Hospital Managers Closely Observed: Some Features of New Technology and Everyday Managerial Work.

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Abstract:
The NHS is experiencing enormous growth in the deployment of information and communications technologies (ICTs). Extensive use of technology serves to 'reconfigure the organisation' through its application in data analysis, communication and decision support. This paper reports some preliminary findings from an ethnographic study of hospital information systems in everyday use, documenting precisely how people, systems and enterprises interact and collaborate. Our paper reports on some of the complexities involved in the use of ICTs in everyday managerial work and documents the articulation in practice of the cultural, organisational and technical arrangements through the investigation of the 'hands on' work of Hospital Trust management.

Introduction: new technology and organisational life in the NHS.
This paper presents some preliminary findings from our ongoing ethnomethodologically informed ethnographic studies (Hughes et al 1994) into managerial work and hospital information systems in everyday use. Our focus is the everyday work of various managers - Clinical Directors, Nurse Managers, Service Managers and Information Managers, and how people, systems and enterprises interact and collaborate. This involves shadowing various hospital managers - usually for a week at a time - documentering and tape-recording their everyday, practical activities moment-by-moment as they occurred (Clarke et al 2001). Our paper reports on some of the complexities involved in the use of Information and Communication Technologies (ICTs) in the provision of information, the production and utilisation of that information in everyday managerial work, and the variegated skill and trust factors relevant to information use in managerial working practices. It documents the articulation in practice of the cultural, organisational and technical arrangements for the use of ICTs in managerial working across organisational boundaries.

This paper's interest in new technology and managerial work in the NHS is part of a more general concern with the 'future of work' and its relationship with technological change. This interest has developed against the background of major transformations in the social and economic environment. (Lash & Urry 1994) and the emergence of an 'Information Society' or 'Informational Economy' (Castells 1996) where a particular emphasis has been accorded the role of IT in supporting skill and knowledge and facilitating the coordination and control of work (Zuboff, 1988) as collaborative work becomes increasingly electronically supported (Grudin, 1990).
In common with other large-scale, distributed, organisations the NHS is experiencing enormous growth in ICT deployment, intended to ‘reconfigure the organisation’ through its application in data analysis and processing, communication and decision support (Scott Morton (1991)). This is recognised within the NHS itself: "We certainly use IT as an explicit catalyst for organisational change, especially the design of working practices" (in Doherty et al. (1999)) and recent reports, such as 'Building the Core,' continue to argue the importance of IT as an intrinsic part of the agenda for change. Healthcare institutions are particularly information intensive and IT increasingly plays an important role in healthcare delivery and management, providing major benefits in reporting, organising and locating clinical information; in coordinating and managing patient healthcare; in cost reduction; and in organisational integration. Such presumptions have been at the heart of NHS design and policy-making processes. “Technological advances offer improved access to services, rapid access to assessment and treatment and to health information when and where patients need it ... The investment in new technology will mean that the equipment in the NHS will, for the first time, start to match the commitment and excellence of staff.” (NHS Press release: 2000) The challenge for the NHS lies in using information systems to organise, store and present health information for effective health-related decision-making.

Despite this emphasis on the importance of technology attempts to analyse organisational and managerial change have often tended to treat IT simplistically, assuming that IT contributes unproblematically to productivity, monitoring and accountability. Many analyses of IT and managerial work tend to be strongly theoretical, failing to examine the details of technology in use. Similarly, whilst much of the research on the future of work has necessarily focused on the immediate impact of IT systems on working practise, some studies (Casey 1995) suggest that; “... it was the social effects that these technologies had on the organisation of work that mattered most to people These organisational constructs and cultural practices, at once made possible and required by advanced technology, represented the most significant shift in organisational life” Amidst the proliferation of theoretical diagnoses of organisational change, then, there is an evident need for close empirical examination: ‘We would expect communications innovations such as computer networks to affect organisational relationships. However, the changes caused by computer network communication will be hard to predict beforehand. Any changes will be as much a reflection of organisational culture as a product of the technology in itself... The absence of an a priori direction in which the technology will take organisations makes the empirical investigation of how computer network technology is being implemented of the utmost importance and urgency.” (Ducatel, 1992,166)

