

Nurses resisting information technology

Stephen Timmons

School of Nursing, Postgraduate Division, University of Nottingham, Queen's Medical Centre, Nottingham, UK

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Resistance in the workplace, by nurses, has not been extensively studied from a sociological perspective. In this paper, nurses' resistance to the implementation and use of computer systems is described and analysed, on the basis of semistructured interviews with 31 nurses in three UK NHS hospitals. While the resistance was not 'successful', in that it did not prevent the implementation of the systems, it nonetheless persisted. Resistance took a wide variety of forms, including attempts to minimise or 'put off' use of the systems, and extensive criticism of the systems, though outright refusal to use them was very rare. Resistance was as much about the ideas and ways of working that the systems embodied as it was about the actual technology being used. The patterns of resistance can best be summed up by the phrase 'resistive compliance'.

Key words: computerised care planning, resistance.

Studies of women resisting in the workplace remain, as Lee-Treweek (1997) points out, comparatively rare. The study by Lee-Treweek, of resistance by care workers in a nursing home, though they were not themselves nurses, has some parallels with the workers in this study, in terms of both the setting and the kinds of work that they did. Some more recent studies on workplace resistance have shown what a diverse and persistent phenomenon it is, even in the era of the Electronic Panopticon. Bain and Taylor (2000) describe how workers in call centres were able to resist, quite successfully, the technologically sophisticated measures that were put in place to observe and control them.

Most studies of nurses resisting have tended to focus on nurses' resistance to doctors. As nurses have traditionally had a subordinate position to medicine (though this is complex: see for instance Mackay (1993) and Svensson (1996)), resistance to medical power and domination are to be expected. A study by Hutchinson (1990) of what she terms 'rule bending behaviour' was observed in a group of nurses.

This encompassed a wide ranging of behaviour, some of it illegal. The kinds of activity Hutchinson describes include changing, or writing up new prescriptions without consulting a doctor. In more recent studies, Manias and Street (2000), for instance, show how nurses were able to use policies and protocols as resources in their resistance to medical domination. Savage (1997) describes how the management of space, and the gestures (or postures) that nurses on a particular (nurse-led) ward used were emblematic of their resistance to medical power.

Resistance by nurses to what might broadly be termed management, which is (indirectly) the focus of this study, has been studied less often. In this case, the particular management initiative that was being resisted was the introduction of computerised systems for the production of detailed plans of care for hospital inpatients. This was the first time that most of the nurses involved in this study had been required to use computers as part of their day-to-day work.

THE VIEW FROM NURSING INFORMATICS

That resistance to IT is a common phenomenon can be seen by the frequency with which it is identified by many commentators within the field of nursing informatics. However,

Correspondence: School of Nursing, Postgraduate Division, University of Nottingham, Queen's Medical Centre, Nottingham, NG7 2UH, UK.
E-mail: <Stephen.timmons@nottingham.ac.uk>

their analysis of it is disappointingly underdeveloped. Typical is Ball et al. (1988), who take as their main analytic approach the idea that resistance should and must be overcome, and that resistance is only worth studying in order to achieve this. Other examples include Feeney (1996), who identifies that resistance to system implementation does occur, and that it can be identified by phenomena such as absenteeism, staff turnover, complaints and low morale. Despite this, Feeney implies that for the potential users of systems, resistance is futile. Strategies to deal with resistance are suggested. These include directive change where staff are required to attend training sessions, and the co-option of resistors into finding solutions to problems. In order to implement IT successfully, sufficient training is needed to overcome lack of confidence and 'quell the fear of losing control'. These views, of which this is far from the only example, see resistance to technology as at best irrational, and at worst dangerous. These explanations of resistance could be summarised as 'technophobia'. An alternative explanation for resistance would be to see it in terms of systems failures. Bauer (1995) critiques the technophobia theory, and suggests that understanding resistance in terms of the fit between the systems (or lack of it) and existing work practice would be a more fruitful basis for enquiry. This distinction between technophobia as an explanation, and system failure as an explanation is a point to which I will return.

WHAT COUNTS AS RESISTANCE?

Resistance by workers to management has been one of the central debates of industrial sociology. An important contribution was the work of Braverman (1974). While he did not explicitly discuss resistance, some commentators have thought that the inexorable nature of the technological changes that he described, the deskilling of workers, meant that resistance is ultimately futile (Knights and McCabe 2000). Others have recruited Foucault, and his concept of power as an all-pervasive force to suggest that resistance by workers to management is either impossible or futile. If, as some Foucauldians would have us believe, the organisation's whole *raison d'être* is the exercise and maintenance of the power of those who already have it, then resistance, presuming that it involves the exercise of at least some power by the weak within the organisation does seem to be an impossibility. Knights and Vurdubakis (1994) critique this position. Their reading of Foucault is that the very all-pervasive nature of power means that resources of power are available to workers as well as managers. Resistance presupposes power, and presumably, inequalities in power. Inequalities in power do not, however, mean that the less powerful are totally

powerless. That resistance occurs, albeit spasmodically, covertly, and unsuccessfully, means that the powerful do not always get their own way. In this study, as in those described by Bauer (1995) and O'Connell Davidson (1994), the resistance to the systems could be seen as being a failure in so far as the systems were implemented and the staff used them. However, as we shall go on to see, the failure of resistance to the implementation of a system does not mean that resistance then 'goes away'. It continues, albeit in more covert forms.

