced at this time, an older care reality can simultaneously be reintroduced.

Iris discussed introducing a new care reality to a co-worker when she used her iPod to calculate a patient's medication dosage when the hospital pharmacy had delivered the medication to the floor in different units than the physician had ordered on the patient's chart. Her co-worker noticed the iPod and asked her if she was playing a game. Instead, Iris showed the nurse the application that allowed her to calculate the correct medication dosage. The co-worker, who would normally have used a textbook to do the calculation, commented:

> *"I didn't know you could do that" (Iris, interview #2).*

By comparison, Patricia described being reintroduced to a care reality that accepted the daily use of computers when she saw the other nurses at the nursing station and in the computer room using information systems. This is a reintroduction because it happens regularly in comparison to a nurse seeing or being told of a care reality for the first time.

Third, the introduction of a care reality can vary in terms of who is doing the introduction. Management, a senior co-worker, a junior co-worker, a teacher, a mentor, a peer and different texts can all introduce a new care reality.

4.5.3 Developing Consciousness

Of particular interest to this research is the process individuals go through after this exposure to new or different care reality, or the phase of developing consciousness.

Developing consciousness conceptualizes a phase experienced by the individual while responding to the introduction of different possible care realities. Similar to the appraisal phase of coping theory, within the developing consciousness phase the individual becomes aware of the discrepancies between the different care realities. The result is a disparity between what the individuals understood about their care reality from their education and past experience and what they encountered while interacting with others that did not share their care reality.

However, unlike the appraisal phase of coping theory, individuals within this research did not develop an assessment of the consequences of the introduction of the care reality during this phase. Rather, during this phase, the individuals realized that there were inconsistencies between his or her care reality and an alternative care reality being presented. Both care realities are explored and compared by the individual, and initial judgments based on the comparison are then made. Within this research on care realities, assessment does not occur until later in the process.

For example, Anya experienced the developing consciousness phase when her floor computerized the medication records. She said she was expected to switch from recording medication on the paper chart to recording it on either the COW[2] or the computer at the nurses' station. This change was introduced by the hospital management as a better way to provide care because it reduced the risk of giving the wrong medication, giving medication at the wrong time or giving too much medication. This was a different care reality than what had been originally introduced to Anya. It involved assigning more priority to informational care through the use of an IS than Anya's care reality accepted. Anya demonstrated this when she stated:

> *"I don't think that using the computer is giving care."*
> *(Anya, interview 2)*

In this phase, the individual becomes aware of his or her care reality; this does not often happen unless their care reality faces a challenge from an alternative source. For example, when I interviewed Beth and asked her what she meant by "care," she stated:

> *"I never thought about it before. It's just, you know, what I do to take care of my patients." (Beth, interview 2)*

After an individual becomes aware of his or her care reality, the next step is to either accept or reject the alternative care reality introduced. Elizabeth, for example, rejected

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[2] COW – Computer on Wheels

the definition of care included in an alternative care reality that rejected the use of Information Systems. She spoke with frustration of some of the other nurses she worked with who did not want to use a new IS that would warn the nurse of possible drug interactions:

> *"There are so many drugs out there now. . .and some of our patients are taking more than ten different drugs. There's no way you can know all the possible reactions. The books are out of date before they're published. The only way to make sure you're providing care is to use this system." (Elizabeth, interview 2)*

Gail also rejected an alternative care reality when she was introduced to the care reality that involved using a laptop computer to document each home visit in Microsoft Word in her job as a district health nurse, and using an expert system to search for nursing treatment suggestions. She rejected this definition of care:

> *"That's not giving care. That's just making sure I do things the way they want." (Gail, interview 1)*

In both of these examples, a nurse has compared his or her care reality to a new care reality and judged it as not defining care. (It is important to note that, if an individual rejects a care reality, he or she still has to continue through the process of sense-making and acclimatizing.)

By contrast, other nurses accept the existence a different care reality. This does not mean they take on the care reality; it means they accept that there is another possible way of providing care. Thus, instead of rejecting the definition of care given in an alternative care reality, the definition is accepted as a new possibility — the individual is open to a change. For example, Anya reflected this subcategory when she spoke of a colleague texting a patient to remind them to test their blood sugar:

> *"I don't think I would do that but it's a good way to try and get them to do it at the same time every day." (Anya, interview 2)*

The phase of developing consciousness conceptualizes the initial experiences and judgments made by the individual while responding to the introduction of different possible care realities. Individuals are exposed to a different care reality and judge if that care reality is valid. This is the starting point of negotiating care realities and it refers to an awareness of the discrepancies between the nurse's care reality and the care reality being introduced. Once an individual has made an initial judgment of a care reality, he or she enters a phase of sense-making, in which the individual deals with the implications of the differences between care realities.

4.5.4 Sense-making

Sense-making was identified in this research as the dilemma an individual experiences when they find themselves in the position of "the other," where the individual's reality does not match the reality being proposed. The individual attempts to understand the differences between care realities and the implications of these differences. This understanding draws on Mead's two parts of the self: the *Me*, which *reflects* the attitude of the generalized other; and the *I*, which *responds to* the attitude of the generalized other (Mead, 1934). During sense-making the individual is sees their care reality from the perspective of an outsider or a individual with the introduced care reality.

In this phase, the individual nurse makes sense of the introduction of the new care reality (Pratt et al., 2000). He or she will struggle with this new care reality by participating in sense-making activities to create a plausible understanding of the new care realities and how they fit with the individual's original care reality (Currie & Brown, 2003). Similar to the appraisal stage of coping theory, the individual within this stage of the negotiation process explores the consequences of the new care reality on his or her care reality (Beaudry & Pinsonneault, 2005). This process will be different for individuals depending on their original care reality. This phase is different from consciousness because it actively develops an understanding of the possible outcomes of the acceptance or rejection of the new care reality.

The tension that exists during this phase is between being a nurse yet having to perform tasks that are not considered by the individual to be care. For example, Andrea had a care

reality that did not include any information systems-enabled informational care tasks. However, within her job as a nurse, she was expected to update an IS with the time spent with a patient, treatment given, treatment recommended, and milestones met.

To make sense of a task that does not fit into their personal views of care, the nurses tended to distance them from the care reality that accompanied that work. Goffman (1961) states one is not "just the role" in which one has been cast; the role is not playing the individual, but the individual is "playing with the role" (Goffman, 1961). Through this role distancing, the participants are able to effectively separate themselves from what the work implies for them. Thus, they were able to perform tasks associated with a specific care reality that the organization has attempted to cast them in, without actually adopting that care reality.

Another sense-making activity was to try and see the positive aspects of the task associated with the new care reality being introduced. This was done by justifying participation in this new care reality and thus neutralizing the stigma. The main method used was rationalization in order to justify their actions. Beth illustrated this method when discussing the use of the iPod she had been given to use:

"It's not giving care. . . but . . .it's helping me give care. I could do it without it but this is just faster." (Beth interview #2)

In fact, during the interviews, the participants spent much time explaining how they made sense of work outside their care reality. Through this rationalization, the meaning of these tasks for the individual was recreated. Beth originally saw the use of information systems as "against care." However, after being introduced to a different care reality that included the use of IS, she began to question this understanding. Through this questioning, the meaning of the task started to change, and a rationalization strategy reinforced the legitimacy of the new meaning.

In contrast to the above sense-making activities that participate to some extent in the new reality, another sense-making activity involves stigmatizing the tasks. Stigmatizing the

care reality often results in resistance, including refusal to use an information system and avoiding the use of an information system.

4.5.5 Acclimatizing

This final phase in the negotiating process denotes the individual adjusting to the exposure of a different care reality. Through *acclimatizing*, the individual's reality is re-solidified and the process of negotiation will begin again with exposure to another different care reality. During acclimatizing, the individual begins to function within the new care reality that has been developed. Tasks and skills might need to be learned or relearned, attitudes may need to be changed, and even personal contacts might need to be altered. During acclimatizing, the symbols that make up the different care reality are moved into the ready-to-hand state.

