Gender and User Resistance in Nursing Information Systems Failure

1. Introduction

In his influential account of the history of the development and implementation of computer-based systems, Friedman (1989) formulates the drive to innovate as a reaction to commonly occurring failures of Information Systems Development (ISD) in organisations. In this respect then, failure has played a pivotal role in shaping the dynamics of information and communication technologies (ICTs). It would seem that when we peer towards the horizon of information systems development, failures loom large (Flowers, 1996; Lucas, 1984). Consequently, the volume of work by academics and practitioners dealing with this phenomenon from the perspective of the relationship between organisational change and information technology has recently increased and includes, amongst others: Fortune & Peters (1995), Vaughan (1996), Drummond (1996), Flowers (1996), Sauer (1993) and Latour (1996). In addition, several writers have applied such a perspective to IT failures in the health service (Robinson, 1994a; Beynon-Davis, 1995; Newman & Wastell, 1996; Bloomfield, 1995).

Although there is no "unified framework for understanding information systems failure" (Sauer, 1993: 3) such "analyses that trade on the image of a predictable, controllable world" (Bloomfield & Vurdubakis, 1995: 2) by definition neglect to problematise failure. In order to more fully understand IS failure in organisations, it has been argued that we "need to appreciate and account for the way analyses of [failure] operate within specific social contexts and professional milieux and are both an influence on, and shaped by, the cultural beliefs, norms and values that surround them" (Bloomfield & Vurdubakis (1995: 1). Accordingly, specifics of the organisational and social context in which failure takes place is of interest in this paper. The areas of social life deemed significant in the case study described below is gender - given that women constitute the vast majority of end-users of Nursing Information Systems.

The case is made for the value of a gender perspective for understanding organisations and the division of labour, as well as technology and users. The literature review combines feminist writings on both technology and organisation whilst challenging essentialist and determinist ideas about women?s inherent incompatibility with technology. This is accomplished by looking specifically at an archetypal female role in the workplace. Hence we look at the social, cultural and gendered nature of nursing as it occurs in the hospital setting and examine how this relates to automated systems and user attitudes to them.

The paper is structured as follows. The next section we argue the appropriateness of a social shaping approach to IS failure. In section three we examine gender approaches to IS in organizations and identify gaps in the literature. Section four looks more closely at gender and IT specifically in relation to nursing practice. The case study begins in section five with a description of the research approach adopted, whilst the case study proper is contained in section six. Finally, discussion of the findings and their affect on the conceptual framework described previously in the paper is evaluated.

2 The Record of Hospital Information Systems Failure

"The accident-prone NHS Information Management Group which has overseen a succession of NHS computer disasters, is on the brink of another meltdown."

(Observer 29.3.98)

The fate of any NIS must be considered in the light of accounts of the way in which previous Hospital Information Systems (HIS) have been deemed failures. The prognosis is not a favourable one. Well

publicised failures include the computer-aided despatching system at the London Ambulance Service (Watts, 1992; LAS, 1993; Beynon-Davis, 1995; Robinson, 1994a; Flowers, 1994; Dutton *et al*, 1995; Newman & Wastell, 1996); the failed integration of computer systems at Wessex Health Authority (Kelsey and Brown, 1993); and nurses? difficulties with data collection for NHS information systems (Brindle, 1995). Recently, the much-criticised Read Codes (a standardised computer dictionary of clinical terms - pivotal for individualised electronic patient records) have been cited as an indication of the bankruptcy of NHS IT strategy.

Whilst the NHS is not alone in its poor track record of implementing IT (Keen, 1994b; Galliers, 1994), it does appear to be especially blighted by lack of success and consistency - attested by the Annual Price Waterhouse Reviews (Grindley, 1992). In relation to NIS, seemingly surmountable problems (Redmond, 1983) still persist (BCS Nursing Specialist Group & IMG, 1995). This negative perception is deepened by the lack of evidence that the resultant systems (costing annually ?220 million) have benefited patient care (Audit Commission, 1995). Further, although the amount of investment does not appear to have any significance on the success of the system (Audit Commission, 1995), nevertheless, there have been some well publicised costly disasters (Observer 29.3.98).

Given the highly political nature of IS development in the NHS, admissions of doubt about the project?s chances of success are unlikely on the part of original sponsors. It has often been remarked that setting out on these projects is risky because, once a large amount of money has been committed, those who sponsored the system have a lot to lose by an admission of failure (Sauer, 1993). Indeed, an acceptance of this possibility is crucial for understanding some of the characteristics of specific ISD projects. The escalator theory explored by Drummond (1996) suggests that projects proceed even when disaster looms partly due to politics, organisational culture and psychological issues (Dutton *et* al, 1995). One such issue is that desisting from a project entails a writing off of prior activities and investments - an admission of being wrong (Quintas, 1996; Keen, 1994b).

Of particular importance to this paper, is the observation that hostility to an IS may also contribute to its downfall. A potential for a conflict of interests and differing perspectives with relation to the new technology is revealed on examination of the stated objectives of the NHS IT strategy. The Resource Management Initiative took place within "a long-term, systematic, though uneven and variegated imposition of ?scientific management? within the NHS" (Flynn, 1992: 36). Further, Keen (1994b) emphasises the potency of the desire for central control over data and the way in which the power of IT prevails in this regard. That the introduction of the internal market reforms was rooted in "more fundamental attempts to reshape and reposition the NHS in the minds of employees, patients and the public in general" (Bloomfield *et al*, 1994: 135), is, shall we say, pertinent for nurses as it affects them in a variety of ways and is fundamental to the outcome of the Zenith NIS described in the case study.

3 A Social Shaping Approach to IS Failure

Before discussing the role of gender in user resistance, we outline our framework concerning the nature of IS failure in organizations. We contend that this is necessary because of the gap that exists both in the IS literature concerning the sorry record of Information Systems Development (ISD); and in areas of social shaping research which fail to problematise common sense notions of ?successful? innovations.

Although managerialist writers and those who favour technical solutions would very much like failures to be rare (Robinson, 1994a), it appears that they are perhaps as frequent an occurrence as success (Lyytinen & Hirschheim, 1987). Much of the research by practitioners and academics concerned with explicating this poor record of ISD (Laudon & Laudon, 1998; Bulkely, 1996; Friedman, 1989) has entailed the identification of social and technical ?factors? (for examples, Sauer, 1993; Flowers, 1996;

Fortune & Peters, 1995; Vaughan, 1996) with associated solutions for their eradication proposed in terms of tools, techniques and methodologies. Such approaches have been criticised for their prescriptive orientation (Hirschheim & Klein, 1989) and their cookbook solutions (Dutton *et* al, 1995). In addition, their erroneous simplification of the complexity of organisational life (Knights & Murray, 1997) into problem situations to be solved in order to fulfil the stated objectives of the organisation, betrays the many rationalist and managerialist assumptions (Robinson, 1994a) underpinning this type of writing.