So it seems fair to say that something perceived to be resistance exists. The next stage is to decide what would 'count' as resistance, in the particular context being studied. As O'Connell Davidson (1994) in her study of resistance to the implementation of a computer system in a privatised utility points out, one of the problems with resistance as a category is that it is so all-encompassing. She says that resistance could be 'anything and everything that workers do which managers do not want them to do, and that workers do not do that managers wish them to do' (O'Connell Davidson 1994, 94). While she herself eschews any formal definition of resistance, preferring to document what actions workers took, and why they took them, she does say that, 'the workers' reactions to the changes ... were implicitly counted as resistance' (O'Connell Davidson 1994, 94). In other words, the actions that management viewed as resistive were defined as 'resistance'. Knights and Vurdubakis (1994) point out that resistance is constituted through being described, analysed, and talked about. This phenomenon influenced the design of this study as far as interviews with the managers of the systems, as well as the users, were undertaken. This was in order to find out what activity they considered to be 'resistance', as this clearly plays an important part in what resistance to the system, in the organisation as a whole, 'becomes'.

For the purposes of this study, the powerful, in the sense that they occupy formal positions of power within the organisation, and control staff and other resources, are the management of the hospitals, who sought to impose computer systems on their nursing staff, and the less powerful are the nurses themselves. However, the existence of the resistance that the system encountered suggests that the nurses, though less powerful, were not powerless, and in terms of the way that their resistance re-shaped the systems, in some ways quite powerful. Here we may use the categories delineated by May (1999), drawing on the work of Bourdieu, 'Firstly there is the power to confer and fix meanings ... Secondly there is the power that comes from the skills and knowledge that people possess, and thirdly there is differential access to wealth and resources' (777). Within this study

both the nurses and the project managers had power of the first type, in that they could, to a greater or lesser degree, define what the systems 'were', and both groups had to take account of the other's interpretations. Both groups had power of the second type, though here the nurses, with their appeals to a wider professional status and rhetoric were perhaps more powerful than the managers. This situation is reversed with the third type of power, as the managers had substantially greater control over resources.

Before attempting to categorise resistance, it is important to delineate, within this study, what resistance was not. It was not a universal phenomenon. Some respondents were quite enthusiastic about the system, or talked about people who they worked with who were enthusiasts. No formal resistance was experienced at any stage of the implementation process. There was no action organised by any of the nursing trades unions, such as strikes, works to rule, or any direct, organised refusal to use the systems. In fact, the nursing unions were largely bypassed in the process of the system implementation. It is interesting to speculate on why this might be, especially as nursing in the UK is a well-unionised profession, and there are official industrial relations structures in the NHS. However, nursing unions, especially the dominant union in the staff group used in this study, the Royal College of Nursing, have never been particularly militant, and at the time that the nursing systems were introduced, had suffered from the general diminution in the influence of all trades unions that took place in Britain in the 1980s. Equally there was no unofficial action or protest on the part of the staff, unlike that described by O'Connell Davidson (1994) where staff took action without the involvement of their trade union. Bauer (1995) describes resistance to the implementation of an IT system in a bank as being temporary, informal, unanticipated and involves communication with 'resistance' as its theme. This perhaps matches more closely the kind of resistance encountered by the nursing care planning systems, than that described by O'Connell Davidson (1994).

One of the few studies to find overt action (within a healthcare context) is that by Dowling (1980). He found instances of systems being abandoned by their users or prevented from working. However, this is a very old, US study, and crucially involves neither the types of systems, nor the professional group, being considered in this study. What is perhaps most interesting about Dowling's paper is that it provides a typology of resistance to healthcare computer systems. Despite the caveats mentioned above, it is perhaps instructive to see how many of them might be found in this study. Dowling delineates five types of resistance. Passive resistance (failure to co-operate) was certainly present in all

of the hospitals in this study. What Dowling describes as 'oral defamation', was also there, though the instances he describes of deliberate breaking of machines were not reported to me. Alleged inability to operate the system was thought to exist by the project managers interviewed, but not by the ward nurses. Data sabotage was not found. Refusal to use was not widespread, though it was mentioned by some interviewees, and was a stance explicitly taken up by one. Again, the real weakness of Dowling's work is that it makes no attempt to situate these phenomena in a wider context, and he suggests standard managerial responses such as improved training and communication without giving much detail about what forms they might take. In addition, as I shall hope to show, resistance is a more complex, multi-layered phenomenon than these analyses might suggest.

This more complex conceptualisation of resistance is confirmed by Hirschheim and Newman (1988), who, though not from a social sciences background, have one of the more sophisticated views of resistance in the literature. They point out some of the problems with the concept, including its pejorative overtones (in this context), and show how 'resistance is contingent upon how change affects the social aspects of the job, i.e. the established relationships in the organisation' (Hirschheim and Newman 1988, 400). They conclude, 'the literature offers the systems developer numerous simple platitudes ... [which] miss the richness and complexity of systems development—in particular the social and political nature of organisational change' (Hirschheim and Newman 1988, 406). Disappointingly, they do not provide a typology of resistance, confining their analysis to broad categories such as unwillingness to participate in systems design, or to use the system when implemented.