4.5.5.1 The strategies of acclimatizing

Several strategies of acclimatizing were identified in this research. Through these strategies, an individual created a new care reality that was made up of an introduced care reality and his or her original care reality. These strategies involved either an internal shift in the way an individual thought of an individual or a technology, or an external shift in the individual's behaviour. Within coping theory, this has been identified as emotion- and problem-focused adaptation (Beaudry & Pinsonneault, 2005). However, within this research, the individuals focused not on an overall change that is implied in the concept of adaptation, but instead on a subtle and gradual process that took place over a period of time through many versions of the negotiation process in which the same, or similar, care realities were introduced and reintroduced.

4.5.5.1.1 Internal

The internal strategies of acclimatizing in this research involved rationalization, through which beliefs and opinions were explored and adjusted.

One type of internal strategy involved the reconstruction of the meaning assigned to objects. This reconstruction was triggered when an individual's care reality did not align with his or her earlier sense-making activities. Thus, reconstruction was needed to

realign the meaning. Sometimes, the participants adjusted the meaning of a given information system to be more compatible with their care reality. For example, Sarah was in the midst of an internal acclimatization process during our last interview. She had told me earlier that she did not see a link between information systems and caring. However, during our last interview she told me that she had used the expert system to find a different way to care for a lesion on the foot of a diabetic patient. Her co-worker had shown her how to use it when she had asked the nurses at the nursing station for treatment advice. When I asked her if she had changed her mind about the link between information systems and care, she responded:

> *"Sort of. . . I guess. It doesn't always get in the way as much as I thought. But it's still not care. It's just helping me give care. . .I guess" (Sarah, interview #2)*

Through this internal process, Sarah questioned her original care reality, which did not allow for the use of information systems to be a part of giving care. She questioned her reality because she was introduced to, and responded positively to, a different care reality in which information systems are a part of care. The result of this process was that Sarah adopted a different care reality where the use of this expert system was a possible tool for giving care.

It is important to note, however, that this internal process does not always result in an individual accepting the use of an information system into his or her care reality. Even in this example, Sarah has not fully accepted the idea of information systems as being a part of care. At best, she could be described as "mixed" based on her responses in the second interview. In fact, other participants reconstructed their care reality to more fully reject the use of information systems. Some participants, when confronted with the care reality of another nurse, negatively adjusted their understanding of the other nurse. For example, Kathy complained about a nurse she often saw using an iPhone to perform medication dosage calculations. Instead of responding as Sarah responded, Kathy readjusted her view of the nurse in a negative fashion:

"I thought she was a good nurse but all she wants to do is use her iPhone."(Kathy, interview #1)

4.5.5.1.2 External

The second strategy of acclimatization was to change one's behaviour to accommodate the introduction of a different care reality, which is an external strategy. Within this research, resistance, avoidance, tolerance, accommodation and acceptance behaviours were all identified through grounded theory coding. These behaviours could be overt or covert and could differ depending on the situation.

The first external behaviour identified was resistance. Through this behaviour, the individual resists the new care reality. This often occurs when the differences between the care identities appear so great the individual does not see any link between them. In this situation, to accept the introduced care reality means to adopt a new, unwanted identity, and therefore, to avoid this, the individual participates in resistant behaviour.

For example, Liz participated in resistant behaviour when her care reality did not accept the use of most information systems to provide care. This disconnect between her original care reality and the introduced care reality was so great that she could not accept a new care reality that incorporated any aspect of the introduced care reality. Liz resisted in several ways. As a surgical nurse, part of her job was to check the patient schedule every day. The hospital she worked at introduced a computerized patient scheduling system. Liz's first form of resistance was to not attend training on the new scheduling system:

"I was too busy doing my job" (Liz, interview #1).

Liz's second form of resistance was to attempt to break the new system. She told me how, on the first day of the new system being used,

"I just kept pressing "esc" because I thought that would break it" (Liz, interview #1).

Liz quit her position as a surgical nurse because she would not learn how the use the new scheduling system. Her hospital reassigned her as a bedside nurse. However, she was only expecting to be in that position for a year because the hospital was expanding the use of the scheduling system and she would be required to use the system in her new role. Her plan in this eventuality was to quit nursing despite the fact that she loved

> *"being a nurse and taking care of people" (Liz, interview #1).*

The second external behaviour identified was tolerance, where the individual merely tolerates a new care reality. Tolerance does not mean acceptance of the care reality, but rather a willingness to acknowledge that it exists and to respect it. This behaviour is made up of a willingness to interact and to cooperate with others with a different care reality. This does not mean it is always a positive relationship; tension and conflict may be ongoing.

For example, Patricia tolerated different care realities. This behaviour was demonstrated in the manner in which she made agreements with her co-workers. Patricia would perform care tasks that the other nurses did not enjoy (making beds, cleaning rooms, changing bed pans) and her co-workers would perform care tasks that required information systems (taking blood pressure, calculating dosages). The tension within this tolerating behaviour resulted in her turning to resistance behaviours and, ultimately, she quit her job.

The third external behaviour identified was accommodation, where the individual accommodates a new care reality. This behaviour consists of compromising; when an individual takes part in accommodation, he or she may not agree with a care reality but can still participate in the care reality. The emphasis in this case is on functional purposes, not identity. Scheff (1968) identified this behaviour in his two types of reality: reality which people believe in and realities that are simply followed. In my data, I found many different examples of accommodating a new care reality. Mike, for example, accommodated a new care reality in his ward when he was told that direct care tasks were the most important. While he did not agree with this care reality, he compromised by

agreeing to perform his direct care tasks at the same time as his informational care tasks (Scheff, 1968).

The fourth external behaviour identified was acceptance, where the individual embraces a different care reality and incorporates it into their care reality. The complete acceptance of a new care reality was an uncommon occurrence within the data. By accepting a new care reality, the individual is accepting a very big change in his or her identity as a nurse. In addition, the acceptance of a new care reality does not just involve learning skills; the individual must also adopt a set of implicit qualities and reject other implicit qualities they used to hold. If they do this, they may not be fully accepted by their peers. Through interactions, often informal, new members adopt a sanctioned way to feel, think and behave within the profession (Kleinman, 1996; Mechanic, 1962).

For example, Carol described her experience of acceptance. She started her career as a bedside nurse whose care reality was based on privileging direct care, feeling mixed about the idea of technology use in direct care and rejecting informational care. She described a period of accommodation in which she would use technology in direct care only if she was required to. Over several years and different training sessions, she began to accept the use of information systems in direct care. She noticed this when she began to use the information systems automatically and not have to think about it. She then repeated the same process with informational care and information systems. This process was more difficult; she lost her close relationships with some nurses during this process. Finally, she switched jobs to become a nurse that trained other nurses on the use of new information systems. There were several reasons for this job change. One that is of particular interest to this research is that:

> *"I was tired of being shunned by some of my co-workers because I'd use the technology and not complain" (Carol, interview #2*).

Kohli and Kettinger (2004) discuss this difficultly in their research into the behavior of the clan and their control on individual behavior. They found that group members use a negotiated consensus to create a discourse that group members use to understand what the correct behaviour is in a given situation (Kohli & Kettinger, 2004).

This leads to the final working propositions:

P7: An individual's care reality can undergo changes during a negotiation process after coming into contact with alternative care realities. These changes can impact their understanding of technology and its use in providing care.

The next, and last, chapter of this thesis follows. In this chapter, I will outline the overall theoretical conclusions and implications of this research, address potential limitations of this study, and discuss areas of future research.