In contrast, the reconceptualisation of IS failure made possible by recent Social Studies of Technology is not only desirable to overcome the weaknesses of technologically determinist and procedural analyses (Dutton *et al*, 1995) but is also useful for a new vantage point from which to see more clearly the process of technological development itself. This is because the controversy which surrounds failure reveals processes that are otherwise obscured in the case of "successful" projects (Bijker & Law, 1992). Focusing on failure and employing a social shaping approach will thereby enable researchers to disentangle how technical and social issues are constructed and delineated (Akrich, 1993). By the same token, however, failure cannot be researched in isolation from stories of technological achievement (Bloomfield & Vurdubakis, 1995).

Further, Pinch & Bijker's work (1987) has shown that distinct "relevant social groups" will define technological problems differently and there will be disagreement over what constitutes success and failure. This suggests that the definition of failure is a social one and not shared by all groups involved in technology development or use (Robinson, 1994a; Lyytinen, 1988). Hence the terms success/failure contain within them the value-judgements of which they are an outcome. It is more appropriate, therefore, to ask *for whom* does a failure present itself as such. In place of these terms, social shaping has long since used "stabilisation" (Callon, 1993; Law & Callon, 1992; Law & Bijker, 1992), to describe in agnostic terms (Latour, 1993) the process by which artefacts come into being and are displaced in the world. Such an alternative approach recognises that the designation of ?failure? to an innovation is the result of hindsight.

It has been suggested that attributing failure to a variety of factors or causes is unsatisfactory, without understanding the context within which they take place (Dutton *et al*, 1995). Our aim is precisely to explore in more depth these gaps in addressing the sorry record of ISD, especially in the NHS.

Part of the conceptual framework of failure delineated above has dictated the focus of the following two theoretical sections, since it has been suggested here that an examination of the context in which failure takes place is essential for a non-deterministic, non-procedural account. Hence in Section 5 we shall examine nursing as a key cultural influence for understanding Nursing Information Systems (NIS) and their users. Before that, however, it is necessary to look at another aspect of orgnisational culture that extends beyond the walls of institutions and into society at large: gender. This will serve to deepen our grasp of the world of the (mainly female) users of the NIS. Such a move is legitimated when we consider gender considerations have been omitted from much of the information technology literature. Noteworthy exceptions have gone some way to overcome literature that neglects ?the way in which organisations both reflect and reproduce the major social inequalities in society and hence the essentially contestable nature of organizational relations? (Knights & Murray, 1997: 38) and these texts shall be examined in detail in the next section.

4 A Gendered Approach to IS in Organisations

Our main concern in this paper is an examination of the role of gender in the outcome of IT adoption and stabilisation. In the previous section we presented a case for a two-pronged approach to understanding failure: by asking *how* and *for* whom does the technology present itself as having failed; and by analysing the social and organisational setting in which failure takes place. With recourse to the

more "macro" approach within the social shaping tradition combined with feminist literature concerning both technology and organisations, this section attends to the second part of the conceptual framework. Our assumptions are that gender is a vital social factor shaping organisational life and that it is inconceivable that the interaction of nurses (largely a female workforce and occupation) with information systems is not in some way shaped by the gendered spheres we inhabit. A historically contingent fact of life is that gender relations do not just involve difference "but inequality and power - male domination and female subordination" (Webster, 1996a: 2).

Within the IS literature, the issue of gender is largely under-theorised, partly due to the belief in the gender neutrality of technology (Knights & Murray, 1994). Recently, researchers into gender and computing have argued for the necessity of an alliance with social science (Lander & Adam, 1997; Star, 1995) in order to overcome the narrowness in perspective entailed in the "add-more-women" goal (Grundy, 1996; Adam, 1997). Where this has been effected, cogent insights into female office workers have been provided (for examples, Green *et al,* 1993; Webster, 1996a; 1996b). However, writing concerned with the gendered nature of user-computer interaction has yet to provide a rich account of how this plays out in the local setting and what it has to do with how failure/success is accomplished. In addition, a paucity of literature dealing with non-clerical women workers as IT users persists. The proliferation of computers in society, bringing in its wake a managerial fixation with the recording and accounting of organisational practices (Knights & Murray, 1997), implies that such users are swelling in number and merit academic research.

Consequently, social studies of technology focusing on issues of gender (Mackenzie & Wajcman, 1985; Wajcman, 1991; Gershuny, 1983; Cockburn, 1983; 1986; 1988; Cockburn & Omerod, 1993; Webster, 1996a; 1996b) can offer a starting point for understanding the organisational and broader societal context of Nursing Information Systems development and implementation. The theoretical and empirical focus will be on those activities concerned with: the sexual and social division of labour; the organisation of work by management; and the allocation of skill labels, skilled status, prestige and rewards (Webster, 1996a).

4.1 Under-theorisation of gender and ICTs

The record of negative experiences of women with information and communication technologies (Adam, 1997; Rasmussen & Hapnes, 1991) suggests that the exclusion of women from computing is likely to continue for some time. The role of gender and ICTs is largely under-theorised, partly because of the assumption that technology is gender neutral (Knights & Murray, 1994). Where gender has appeared as a research issue within the IS literature the fact that traditional questions orient towards the goal of "add-more-women" (Grundy, 1996; Adam, 1997) is problematic. Firstly, it assumes "success" is constituted by the victory of computer systems projects and thus entails a managerialist slant; and secondly, it is a product of liberal feminism and technological determinism with computers being seen *per force* to be a good thing. Thus resistance or rejection is deemed undesirable. Admittedly, given the feminist origins of much of this work, there is not a demonising of users (Oliver & Langford, 1987). Rather, inconfidence and cultural bias, etc., are all relevant and necessary explanations employed to combat notions of women?s technological ineptitude. Still, resistance may be viewed otherwise. For example, as a sign of consciousness amongst women (Ledwith & Colgan, 1996) and as such it is, from a feminist standpoint, a laudable activity:

> *Women have not stood passively by as computer-based technologies have been applied to all spheres of their work; women have engaged in various forms of resistance and other forms of industrial protest* (Webster, 1996a: 4).

Hence, resistance and rejection may be viewed as a positive "success" by the women involved in this type of action. Alternatively, subversion can be seen as creation rather than destruction, if viewed as end-user shaping. Indeed, it has been suggested that since women are excluded from formal design one

feminist strategy to “bring women in” is to shift focus to consumption of technology (Webster, 1996: 5) and the process of “innofusion” (Dutton *et al*, 1995).

4.2 Organisational sociology, gender and ICTs

Aside from the critique of determinism and managerialism (Robinson, 1994), some writers in the gender and computer field have been unsatisfied with the approaches described above and have deliberated new research perspectives for some time (see, for example Lander & Adam, 1997; Grint & Gill, 1995). Further, in the same way that this literature ignores mainstream feminism, resulting in a ? pressing need to establish appropriate theoretical bases for gender and computing research? (Adam, 1997: 17), so too it largely neglects the work carried out by organisational sociologists. On the other hand, the sociologists, who *have* examined users and information systems, rarely focus on the role of gender - it is a neglected area, prone to ghettoization (Alvesson & Billing, 1997).

For the present, we are keen to elaborate on Star's (1995) comment that computer scientists need social scientists. This we feel will be productive for understanding the rubric of gender, technology and organisations (with the focus on users and success/failure issues). This is in keeping with our stated intention in Section 3, to bring together the work of SST with information systems development literature.