Massaro (1993a, 1993b) provides a detailed analysis of the implementation of physician order entry. He shows how the system caused unanticipated changes to traditional methods of working, which formed a locus of resistance, though this was eventually overcome. Ash has shown (in a series of papers including Ash (1997), Ash et al. (2000) and Ash et al. (2001)) that acceptance or otherwise of computer systems by healthcare professionals (physicians in her studies) cannot be characterised as being simply resistive or supportive, but should instead be seen as complex and emotional, with subjects holding apparently contradictory positions.

For the purposes of this study I shall not seek to define in advance what resistance is, but instead draw on social actors' accounts and sketch out here some ideas about what might count as resistance, and were counted by the project managers as being resistance. These are derived partly from the literature discussed above, and from some of the

preliminary discussion with project managers that formed part of the planning stage of this study. They include three apparently simple notions:

- refusal to use the system;
- attempts to minimise use of the systems;
- criticism of the system.

THE STUDY

The aim of this study was to establish:

- 1 Are computerised systems resisted by the staff who are required to use them?
- 2 If resistance exists, then what forms does it take?
- 3 If this resistance occurs, then why?
- 4 How is any resistance situated within a wider context of nursing culture?

This study focused on computerised systems for the production of detailed plans for the care of hospital in-patients by nurses. They were introduced into UK hospitals during the 1980s and 1990s, as part of the Resource Management Initiative. Three UK district general hospitals in the south of England were selected for this study. The systems had been implemented at the three hospitals over a period of 2 or 3 years. Though all the hospitals used care planning systems from different manufacturers, they were broadly similar in their functionality, interface and usage. These were all terminal-based systems, where the majority of data were entered via a keyboard. Wards typically had two or three terminals. Care plans were supposed to be written and updated for each in-patient, however, at the time that the research was conducted no hospital achieved their target of 100% of in-patients having a fully written and evaluated computer care plan. The systems were used by qualified nursing staff¹, largely drawn from Grades D, E, F and G. Nursing students were allowed to use the systems under supervision, though they were not allowed to 'sign-off' care plans as being complete. Student nurses were not included in the study as they were not allowed to use the full functionality of the systems, and they did not have sufficient experience of practice to be able to talk about the use of the systems in a wider context. Other staff were not allowed to use the systems, though some interviewees reported occasional use by health care assistants.

One of the reasons for this choice of interviews as a method was the relative rarity of these kinds of studies in the existing nursing informatics literature (at the time of the study). Nursing informatics (for example, Newton (1995) and Large (1994)) have used mainly quantitative methods to examine attitudes. A review of the literature undertaken by Lacey (1993) confirms that the studies conducted up until that point had been almost exclusively quantitative. Lacey concludes that 'the literature lacks adequate research support of the attitudes held by nurses toward computerisation' (239), meaning that the studies reviewed were inconclusive or contradictory. This might suggest that these kinds of methods have not been very successful in establishing any more complete and coherent account of what resistance might be, and how it relates to wider aspects of nursing culture. This is confirmed by Hardiker, Heathfield and Kirby (1995), who seem almost mystified by the continued resistance from nurses that they experienced in implementing a care planning system. The resistance that they found mainly manifested itself in an unwillingness to use the system. They suggest that the problem must be situated in 'more complex cultural and socio-technical factors'. Stapleton (1994) points to the importance of the personality of the system's project manager as a factor in determining the success of implementation. This again suggests that the issues here lie deeper in the social world, where more qualitative methods are needed to investigate them.

The other reason interviews were chosen as a method was because of the nature of the subject under consideration. If a group of nurses say that systems are resisted, then it seems reasonable to assume that they are. If this resistance exists, and it constitutes a problem for the field of nursing informatics (as it seems to be) then again it is reasonable to assume that nurses are knowledgeable reflexive actors who can give meaningful accounts of their actions in this context and the reasons for them. Twenty-eight semi-structured interviews were conducted with 'ordinary users', that is, qualified nurses working in wards and using the systems, and, at each hospital, one interview with the project manager for the system. The group interviewed were broadly representative of qualified nurses in the hospitals in the study. Wards were selected randomly.

All of the interviews conducted were transcribed and an analysis undertaken by the author, supported by QSR NUD*IST software. Short sections of the transcript (1–10 lines) were assigned a code. Initially, this tended to be a simple summary of what that section was about. As time went by, and the number of codes expanded, more analytical codes were developed, and certain sections were assigned more than one code. No part of any transcript was left uncoded.

¹The qualified nurses in this study were all Registered Nurses with the UK's governing body for nursing, the Nursing and Midwifery Council. They had all completed at least a three-year full-time course in order to qualify as Registered Nurses. The majority of nurses interviewed had trained at a time when nurses education was managed directly by hospitals. A minority had trained in universities. Many had, in addition, postregistration professional qualifications.

As the analysis developed, the codes were grouped together in a 'tree' structure, to facilitate the process of analysis, developing themes and theory building.

Once all of the data had been entered, the codes were refined. This was in order to reduce their numbers, eliminate duplication, and to permit the development of more sophisticated analytical categories. As this process continued, new links between codes became apparent. The most important way in which the software was used to support the analysis was through its reporting features. This enabled all of the sections of transcript which related to a particular code or codes to be retrieved in one block, enabling the drawing out of similarities and differences. The limitation of these methods in terms of generalisability is acknowledged. As a qualitative study, this was not what was being sought. Likewise, this study will have been, to a degree, subjective in the conduct of interviews and the analysis of data.