Chapter 5

5 Discussion and Concluding Remarks

The goal of this research was not to verify or test the existing theories, or to simply take an existing theory of identity and apply it to an individual's understanding of an information system and thus its use and nursing. Instead, it was to gain a deeper understanding of the experiences of nurses working with information systems and to understand why stories like the ones above are so common in our healthcare system. The overarching perspective I took was consistent with Orlikowski and Iacono's (2001) ensemble view, in which the social, cultural, and political factors within work shape and are shaped by technologies that are deployed (Orlikowski & Iacono, 2001). This chapter is the conclusion of the research and contains a summary of the research and key findings, as well as a consideration of the limitations of the study. This chapter concludes with a discussion of the broader implications and recommendations that arise from the study findings as they relate to IS and nursing research and practice.

5.1 Summary of the Research

The use of information systems in nursing is a growing phenomenon. The purpose of this research was to explore the ways in which identity influences the way nurses construct the meaning of the experience of using information systems within nursing. The intent was to produce an in-depth theoretical understanding rather than a description of the experience or a testable model of IS use.

The Symbolic Interactionist approach and, more specifically, the Chicago School of SI (Blumer, 1969; Mead, 1934) and Heidegger's theory underpin the theoretical perspective applied in this study (Mulhall, 1996). The perspective of SI places a clear emphasis on meaning, interpretation, self and social interaction (Blumer, 1969). According to this view, human beings are not passive, but instead construct actions on the basis of how they define and interpret situations (Blumer, 1969). A second assumption is that meanings are not inherent to objects or things; rather, they are socially constructed (Blumer, 1969). A

further point is that human society consists of people engaging in ongoing action and interaction (Blumer, 1969).

This research was performed using a grounded theory method. It was carried out in three cities in Canada: London, Ontario; Ottawa, Ontario; and Vancouver, British Columbia. Purposive sampling and theoretical sampling were used and the main sources of data were in-depth interviews, textual analysis and observation. In accordance with grounded theory methods, data analysis commenced directly following the first interview. Constant comparisons of data, concepts and categories were conducted through three reiterative coding steps: initial coding, focused coding and theoretical coding (Charmaz, 2006).

This research identified a multi-faceted understanding of care as central to the nursing identity. Care was constructed differently for each participant. This individual understanding of care, his or her care reality, was the core category developed in this research. An individual's care reality determined the meaning of information systems and their use. This understanding of care, and the meaning of nursing objects, needs to be maintained and negotiated when the individual nurse interacts with other nurses with different care realities. Orlikowski and Iaconao (2001) stated that the meaning of a technological artifact is conditional; they identified several reasons why the meaning can change (different features, new standards, etc.). Within this research, I identified that the meaning of the artifact is also conditional on the identity of the participant.

5.2 Understandings

Informed by an SI approach, this research explored the experience of nurses interacting with information systems. This study came to the following four conclusions:

5.2.1 Care Reality

This research identified the existence and importance of an individual care reality. My research shows this to be an individual's multi-faceted understanding of care that is central to the nursing identity. It is made up of four elements of care: direct care, emotional care, informational care and organizational care. Each individual's care reality

was constructed personally, with different levels of acceptance and priority for each element of care. This care reality was identified as a main source in the creation of meaning of nursing objects, including information systems objects.

In addition to identifying the existence of a care reality and its importance on an individual's understanding of information systems objects, this research also identified a link between care reality and an individual's behaviour. In this research, an individual's use of an information systems object was a reflection of the different levels of acceptance and priority for each element of care.

5.2.2 Information Systems Perspectives within the Care Realities

The second result of this research was my identification of the existence and importance of ready-to-hand and unready-to-hand information systems objects within nursing (Mulhall, 1996). While engaging with information systems objects as ready-to-hand through skilled coping is the primary way an individual engages with the world, sometimes the skilled coping is disturbed. If this happens, the object is experienced as *unready-to-hand* (Mulhall, 1996). In an unready-to-hand situation the individual experiences the information systems object and not the tasks.

The participant reflected the ready-to-hand nature of an information systems object when he or she accepted and adopted a care reality in which the use of the information systems is a part of giving care. This was identified as "Information Systems Driven". The participant reflected an unready-to-hand nature of an information systems object in two different situations. The first is when he or she had mixed feelings about accepting and adopting a new care reality in which the use of the object was a part of care; in this situation, the participant adopted a care reality that incorporated these mixed feelings. This was identified as "Information Systems Enabled". The second situation is when the individual was unwilling to accept a care reality in which the use of an object was part of care; in this situation, the participant adopted a care reality that rejected the use of the technology. This was identified as "Information Systems Free".

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5.2.3 Negotiation Process

The third result of this research was the identification of a care reality negotiation process. In this process each individual is continuously introduced to different care realities when they come into contact with co-workers or management who do not share the same care reality. The individual must then go through a negotiation process whereby each individual manages his or her care reality. The process includes four phases: exposure, developing consciousness, sense-making and acclimatizing.

5.2.4 Identity Shapes Information Systems Interpretations

The final result of this research was the identification of the impact of an individual's identity on his or her understanding of information systems. Identity as a concept within IS research has not been fully developed. Both Nach et al (2009) and Lamb and Kling (2003) theorized that technology may have an impact on an individual's identity. However, they did not consider that an individual's identity may have an impact on their technology use. Through the study of the individual's identity, this research illustrates how the symbolic nature of the information system is manifested from the individual's identity and how the individual's identity therefore shaped their technology use. This is the ongoing result of the negotiation process in which the meaning of the information system is adjusted to fit into the individual's care reality and the care reality is adjusted to accept or reject an information system. This is an important finding as information systems are increasingly changing professional practices in ways that create paradoxes, disconnects and internal struggles through their various symbolic meanings.

5.3 Contributions

This research has several research and practical implications. From a research perspective this study makes a solid theoretical contribution to the information systems field by offering new working propositions to begin the development of a new theory of the impact an individual's identity on their interpretation of an information system and the impact of an information system on an individual's interpretation of his or her identity. Although the IS and nursing literatures have made substantial contributions to our

understanding of post adoption behaviour and nursing identity, little had been done to unify these areas of research and explore how identity and post adoption behaviour may be implicated together. In response to this limitation, I have theorized 7 working propositions which characterize three IS based care realities within nursing and also provide preliminary, yet compelling, explanations of the process of negotiation that occurs when individuals with different identities interact, thus providing a more dynamic perspective than has previously been considered in IS research. The finding of the importance of identity on an individual's understanding of an Information system can help us understand the reasoning behind an individual's adoption and post adoption behaviour. For example, the Task-Technology Fit (TTF) theory can be complemented by the addition of identity. TTF states that an individual is more likely to use an IS if there is a match between the capabilities of the IS and the tasks that the user must perform(Goodhue & Thompson, 1995). The findings from this research, specifically that an individual's identity may impact their understanding of an information system, can help us further refine the concept of fit. Specifically, an individual's identity may impact their understanding of the task or of the task performed with an information system. This may help to explain why some individuals still resist using an information system even if there appears to be fit between the capabilities of the IS and the task. Additionally, the Information Systems literature has identified a wide variety of use behaviours. The identification of the importance of identity on an individual's understanding of information systems may help us understand the reasoning behind some of the behaviours identified in previous IS research. For example, Lapointe and Rivard, (2006) identified several types of resistant behaviour in the introduction of a CIS for physicians. While they identified the importance of the roles played by implementers and users in determining the outcomes of a CIS implementation the use of this theory may have helped them gain a deeper understanding of both the early attitudes of the participants and the change in behaviour through the implementation process.

