Keywords: nursing informatics, resistance, professional culture

Abstract
Resistance to computer system is a common, though often under-investigated, phenomenon. Two implementations of computer systems, in different settings are discussed, and the ways in which they were resisted described and analysed. Some commonalties in how resistance was manifested are considered, and some suggestions made about how this knowledge might usefully inform design and implementation of systems in the future.

Introduction
Though resistance to Information Technology (IT) is often dismissed as being merely ‘technophobia’, it remains an issue that many IT implementations, notably in health care, have to deal with (1,2). In addition, resistance does not necessarily cease when the systems have been implemented and are in regular use. Instances of this persistence of resistance to ‘successfully implemented’ systems have been described in a bank (3) and in a utility company (4), but this kind of resistance to IT has not thus far been extensively analysed in the NHS.

This paper reports on two studies where resistance by nurses to IT–based systems was found in the NHS. What we believe is particularly important about these findings is that the settings and the systems in the two areas researched could not have been more different. The systems, technology, geographical location, service and staff groups involved were all different in both cases, and yet, as we shall see, much of the resistance manifested itself in similar sorts of ways.

Study One
This focussed 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 selected for this study over a period of two or three 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 inpatient, however at the time that the research was conducted no hospital achieved their target of 100% of inpatients having a fully written and evaluated computer care plan. The systems were used by qualified nursing staff, 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. Other staff were not allowed to use the systems, though some interviewees reported occasional use by health care assistants.

Semi-structured interviews of about 30 minutes were conducted with 29 qualified nursing staff in a variety of wards in the hospitals. These all used an interview schedule, though all questions were not put to every interviewee. More prolonged interviews (about 90 minutes) were undertaken with the project managers who had implemented the systems in each of the three hospitals. A qualitative approach was chosen in order to investigate how their perceptions about the systems, and the use they made of them, were grounded in the beliefs and values of the nurses interviewed about, for instance, what nursing work was. Interviews were transcribed, and their content analysed into themes with the support of QSR NUD*IST version 4.
Resistance

Outright refusal to use the systems was uncommon. What was more common was interviewees saying that 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”, and “… people that just refused point blank to use it at all.’ No interviewee was more specific about who had refused to use the system, and they did not offer any explanations (apart from the quote above) about why. When asked about the reaction of other members of staff to this refusal to use the system, it seemed that this kind of behaviour was ‘just tolerated’ despite the fact that, presumably, it meant increased work for the other members of staff. This indicates that downright refusal to use the system was not unheard of, and, even if it was rare, that it was tolerated within the community of the ward nurses.

Much more common were a variety of ways in which use of the systems was adapted, or delayed. Among these was the phenomenon of care plans being created and updated, but not as completely as they should have been. Portions of the work were left undone. The most commonly reported form of this was failure to do the evaluations of the care that had been given. While this is an essential part of the nursing process, on which the systems are based, it is probably fair to say that this type of work has often been neglected in paper-based systems as well as in this computerised context. Porter (5) and Porter and Ryan (6) both report studies where aspects of the nursing process were neglected by nurses using them in paper-based systems. The other area which was neglected was the regular updates of the care plan, which are supposed to take place on at least a daily basis, if not more frequently. As one interviewee said;

‘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’

The aspect of the system that was used the most diligently was the evaluation and care plan produced on admission. However, even this was sometimes not done;

‘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.’

This use of paper as a substitute for using the computer was not confined to the admission, but to updating as well, as this excerpt shows;

Researcher: So what you are saying is the care plan is kind of updated but it’s the paper print that’s updated rather that 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 of the main things reported was that use of the system was often delayed in favour of other activities: ‘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’ or ‘ I mean it’s not something that you rush in every morning and do.’ A common theme was that the work that needed to be done on the system was left:

- To the afternoon
‘The time is mostly in the afternoon, we use it a bit more’

- To the late shift
Another commonly reported method of displacing the work was to the late shift, again on the assumption (not always justified) that they are less busy. ‘Hopefully someone will do it on the next shift’ and ‘they get left to the next shift.’

- To the night staff
Again, this is held to be a time when there is the opportunity to ‘catch up’ on the system; ‘….. find that it’s left to the night shift’ and ‘[only] time I’ve ever got to work on the computer and really hammer at it is during the night because during the night you do get the time to sit down and really go at it.’ However, as this interviewee pointed out, writing and updating care plans at night is not without its problems, as, for instance ‘you can’t always look at the pressure areas until the next day’ (because the patient is asleep). This called into question, certainly in the minds of the ward nurses, the value of the information that was stored on the systems. If it had been recorded in this way, rather than
contemporaneously, and with the patients’ involvement, it was considered to be of dubious quality.

Both the various manifestations of not using the systems, and of delay, could be considered as examples of ‘working round’ the systems. On the whole, the nurses had little choice but to use the systems. What was less susceptible to management control, however, was how (and when) the systems were used. Thus the nurses using the systems were, to an extent, able to fit the systems to their patterns of working, and, as we shall see, this had the effect of changing what the systems became through the processes of implementation and usage.