Against notions of technological and biological determinism, we set out to show that both technology and gender are socially constructed and mutually defining (see Figure 2). Further, we offer explanations as to the disadvantage suffered by women in their relation to technology. Our intention in doing so is to play a part in reducing the power of 'common sense ideas' which typically involve underestimating women's technological ability and are partially a consequence of how technology is defined in society. The social construction approach with materialist explanations is intended to persuade that women's relationship with technology is not a fixed entity but rather due to social convention. One consequence of this is that the relationship is open to change - a non-incidental consideration given that “gender research...is clearly a political project” (Alvesson & Billing, 1997: 11).

Within the exploration of the phenomenon of failure described above, users are brought into the foreground. In the paper a case is made for the significance of users' perceptions of and responses to technology in determining the fate of IS. In keeping with the agnosticism advocated by practitioners of social shaping, acceptance or rejection of the technology is not adjudged as good or bad. Rather, we seek to understand the subjective rationalisation of their actions by the users especially with regard to the role of gender in this process.

A sub-issue of the gender research is constituted by an exploration of the gendered sphere of nursing. This is deemed necessary if we are to get closer to the inner world of nurses and to make sense of their reactions to and views of technology. This will be discussed in the next section.

5. Gender, Nursing Practice and IS

Having established the need to examine the social and organizational context in which failure takes place with an emphasis on gender considerations, we develop some issues relating to nurses as potential users of information systems. Two main influences on nursing practice are delineated: hands-on care versus professionalisation. Since the former has its roots in traditional roles of women in society it is tentatively posited as pertaining to the female sphere; whilst the latter, with its association with rationality, scientism, clinical intervention and standardisation is seen as derived from a more masculine domain. This proposition is examined in relation to the empirical research, and the complexity of how this plays out in the local setting recorded.

In the next section we apply some of the concepts developed in the previous section and in section three to the organizational setting of the UK National Health Service, and examine the specifics of nursing, gender and information systems. It is intended that together these sections will provide the possibility of showing ?how the values and understanding of different groups influence the way they view organisations and act within them? (Alvesson & Billing, 1997: 9). This will complete the construction of the conceptual framework with which to examine the empirical study.

Nursing is evidently a gendered job (Davies and Rosser, 1986), not only because women make up the vast majority of workers (Corby, 1997), but because of the centrality of care (the customary duty of women), to the work they carry out (Brechin *et al*, 1988). In addition, the gendered occupation of nursing is associated with the notion of ?a good woman? (Davies, 1995). In contrast to Doctors expertise which is seen as scientific, the result of acquired knowledge, the role of the nurse blurs with that of the ideal woman:

> *Some people believe "good nurses" have the right qualities through instinct, luck or an accident of birth, and need only a bare minimum of instruction, while others think nursing should be a graduate profession with every nurse taking a degree.* (Salvage, 1985: 51)

Thus we might say that health work is divided between the high status of curing, interventionist work (traditionally carried out by mainly male doctors) and the lower status supportive, caring work (carried out by nurses, who are mostly women) (Wagner, 1993). This, we argue, makes sense only if conceived as a reflection of different and unequal roles found in society at large. Further, for nurses, proximity - both physical and emotional - epitomised by the phrase "hands-on", is deemed essential if good care is to be provided (Bowker *et* al, 1995). Given what was said with regard to technology as a masculine culture, we suggest that the implications for nurses' relationships with computer technology are likely to be adverse: that is (a) using a computer distances the nurse from the patient, thereby preventing hands-on care being delivered; and (b) given the association of women with caring and *not* science (the prevail of doctors) it is unlikely that nurses will feel computers are within their realm of capabilities. The perceived negative effects of technology, combined with the lack of confidence on the part of nurses are liable to influence the acceptance or rejection of Nursing Information Systems (NIS) in hospitals. Although popular perceptions do not anticipate that these "angels" will fight for improvements and resist unpopular changes, they nevertheless have a combative - albeit hidden - tradition (Bagguley, 1992). This is portentous for the success/failure outcomes of information systems implementations.

Counteracting these potentially adverse influences for systems usage, is the belief by some that the development of NIS can further the cause of nurses. There is a notion of making nursing visible (Bowker, *et al*, 1995) in order to overcome the undervalued contribution of nurses to patient health care. This under-valuation relates not only to the division of labour in society (played out locally between doctors and nurses), but also to the esteem placed on all things scientific/technological, expressed as the superiority of masculinity over femininity (Harding, 1986; Knights & Murray, 1994). Those members of the nursing occupation in positions to direct strategies for the profession tend to lean towards professionalisation through science as the way forward. In so doing they appropriate the symbolic power of computing to confer the prerequisites of objectivity and standardisation on nursing practice (Bowker *et al*, 1995).

When it comes to understanding nursing and computers, we are faced with a paucity of literature dealing with the social and organisational context of NIS. The notable exceptions to this include Wagner, 1993; Bowker *et al*, 1995; and Westrup, (1996). Other, more prescriptive readings are found under the title of "Nursing Informatics" and are discounted here for their (covert) partisan support of

computer-based systems. Specifically, we are interested in a type of nursing promoted as scientific in its approach to caring for patients - care planning. These themes are examined within the framework of social shaping along the lines developed earlier. This is not the place to rehearse many of the themes related to nursing practice.

6 Research Approach

The focus of the case study is directed to the Zenith care planning system at the Eldersite Hospital and its users. Initially, a pilot study (deemed crucial in testimony studies [St Leger *et al*, 1992]) was carried out in eight sites in the Kinthorpe region. The interviews were mainly with Project Nurses (see Table 1), hybrid professionals produced perhaps to overcome the perceived gap between developers and domain users. It is significant that 6 of the 10 Project Nurses were male, whereas men make up only 10% of nurses generally. The main study entailed semi-structured interviews, informal evaluations of the NIS as well as the analysis of the various texts and representational practices associated with IS training and use. Indeed, much of the story which unfolds below was pieced together through ?benefits realisation? and update reports and correspondence written by members of the Nursing Implementation Team or the IT manager (see Table 2).

The interviews took place during a ten-month period with a cross-section of those members of staff who were deemed to be affected by the introduction of the Zenith system. These included different wards (specialties), various grades, and men as well as women (See Table 3). Additionally, a number of actors involved in the design and implementation of Zenith were interviewed.

The questions aimed at eliciting views and information on issues directly raised by Zenith's implementation and presence (Table 5), as well as concerns developed in the first part of the paper. The interviews were both taped and notes taken by hand, and in line with qualitative research approaches, witnesses were encouraged to comment freely when important issues were raised. In addition, qualified nurses were observed entering details to the care plans and senior nursing staff creating rosters.

A small amount of statistical data concerning the nurses? background was gathered as shown in Table 4. The main aim of this was to verify that a cross section of nursing staff eligible to use the Zenith system had been interviewed. The transcripts from the tape recordings of the nursing staff were organised according to topics or issues raised in the discussion.