NHS Managerial Work and New Technology: fieldwork observations.
In this section we present some empirical examples from our fieldwork observations to illustrate different aspects of the relationship between managerial work, new technology and organisational change. One common observation is that, despite the increasing investment and emphasis on 'new' technology, managerial work with IT often involves working with various kinds of 'legacy' system. A legacy system is one which, having been introduced with the best of intentions as an 'all singing, all dancing' solution has not been maintained, modified or developed to accommodate organisational or technological change. In consequence the system is unlikely to do all that is required or even 'talk' to more recent applications. So, for example, the Trust
Pharmacy system, crucial for the costing of drugs and treatment, was unable to 'talk' to any of the other databases or management information systems, necessitating 'workarounds' in the form of the printing of documents and the double, and sometimes treble, entry of data. Such 'legacy' issues, of which this is but one obvious example, can arise relatively rapidly due to the fast changing nature of organisational priorities and organisational life, such as, for example, the move to GP fund-holding. This illustrates some of the difficulties of introducing and deploying technologies in organisations undergoing continuing and often significant change. In documenting the various workarounds required of legacy systems our observations point to a continuing and important facet of managerial work. The observations highlight how legacy concerns are not merely technological but also organisational in the sense of being intimately wrapped up in the everyday accomplishment of work and thus responsive to changes in working circumstances and priorities. Consequently, an appreciation of legacy needs to move away from a purely technological stance - with its emphasis on ageing systems and outdated code - to admit the importance and impact of organisational issues. Any attempt to resolve legacy issues will depend for its success on understanding that organisational change will necessarily have to confront legacies as the practical issues of daily work; understanding how technologies become embedded and are oriented to within everyday working practice. The paradox of such legacy systems is that such systems are adhered to long after their usefulness has become limited, precisely because of the way in which they are embedded within longstanding social and organisational processes.

The Management Information System
The many legacy issues stemming from the local organisational history impinge on the day to day practical organisation of work for the NHS Managers we observed. The three hospital sites are not networked and there are numerous problems with the current Management Information System (MIS). The information section, which inputs all MIS data, can directly access data from departments, but must use the telephone for information from the other hospitals and it is often impossible to get an accurate, up-to-date picture of any given situation, e.g., waiting lists.

An example of the effect of this kind of organisational problem comes from the Directorate Manager of Orthopaedics (DMO). The DMO has developed ‘process maps’ for each possible type of patient seen by her directorate, e.g., referrals via GP, referrals from the Accident & Emergency department. This is central to one of her key roles, the monitoring of how efficiently patients are treated. She focuses on how much “activity” is taking place in her directorate, i.e., how many patients are being treated. The idea behind these process maps is to identify what the DMO refers to as “bottlenecks” in the medical process. For example, on the process map for ‘new fracture clinic patients’ there is a problem with patients’ case notes not being collected prior to their appointment. As stated on the process map “this often causes delays as the process does not happen. Patient arrives in clinic but no records.” The direct effect of this is that the patient’s appointment may be cancelled if records are not found in time, thus leaving that patient on the waiting list for longer than necessary. The DMO thus cannot access up to date information about waiting lists from the MIS. Furthermore, the information available does not really identify “bottlenecks” - the MIS information shows numbers of patients waiting but does not tell what the DMO calls “the whole story”. Thus with a target maximum waiting list time of thirteen weeks the MIS data shows the percentage of patients for each consultant who have
been waiting in excess of that time. This may be misleading, as in the case of spinal patients where the MIS information showed that an apparently alarming 100% were waiting over thirteen weeks for one particular consultant. This was accounted for by the fact that only one patient was on the waiting list and the consultant in question had left and his replacement was not yet in post. To get a more accurate picture the DMO must resort to other forms of record and recall. The DMO ‘uses’ the MIS information but does not trust it to “tell the whole story”. These instances from the MIS system highlight the importance of understanding organisational settings as a precursor to systems design.

**Everyday Managerial Work: Bed Management**

Observation of the management of waiting lists and bed management illustrates the value of IT in coordinating work across different sites and different organisational units. In particular it illuminates the sheer complexity of managerial work with the figures produced by the technology requiring interpretive work that carries organisational implications. Hospital waiting lists and the availability of hospital beds is inevitably a highly charged political issue. At the time of the observations a great deal of concern was given to 'Winter planning' which was, in turn, related to previous national press reports, of hospitals being closed to new patients or patients waiting on trolleys. This concern was reflected not just in a daily managerial focus on bed numbers but also related statistics connected to waiting time on trolleys and the 'escalation policy'. The 'escalation policy' was linked to a government requirement that no patient should be kept on a trolley for more than 12 hours. Trolley waiting times were closely monitored and the Trust had contingency plans to open up a day-case theatre to accommodate more beds and patients. The ‘bed availability’ data is available on the MIS but is inaccurate for a number of reasons. Bed management was associated with a system of alerts that instigated various managerial responses: "to go to red (alert) the Directorate Manager has to go and count. If the position is that we (the Hospital) are closed to admissions the Directorate Manager has to come in and physically count the beds ... Ward Sisters can be naughty. If they know they have five admissions coming in tomorrow ... you can understand where they're coming from."