The theoretical basis for this study is the social construction of technology. Developed principally from the work of Bijker, Hughes and Pinch (1987), this is the idea that machines have meaning, and, in fact, they can have different meanings for different groups of people. Pinch and Bijker (1987) refer to this feature as the 'interpretative flexibility' of machines. For instance, a care planning system could variously be interpreted as being symbolic of an up-to-date, high-tech profession (perhaps by those funding the implementation), as a way of improving the care of patients (perhaps by those implementing the systems) and as a bureaucratic imposition (by those who are required to use it). Pinch and Bijker suggest that technologies will eventually reach a point at which one interpretation becomes dominant. Though debate continues about whether this ever actually happens (for instance, Woolgar (1996)), the care planning systems had not reached that point.

The flexibly interpreted nature of technology influences its development. Pinch and Bijker also show how the development of technology is not an inexorable 'Whig' process of continuous improvement where the 'best' technology becomes dominant over a period of time, but is a result of a variety of forces acting in the social rather than the technical arena (if these two can indeed be separated). They stress that things could always have been otherwise. They advocate a multidirectional model of technological change and deny a linear one. It does not take the system as being a fixed, objective entity, but instead considers it to be subject to interpretive flexibility, that is, the system means different things to different people. The process of implementation, far from being a simple set of stages that can be described in the flow charts so typical of formal project management methods, is actually a process of negotiation and definition. This

process determines what the system will be, and the various actors involved bring differing resources of knowledge power and interpretation to bear during this stage. In fact, the system is always in the process of implementation, it is constantly being redefined and renegotiated between, among others, those implementing the systems, 'managers', and those using the systems, 'nurses'.

This approach has already been used successfully to analyse the implementation of computer systems in UK hospitals. The work of Bloomfield and others (Bloomfield 1991; (1995), Bloomfield and Coombs (1992), Bloomfield and Vurdubakis (1994); Bloomfield et al. (1992), Bloomfield, Coombs and Owen (1994), Bloomfield et al. (1997)) has shown how ideas like 'flexible interpretation of technology' can explain what is going on in an organisation during and after systems implementation. Though Bloomfield's work takes as its main focus systems that were designed to support the work of doctors and managers (and, indeed, doctor-managers), rather than nursing and nurses, this approach can be helpful in understanding the implementation of nursing systems.

FINDINGS

Refusal to use the systems

Complete refusal to use the systems was not common. More commonly interviewees said they knew, or knew of, someone who did not use the systems. For instance '... our Sister who has retired refused to use it at all, because at the end of the day she said "I didn't come into nursing to use a computer", which is true'. One interviewee had, however, refused to use the system outright. The first unusual factor in this was that it was the manager (ward sister) of one ward who had refused, successfully, to have the system implemented on her ward at all. The strategy that she had employed to do this was interesting, as she had achieved and sustained this refusal by deploying a professional rhetoric. Her ward, whose primary function was rehabilitation, rather than care, was explicitly multidisciplinary. This meant that all the staff, from a variety of professional groups (not just nursing) worked to one method of planning and organising care. Thus this ward did not use the theoretical concepts that underpinned the system, like nursing models and the nursing process, as many of the people planning and delivering care were not nurses, but, for instance, physiotherapists and occupational therapists. She therefore argued that the system was based on inappropriate ideas for use on her ward, and that a purely nursing system could not be used by these professional groups. This strategy proved highly successful, and at the

time of the interview, she had successfully resisted implementation of the system on her ward for over 2 years.

This is probably not the only factor in her success. It should be pointed out that this individual is a particularly strong and articulate woman (even by the high standards of ward sisters). This was an exceptional case. However, it does give the first indications of a phenomenon which was found in the interviews with the project managers. This was that the project managers were prepared to tolerate (and sometimes even be complicit in) a degree of resistance. Their efforts to overcome resistance would only be taken so far, and an individual like this ward sister, who was prepared to put up sustained and sophisticated resistance, was likely to be tolerated.

ATTEMPTS TO MINIMISE USE OF THE SYSTEMS

Things that don't get done

Care plans were created and updated, but not as completely as they should have been. Most commonly reported was a failure to record evaluations. However, Porter (1995) and Porter and Ryan (1996) both report studies where aspects of the nursing process (including this one) were neglected by nurses using paper-based systems. Also neglected was updating the care plan:

It is used, it is not used as much as it should be. If you've had normal numbers of staff and the patients don't actually get put onto the computer ... we're supposed to at the end of each shift, do dependencies for that shift. It very rarely gets done.

(That is, though the systems are used, lack of staff and pressure of work means that they are not used as much as they 'should' be, and that the 'dependencies', that is, the evaluations, were most likely to be neglected.)

Conversely, the feature used most often was the recording of details and creation of a care plan on admission, though it was not unheard of for this to be avoided:

A lot of people who use the hand-written sheets (on admission), and then say, 'Oh I didn't have time to put it on the computer.'

and

Researcher: So what you are saying is the care plan is kind of updated but it's the paper print that's updated rather than what's on the system?

Interviewee: ... from an updating point of view I think people are more inclined to update a hand-written care plan.