7 Case Study

7.1 The Design and Installation of Zenith

Zenith Nurse Management System is a database system whose purpose is “to support the decisions of managers and clinicians by providing informed, sensitive and timely information in ways which are effective and understandable”. The system comprises three main functions: Care Planning, Rostering and Workload Assessment. The main focus of the study is the Care Planning function since it is directly related to the delivery of care and pertains to the work of nurses on the ward, (rather than the staffing problems which are the responsibility of sisters and managers only) and because the majority of users interact with this part of the system.

The care planning function (insert into earlier section) consists of a database of Care Libraries which can be edited individually and free text added to produce a printed and standardised document. These are intended to replace the hand-written notes used by nurses in the recording of their intended care delivery for patients.

The Zenith system was developed by a small software house, run by two designer directors who had worked on NIS in the United States. The development team comprised these designers, two

programmers and four nursing staff.

Three years prior to the study, the product had been purchased by the Royal Eldersite Hospital, following a year long extensive evaluation and procurement process and reflected the best available at the time. It was initially piloted with the intention that it met the recommendations of the Audit Commission in the use of the Care Planning and Rostering modules and as part of the Resource Management Project.

The installation of Zenith formed part of a broader implementation project management which was steered by a Nursing Implementation group, chaired by the Director of Nursing. It included the Directorate Nurse Managers, the Hospital Manager, the External Management Consultant and the Nursing Information Team (see Table 3). In this respect then, the importance of a high level of support for the Zenith system was recognised from the outset. This group, assisted by the IT manager, set about on a training and implementation strategy which entailed an identification and listing of the strongest wards (those likely to be responsive to the system) and working outwards from this presumed success. The implementation plan was established following the procurement of the Zenith system and aimed to have full usage throughout the 100 wards of the Eldersite hospital within one year (see Table 6).

The implementation of the system was seen as essential if hospital resources were to be used effectively. Since nursing costs accounted for over 40% of revenue expenditure within the acute hospital, four specific objectives were defined to:

1. improve the quality of nursing care by enabling the examination of quality, nursing audit and improved planning;
2. maximise the time available for nurses to undertake the provision of nursing care to patients;
3. enable nurses to be deployed in response to objective workload measures; and
4. provide information which will facilitate more accurate costing of the nursing resource and provide data for CMMS [Case Mix Management System].

As is the case with many tales of IS in the NHS, the story of Zenith had begun with the desire and perceived need for standardised health care practice and methodological financial management (Keen, 1994b). For those on the front line effecting these IT-led changes the experience was one of insecurity and instability. Many of the region's Project Nurses interviewed spoke of the introduction of technology in relation to the RMI.

Given the fact that many of the organisational changes taking place at that time were already quite unpopular with the nurses, the association in people?s minds of IT and these upheavals boded badly for the Project Nurses? efforts to enrol nurses to using the NIS. Throughout the region, the initiatives were further criticised for being badly planned, without any organisational commitment and sometimes contradictory to one another, making the job of people championing new IT systems very insecure:

> *It's shifting sands all the time, so many objectives to meet - what we started last April is completely different to this...it?s a state of flux.*

7.2 The Job of Nursing

Care for the patients - that?s what we?re here to do. We?re not computer programmers.

Sister Fay Andrews, Urology

In Section 2 we established the importance for systems outcome placed upon user response to the technology in question. In order to understand the possible ways in which the Zenith system might change the way nurses do their job and the nurses' feelings towards the computers, it is first necessary

to delineate their views of their role in the hospital studied. It is in this section that we paint a picture of the general attitudes nurses have to their jobs in order to contextualise their reaction to and relationship with the new technology. In addition, if the enrollment process effected by advocates of the system is deficient in some way (that is that users resist the role allotted them, at the moment of confrontation with the technology [Callon & Law, 1982]), then the technology will not stabilise in a straightforward fashion.

What do nurses do?

The scope of characteristics required to do the job well suggests a broad role for the nurse. Not surprisingly, the interviewees found it difficult to pin down what their job is. The broadest response to the question, "What do nurses do?" was simply and assertively: "Care!". Others talked about caring for people both physically and emotionally or helping them to get better. Caring for the patient was described by one nurse as "wanting the best for them". Some viewed themselves as the administrators of care prescribed by the doctors. In Mental Health the nurses were there to "help people come to terms with their illness". Finally, many expressed the sentiment that nurses tended to be "put upon". This was succinctly and forcefully communicated by an experienced Sister from Urology:

> *If no-one else will do it, it will be a nursing job...We?re easily pushed around. People play on our conscience and always have done.*

In addition, a staff nurse from Orthopaedics thought patients underestimated the difficulty of the job, the amount of responsibility (for relatively little reward) and the expertise required to carry it out:

> *We're not given credit for what we do, I don?t think. And it's only when people come into hospital they say: "Oh, don't you do a lot? and they don't realise what a nurse does, and they don't realise all the different roles you've got to have. It's not just cleaning someone up.*

Interestingly, psychiatric nurses (who were all males) were much more positive about their own standing in relation to other professions and generally in themselves. They felt very valued, whilst highlighting the fact that Psychiatric nurses tend to be far more appreciated and listened to than their colleagues in General Nursing. As one staff nurse from a Mental Health ward endeavoured to explain:

> *General Nurses do as they're told. Psychiatric nurses tell people what to do. I don't know whether it's the type of person you get doing Psychiatric Nursing or it comes through with the training and the experience you get.*

In this respect they mentioned favourably the accountability entailed in professionalism.

According to the region's Project Nurses, one of the reasons why there is hostility to the system is that it takes nurses away from care. For many nurses, the Zenith system, as part of the administrative tasks they had to complete, took them away from hands-on care. This was partly because the location of terminals (in the nursing station or a rest room) meant that patients had to be interviewed and assessed in their bed, and then the nurse would leave the bedside to put the information into the computer. This was explicitly counterposed to spending time talking to the patient by many of the interviewees. Even where the nurses did not immediately draw up a care plan following patient assessment, they felt they were having to prioritise record keeping over direct care. A senior staff nurse, who was very hostile to the system, thought it was a disgrace that the only time left for talking to patients - the afternoon lull - had been designated for updating care plans.