The managerial focus on bed management was supported by the collation of a weekly site report circulated by email, for example;

"Weekly sitrep (site report) attached for your information. Large volume of medical sleepouts at both main sites. Current position:

XXX: no available beds now although position will change. Some elective admissions for today being cancelled and admissions for next 2 days under review with relevant clinical directorates...

ZZZ contacted by GGG last night to take medicine emergencies from south of GGG area... some patients at ZZZ still waiting for beds at DDD to become available"

The availability of hospital beds across the two sites is co-ordinated by the Bed Manager (BM). The role of the BM is to constantly monitor and maintain the process of bed management in such a way as to avoid a situation where no beds are available. This is best explicated by reference to events that took place during the fieldwork.

On arrival one morning at one hospital (in the three hospital trust) the Directorate Manager of Orthopaedic’s (DMO) first words were “We’re minus nine beds”. It became apparent that there was some kind of ‘bed crisis’ happening - assumed by the staff present to be caused by a road traffic accident -- and that the DMO would be taking some action to determine the position of her directorate. The reference to ‘minus nine beds’ was to the state of play across all three sites, not only within the
orthopaedic directorate, and this information had come from the BM. Although the ‘minus nine’ was referred to as being the “state of play”, it actually referred to the situation if all patients were admitted as expected for that day. The DMO said that she needed to go to the orthopaedic wards to assess the situation, adding, “we go through our usual rituals for situations like these”. The DMO argued that it was essential to physically survey the wards rather than trying to get information another way e.g. by telephone; that establishing the availability of beds is “a very physical thing”. Establishing availability was represented as a process of “chivvying people up”.

Exactly what this meant became apparent once we arrived on the wards. First, the DMO walked around the floor of orthopaedic wards and did a count of seemingly empty beds. She then went to the nurses’ station where there is a noticeboard that represents the bed situation. The noticeboard represented the total ward area, with each ward ‘bay’ (usually comprising six beds) marked separately. A metal slot where a card, with the patient's details, could be placed represents each bed. Cards that had been placed straight into the slots represented existing in-patients. Cards placed diagonally in the slots represented patients due to be discharged, pending a visit by social services, a consultant, the physiotherapist etc.

The presence of diagonally-placed cards forced an immediate re-count for the DMO, as her count was based on a ‘head-count’ of patients present. The DMO then discussed available beds with the ward sister, who explained the expected time/date of discharge for the ‘diagonals’. The ward sister also pointed to two cards for existing in-patients and explained that they were terminally ill but that she “couldn’t guarantee a day or time for them”. The DMO then left the nurses’ station and went to speak to the physiotherapist to ascertain whether there were any 'walking wounded' - patients who were fit for discharge or who were likely to become so that day. Through these processes, the DMO established that there were enough beds to see them through the ‘crisis’. On leaving the ward area, the DMO said that establishing the availability of beds is “a very physical thing”.

The apparent solidity and objectivity of managerial information can thus continually be challenged as new data come to the fore, - in bed management, for example, where supposedly 'occupied' beds become available. Understanding of the data is facilitated through reconstructing the available information - that Ward Sisters were 'being naughty' or that some beds are occupied by 'walking wounded'. Thus readings of the bed management data are ‘defeasible’, capable of being re-interpreted to fit with new items of information and presented to different audiences. The Bed Manager actively orients to the data in order to accomplish the practical task at hand.

Bed management and the bed management figures impact on other aspects of managerial activity and reporting - most notably in managerial calculations of activity, bed occupancy and patient turnover, all of which are relevant in national calculations and audit of performance. A great deal of managerial work is consequently devoted to untangling, interpreting and re-calculating the statistics on activity and patient turnover to take into account the process of bed management. Its not that the statistics are not trusted, they are not regarded as 'just any old numbers' but that their limitations are recognised and related to how there are collected and collated. So, for example, although activity figures are provided on a Ward basis this is affected by such things as 'sleep-outs' - where patients from another Ward are moved into any unoccupied beds. The Unit Manager needs to extract 'her patients'
and 'her doctors' from the figures in order to gain an accurate account of occupancy and length of stay to generate any performance indicators. Managerial work in these circumstances is not then subverted or simplified by the widespread use of new technology.