One ward sister was happy to tolerate this practice because, as she said, 'I'd far rather that people were documenting

care on paper than not documenting it at all.' In fact, the practice of not updating the records of the care that had been provided was widespread, and, as this excerpt shows, led to one interviewee questioning the value of the system.

Interviewee: ... So the problem with care plans is that they're not updated, so the whole thing falls down. So a care plan will still say that a patient is under sedation after 3 days, when what we would actually be doing is trying to wake that patient up.

Researcher: So the problem is that the care plan is created, but not updated?

Interviewee: Yes, because it's so time consuming to do these things, a patient is assessed using a model, but the care plan is not updated as the care given changes. What value is the model if we're not going to use it? So it becomes a paper exercise.

Delay

Writing and updating care plans was often delayed: 'there is always something to do, and I really do think God forbid that it's [the system] at the end of most of our priorities.' Sometimes this was left to later in the day, or it was left for another shift team to do.

CRITICISM OF THE SYSTEM

The most common form that resistance took was criticism of the systems. None of the interviewees were uncritically positive about the systems. Their criticisms were varied, but some of the most frequently occurring are considered below. They have been classified into groups.

Criticisms of the system itself

TIME CONSUMING

Perhaps the criticism which was voiced most frequently was that the systems were time-consuming to use: 'There is a lot of wasted time', 'I think it's well known throughout the hospital that every ward does get frustrated at times'.

NOT ENOUGH TERMINALS

After the time-consuming nature of work on the system, the lack of enough terminals was the criticism raised the most often. Due to the financial constraints in purchasing the systems, most wards had only two terminals, and sometimes only one (though occasionally three). When this factor was combined with the ward being busy, especially in terms of new admissions, which create a great deal of extra administrative work, there were queues for the terminals. 'Not

enough when obviously the patients come in we could have something like up to 19 admissions a day.'

Interviewee: The other problem is that there's only two computers on the ward.

Researcher: So physical access is a problem?

Interviewee: In an ideal world we would have a computer in every bedspace.

A related issue was the difficulties in getting access to a terminal caused by other staff groups using it. The terminals had been introduced into the ward environment specifically for the use of nurses for the care planning systems. However, the hospitals sought to maximise the benefit of their investments. Thus, as other systems, notably pathology results reporting, and the Patient Administration System (PAS), were implemented, the terminals on the wards were intended to be used for these purposes as well. Thus, the terminals were used by doctors (principally for pathology results) and ward clerks (updating the PAS) as well as nurses. Other staff groups like physiotherapists or occupational therapists used the systems as well. The problems with access to a free terminal tended to become even worse. As one of the project managers said, 'because they've only got two points, it's quite difficult, because there is a lot of competition for the two PCs on the ward because the doctors use them as well' and 'I think the difficulty is the access ... You have two computers, the ward clerk is on one, the doctor is getting blood results on the other.' This phenomenon, of competition for access to terminals, points to some quite interesting aspects of relationships between different professional groups, and the part that power plays in determining them (Timmons and Tredoux 2000).

CREATES VERY LARGE RECORDS

The sheer physical effort involved in hand writing care plans tended to put a limit on their size. As the computer makes it easier (some would say compulsory) to write longer care plans, the amount of documentation tended to grow. The ease with which care plans could be printed out also meant that, contrary to the intention of reducing the amount of paper on a ward, the systems actually had the effect of increasing it. The following excerpt illustrates the issue:

Interviewee: It's a waste of paper.

Researcher: why is that?

Interviewee: I think that it's too easy on the computer, everything is just there and it's too easy to just continuously press print. When I was first here, I did my first placement

over in [other hospital] and we weren't computerised over there, so I'd be writing my own care plans. I think because of that, I'm more selective about what I actually fill out on the computer, it's too easy on the computer to write a care plan and print it without making it specific to that one patient or problem.

TOO EASILY INTERRUPTED

The computer terminals were most often sited at the nurses' station, usually in the busiest part of the ward. This meant that some of the interviewees felt that they could not concentrate for any length of time on writing or updating care plans, as they were 'constantly' interrupted, by other staff, but especially by patients and their relatives. Their remarks on these incidents are quite revealing. What emerges is the idea that the patients and relatives do not see using the computer as being 'real work' (as discussed by Melia 1984, 1987), that is, it was acceptable to interrupt the nurse while she was using the computer (and, presumably, not when she was engaged in other types of work).

Majority of patients would say, seeing the nurse sitting behind the desk at the computer, — she's free to talk to me because she's not doing anything.... It's at the nurse station which the public passes most frequently. So there are frequent interruptions — as I said earlier, if she's sitting at the computer, people think they can talk to her, so your thoughts are interrupted continually.

One interviewee expressed herself more strongly, 'You get the impression that relatives are staring at your back thinking "What the bloody hell are they sitting there for?"' Payne, Hardey and Coleman (2000) also found the idea among the nurses that they studied that they should not be seen to be spending time at the computer producing care plans, as this was not 'real work'.