Kardex, Assessment Documents and Continuation Sheets

A good deal of duplication in record keeping was due to the continuing use of Kardex "the traditional form of card-based record keeping for nurses - alongside the care plans. Indeed, all the wards still used Kardex, and for nurses this was *the* record to trust. It was the anchor to their work even though there were varying types of documents. The care plan never became the sole means of recording nursing work. This is a significant point for the way the Zenith system was resisted. As one staff nurse put it:

> *We're neither doing one thing nor the other, we're doing a bit of both.*

Information from the interviews suggests that nurses used up to four main documents to process the patient's stay in the hospital: the assessment document was used first to gather all the main details of the patient?s state of health, as well as their vital statistics; this was then used as the basis for the care plan - the nurses responded to the diagnosis, detailing the care required; the Kardex was utilised to minute activities carried out - as per the plan; and finally this was backed up by the continuation sheet - which are bound. As Sarah Jifford recounts, the nurses were very loyal to this register:

> *We write it all up in the Kardex to cover ourselves...Kardex is the main stay of everything. If we were without Kardex we'd be lost.*

By contrast, the Zenith care plans were criticised for either having too little or too much (redundant) detail. Some believed that the standard care plans which did exist in the core care libraries made nurses think less about what they were doing, and thus de-skilled them to an extent. On the other hand, where a plan existed, the nurses would have to type in all the details themselves "which was no mean feat since few were trained typists. Hence, it could take longer to produce an automated care plan" especially since the nurses had to wait for the rather slow network in order to call up the Patient Administration System and get the patients details. Even when nurses had time to spend on administration, there would often be a queue for the one terminal on the ward. In addition, the nurses still had to take written notes from the patient upon their admission to the ward, and then type in the details to the care plan. Thereby duplicating the amount of their administrative work ? perceived by many as the most unattractive aspect of the job. Finally, the shortage of time faced by nurses meant that the Zenith system did not "make visible" how hard the nurses worked: if they were not busy they had time to type up the plan (in retrospect, rarely an advance); if they were busy, they could not do a plan. However, management had made it clear that the automated care plan would be taken as proof of work carried out. No plan meant they had not done the work.

Resistance

It is true to say that expectations of the information technology was rather high before the installation of the system. Nurses have come to believe that an information system could solve their problems, relieving them unpopular administrative tasks and freeing up their time to deliver high-quality patient care, which was seriously frustrated at the time. In addition, promises were made on behalf of the system, in terms of its ?potential?, which would be realised if users committed themselves. Efforts were made to enrol nurses to the system by participation in implementation committees, via training sessions, "Benefits Realisation" seminars. Yet, it is doubtful that these were adequate to secure support for the system. Firstly, participation was limited because of the selection process for user representation. It had been assumed that high-ranking nurses on the ward would make the most suitable candidates. But these were often older nurses, less familiar with computers, and hostile to the information system. Secondly, the training strategy was cascade training with sisters as the ward tutor

who was to initially train others. This was a problem since the sister was likely to be very busy and not familiar with computers prior to Zenith training. Thirdly, the "benefits realisation" sessions were attended voluntarily and therefore unlikely to make any impression on those who were hostile to the whole IS project since they simply elected not to attend. Despite the committees, user representation and participation, many nurses felt that they were not "really consulted about what they wanted" they had not been asked nor listened to. This had led to the outright refusal by some to use the system. Of course, all of this was intermingled with their own fear and lack of confidence concerning information technology. That is not to say nurses have no technical expertise. Indeed, the vast array of sophisticated machinery (often run by software) with which they mediate patient care on a daily basis, is a testament to their technical capabilities. Interestingly enough, they themselves did not recognise this. In relation to the system, alternative means of persuasion such as outright coercion were evidenced, but not applied, as systematically as some supporters of the system would have liked. Resistance, through non-usage, was both possible and effective.

Epilogue: Rhetoric of Retreat and the Achievement of Failure

Given the level of hostility described in this case study, it would not surprise the reader that the system was eventually withdrawn.

Dissent legitimised

Three years after the start of implementation, nurses' opinions were detailed in a report on the Zenith system. There is also a good possibility that the looming decision of whether to carry on with the system (a significant cost to the Trust which would not be supported by region who were pushing their own system, Companion) promoted a less partisan report from the project team. Whereas previous benefits realisation reports were intended to convince the reader of the need to continue with the project, this one raises the question of whether it is worthwhile to continue, and mobilises the nurses' views to do so. Included in the report are suggestions of what can be done to improve the situation. This entails the setting up of a focus group of Clinical Nurse Specialists to meet bi-monthly and to carry out ward audits of the care planning system, monitoring the functionality, identifying problems and assessing requests in relation to reports.

Dissent mobilised

Two months on, the IT manager had prepared a report for the Information Management and Strategy (IM&T) group at Eldersite. It is clear from this report that the impetus to make a decision about the continued implementation of Zenith arises from the suppliers demand for the aforementioned outstanding structured support fee of ?26,000 to be paid. Eldersite were in fact in dispute with the suppliers and were receiving no external software support at this time. In the meantime, the hospital had joined a consortium "in order to ensure that the Trust were being protected". In response to Eldersite's refusal to pay the maintenance fee, the suppliers declined to realise the new version of the Zenith system (presumably containing improvements requested by the Trust). The report is said to be based on a specially organised Zenith Workshop where users? views had been represented by managers and end-users. Significantly perhaps, Mental Health (who liked the system and were said previously to produce plans for 99% of patients) were not represented "due to former commitments. However their views were sought separately". It is at this stage that problems with the *system*, not just the users, are brought out.

Failure declared

Later, in the autumn of that year, coinciding with the end of the three year roll-out period of the RMI project, in a "Sign off" report from Eldersite, the decided failure of the NIS is described as non-achievement. However, something is gleaned from the ashes:

The principal achievement of the Resource Management Project with in Eldersite has been the implementation of organisational change.

8 Discussion

The case study raises a number of important issues related to gender, resistance, and failure. Although the Zenith system was eventually regarded as a failure, there are several ways in which the project may be considered a success. Firstly, Zenith was a success for its sponsors for a good proportion of its life, before becoming a failure. Although the system had been a failure in the eyes of many nurses for some time, it was only when management and the implementation team decided to construct it as thus, that the system was officially dubbed a failure. Hence, failure is here more appropriately viewed as a *process* rather than an event.

Secondly, Zenith was a success in other hospital trusts and was also a success in the Mental Health Unit. But this variation cannot simply be attributed to ?mismatch?. Indeed, according to the Mental Health staff themselves, care plans were *least* appropriate on their wards because of the specificity of individual illness. Yet it is here that they have the most success. This, the IT manager writes, is because of the commitment of the staff and their willingness to adapt their working practices to the exigencies of the system.

This leads to the third success of the Zenith project: it had the effect of accustoming nurses to the use of computers and to keeping records of their work. This final point is significant for the future of ISD at Eldersite and further afield. In Section 2 we had stated that innovation in ISD entailed not only the computers and software but the new routines and organisational behaviour the required and entailed. The implementation of organisational change, a criteria of success for the RMI is vaunted, since nurses have accepted the fact of life of keeping electronic records.

Lastly, from different perspectives the *withdrawal* of Zenith was a success. Evidently, through fear of rejection, the withdrawal of the system was a success. However, an unwillingness to conform to a system (suspected of furthering the auditing and costing practices associated with the RMI) also forms part of the explanation for user resistance through the eyes of opponents to this government policy. Successful resistance achieved the nurses' objective - the withdrawal of the Zenith system.

Stabilisation and closure in failure/success

A key point in Zenith is proof of the validity of arguments by social constructivists that for a technology to stabilise, the relevant social groups must be persuaded that they need to ?pass this way? to solve their problem, or accomplish their task. In the case of the Zenith system, an alternative route to recording nursing care was kept open. The automated care plans were *not* a substitute for all the other documentation that had preceded the installation of Zenith. Kardex remained the preferred record of delivered care. This preference was due in no small part to the persistence of an established culture and routine centred around the Kardex and reinforced by the care plan?s negative qualities: its physical location, aesthetic aspect and limited access to it due to a dearth of PC?s.