Table 15 Working Propositions for Future Research

P1: An individual's care reality determines the meaning of nursing objects, especially information systems.
P2: There exist three care realities to consider when exploring the understanding of an information system by a nurse. These realities are called information systems driven, information systems enabled, and information systems free.
P3: How an individual understands an information system will impact how he or she will use it.
P4: An individual's whose care reality is *information systems driven* will use more information systems and features to provide care.
P5: An individual's whose care reality is *information systems free* will refuse to use information systems and features to provide care
P6: An individual's whose care reality is information systems enabled will partly accept the use of information systems but will not extend their use
P7: An individual's care reality can undergo changes during a negotiation process after coming into contact with alternative care realities. These changes can impact their understanding of technology and its use in providing care.

Second this research explores the relationship between information systems and work as identified by Barley (1996). Barley calls for a deeper understanding of work and technology; this research responds to his call by investigating how nursing work (care reality) is conducted, how it changes and how it is negotiated in the face of technological change. In addition, this research identifies a methodology that can successfully be used to explore this relationship between technology and work reflecting Orlikowski and Iaconno's call to study the ensemble view of technology. The attribute-based style of research typically associated with systems use studies cannot reflect the nature of the ensemble view espoused by Orlikowski and Iaconno – different methods are required to expose the social, cultural, political and work-related conditions within which the ensemble view places technology. The methods used in this research provide an important path for future research seeking to deploy an ensemble view.

Third, this research highlights the impact of identity on information systems use. As outlined earlier, identity as a concept within IS research has not been fully developed. Both Nach et al (2009) and Lamb and Kling (2003) theorized that information systems

may have an impact on an individual's identity. However, they did not consider that an individual's identity may have an impact on their information systems use. This research identifies the impact of identity on information systems use through the identification of the care realities and the impact of the care reality on the understanding of information systems.

Fourth, this research contributes to the post adoption literature by identifying the negotiation process individuals go through as they are introduced and reintroduced to changing work practices. This process, through which an individual adjusts their care reality, highlights one of the ways the individual makes the various post adoption decisions identified by Jasperson et al (2005). Hsieh and Zmud (2006) point out that many post adoption behaviours are voluntary; the individual can choose to use the IS in a manner that just meets the mandated behaviour, or the individual can chose to expand their knowledge and behaviour beyond what is organizationally mandated (Hsieh & Zmud, 2006). The negotiation process extends this research to explore how these choices are made and the impact of these choices on future choices.

Fifth, this research extends the current understanding of technological frames. Orlikowski and Gash (1994) developed a theoretical understanding of technological frames that allows the individual to make sense of the information system and themselves in relationship to the information system (Orlikowski & Gash, 1994). This research, through the concept of a care reality, builds on this understanding of the technological frame by identifying a possible way a technological frame is formed. By understanding and exploring an individual's care reality, we can begin to more fully understand the technological frame of an individual. In addition, through the idea of the different care realties we can begin to see why a professional group that seems to share an essence may not have congruence in technological frames.

Sixth, by using nursing as a profession, this research has demonstrated how technology use and work are intermingled and how individuals react to, cope with and adapt or fail to adapt to that change. This is a model of research that could be used to better understand work change in other professions as well.

The implications for practice from this study are threefold: for nurses needing to incorporate the use of information systems into his or her care reality, for nursing educators and for information systems professionals designing and implementing information systems within nursing.

This study found that care realities can and do change. Through the negotiation process, individuals may accept the use of information systems. However, this acceptance may not be complete or fast. It is therefore desirable that nurses who do not accept information systems use in their care realities are often introduced and reintroduced to care realities that accept information systems use in a variety of different ways. One possible channel is through formal training, but also informal use and discussions on information systems use.

This study found that nurses view information systems and their use through their care reality and that this care reality is different for different nurses. It is therefore desirable that administration and information systems designers develop and introduce information systems that can work in a variety of care realities.

Finally, this study found that information systems can be ready-to-hand or unready-to-hand. The participants reflected a ready-to-hand nature of an object when he or she accepted and adopted a care reality in which the use of the object is a part of giving care. By introducing and reintroducing the care realities of others, we can help nurses change their own care reality to allow for the use of information systems. In addition, we must ensure that information systems fit as easily as possible into the ready-to-hand perspective for the individual. One possible channel is to ensure that an information system fits the task it is designed for. Another possible channel is to ensure that nurses are comfortable using an information system. This can be accomplished by incorporating information systems in a positive manner into the care realities in both education and ongoing training that involves performing the related tasks in the nursing environment.

5.4 Study Limitations

No research is perfect and this study is no exception. There are several limitations to consider.

The study was constrained in the choice of participants, technologies and environments studied. In this research, multiple technologies and multiple types of nurses in a wide variety of working environments were studied. By choosing breadth and not depth this research is, therefore, limited. For example, while it was appropriate that all participants had completed their education as a RN, further into this research is became clear that there might be differences in the type of nursing being performed in the different working environments, and these differences could not be deeply investigated. The findings may have evolved differently if these differences had been controlled for in the original study. While this is a limit to the study, it was a conscious choice that was informed by the methods and rationale of symbolic interactionism and Grounded Theory.

5.5 Recommendations

The findings of this study not only contribute to a theoretical understanding of the study phenomenon, but could also be translated into practice for the benefit of nurses, educators and IS professionals.

5.5.1 Opportunities for Future Research

The first area of future research should focus on refining the process model developed within this research. At the momement this model is theoretical and more data needs to be collected to more fully understand the negotiation process. For example, not everyone I interviewed or observed went through the negotiation process and not everyone went through the same stages. This is a starting point to understand the interactions between individuals with differing care realities. However, more work is necessary to fully explore and refine this model. It is possible that the stages are not as discrete as I have theorized and that the individuals may not follow these stages in the linear manner as I have theorized. For example, given how quickly some individuals went from Exposure to Developing Consciousness it is possible that they are not two different stages. Similarly,

while the data I theorized from had nurses moving from Sensemaking to Acclimatizing it is possible that other nurses may not move from sensemaking at all or may move backwards.

The second area of future research should focus on the connection between an individual's interpretation of an IS and how that influences his or her behaviour. In light of the findings of the impact of care realities on an individual's understanding of an information system, the next step will be to determine the connection between this understanding and the individual's use behaviour.

The final area of furutre research should focus on the application of this theory outside of nursing. . An opportunity exists to explore the other possible realities within healthcare that may be informing other professional groups in their post adoption behaviours. By understanding the different realities of physicians and allied health groups, we can begin to explore the problems associated with IS use throughout the field of healthcare. This research can also be extended outside healthcare into other fields where identity is a part of the relationship between information systems and work as identified by Barley (1996). For example, information technologies are making their way into every part and every level of contemporary organizations. Many knowledge workers are seeing their work change, be they senior managers, consultants, analysts, etc. The methods and theories deployed in this research present new ways of approaching post adoption behaviors and use research.

The research questions addressed in this study were:

> *What role does a nursing identity play in a nurses' interpretation of information systems that he/she is called on to use in the practice of nursing.*
>
> *How are these interpretations formed and changed?*
>
> *How do the interpretations of information systems differ between nurses?*
>
> *What are the implications of these differences on information systems use?*

My research identified that an individual's nursing identity is centred on his or her personal, multi-faceted understanding of care. This understanding is the link between an individual's care reality and his or her behaviour toward the information systems within their workplace. These interpretations are formed and changed through a care reality negotiation process; in this process, each individual is continuously introduced to different care realities when they come into contact with co-workers or management who do not share the same care reality. The individual must then go through a negotiation process whereby each individual manages his or her care reality.

This research produces a theoretical understanding of the experiences of nurses interacting with information systems. The findings inform nursing research and practice, as well as contribute to the development, implementation and use of information systems in other areas of the modern healthcare system.

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Appendices

Appendix A. Email to Nursing Contacts

Dear {name},

As you know I'm in the process of wirting my dissertation. I am focusing on the use of Information Systems by nurses. Specifically, I am interested in their understanding of ISs and their use in their work.