RELIABILITY

One of the most frequently occurring criticisms was of the system's reliability. This was an issue in all three trusts used in this research. A few quotes should suffice: 'Reliability is an issue it's very frustrating when the system goes down', 'complain about the fact that it goes down so often', 'So if the computer goes down we're stuck, we can't get into the patients' details'. This issue is in fact divided into three separate ones, which are the system breaking down (crashing), the system being very slow to respond to keystroke input, and the system being taken offline for maintenance or back-ups. The managers implementing the systems had different views on this issue and believed that reliability was used as an 'excuse'. For the purposes of this study, whether the systems genuinely were reliable or not is not especially significant, and would, in any case, have been hard to

establish. What matters is that 'unreliability' was deployed by the users as a reason for not using the systems, and as a criticism of it, and that, conversely, the project managers said that reliability was not a 'real' issue, and that this particular discourse could be categorised as an 'excuse', and therefore ignored. This is a good example of how social construction of technology can help illuminate an issue. What is at stake here is not whether the systems are, in themselves, 'reliable' or 'not reliable'. What could be said to be going on is a struggle between two contending interpretations of the systems' reliability.

Security issues

USE BY UNQUALIFIED STAFF

Use of computer by unqualified staff is quite a complex area, not least because of the professional issues it raises. A small number of interviewees reported that care plans were being completed and updated by unqualified nursing staff (sometimes referred to as health care assistants (HCAs)). This is problematic from the standpoint of qualified nurses. This is because the writing of care plans, because it involves using specialised nursing knowledge such as the nursing process and nursing models, can only be done by qualified staff. Unqualified staff do not have the professional knowledge or credentials to do this kind of work. It was thus resented by the qualified nurses as a usurpation of their professional territory, and is, potentially, illegal. An interviewee explained the problem:

Researcher: By your junior colleagues you're talking about unqualified staff?

Interviewee: Basically yes. Which is inappropriate because they are fantastic here, but their experience is limited and they might not be doing an appropriate care plan. If you go in that [the care plan] at the end of the day you're legally responsible for whatever care plan they put down there.

A qualified nurse who colluded in such a practice (for instance, by sharing a password) would, strictly speaking, be in breach of the UKCC's Code of Professional Conduct. Nevertheless, it was reported as occurring, because the qualified staff were 'too busy' to update the computer. As one sister said, 'Potentially that whole paperwork system could be done manually, used manually and then input by the ward clerk. So a ward could look good, but there had been no qualified nursing input.' Again, no one ever said that this was occurring on their ward, only that they had heard of it happening. It is thus difficult to gauge how widespread this kind of activity was, as, for the reasons outlined above, the

interviewees would have been unwilling to admit that they had colluded in it.

Nursing issues

WORKING AWAY FROM THE PATIENT

Related to the issue of the limited number of terminals is that of the impact that the systems had on where and how certain parts of nursing work were done. In paper-based systems, the creation of the admission assessment, and the writing of the care plan took place at the patient's bedside. Usually, the patient was involved in this process, at least to the extent of answering the nurse's questions, if they were able. The care plan was left at the end of the bed where it was accessible to nursing and other staff, and was (supposedly) updated throughout the patient's stay.

The implementation of computerised care planning systems changed this. Information was still collected at the bedside, from the patient, but the position of the terminals meant that the care plan was no longer created and stored close to the patient. Instead the nurses had to make notes at the bedside, and then create the care plan some distance away, at the nurses' station. This was another factor which caused the phenomenon described above of the care plan being 'left' until later, or the updates not being done. One interviewee described the difficulties this caused her:

You're always doing your computer work away from the patient, so you've either got to have a very good memory, because by the time you've asked them the questions, gone back to the computer and then sat down and fill out your care plan, I usually forget, then you're to-ing and fro-ing from the patient.

MODELS NOT IMPLEMENTED CORRECTLY

A more sophisticated critique of the system was put forward by one of the interviewees:

Researcher: Would you say that there are problems with the way the Roper² model and the nursing process are implemented within the system?

Interviewee: It's a problem that you can't use another model, a more appropriate one, and because you're stuck with only one model to use, people get very familiar with it and don't use it properly. There are two other aspects of Roper's model that are just totally ignored by the hospital, and by most healthcare organisations. So there are problems because it narrows peoples' horizons and they think, 'That's what's on the system, and that's what I must use', and they won't think laterally.

²The model of nursing care devised by Roper, Logan and Tierney (1980) was the basis for all of the systems studied.

Researcher: I'm told that this is a problem by my colleagues who know about these things. When I've explained how the model is implemented in the system, they say, 'There's more to it than that'.

This critique hinges on quite a subtle point about the model of nursing used as the theoretical underpinnings of the system. The Roper, Logan and Tierney model uses 12 'activities of daily living' to guide and structure nursing care. However, there are two other major aspects to the model. The first of these is a dependence/independence continuum, and the second is the point that a patient is at in their life span (Pearson and Vaughan 1986). In order to utilise the model fully, these additional factors would need to be considered in planning care, as well as the 12 activities. None of the systems, though they all used the Roper, Logan and Tierney model, explicitly included these additional factors. The problem that this interviewee is alluding to is that by excluding these parts of the model, and concentrating on the 12 activities of daily living, there is a danger that the care given will be mechanical and reductionist, which is exactly what nursing models were designed to guard against. Here is another good example of interpretative flexibility (Pinch and Bijker 1987) at work. The Roper, Logan and Tierney model, a fundamental part of the systems, is being interpreted in different ways by different actors. The usefulness of this approach is confirmed by Latimer (1995) who uses related ideas from the field of sociology of technology to explain the implementation of the nursing process.