It would appear that the failed rhetorics to enrol nurses into the use of IT were not, on the whole, supplemented by more coercive measures. Further, although behaviour was intended to be circumscribed by the script of the technology, this could not have been achieved without stabilisation of the Zenith system and its establishment as an obligatory point of passage for recording nursing activities. Given the necessity, due to shortage of time, to choose between giving hands on care or writing records, nurses elected care.

Discussion 2: Gender, Care and Resistance

The role played by gender in the demise of the Zenith system is both fundamental and indirect. Gender

did not appear to have any explanatory power amongst the nurses since they took for granted that women should be the carers in society. This is precisely our connection of gender with the nurse as computer user.

The two opposing influences identified earlier as affecting nurses' attitudes to IS and linked to issues of gender were professionalisation versus hands-on care. Professionalisation, it was suggested, tended to use a rather “masculine” framework for assessing the qualities of nursing: hence rationality, the scientific approach, standardisation and the use of IT were seen as advantageous for nursing. In contrast, the dominant culture at ward level prioritised physical proximity to the patient and a caring approach. These two discourses were in evidence in the case study.

The dissatisfaction amongst nurses in relation to their jobs hinged on their inability to deliver emotional and physical care. And it is far from clear how this frustration could ever have been answered by an IS. In the example of the Zenith system, the hands-on culture was deemed incompatible with the use of computers.

The centrality of care summarised by a “hands-on” approach would suggest that professionalisation as the embodiment of a scientific and theoretical approach to nursing had not been successfully translated to the wards of Eldersite. Project 2000 was viewed negatively (because of the deficient practical training nurses), yet the qualified nurses evidently wanted to be valued for more than the cleaning duties. Professionalisation for these nurses implied the status and respect they believed they should have received, but was sometimes wanting. This desire did not, however, translate into enthusiastic computer usage.

Conditions in general appeared to have deteriorated and for many, the Zenith system had made the job of nursing harder at Eldersite because it was more “involved”. The changes inaugurated by Zenith?s installation had increased the proportion of administration tasks in their daily lives, reducing the proportion of time spent on direct patient care. In return, no great improvement in the nursing care of the patient resulted.

Interestingly, the apparent dominance on the ward of the hands-on culture (and perhaps the triumph of femaleness over masculinity?) does not preclude resistance, although it seems to have had a powerful shaping influence over the way that resistance was carried out. The demands of the ward and the hierarchical nature of nursing imply certain constraints curtailing nurses? behaviour. At the time of the empirical research, there was a high level of compliance with unpopular policies, according to the nurses at Eldersite. Yet disagreement festered beneath this surface. Thus, the senior nurses' seemed especially angered at the way their own reluctance to endanger patient care was used against them. Many of the nurses from different grades on the General wards resented the devaluing of their work by other health care professionals. Their treatment and lack of self assurance stands in stark contrast with those in the Mental Health Unit, as described below.

Technology as masculinist culture?

It was argued in Section 2 that the predominance of a culture of hands-on care, being intimately linked with femaleness, would exclude or be unfavourable to IT if viewed as masculine culture. Many nurses - especially more senior nurses - expressed the view that the term “technology” held problems for them. In addition, nurses tended to subsume the terms “new technology” and “technology”, with the technology already on the wards referred to more favourably as ?machines?.

Further, the allegiance to technology was associated with climbing the ladder to management, thereby confirming the “away from care” view of technology on the part of nurses. Given that hands-on care was valued above all else by nurses, this was unlikely to make the technology appear attractive. In fact, this association would have condemned the system still further in the eyes of many nurses on the

wards.

The lack of self worth evident in some of the things the nurses' recounted, concerned not only to IT but also their standing. It is significant that the male nurses interviewed did not experience technophobia or inconfidence, even when they were older and/or sceptical of Zenith's usefulness. They appeared more self-confident, and had a feeling of worth that was rarely observable amongst those in General Nursing. This is perhaps due to the nature of the work. It is impossible here to say whether this state of affairs has arisen because of the nature of the work, or because it is where male nurses are predominantly found. No doubt there is a dialectical relationship between the two. Certainly, the gender paper was not falsified or undermined by this observation.

9 Conclusion

It seems impossible to even begin to understand the lives of nurses without recourse to the existence of gendered spheres. The centrality of care to nursing practice has come to be thought of as the prerogative of women in our society, establishing a triangulation of mutual constructions between females, care and nursing. That is not the same as saying all actors are thus structured entirely within this framework, such that, for example there are no male nurses, or that they nurse in a fundamentally different way. But it does tell us why men are an *exception,* and the social price individuals pay and for acting out of synch with these so-called ?natural? laws of behaviour. Indeed, it is the *invisibility* of the gendered nature of nursing which is so interesting and menacing at the same time. The tendency in our culture towards dichotomous classifications of the world ensures that the association of technology with masculine culture, although not stated explicitly, will make IT alien to nurses who, when carrying out their duties effectively, act out the archetypal female role. Hence the corresponding construction of technology and ?objectivity? (or intervention or cure, depending on the context) as male. Given the archetypal gendered roles in health care, the division of labour that pervades most organisations is extreme in its consequences for nurses who most definitely inhabit the female sphere. This implies that the priority of physical and emotional proximity to patients will mean hands-on care over-rides all other concerns including the use of IT if it is seen to detract from this. Gender then plays a significant role in the fate of IS.

The combination of feminist writings on technology and organisations, applied to the empirical research, resulted in observing close to how technological expertise is mutually constructed by the particular definition of technology. Again, nurses *themselves* tended to call the sophisticated artefacts that they handled with ease, “machines”, even though these may have been run by sophisticated software. Perhaps the association of computers with “new technology” increases the likelihood of this distinction being drawn. Whatever the case, nurses are, to all intents and purposes, “technical experts”, though may not consider themselves to be. This further suggests that women's relationship with technology is indeed due to social convention and evolves over time, as the significance placed by nurses on age of the users shows.

The example of nurses' counteraction illustrates how resistance is shaped by the environment in which it takes place. Hence, this paper has contributed to an examination of resistance to technology in relation to gender. In Section 4, we described the main features of hospital life for nurses. We saw in the empirical sections that despite the stifling images of acquiescence, nurses can and do resist measures they do not like. It is likely that they do so *because* they perceive themselves as angels, the guardians of the health service. So although the image can be a stifling one, it can also have the opposite effect, igniting rebellion, when the service appears threatened by official policy. If we shift from an agnostic view and take a partisan view of nurses' ability to increase their control of the workplace and achieve a certain level of autonomy, then professionalism is seen in a poor light. It

serves to cut off qualified nurses from other health workers; and it acts a barrier, rather than a bridge, to autonomy because it can be mobilised to exert political and moral control over nurses. Finally, its uncritical advocating of compliance with IS fails to assess the validity of such systems and their potential effects on the working lives of women.