The overall picture is of what one might call ‘resistive compliance’. This is perhaps best summed up by two quotations, one from a nurse who used the system, ‘[they] use it and they moan’, and one from one of the project managers, ‘people are starting to knuckle under, but I think the worst … is they…. put it [at] a very high level of decibels.’ These findings parallel those of East and Robinson (7), who mention resistance to information systems, albeit in passing, in a paper on a wide variety of changes in nursing that they studied. As they 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’. (7, p58).

**Study Two**

This was a study of a Community Information System (CIS), within a Primary Care Trust in the north of England. Community nursing teams in that trust used the CIS. This system used palm-top computers to record details of each visit made by a nurse to a patient, including the patient’s demographic details, what kind of visit it was (for example initial, assessment or follow-up) and what was done for the patient. Palm-tops were chosen because the nurses did most of their work in patients’ homes, and thus did not have access to terminals. (Interestingly, this would have overcome one of the principal complaints of the ward nurses in the first study, which was that the terminals were inaccessible. As we shall see, this technological solution was not sufficient to overcome the resistance by the community nurses.) Periodically, the nurses would download the information from their palm-tops to a central system that collated data and produced management reports. All of the fieldwork was undertaken as a naturalistic enquiry (to ensure minimal interference) by one of the authors of the study (SM) The data was acquired mostly through participant observation, working with a team of 22 community nurses over a period of three months. It was based on watching, listening and informal conversations, and everyday interactions. Documentary evidence was in the form of reports from the system which were routinely run towards the end of each month, to confirm the frequency with which individual members of staff downloaded data.

**Resistance**

As with the first system discussed, the CIS was ‘successfully implemented’, at least as far as the management of the Trust was concerned. All of the relevant nurses were issued with palm-tops, which they used routinely, and no one refused to use the system. However, this picture conceals a much more complex pattern of use and non-use of the system. The nurses tended not to use the CIS in the way in which its designers intended. Instead of inputting the details of a visit as that visit ended, they tended to ‘save up’ the work on the systems until the end of their working day. Often all of the data for a day was entered at once. Use of the system was thus not used in the way in which its designers intended. Instead of inputting the details of a visit as that visit ended, they tended to ‘save up’ the work on the systems until the end of their working day. Often all of the data for a day was entered at once. Thus use of the system was changed in terms of time. A similar pattern was observed in the very different circumstance of the care planning systems discussed above. Most community nurses left it until the end of the week, but in one case no data was entered for three months.

A practice that occurred in both the community and hospital settings was the delegation of using the computer to unqualified staff. In the hospital setting this was problematic from a professional viewpoint, as unqualified staff should not have been writing care plan, while in the community it raised no professional issues, as the data were administrative, but did raise questions about the accuracy and wider quality of the data. This practice was justified on the grounds that using the systems was not seen by the community
nurses as a ‘professional’ activity, that is, it was not part of, in their view, nursing. In parallel with nurses in hospital, one of the main reasons given for this pattern of usage of the system was lack of time; that is, other work was a higher priority. However, like the hospital systems, downright refusals did not occur, and it seems that nurses ‘self-regulated’ their use of the system at a level where the system was used ‘enough’ to keep managers happy, but were not used at the level or in the ways that their designers or the managers intended. Like their hospital counterparts the community nurses could have been said to be displaying ‘resistive compliance’.

Another similarity was in how, rather than when the system was used. The nurses tended to record the bare minimum of data necessary, and this, combined with the displacement of the system’s use in time led to a very high rate of errors. This necessitated error corrections being passed back to the nurses. Perhaps unsurprisingly, they viewed this as an ‘administrative’ task, and it was thus given low priority.

The main justification offered by the community nurses for not fully engaging with the system was that they got nothing back from it. It was perceived as being entirely an administrative system, and was memorably described as ‘feeding the beast’. This was due, in part at least, to some specific problems with the system, in that it was slow, and that support staff who could have assisted with running reports were not often available. Other technical and managerial issues that may have contributed to the negative views of the community system was that it was largely imposed on the nurses, with little user involvement in design and implementation, and there were some problems with the initial levels of computer literacy of the nurses.

However, there was a wider issue that the system’s most important function as far as the organisation was concerned was to provide information for the management of contracts, to show whether the activity that was being carried out was of the types and levels contracted for. Though the information could have been used, for instance, to inform the management of workload for individual nurses or teams, this was not, largely, carried out.

The nurses did not necessarily see the management of workload as a benefit. There was also concern expressed that it could be used as a kind of Electronic Panopticon¹, a way of monitoring what work community nurses were doing. It is important to understand this in context. Community nurses, by the nature of the work, are much less visible to management than their counterparts in hospital. As such they have a degree of professional autonomy not shared by all nurses. They were naturally concerned about the implementation of any technology that could monitor their working practice, and thus extend managerial control of their working lives. In this case, no attempt was made by management to use these facilities of the systems, but this did not reduce the nurses’ concerns that it might happen at some point in the future.

Discussion

Both groups of nurses, though in very different circumstances, complied with the implementation of the systems, largely because they had to, or at the very least, resistance on that scale would have been difficult for them to maintain for any length of time. However, their use of the systems can be characterised as ‘resistive compliance’, meaning that where the exercise of their own discretion was possible in terms of the usage of the systems, resistance was not uncommon. Both groups of nurses complied where they had to, and resisted where they could.

There was no one simple phenomenon that could be called ‘resistance’. Instead it might better be characterised as lots of different resistances. Nurses inhabited different resistances at different times, and different situations. No one person could be described simply as ‘resistive’ or ‘supportive’. Resistance depended on the contexts of time and place. Talk about resistance was variable; it changed and contradicted itself. The recruitment of ideas from the professional discourse of nursing shows how ‘resistance’ itself belongs in the realm of discourse. The diffuse, strongly contextual and discursive nature of resistance to these systems in these settings suggest that it resembles more closely the Foucauldian conceptualisation of resistance discussed by Knights and Vurdubakis (12) in their critique of the treatment of workplace resistance in labour process theory. For Knights and Vurdubakis, labour process theory
would tend to imply that resistance is futile. They contend that the diffuse, albeit unequal, distribution of power in any organisation means that resistance (to management) is always possible, though it may, ultimately, be unsuccessful. Developing this theoretical approach, Knights and McCabe (3) show how resistance by workers in a bank to total quality management had some similarities to the forms of resistance described in this thesis, in that staff avoided using systems when they could, or used a variety of strategies to minimise their use of systems. Along with Knights and Vurdubakis, we would contend that resistance by nurses is not futile, and we would point to changes in government policy (such as Making a Difference (13) or Improving Working Lives (14)) as (partial) evidence for this. In the case of systems, it could be that resistance forms what Bauer (15) calls a benchmark for testing the ‘reality’ of a system.

What is perhaps of wider significance (not least to those who would seek to design and implement computer systems in nursing in the future) are the explanations that the nurses gave for their patterns of use (that is, their resistance). Whether these accounts are ‘true’ or not is almost an irrelevance from one standpoint. If resistance to information systems is a real phenomenon, and nurses have accounts of it that they will report to an investigator, and if they have justifications that they use to explain this behaviour, then, in a sense, this is the ‘reality’ that anyone who, for instance, wants to implement a system will have to deal with. Both groups, despite the differences in their circumstance and clinical practice said that the main reason that they used the systems as they did was the priority given to direct patient care over tasks (of which using the computers was one) which were perceived as ‘administrative’. This confirms the findings of Melia (16, 17), Porter (5) and Mason (18) who all show how central direct ‘hands-on’ patient care is (and continues to be) to the culture of nursing. While most commentators would say that this is only as it should be, it does, as we have seen, present real problems to those who would wish to change nursing practice.

What we have shown in this paper is that even though there are substantial differences in the circumstances of the two groups of nurses studied, there are striking commonalities of nursing culture which, we believe, go a long way to explaining why the resistance was so similar. An explanation of this phenomenon is outwith the scope of this paper, but we can at least make a couple of suggestions. Firstly, in the UK, nursing is a fairly unified profession, with, for instance, a single professional body, and perhaps more importantly in this case, a common programme of professional training and education. This means that all of the nurses studied will have been through fairly similar experiences and acculturation while they were students. Secondly, we would point to wider ideas within our society about what nursing is, and what nurses should (and shouldn’t) do. It is possible that the nurses were drawing on these resources as rhetorical strategy to justify their relationship with the systems.

Conclusion
Both of these studies were (relatively) small, and qualitative in nature, which may mean that they lack reliability. However, they do tend to suggest that the area of culture, especially the informal or taken-for-granted aspects of culture and practice may be a fruitful site for further investigation of some of the difficulties that have historically been encountered in the implementation of computer systems in health care. Other studies of nursing systems (19, 20) confirm this, as would the more general turn within the field of health informatics towards the study of what might be termed human factors. We believe that these studies make a significant contribution to this, by pointing out how relevant aspects of culture may be more general, and found across a profession, rather than being exclusively locally constituted. An approach to this area which may address some of the problems of reliability and validity with the studies reported in this paper would be a multi-method, multi-centre study, combining both quantitative analysis of large samples (possibly by questionnaire) with more detailed qualitative fieldwork, combining interviews and observation.

References


(Footnotes)

1. Foucault (8) shows how what he calls the Panopticon, (derived from a design for the layout of a prison, by Jeremy Bentham) where people and what they are doing can be made visible, and can thus be monitored, is a useful model in explaining a large number of modern institutions. Several writers (9) (10) (11) have invoked the idea of the ‘electronic panopticon’ to convey how computer systems can potentially be used as a method of surveillance in the work place, though opinions differ widely.