Another criticism of the systems were that they did not include any alternative models of nursing, other than Roper, Logan and Tierney. The field of nursing models is characterised by a great deal of diversity, and Pearson and Vaughan (1986) recommend that a ward (or other practice area) debate which model is appropriate for them. There are no technical obstacles to the implementation of alternative models within any of the systems used, which begs the question of why the Roper, Logan and Tierney model was used to the exclusion of others. This replicates the findings of Keen and Malby (1992) who found that the Roper, Logan and Tierney model was the only one used, despite others being available, and it being technically possible to implement them in the systems.

The rhetorical strategy used by this interviewee has something in common with the example given above of the sister who was successfully able to prevent the implementation of the system on her ward, though in this case both the aims and the outcome were different. Again, it relies on the deployment of detailed, professional knowledge, which makes it a more effective strategy within a nursing environment. This is because nursing knowledge and ways of work-

ing are being counterpoised to 'managerial' knowledge and ways of working, and the implication is being made that managers are (inappropriately) trying to interfere in 'professional' nursing issues, that are not properly within their remit. This stance can then be used to legitimise resistance, in defence of professional values.

DETRACTS FROM INDIVIDUALISED CARE

Related to the criticism above (on the grounds that it is also an appeal to nursing professional knowledge and values) is the suggestion that the systems detract from the provision of individualised care. The idea of the individualisation of care was part of the changes in nursing that revolutionised the profession in the 1960s and 1970s, as nurses attempted to move away from the routinised patterns of task-based care that had characterised nursing practice up until that time. Treating the patient as an individual, 'whole' person remains a major part of how nursing defines itself, particularly by contrast with medicine, which is perceived (by some nurses) as being reductionist, concerned only with pathology and body systems.

The systems were criticised for being too generalised, 'Generalised because basically a lot of the care plans, if you've got someone with breathing problems, the way the computer works is that you're doing a lot of exactly the same things for someone with breathing problems.'

This criticism operated at two levels. The problems, goals, and interventions that were available to the nurses creating the care plans from the system libraries were considered to be too generalised, and in need of time-consuming tailoring to fit the individual patient:

Time consuming because care plans, what it does is give you problems related to diagnosis, rather than problems related to the individual, so when you want to be specific and individualised, you have to go into 'Create', write your own stuff. By the time you've gone into that, and written, and come out, you could have written four or five care plans by hand. Very time consuming.

At another level, the provision of core care plans (that is, care plans already partially written for particular types of patients (like hip replacements)) were also thought to detract from the individualisation of care.

It's not very nice to suggest that there are staff doing this but you can to a certain degree, only to the care planning, do core care planning, print loads of it out with no thought, or with minimal thought, without really being individual, as I said earlier, to that individual's needs. There is an element within the computers for you to be lazy, which I think you wouldn't get if you were writing them out.

The implication here is that, for whatever reason, nurses would simply print out the relevant core care plan, with a

minimum of tailoring to the needs of the individual patient, simply because the systems made it possible to do so. This is confirmed by Payne, Hardey and Coleman (2000), who also found that core care plans would be generated with a minimum of personalisation.

DEGRADES SKILLS

Related to the previous point is the idea that the system was degrading nursing skills. The concern was expressed that because core care plans were available within the system, and because there was an extensive library of problems, goals and interventions, nurses who used the system would become dependent on it, and gradually their skills at planning care would be reduced, 'when it goes down, they don't know how to combat that, because it involves hand-writing stuff. This is the problem, people are becoming too dependent on it, they've built it into their daily life so much.' This seemed such a significant point that I checked whether that was what the interviewee really meant:

Researcher: Do you think that there is a danger that they might degrade the skills of care planning?

Interviewee: I think definitely, I think definitely the skills of assessment, just really understanding the tools because you can.

This again is quite a powerful argument, as it implies that the system is potentially striking at the very heart of what makes nursing distinctive as a profession. Both the idea of a lack of individualisation, and the degrading of nursing skills have parallels with the work of Harris (1990), who found that nurses viewed computerised care plans as deautonomising, that is, reducing the control that nurses had over the care planning process. This was due to the tasks/goals being suggested by the system (and therefore by management), rather than by the nurses themselves. The nurses had to adapt to the way the system operated, and use the standardised categories it suggested.

Harris also found that the nurses in her study thought that the system caused deindividualisation. The choices on the system were too broad to get a good fit to the patient. A third component was the loss of expertise. Nurses believed that they were losing skills they learned in their training. The issue of the tension between the desire of nurses to protect (or enhance) their autonomy as professionals, and the desire of the management to measure and control what nurses did.

As might have been predicted by Pinch and Bijker (1987), or Wagner (1993), the systems were 'flexibly interpreted'. In this case the interpretations included (but were not limited to):

- something that was being imposed for administrative reasons;
- a way of recording information as a defence against litigation;
- part of the professional project in nursing.

No one of these interpretations had become dominant at the time the research was done, and, as such, the systems had not reached what Pinch and Bijker (1987) term 'interpretative closure'. In fact, this struggle between contending interpretations is one way of understanding the resistance that the systems encountered. What the project managers called 'resistance' could be seen as alternative interpretations of what the systems 'were'. None of what Pinch and Bijker (1987) term the 'relevant social groups' had been able to impose their interpretation. However, resistance can also be understood in terms of wider sociological studies of the workplace. To do this, I will use the work of Fleming and Sewell (2002).