References

Adam A (1997) ?What should we do with cyberfeminism?? In: R Lander & A Adam (eds.) *Women in Computing* Intellect Books, Exeter

Alvesson M & Billing Y D (1997) Understanding Gender and Organizations Sage, London

Audit Commission (1992) Caring Systems: Effective Implementation of Ward Nursing Management Systems HMSO Press-on-Printers Ltd, London

Bagguley P (1992) ?Angels in Red? Patterns of membership amongst UK professional nurses? In: K Soothill, C Henry & K Kendrick (eds.) Themes and Perspectives in Nursing Chapman & Hall: London

BCS Nursing Specialist Group & IMG (1995) Benefits Realisation Monograph on Nursing Information Systems (NIS) Information Management Group of NHS Executive, London

Benyon-Davies P (1995) ?Information systems "failure" and risk assessment: The case of the London Ambulance Service computer-aided despatch system? In: G Doukikis et al (eds.) Proceedings of the 3rd European Conference on Information Systems Athens, 1-3 June: 1153-1170

Bijker W E & Law J (eds.) (1992) Shaping Technology/Building Society, Studies in Sociotechnical Change MIT Press, Cambridge

Bloomfield B P (1995) ?Power, machines and social relations: Delegating to information technology in the National Health Service Organization 2(3/4), August/ November: 489-518

Bloomfield B P & Vurdubakis T (1995) ?Risk, blame and agency: Deliberating IT failures in organizations? CROMTEC (Centre for Research on Organisations Management and Technical Change) Unpublished article

Bloomfield B P, Coombs R & Owen J (1994) ?A social science perspective on information systems in the NHS? In: J Keen (ed.) Information Management in Heath Services Open University Press, Buckingham

Brechin A, Walmsley J, Katz & Peace S (1998) Care Matters: Concepts, Practice and Research in Health and Social Care Sage Publications, London

Brindle D (1995) Paperwork key to nurses? strike action. Failure to collect data can hit employers but not patients, *The Guardian*, 18/04/95.

Bowker G C, Timmermans S & Star S L (1995) ?Infrastructure and organisational transformation: classifying nurses? work? In: W Orlikowski, G Walsham M R Jones & J I

DeGross (eds.) Information Technology and Changes in Organizational Work Chapman and Hall, London

Callon M (1993) ?Variety and irreversibility of networks of technique conception and adoption? In: D Foray & C Freeman (eds.) Technology and the Wealth of Nations: The dynamics of Constructed Advantage Pinter, London

Cockburn C (1983) Brothers, Male Dominance and Technological Change Pluto Press, London

Cockburn C (1986) Machinery of Dominance: Women, Men and Technical Knowledge Pluto Press, London

Cockburn C (1988) ?The gendering of jobs: Workplace relations and the reproduction of sex segregation? In: S Walby (ed.) Gender Segregation at Work OUP, Milton Keynes

Cockburn C & Omerod S (1993) Gender and Technology in the Making, Sage, London

Corby S (1997) ?Opportunity 2000 in the National Health Service: a missed opportunity for women? Journal of Management in Medicine Vol. 11 No. 5

Drummond H (1996) Escalation in Decision-Making: The Tragedy of Taurus, Oxford University Press, Oxford

Davies C (1995) Gender and the Professional Predicament in Nursing Open University Press, Buckingham

Davies C & Rosser J (1986) ?Gendered jobs in the Health Service: A problem for labour process analysis? In: D Knights & H Willmott (eds.) Gender and the Labour Process Gower Publishing Company Ltd. Hampshire

Dutton W H, Mackenzie D, Shapiro S & Peltu M (1995) Computer Power and Human Limits: Learning from IT and Telecommunications Disasters PICT Policy Research Paper No. 33

Flowers S (1996) Software Failure: Management Failure. Amazing Stories and Cautionary Tales, John Wiley & Sons, Chichester

Flynn R (1992) Structures of Control in Health Management Routledge, London

Fortune J & Peters G (1995) Learning from Failure. The Systems Approach, John Wiley & Sons, Chichester

Frenkel K A (1990) Women and computing, *Communications of the ACM*, 33:11, 34-46.

Friedman A L with Cornford D S (1989) Computer Systems Development: History, Organization and Implementation, John Wiley & Sons, Chichester

Gable G G (1994) Interpreting case study and survey research methods: an example in information systems, European Journal of Information Systems, 3:2, 112-126.

Galliers R (1994) ?Information and IT Strategy? In: J Keen (ed.) Information Management in Health Services Open University Press, Buckingham

Grindley CBB (1992) (ed.) Information Technology Review 1992/3, Price Waterhouse, London.

Grundy F (1996) Women and Computers, Intellect, Exeter

Hirschheim R A & Klein H K (1989) ?Four paradigms of informaiton systems development? Communications of the ACM Vol. 32, No. 10: 1199-1216

Keen J (1994b) ?Information policy in the NHS? In: J Keen (ed.) Information Management in the Health Services, Open University Press, Buckingham.

Kelsey T & Brown C (1993) ?Government accused of misleading Parliament over Wessex Health Authority?s computer contracts: former Tory ministers linked to wasted ?63m? The Independent, 15 March

Knights D & Murray F (1994) Managers Divided, John Wiley and Sons, Chichester

Knights D & Murray F (1997) ?Markets, managers, and messages: Managing information systems in financial services? In: B P Bloomfield, R Coombs, D Knights & D Littler (eds.) Information Technology in Organizations: Strategies, Networks, and Integration Oxford University Press, Oxford

Lander R & Adam A (1997) Women in Computing, Intellect, Exeter

Latour B (1993) ?Ethnography of a "high-tech" case. About Aramis? In: P Lemmonier (ed.) Technological Choices: Transformations in Material Culture since the Neolithic Routledge & Kegan Paul, London (372-398)

Laudon K C & Laudon J P (1998) Management Information Systems: New Approaches to Organization and Technology Prentice Hall, New Jersey

Law J & Bijker W E (1992) ?Postscript: Technology, stability, and social theory? In: W E Bijker & J Law (eds.) Shaping Technology/Building Society, Studies in Sociotechnical Change, MIT Press, Cambridge

Law J & Callon M (1992) ?The life and death of an aircraft: a network analysis of technological change? In: W E Bijker & J Law (eds.) Shaping Technology/Building Society, Studies in Sociotechnical Change, MIT Press, Cambridge (29-52)

London Ambulance Service (1993) Report of the Inquiry into the London Ambulance Service London Ambulance Service, South West Thames Regional Health Authority, London, February

Lucas H (1984) ?Organisational power and the information services department? Communication of the ACM, January

MacKenzie D & Wajcman J (eds.) (1985) The Social Shaping of Technology Open University Press, Milton Keynes

Newman M & Wastell D G (1996) ?A tale of two cities? European Conference on Information Systems, Lisbon, Portugal, 2-6 July

Oliver & Langford (1987) ?Myths of demons and users: Evidence and analysis of negative perceptions of users? In: R Galliers (ed.) Information Analysis: Selected Readings Addison-Wesley, Wokingham

Pinch T J & Bijker W E (1987) ?The social construction of facts and artifacts or how the sociology of science and the sociology of technology might benefit one another? In: W E Bijker, T P Hughes & T J Pinch (eds.) The Social Construction of Technological Systems, MIT Press, Cambridge, MA (17-50)