I would like to ask you to forward this email to any nurses you know who might be willing to take part in my research. I am looking to interview nurses for my dissertation (entitled "Identity and the Computer: Interpretations of Information Systems Technology in the Healthcare Workplace") that is under the supervision of Dr. Deborah Compeau and Dr. Nicole Haggerty at the Richard Ivey School Business at the University of Western Ontario.

Participation in this study is voluntary. The participant may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect. The individual will not personally benefit from participating in this study, but his or her participation will help us develop new knowledge. There are no known risks to participating. No personal identification information will be disclosed: all responses will remain confidential. All analyses will be conducted at the group level. Only summary results will be released. The findings will be included in my dissertation that might be published in the future. A copy of the research findings will be available upon request (approximately 8 months after the study is completed). If the nurses have any question about the conduct of this study or their rights as a research subject, they may contact The Office of Research Ethics at XXX-XXX-XXXX or by email at XXXXXX@XXX.XX.

This e-mail is for nurses to keep. If they are interested in participating or would like more information before making a decision, I can be reached by phone (XXX-XXX-XXXX) or e-mail (XXXXXX@XXX.XX). Thank you very much for your help.

Sincerely,

Hannah Standing Rasmussen

Ph.D. Candidate, Management Information Systems

Richard Ivey School of Business,
The University of Western Ontario.

Appendix B. Information Letter and Consent Form

Dear {name}

Nurses, throughout our healthcare system, use IT to perform many healthcare related tasks. Yet we do not fully understand why and how nurses use or do not use information technology. To address this gap, I am conducting research as a part of my dissertation (entitled "Identity and the Computer: Interpretations of Information Technology in Nursing") that is being conducted under the supervision of Dr. Deborah Compeau and Dr. Nicole Haggerty at the Richard Ivey School Business at the University of Western Ontario.

As a member of the nursing community you are being invited to participate in this study through this interview. About 50 individual nurses are being contacted to participate in this study. This interview will take place at a time that is convenient to you, at the Richard Ivey School of Business at the University of Western Ontario or in a place of your choosing. This interview will take about 30 minutes to an hour to complete. Once the interview is complete the researcher will review the data. If at this time the researcher find she has more questions she will contact you to arrange a second interview. You may refuse to participate in this second interview.

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from this interview or the study at any time. If during the course of this study, new information becomes available that may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

You will not directly benefit from participating in this study, but your participation may help us develop new knowledge. For example, through your participation we may begin to understand the motivations that nurses have to use or not use IT in their role as a nurse.

There are no known risks to participating. No personal identification information will be disclosed: your responses will remain confidential.

All analyses will be conducted at the group level. Only summary results will be released. Your research records will be stored in the following manner: locked in a cabinet in a secure office. If you agree for the interview to be recorded audio tapes will be listened to only by members of the research team and they will be destroyed after 5 years. You will not be compensated for your participation in this research study. You do not waive any legal rights by signing the consent form. With your permission this interview will be recorded. You may ask that the recording be stopped at any time during the interview. These recordings will be stored on the Ivey network drive. This network is firewall protected and requires a password to access. Any hard copies of transcripts of the

interviews will be stored in a locked filing cabinet in the researcher's locked office. Additionally, pseudonyms will be used in transcripts.

The findings will be included in my dissertation that might be published in the future. If the results of the study are published your name will not be used. A copy of the research findings will be available upon request (approximately 8 months after the study is completed). If you would like to receive a copy of the overall results of this study please email the interviewer at XXX-XXX-XXXX or put your name and address on a blank piece of paper and give it to the interviewer.

If you have any questions about your rights as a research participant or the conduct of the study you may contact Dr. David Hill, Scientific Director, Lawson Health Research Institute, XXX-XXX-XXXX or the Office of Research Ethics XXX-XXX-XXXX, email.

This letter is for you to keep. If you would like more information, I can be reached by phone XXX-XXX-XXXX or e-mail Thank you very much for considering participation.

Sincerely,

Hannah Standing Rasmussen

Ph.D. Candidate, Management Information Systems
Richard Ivey School of Business
The University of Western Ontario.

Please sign and return this consent form to the interviewer.

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Name of participant (please print): _____

Signature _____

Date_____

Name of person obtaining informed consent (please print):

_____

_

Signature_____

Appendix C. Interview Checklist

Arrive 15 minute before appointed time

Date:

Time:

Location:

Things to prepare:

1. Participant contact information
2. Transportation details
3. Map
4. Cell charged
5. Folder with information sheet, consent form, and demographics
6. Interview questions
7. 2 digital recorders with new batteries
8. Extra batteries
9. Pens
10. 1 notebook
11. Business cards

Start of interview:

1. Greeting, self introduction
2. Find a quiet and private place for interview
3. Turn off cell
4. Explain the aim of the study
5. Information sheet and consent form
6. Set up and check recorder
7. Explain the interview
    a. Estimated time
    b. Can stop interview whenever they like
    c. Will send them a transcription of the interview if they like
    d. Will change any identifying information
    e. Any questions?

At the end of interview:

1. Anything to add?
2. Potential for future contact?
3. Anyone they think I should talk to? (give card)

Post-interview:

1. Field notes
2. Reflexive journal
3. Back up files

Appendix D. Interview Guide for Semi-Structured Interviews

Note to participants:

I want to know about your experiences and feelings working with computers as a nurse. While this research is focusing on computers I also want to know about being a nurse – from your own experience.

Possible Interview Questions:

1. Why did you become a nurse?
2. What types of technology do you use as a nurse?
3. Do you like using the technology? (why or why not?)
4. What does “care” mean to you?
5. Can you care using computers?
6. What type of computers do you use as a nurse?
7. What about in the rest of your life?
8. Would anyone you know describe you as a “computer user?”

Appendix E. Texts

Table 16 Texts for Textual Analysis

Text	Source	Notes
Martha Raile Alligood Nursing Theory: Utilization and Application 4th edition 2010 Mosby Marylands Heights Missouri	Mark	
Barbara Arnoldussen First Year Nurse: Wisdom, Warnings and What I Wish I'd Known My First 100 Days on the Job. 3rd Edition 2009 Kaplan Publishing New York	Beth	Beth saw this in her professor's office and bought it herself after a bad day in her first placement.
Linda Louise Childs, Lesley Coles, Barbara Marjoram Essential Skills Clusters for Nursing: Theory for Practice 2009 Wiley-Blackwell Oxford UK	Emily	
Donna Ciliska, R. Brian Hayes, Susan Marks Evidence-Based Nursing: An Introduction Nicky Cullum 2008 Blackwell Publishing Oxford	Mike, Vanessa	
Juanne Nancarrow Clarke Health, Illness and Medicine in Canada 3rd edition 2000 Oxford University Press Don Mills	Sarah	Sarah discussed this book when we spoke of her education.
Martha Keene Elkin Anne Griffin Perry Patricia A. Potter Nursing Interventions and Clinical Skills 4th edition 2007 Mosby Elsevier St Louis, Missouri		Seen in nursing stations.
Sheila P Englebardt, Ramona Nelson Health care informatics: an interdisciplinary approach 2002 Mosby	Mike, Sue, Elle	