'ŠVEJKISM': A WAY OF UNDERSTANDING RESISTANCE?

One way of drawing together what might be seen as a very broad conceptualisation of resistance is provided by Fleming and Sewell (2002). Reviewing the recent sociological literature on workplace resistance, they say that 'an inadequate or incomplete notion of resistance was and still is being used in much research investigating corporate controls' (859). They develop a conceptualisation of workplace resistance they term 'Švejkism'. This they derive from Jaroslav Hašek's (1973) novel *The Good Soldier Švejk and his Adventures in the Great War* and its eponymous 'hero'. Fleming and Sewell delineate four aspects to Švejkism:

- Equivocal affirmation: 'This allows employees to affirm (...) their commitment to the organisation (...) in a manner that preserves a sense of difference' (Fleming and Sewell 2002, 866). As was shown above, most of the nurses were 'committed' to the systems, but that commitment was very equivocal.
- Practice as performance: What many of the nurses did was to use the systems in such a way as to demonstrate publicly that they were using them, but do no more than that. They would do 'enough' to keep the ward manager or the project manager, 'happy'. Their use of the systems was therefore a kind of 'performance', designed for the impression it would create in the minds of others.
- An ironical disposition: The use of the systems' reliability (or otherwise) was thought by one of the project managers to be 'ironic'. What she meant by that this was the way in which reliability was used as (in her terms) 'an excuse'

for not using the systems. She maintained that reliability problems would apparently resolve themselves once she visited the ward in question.

- Scepticism and cynicism: a great deal of these were expressed by the nurses interviewed. However, Fleming and Sewell (2002) take this further, saying that 'Švejks may choose to fight or sit out particular battles' (868), that is they resist strategically, picking on issues where they think they have a chance of success, rather than wholesale resistance. Again, Fleming and Sewell (2002) contrast this view of resistance with some ideas found in the literature, which characterise workplace resistance as an 'all-or-nothing' phenomenon.

One of the things that is most attractive about this analysis is the way that it captures the ambiguity and complexity of the resistance performed by the nurses in this study. They did not conform to conventional stereotypes or workplace resistance, and even though the systems had been 'successfully implemented' (in the eyes of the hospitals' managers), this did not mean that continued resistance was impossible.

SUMMARY

The systems were resisted by the staff, though variably and in a variety of forms. The reasons for resistance are to be found at the interface between system design, on the one hand, and nursing culture and practice on the other. I would characterise the nurses' relationship with the systems as being one of 'resistive compliance'. As one interviewee said, '[they] use it and they moan', or one as one of the project managers said, 'people are starting to knuckle under, but I think the worst ... is they ... put it [at] a very high level of decibels.' Similarly, East and Robinson (1994), who studied resistance to information systems nursing say:

This is not to suggest that the nurses were actually resisting change in the way that some of their managers appeared to suspect. They were not actively sabotaging these new developments as sociologists have described in industrial settings ... rather there was a sense of resignation, on the whole, and, amongst many of the staff, a grudging willingness to 'give things a go'. (East and Robinson 1994, 58).

This is probably why the project managers were prepared to tolerate, for instance, the ward sister mentioned earlier who refused to have the system implemented on her ward. The project managers felt that they could afford, metaphorically, to lose the odd battle when they were, overall, largely winning the war.

The data from this study would tend to confirm that 'technophobia' cannot explain most of the resistance in this context. Instead, the remarks made by the nurses inter-

viewed suggest that 'system failure' is a much more productive explanation. The systems did not take account of the ways in which the nurses practised, which were often deep-seated, long-standing, and, to the nurses, entirely justified. Resistance, in this context, cannot be reduced to one dimension. Instead, it was a complex, variable phenomenon.

Resistance was justified in a variety of ways, largely by 'blaming the system', but also by blaming the users (by both the project managers and the users themselves), and even by 'blaming the organisation' (McLaughlin et al. 1999). Resistance was discursive (it was as much about ideas as systems), and was contextualised in terms of wider discursive categories drawn from the realm of nursing. Though the consideration of resistance within this study has necessarily produced a complex picture, reflecting what is a broad and complicated phenomenon, resistance remains a useful analytical category.

Resistance, as an idea, has not been stretched so far that it encompasses all aspects of the nurses' relationships with the systems. As was discussed earlier, compliance, though not the main focus of this study, was nonetheless a significant factor in these relationships, resulting in the creation of the category of 'resistive compliance' as an attempt to summarise this relationship. It is only by the use of the concept of resistance that, for instance, issues like the displacement of work on the care planning systems in time (the phenomenon of 'leaving it to the next shift') were brought to light, and analysed in the context of nursing culture. Resistance, though complex, remains not only analytically useful, but also pragmatically useful, as it is a part of the process by which an 'idealised' system is socially shaped or constructed into a working technology, part of the social fabric of area where it is being used. I would echo Bauer (1995) for whom resistance forms part of the workability testing of computer systems. Understanding resistance is part of understanding the design and implementation of most IT-based projects. In addition, that resistance was contested between, among others, the nurses, the project managers, the organisation and the profession as a whole draws our attention to other important issues, such as the symbolic role that systems have to play.

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