Managerial Issues of Implementation
Our observations of everyday managerial work provide some insight into the ways in which the defects and deficiencies of the new technologies that have been put in place arise from trying to use the system in the context of doing managerial work. When a manager needs a piece of information ‘to hand’ it is precisely then -- when the options are highlighted -- that consideration will be given to the means of solving this problem, using these available resources. Particular artefacts and methods then become relevant that were previously part of the unconsidered background of the work setting.

Working within a highly distributed service that aims to provide 'seamless care' requires that managers need knowledge, or an ‘awareness’, of numerous separate and formally independent organisations. What clearly emerges from our observations of managerial work is its complexity. Much of the ‘organisational knowledge’ regularly utilised in the managerial work of coordination and decision making is not of a kind that is transparently visible in procedures or simply facilitated by reference to the record. Providing IT support for such contingent work requires that systems necessarily pay attention to the occasioned character of activities. If the aim is to embed knowledge properties in management information systems then it needs to be captured and managed in a way that will make it accurate, available, accessible, effective and usable. Such a task is hardly a matter of simply automating existing records or procedures, but raises complex conceptual and empirical issues: “For shared databases and the like to be more than repositories or archives, and for contributions to be appropriate for some practical purpose .. the entries have to be tailored for the demands, or ‘designed’ for their recipients and sensitive to their circumstances.” (Heath and Luff 1996: p. 362)

The challenges for the implementation of managerial systems in the NHS are then numerous and significant. For example, there are a large number of configuration issues concerning the detailed design of interaction with the system. There are issues too concerning the extent to which record-keeping practices may be standardised. Further, many of the implications of greater information integration, i.e., more rapid information flows, novel information representation and record keeping practices, will only become fully understood and exploited through experience. For example, integration may change existing -- or create new -- work dependencies between e.g., clinical and administrative departments in unexpected ways. Another problem may appear through the loss of important data because staff violate procedures, short-cut or ignore the system. This results in high implementation and maintenance costs, and loss of effectiveness of the system over time. A major risk then is a degraded level of service through staff avoiding use of the system and subsequent failure to achieve operational and strategic goals.

Routine Managerial Work
Our interest in carrying out ethnographic observations of everyday managerial work is in how such work gets organised. That is, how the orderliness of managerial work can
be seen as arising from within the activities carried out by managers as part of their everyday work - work that incorporates technology use in various forms. Despite the grand claims for the empowering and liberating features of new technology, managerial work with IT is generally routine, everyday work consisting of using email, and routine data collection and collation. In the extract from the fieldwork observations below the Manager of Oncology is using a spreadsheet to update their database. Entering the data into spreadsheet took a large part of a morning interrupted by interviews, phone-calls and so on.

Next:
1. Working on spreadsheet - Excel
2. Arrangement with XXX - chemotherapy - not in normal contract - has to keep record to arrange billing, (This was an authority that did not currently have its own dedicated cancer treatment facility and so was using this centre's personnel)
3. Puts data on spreadsheet and to give to financial Director (for contracts and billing)

12. Doing spreadsheet - doing database - names and addresses - financial spreadsheet (details of drugs) " .. it comes back here because the Pharmacy system doesn't talk to anyone else.¨ (Surgeons go to peripheral hospitals - at XXX authority - she gets activity figures from hospitals - faxed through - activity consists of new referrals and follow ups - which forms the basis of contracts).

24. Doing spreadsheet - ZZZ district ".. they recorded her as having seen no new patients when in fact she'd seen 20" correcting figures on spreadsheet . amending consultants sheet (Knew that the figures 'looked wrong' so phoned surgeon)

33. back to spreadsheet .. "the important thing is the postcode .. because from the contracting point of view it determines which Health Authority picks up the bill.."

What it is important to stress here is the obvious and routine way in which IT usage is woven into everyday managerial work. Furthermore, the accomplishment of managerial work often has little directly to do with the technology; instead various features of the mundane interactional competencies of those involved are regularly and routinely observed to play an important part in the work. This includes, for example, knowing how to produce formulations, tell stories, present scenarios and so on. These interactional competencies provide members with the opportunity and facility to present their understanding of the institutional interaction that just took place, and the implicativeness of that interaction. In the following extracts from the fieldwork, for example, the Manager has received a phone call from Personnel concerning the pay of a nurse working on 'flexi-time'.