Quintas P (1996) ?Software by design? In: R Mansell & R Silverstone (eds.) Communication by Design: The Politics of ICTs Open University Press

Redmond D T (1983) ?An overview of the development of National Health Service computing? In: M Scholes, Y Bryant & B Barber (eds.) The Impact of Computers on Nursing Elsevier Science Publications B V, North Holland IFIP-IMIA: 59-69

Robinson B A (1994) ?Social context and conflicting interests in participant understanding of information systems failure? In: Information Systems Methodologies BCS Information Systems Methodologies Specialist Group, Edinburgh

Robinson B A (1994b) ?And treat those impostors just the same: Analysing systems failure as a social process? PICT (Programme on Information and Communications Technologies) Doctoral Conference Edinburgh University, August

Salvage J (1985) The Politics of Nursing London, Heinman

Sauer C (1993) Why Information Systems Fail: A Case Study Approach Alfred Waller, Oxfordshire

Star S L (1995) ?The politics of formal representations: Wizards, gurus and organisational complexity?. In: S L Star (ed.) Ecologies of Knowledge: Work and Politics in Science and Technology SUNY Press, Albany (88-118)

Vaughan D (1996) The Challenger Launch Decision: Risky Technology, Culture and Deviance at NASA, University of Chicago Press, Chicago

Wagner I (1993) ?Women?s voice: the case of Nursing Information Systems? AI & Society 7: 295-310

Wajcman J (1991) Feminism Confronts Technology Polity Press, Cambridge

Watts S (1992) ?The London Ambulance Service crisis: Managers created an atmosphere of mistrust? The Independent 8 November

Webster J (1996a) Shaping Women?s Work: Gender Employment and Information Technology Longman, London

Webster J (1996b) ?Revolution in the office? Implications for women?s paid work?. In: W H Dutton (ed.) Information and Communication Technologies: Visions and Realities Oxford University Press, Oxford

Appendices

Table 1 Background Details: Project Nurses in Pilot Study in Kinthorpe

Hospital	**Reference**	**Role**	**Information System**
Trust A	Ken Michael	Project Nurse	COMPANION
Trust B	Brian Toose	Director of Nursing	COMPANION
Trust C	Colin Vincent	Project Nurse	COMPANION
Trust D (Eldersite)	Maxine Evan	Project Nurse	ZENITH
Trust E	Helen Ingram	Project Nurse	COMPANION
Trust F	Melissa Graham	Project Nurse	MURPHY
Trust G	Duncan Collins	Project Nurse	COMPANION
Trust H	Keith Hodges	Head of Nursing	SEIZE

Table 2 Zenith System Documentation

Author	**Job**	**Date**	**Title**	**Published**
Tim Mayne	Resource Management Project Nurse	April 1991	*An operational requirement for a Nursing Information System for the Royal Eldersite Trust*	Eldersite NHS Trust
Randolf Simon	Zenith Nursing Advisor	February 1993	*HCH Benefits Realisation Using the Zenith Ward Management System*	HCH Project Group
Maxine Evan & Tim Mayne	Zenith Project Nurse & Eldersite IT Manager	June 1993	*A Summary of the Benefits of the Crescendo Nursing System*	Eldersite NHS Trust
Maxine Evan	Zenith Project Nurse	July 1993	*A Response to the Audit Commissions Report on the Nursing Care Systems*	Eldersite NHS Trust
Orbit Project Team	Orbit Software Supplier	1994	*Companion Workload Methodology*	Orbit, for Kinthorpe Regional HA
Maxine Evan	Zenith Project Nurse	June 1994	*Zenith Annual Update*	Nursing Information Department
Maxine Evan	Zenith Project Nurse	February 1995	*Evaluation and Future Implementation of the Zenith Nurse Management Information System*	Eldersite NHS Trust
Maxine Evan & Tim Mayne	Zenith Project Nurse & Eldersite IT Manager	July 1995	*Zenith Nurse Management Information System Review* (Draft 1)	Eldersite NHS Trust
Tim Mayne	Eldersite IT Manager	October 1995	*Resource Management Sign Off Report*	Eldersite NHS Trust

Table 3 Background Details of Actors: Main Study Zenith Project

Role and Group	**Name** (if appropriate)
Zenith Suppliers	
Zenith Nursing Advisor	Simon Randolf
Zenith Resource Allocation & Project Manager	Sandra Stern
Nurse Information Group	
Eldersite Project Nurse	Maxine Evan
Eldersite IT Manager	Tim Mayne
Eldersite Assistant Project Nurse	Alison Lorde
Nurse Implementation Group	
Eldersite Director of Nursing	
Eldersite Directorate Nurse Managers	
Eldersite Hospital Manager	
External Management Consultant	

Table 4 Background Details: Nurses in Main Study at Eldersite

Reference	**Role**	**Ward**	**M/F**	**Grade**	**Organis?n**	**Years In Service/ At Eldersite/ In Post/**		
Wendy Jennings	Staff Nurse	5 Surgical	F	E	RCN	11		4
Mayra Urmson	Sister	5 Surgical	F	F	UNISON	25		6
Anita Sanders	Staff Nurse	5 Surgical	F	D	UNISON	15		2
Ursula Peters	Staff Nurse	3 Children?s	F	D	RCN	4		2 months
Fay Andrews	Sister	6 Urology	F	F	UNISON	27	All	7
Eve Allinson	Staff Nurse	6 Urology	F	E	UNISON	10	All	6
Sarah Jifford	Staff Nurse	12 Orthopaedic	F	E	RCN	9	All	6
Bev Knights	Staff Nurse	12 Orthopaedic	F	D	RCN	9	6	5
Rose Dalby	Staff Nurse	7 Surgery	F	E	UNISON	12	10	7
Chris Atkins	Staff Nurse	7 Surgery	F	D	UNISON	5	5	1
Fiona Gardner	Staff Nurse	7 Surgery	F	E	UNISON	36	18	10
Mandy Lewis	Staff Nurse	7 Surgery	F	D	RCN	4	All	7 months
Greg Johnson	Charge Nurse	Ash Mental Health	M	G	UNISON	18	5	8
Ed Smith	Staff Nurse	Ash Mental Health	M	E	UNISON	8	All	1
Frank Heath	Staff Nurse	Southbank Mental Health	M	E	UNISON	10	All	5

Table 5 Indicative Question Topics

Interviewees were asked to provide information on the following topics:

- Their personal details and history in nursing
- Their job and responsibilities
- Their experience and views on styles of nursing
- Their level of participation in the ISD process
- Their expectations of and training for the system prior to implementation
- Their level of usage of the information system
- The relevance of the information to their job
- The effect of the information system on their job
- How they used to the information
- Their views and experience concerning technology and health care in general
- Their opinion of the screen layout and information content

Table 6 Zenith System Implementation Roll-out Plan

June 1992	Care Planning and Rostering	5 pilot wards
September 1992	Care Planning and Rostering Workload Measurement Interfaces with IPS/PAS	15 wards 5 wards
December 1992	Care Planning and Rostering Workload Measurement	25 wards 15 wards
March 1993	Care Planning, Rostering and Workload measurement CMMS interface implemented	35 wards