St. Louis, Missouri		
Christine E. Hallett Celebrating Nursing: A Visual History 2010 Fil Rouge Press Ltd. London UK	Emily	Emily got this as a present and recommended it to me as something "interesting."
Judity M. Hibberd, Donna Lynn Smith Nursing Leadership and Management in Canada 3rd edition 2006 Mosby, Elsevier Toronto		Seen in nursing stations.
Anna C. Jamme Textbook of Nursing Procedures 1921 The Macmillan Company New York	Sarah	Sarah discussed this book when we spoke of her education.
Janet Kraegel, Mary Kachoyeanos "Just a Nurse": From Clinic to Hospital Ward, Battleground to Cancer Unit – The Hearts and Minds of Nurses Today 1989 Dell Publishing New York	Carol	Carol commented that "everyone read this when it came out."
Oliver D. Selvin Nursing Models. Theories and Practice Hugh P McKenna 2008 Blackwell Publishing Oxford UK	Mike, Vanessa	
Marjorie McIntyre , Carol McDonald Realities of Canadian Nursing: Professional, Practice, and Power Issues 3rd edition 2009 Lippincott Williams & Wilkins Philadelphia		Sarah discussed this book when we spoke of her education. She said it would help me understand being a nurse in Canada.
Anne Griffin Perry, Patricia A. Potter Elsevier Mosby Mosby's Pocket Guide to Nursing Skills and Procedures 7th edition 2011 Mosby Maryland Heights Missouri		Many nurses carried this type of book around – especially the younger nurses.
Harriet C. Moidel, Elizabeth G Giblin, Berniece M Wagner Nursing Care of the Patient with Medical	Anya's nursing station	I saw Anya referencing this textbook. She

Surgical Disorders 2nd edition 1976 McGraw-Hill Book Company New York		also showed it to me. Several other nurses in different wards referenced other similar textbooks
1. Patricia A. Potter, Anne Griffin Perry Janet C. Ross-Kerr, Marilynn J. Wood Canadian Fundamentals of Nursing Revised 4th edition 2010 Elsevier Canada Toronto	Mike, Vanessa, Patricia, Carol, Anya	All participants recommended reading a first-year nursing textbook
Sally Shaw Nursing Leadership 2007 Blackwell Publishing Oxford UK	Mark	
Margaret A Skurka Health Information Management: Principles and Organization for Health Information Services 5th edition 2003 Jossey-Bass San Francisco	Mike, Vanessa	
Health and Healthcare in Canada Alexander Segall Neena L Chappell Prentice Hall Toronto 2000	Elle, Vanessa	
Jenny Spouse Professional Learning in Nursing 2003 Blackwell Publishing Oxford UK	Rachel	
Sandy Summers, Harry Jacobs Summers Saving Lives: Why the Media's Portrayal of Nurses Puts Us All at Risk 2010 Kaplan New York	Mark	Mark mentioned this book when we discussed nursing stereotypes.
Joseph Tan, Jossey-Bass E-Health Care Information Systems: An introduction for Students and Professionals 2005 Lippincott Williams and Wilkins	Mike	

San Francisco		
Carol Taylor, Carol Lillis, Priscilla LeMone Fundamentals of nursing: The Art and Science of Nursing Care 4th edition 2001 Lippincott Williams and Wilkins New York	Mike, Vanessa, Patricia, Carol, Anya	All participants recommended reading a first-year nursing textbook
Kate Trant, Susan Usher Nurse, Past, Present and Future: The Making of Modern Nursing Black Dog Publishing London UK 2010	Sarah	Sarah pointed this out to me in a bookstore as interesting.
Karen A Wager, Frances Wickham Lee John P Glaser Heath care information systems: A practical approach for health care management 2nd edition 2009 Jossey-Bass San Francisco	Mike	
College of Nurses of Ontario http://www.cno.org/	Sarah	
Royal College of nursing http://www.rcn.org.uk/	Vanessa	
Arthur Labatt Family School of Nursing http://www.uwo.ca/fhs/nursing/	Carol	
College of Registered Nurses of British Columbia https://www.crnbc.ca/Pages/Default.aspx	Anya	
School of Nursing (UBC) http://www.nursing.ubc.ca/	Anya	

Appendix F. Examples of Memos

Memo 1: Nightingale

Comment from interviews

Emily (nursing professor, family health nurse):

"Nightingale is more relevant now than ever."

"I've been returning to her work more and more often"

Vanessa (nurse practitioner) (age: 37):

"I can't believe you're reading about Nightingale. No nurse reads Nightingale anymore."

Text Analysis

Nursing Texts

All of the textbooks I've read have been very positive about Nightingale as the founder of modern nursing. Each textbook has at least one section on her in the history of nursing chapter. Often the idea of her research, and her attempt to introduce a standardized education for nursing is the focus and not her role as a caregiver.

General Comments

Nightingale came into this research quite early. I've been playing with the idea that some nurses view nursing as a caring profession whereas others view it in more practical terms. Before I started the formal interviews I'd only hear slightly negative comments about Nightingale and the romantic view some nurses have of "soothing the fevered brow" versus real nursing involving bed pans and practical tasks. Hence the working title "Of Nightingales and Nerds". However, as I read more and interviewed more I was surprised by the positive comments on Nightingale from Ava and by the numerous mentions of

Nightingale in the textbooks. I think the focus in textbooks on her research is partly due to the need nursing feels to proclaim itself a true "profession".

I'm curious to know if the area of practice that a nurse is in may affect this understanding of Nightingale.

Next steps: I'm including the idea of Nightingale into interviews. Hopefully as I get some different types of nurses I'll see more about the views about her and her work.

Memo 2: Information seeking/storing

An understanding that has come up in both interviews and textbooks, aimed at NIS, is that IS can be used by nurses to seek information and store information. The seeking information is linked to an acceptance by the nurse in evidence based practice. The storing information is linked to an acceptance that the IS is a better way to store information than other ways (by book etc).

Within textbooks aimed at nurses in general IS is identified as only one way, and perhaps not the best way, to store information. Cue cards, booklets etc are also mentioned

Within the 2010 textbooks aimed at nurses in general each chapter has websites that can be used by the reader.

Comment from interviews

Nicholas: (Advanced Practice Nurse, 39)

"Nursing is an oral profession"

Ava (nursing professor, family health nurse) (age:?? Has an 18 year old son):

"It's impossible to convince most nurses that you do not have to do shift change updates in person"

Within at least one textbook on evidence based nursing the authors discuss the issue that most nurses will ask other nurses for information before they would go to an IS based system.

Appendix G. Interview Transcription Example

This is an example of the interview transcript of the first interview with Patricia. Additional comments were added after the transcription process from field notes.

Table 17 Interview Transcript Example (Patricia)

Name of speaker	*Transcription*	*Additional comments*	*time*
Patricia	*"I'm very, very fussy when it comes to patient care, how to make beds and everything, cause my room, if you walked into my room you would think, oh, this is a nice tidy room." (Patricia, interview #2)*	*Patricia smiles and makes a smoothing motion.*	*3:25*

Appendix H. Field Notes Example

Sat down at the nursing station to wait for the head nurse to arrive. The nursing station is a long counter at the entrance to the ward. There are five nurses sitting at the counter. There are two standing up. There are two computers. One is being used by a nurse the other is turned off. The counter is covered in beige folders. Anya introduces me to the nurses at the station. One of them says “oh you’re here to judge us” and walks away. Another one tells me “ignore her” and asks me about the research. Anya and another nurse start to show me the files on the counter. They want to show me the paper version of the file that the nurse on the computer is looking at. Anya picks up one file but it’s empty, she picks up another file but the paper she is looking for is missing. She stops and explains it to me instead.

Appendix I. Reflexive Journal Example

I have just returned from XX hospital. Here I interviewed three nurses and performed one observation session.

The nurses that I interviewed all work in surgical preparation and recovery. The patients are there for day surgeries. They asked to be interviewed in their lunch room during their breaks. I was given a tour of their ward before I performed the interviews and afterwards waited at the nursing station for an hour until the head nurse met with me.

One of the things I thought was very interesting was the lack of technology on the ward. I commented on it to the nurse giving me the tour. She laughed and pulled aside a curtain at the end of the ward. I thought it was a window but it actually separated one ward from another in the same wing. This ward was for treating patients who had or were about to undergo cardiac surgery. It was noisy! And there were machines everywhere!

I started to count them but quickly lost count. When we went back to the first ward I suddenly noticed that while there weren't as many machines there were still quite a few. Each bed had a heart rate monitoring machine, and there were several different pieces of equipment lined up against the walls. At the nursing station they had three computers. I have stopped noticing the common pieces of technology too. I'd better be careful of that.

Appendix J. Technologies in Nursing

This table outlines all of the technologies observed within this research.

Nursing Technologies Observed

Smart phone	Personal computer	RFID tags	Nursing station computer
iPad	Access	Word	Electronic health record
iPod	Nursing Information System	Aneroid sphygmomanometer	Pulse oximeter
Stethoscopes	Electronic thermometer	Oral thermometer	Tympanic thermometer
Specialized Beds	Automatic blood pressure monitor	Clinical support Aps	Ophthalmoscope
Watch	Otoscopic	Internet	Intranet
Computer on wheel (COW)	Handheld computer	Voice recorder	Bar codes
Web sites	Telehealth	IV pump	Catheter
Diagnostic imaging equipment	Databases	Electronic Lift Systems	Computerized Staff Schedules

This table divides these technologies into IT and non IT technologies to illustrate that participants used both IS and non IS technologies.

Categories of Nursing Technology

IS	**Non IS**
Smart phone	Stethoscopes
Electronic health record	Catheter
Nursing station computer	Ophthalmoscope
Clinical support apps	Syringe
Internet	Telephone
iPad	Specialized beds
iPod	Aneroid sphygmomanometer
Monitors	Pulse oximeter
Intranet	Tympanic thermometer
Computerized staff schedules	Electronic thermometer
RFID	Automatic blood pressure monitor
Tele-health	Otoscopic
Training software	Diagnostic imaging equipment
Personal computer	Voice recorder
Word	Oral thermometer
Access	Electronic Lift Systems
Nursing Information System	IV pump
Watch	
Computer on Wheel (COW)	
Websites	
Handheld computer	
Databases	
Bar codes	

Appendix K. Chain of Evidence

This appendix includes three tables that outline the coding of the individuals based on their care reality and their understanding of information systems. Example evidence is given to provide a chain of evidence to the conclusions.

The first table outlines the four types of care identified within the data, the elements that make up the type of care and its definition. Example evidence for the existence of the type of care is also given. Each type of care has several different elements that were present in differing amounts. The presence of each element was not always observed. The second table outlines the understanding of teach type of care for the individuals interviewed. Example evidence for the conclusions is provided. The third table outlines the three possible dimensions of Care Realities and Information Systems. Example evidence for the existence of dimension is provided.

Division of Care

Construct	Element	Definition	Example Evidence
Direct Care	Hands on	task is directly associated with the patient's body	". . . Most of my patients I have to feed them, I have to give them bowel care which makes them go to the bathroom, I have to shower or bath them, dress them, get them up, feed them lunch, lay 'em down, get them up, feed them supper." (Patricia, Interview #1).
	Physical presence	physically present in the same room as the patient	The hands-on interaction with the patient. So when you're in the room at the bedside that to me would be the bedside nursing." (Carol, interview #1).
	Technology-based	performing tasks with the use of technology	Observed Katy monitoring of the oxygenation of a patient's hemoglobin using an oximeter
	Manual	performing tasks without the use of technology	Observed Patricia making patient comfortable by bringing him water and a book to read. She then adjusted his

			pillow and reading light.
Emotional Care	Touching	Physically touching a patient while not performing direct care tasks	Emily told me about touching a patient's arm as they spoke to her to express that she was listening and supporting him
	Being with	Being physically present and engaged with the patient	Vanessa told me about taking time to sit and talk to a patient and spend some time getting to know them
	Expressive	Tasks associated with expressing and helping patients to express emotions	Emily told me about talking to the father of a disabled child and helping him express his anger and fear about the situation
Organizational Care	Organizing	Tasks associated with organizing	Emily described organizing the drug cabinet
	Tidying	Tasks associated with cleaning	"tidying up your nursing station, I just emptied a whole box full of diapers and put them on the shelves to clean the utility room. I'm always puttering, stocking linen shelves, the linen carts I mean." (Patricia, interview #1).
Informational Care	Information seeking	Tasks associated with looking for patient information and /or treatment information	Observed Elle looking for information in a patient's file.
	coordination of care	Tasks associated with ensuring patients receive care from the variety of sources involved	"*they (nurses) also do a lot of coordination. So, if you have a patient in the N.I.C.U. for example, it's the bedside nurse that keeps track of when the tests were done, who, what specialty came and saw and so they kind of coordinate at that level" (Carol, interview #1)*.
	Scheduling	Tasks associated with scheduling patient care	Mike told me of trying to schedule all of a patient's tests so that the patient could have his surgery
	Information	Performing tasks	Observed Mike searching for treatment

	systems based	with the use of information systems	options for relieving foot sores due to diabetes on his ipod.
	Manual	Performing tasks without the use of information systems	Observed Anya searching for dosage recommendations for pain killers in a paper manual in the nursing station.

Understanding of Care Elements Care Realities and Information Systems

	DC		Example Evidence	EC	Example Evidence	OC	Example Evidence	IC		Example Evidence
Name	*M*	*T*						*M*	*IS*	
Carol	C	M	*"I'm of the time that we used to take blood pressure, you know, with the stethoscope and that cuff, now we roll the little machine in put the cuff on and it takes the pulse and the BP and the oxygen, you know, the whole thing. . . . and even for someone who hasn't always had that technology there, it becomes so much a part of your day-to-day routine that you*	C	Carol discussed EC elements first when asked "what is care"?	I	Carol preformed OC tasks after performing other types of care.	C	I	"*they (nurses) also do a lot of coordination. So, if you have a patient in the N.I.C.U. for example, it's the bedside nurse that keeps track of when the tests were done. . ." (Carol, interview #1)*.

			don't even think that as being technology as such." (Carol, interview #1)							
Carolyn	C	M	Carol was observed using both manual and technical methods to give direct care. When asked if using the blood pressure machine was "giving care" her response was "I guess"	C	Carolyn spoke of discussing treatment options and the patient's feelings about the options when I asked her about care.	M	Carolyn was observed tidying up the nursing station during a quiet time of the evening. When I asked her if that was part of providing care her response was "It helps"	M	I	"putting things into the computer is a waste of time" (Carolyn, interview #2)
Patricia	C	I	Patricia described only manual elements of direct care. When I asked her about technical methods she responded "that gets in the way" (Patricia interview #1)	C	Patricia described caring for her patients though an imagined comment from her most recent patient: *"they're gonna say; oh she was so nice she came and asked me how I was" (Patricia,*	C	*"tidying up your nursing station, I just emptied a whole box full of diapers and put them on the shelves to clean the utility room. I'm always puttering, stocking linen shelves, the linen carts I mean." (Patricia, interview #1).*	I	A	Patricia described arranging with other nurses for them to perform manual IC tasks because she felt they took her away from giving care. She described performing IC tasks using an IS as "hurting them (the patient)" by distracting the nurse (Patricia, interview #1)

					interview #1).					
Mike	C	C	When I asked Mike if there was a difference between manual and technical DC tasks he responded that they were both valid depending on the situation.	M	Mike described EC tasks as not being care "by itself. Except if the problem is just emotional" (Mike, interview #2)	M	When I asked Mike if organizational tasks were care he responded that along these tasks were not care but not doing them was against care.	I	C	Mike was the first person to mention IC tasks performed using IS as care. He was observed being frustrated performing an IC task without an IS. When I asked why he was frustrated he told me the time it look to perform the task manually made him angry because it meant he was behind seeing his other patients. He didn't believe it was against care because the tasks still had to be performed to take care of the patient. *"It helps me organize everything and make sure I've provided care" (Mike, interview #2)*
Vanessa	C	M	Vanessa described manual DC tasks. When I asked her about technical DC tasks she hesitated briefly	C	Vanessa quickly described EC tasks when I asked her about care.	M	Vanessa did not described OC tasks when I asked her about care. When I asked her about OC tasks she stated that "they aren't really care but . . . I don't	C	M	Vanessa described manual IC tasks when I asked her about care. When I asked her about IS enabled care, after thinking about it she agreed that they were "mostly" care tasks.

			before saying they were care.				know I've never thought about it." (Vanessa, interview #2)			
Katy	C	M	Katy described preforming manual DC tasks when I asked her about care. When I asked her about technical care tasks she said "well some of them" were care.	C	Katy described listening to patients while performing manual DC tasks as a part of giving care	I	Katy did not described OC tasks when I asked her about care. When I asked her about OC tasks she said "no, when I have to do that I can't do my job" (Katy, interview #1)	I	I	When Katy found out about my research she stated "you don't want to interview me, I don't do any of those things unless I'm forced to" (Katy interview #1). When I asked her why she said anything in the IC task list was "secretary work and was the reason why nurses couldn't do their real job" (Katy, interview #1).
Gail	C	A	Gail described preforming manual DC tasks when I asked her about care. When I asked her about technical care tasks she said "we should take the term "care" out of health care. We don't take care of	C	Gail described emotional care tasks as "that's real care – actually being with the patient, keeping them company . . ." (Gail, interview #1)	I	Gail described OC tasks as being necessary but keeping a nurse away from taking care of their patients.	I	A	Gail told me that while recording data might be necessary it wasn't care and it distracted the nurse from providing care. When we spoke of IC tasks performed using an IS she said that having a nurse use and IS to perform IC tasks would hurt the patient because the patient wouldn't be getting care from the nurse but from a

			people, we just hook them up to machines to keep them alive" (Gail, interview #1)							computer. "The computer's taking over all of the nursing jobs and telling the nurse what to do" (Gail, interview #1)
Elizabeth	C	C	When I asked Elizabeth about different DC tasks she responded that both methods of performing the tasks associated with DC were care.	I	Elizabeth described emotional care tasks as interfering with a nurse's ability to perform care.	M	Elizabeth described OC tasks as being necessary but not being care by themselves.	I	C	Elizabeth believed that performing IC tasks manual interfered with a nurse's ability to give care because of the time involved in performing them and the possible inaccuracy of manual methods. *"recording that information is important. If you don't record it right away, and . . . and properly, the next nurse won't know what you've done and what's happening with the patient" (Elizabeth interview #2)*
Emily	M	M	*"I never met a nurse who wanted to go into nursing to give needles, they all wanted to care for*	C	Emily first described EC care tasks as care. "Talking to the parents, making sure they're dealing with the	I	Emily described OC tasks as being necessary but keeping a nurse away from taking care of their patients. "They	I	I	Emily described both types of IC as taking time that should be used to perform nursing care.

			people" (Emily, interview #1)		anger and guilt that often comes with having a disabled child" (Emily, interview #2)		could just hire some more porters and cleaners to do that stuff" (Emily, interview #2)			
Sarah	C	I	When asked to list tasks that she thought were "care" she responded: "taking a patient's temperature, changing their bandages, feeding them . . ". When I asked about technical care she responded: "I don't know. Usually the machines get in the way" (Beth, interview #1)	C	Sarah described EC tasks when I asked her to tell me about care.	I	I observed Sarah looking for a document and saying "someone should tidy this paper up". She didn't do it. When I asked why she said "I'm too busy to do that"	I	A	Sarah told me told me she would refuse to work in a hospital that required her to perform informational care using a computer
Beth	C	M	Beth told me about taking care of her patients in the ICU. She described	M	"It's not really something that comes up with my job. Most of my patients are unconscious. But	I	I observed Beth quickly tidying up the books in the nursing station. I asked her if that was care she said "no but	I	I	I observed Beth leaving all IC tasks, both manual and IS enabled to the end of her shift. When I asked why she told me she always did that because

			manual DC tasks. When I asked her about technical DC tasks she said "I always forget about all of the technology" (Beth, interview #2)		if they're awake sure" (Beth, interview #2)		it's easier if I don't have to search for a book".			she finds these tasks distract her from her job.
Becky	C	C	When I asked Becky about different DC tasks she responded that both methods of performing the tasks associated with DC were care.	C	"Absolutely it's care."	I	Described these tasks as necessary but not care	M	C	Becky expressed some concern that performing IC care manually may hurt a patient because the information might be out of date.
Andrea	M	C	Andrea is a respiratory nurse. She pointed out to me that a lot of her DC tasks were technical. She was concerned by the idea of	C	Andrea stated that stress and other emotions can affect an individual's ability to breath so EC tasks to her were part of providing care.	I	Described these tasks as necessary but not care	M	I	"*Using it takes me away from giving care*." *(Andrea, interview #1)*.

			performing DC tasks manually if a technical option were available.							
Rachel	C	C	When I asked her what care was she listed several DC tasks – both manual and technical	I	noted that she felt that she needed to remind herself to talk to the patient while she checked the patient's blood pressure and heart rate. When I asked why she responded htat it wasn't really her job	I	Described these tasks as being downloaded to nurses but not really a part of their job	C	C	*"I'm actually taking care of them when I do that stuff" (Rachel, interview #1).*
Matt	M	M	When I asked Matt about different DC tasks he hesitated before responding that both methods of performing the tasks associated with DC were care.	C	Matt described EC tasks when I asked him "what is care".	I	Described these tasks as necessary but not care	M	M	Matt did not describe IC tasks when I asked him about care but when I mentioned them he agreed.

			During observation I noted that he performed EC tasks first and DC tasks second. If he ran out of time he did not perform DC tasks. He noted they needed to be performed for the next nurse. When I asked about that he stated that he was not a bedside nurse and the EC tasks were his focus.							
Liz	M	C	Liz described technical DC tasks when I asked her about care. She agreed that non technical tasks were care too but not for her because they didn't come up		Liz described care as making sure a patient was comfortable and not too worried before surgery.	M	"That's not really care. I mean it has to be done but it needs to be done before or after" (Liz, interview #1)	I	A	When I asked about IC using information systems: "No that's not giving care. That's asking a computer to do your job. That's going to kill your patient" (Liz, interview #2)

			in her job.							
Anya	C	M	Anya was observed performing both technical and manual care tasks. When asked she responded: "I was taking care of her"	M	Anya described EC tasks when I asked her if they were care.	I	Anya tried to show me some paperwork but couldn't find it. When I asked whose job it was to organize it she said "anyone who is not busy taking care of patients"	M	I	Anya did not describe IC tasks when I asked her about care when I mentioned them she stated "doing the charts in the room, maybe but not if I have to go to the computer" (Anya, interview #1).
Alice	C	C	When I asked Alice about direct care "We have some amazing technology to care for patents now" (Alice, interview #1) .	C	Alice described some EC tasks when I asked her to tell me about care.	I	"no that's not care." (Alice, interview #1)	M	I	"Computers? No that's not care" "Yeah making sure the info on their files is right is care" (Alice, interview #1)

DC – direct care; EC – emotional care; OC – organizational care; IC – informational care ;M – manual; T – technological; IS – information Systems; C – care; M – mixed; I – interferes; A – against;

Dimension of Care Realities and Information Systems

Construct	Definition	Example Evidence
Information systems free	Rejects the information care element given through the use of information systems objects	Anya walked past a computer in the nursing station and looked up information in a book
Information systems driven	Fully embraces informational care element given through the use of information systems objects	Mike downloaded an app to calculate the dosage for a patient's medication instead of looking it up in a book in the nursing station
Information systems enabled	Partly embraces informational care element given through the use of information systems objects	Vanessa used a database to look up test results of a patient but looked up the BMI for a patient in a book

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