1. Phonecall - gets staff attendance sheets .. going through the figures "Oh God, I don't know what's going on here."
Staff nurse is claiming she's been underpaid when the statistics seem to suggest she's been overpaid . Explaining over the phone .. ".. sometimes they miss the deadline and so claim the next week."

2. Goes to get flexi-sheets - looking at sheets to work out how many hours worked - looking at sheet and checking against calendar.

3. Goes to pile of unfiled documents - gets staff attendance sheets - comparing handwritten sheets against computer print-out

4. Gets another folder out with more computer print-outs
5. Doing calculations - additions/tallies on blank sheet of paper. "It gets a bit complicated. They work flexi and she had to work a weekend and also she did some work for the Medical Directorate (a different unit) and she's saying she's not been paid."

6. Looking at tallies/numbers on sheet. "I put in September. She said she's worked... (looking at list)."

7. Phoning Personnel. "I've looked back ... I think something to do with August... because in August she worked 4 hours for the Medical Directorate but looking in my copy... 10 hours flexi paid off and 9 hours extra working... I didn't put it in... in August... if you look in the September sheet I put 4 hours worked in the Medical Directorate..." (phone conversation continues for some time about how many hours)... "I don't know... I think we'd better start again from scratch... she thinks she's been underpaid and we think she's been overpaid and neither matches what's down on the sheet..."

8. Checking pile of papers to see if there's any more documentation - finds some pay sheets. Begins process of tallying again. "I'm putting it in some semblance of order and then I can explain it to Personnel..."

The interactional competencies, the formulations produced here, are put forward to propose particular views of both 'how things are' and 'how they came to be that way'. In this case it includes notions about how this particular pay claim came to be disputed and the possible origins of the dispute. The formulations and scenarios produced over the phone, for example, include instances of the kind of working up of a presumed sense of shared experience, knowing how to make a story of working hours and their calculation relevant, and to project its significance in some way. Knowing how to build a recognisable and coherent scenario draws upon assumed sets of common-sense understandings about 'how we do this kind of work'; and 'how we resolve this position' which in this case involves 'starting from scratch'. Thus in their work with the technology and in communication with other units managers are not simply 'reading the figures' or 'reading an account' but are involved in 'interpretive work' with the aim of translating the circumstances of a patient or staff or unit into an appropriate organisational formulation. Data and information provided by managers to the various distributed units are produced to construct a case - sufficient to direct the immediate course of action - in this instance whether the nurse has been correctly paid.

**Conclusion: managerial work and systems design.**

These accounts of everyday managerial work, with and without information technology, would merely be a series of interesting vignettes or 'war-stories' was it not for the implications such accounts have for the design of new technologies and the support of working practice. In 'The Computer Reaches Out' Grudin (1990) considers how we might design technologies for distributed working in everyday organisational life, and presents a persuasive case for a movement beyond the engineering mentality to attend to some of the everyday realities of organisational life. This requires paying serious attention to 'being a user' of the technology in an organisational setting. At the same time a number of studies, in both medical and non-medical settings, have suggested that systems failure is commonly associated with inadequate attention to the social context of work. As design attempts to accommodate some of the complexities of organisational working, so the challenges facing systems designers necessarily increase. These new challenges involve attending to the lived reality of organisational groups - much as we have described it here - in order to design effective systems.

The challenges posed by systems evolution have not been matched by organisational strategies for systems configuration. Vendors, systems integrators, implementers and users all suffer from difficulties in initially adequately characterising the nature of
organisational work, and subsequently tracking how that work changes in the presence of a new system. These difficulties are especially significant in the context of organisationally complex, large-scale work settings. Most prescriptions for increasing the fit between system, and user and organisational needs succumb to the ‘design fallacy’, that failure is due to inadequacies of the requirements gathering and design phases. In contrast, we argue that as software systems and artefacts penetrate more and more into people’s working lives, the ‘design problem’ is not so much concerned with the creation of new technical artefacts as it is with their effective configuration and integration with work practices. As Berg argues: "Seeing that different tools can carry different logics, seeing how different tools reshape practices in different ways, opens the way to a much more fruitful strategy. Breaking away from having to either embrace formal tools or denounce them by shifting the terms of the debate creates new space, new leverage, and new potentials for intervention, comparison, preference, and maybe even choice."

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References: