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TRICKS OR TROMPE L'OEIL? AN EXAMINATION WORKPLACE RESISTANCE IN AN INFORMATION RICH MANAGERIAL ENVIRONMENT.

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Abstract

Management information generated by workflow information systems is often used for planning, costing, decision making and other management activities. By application of the principles of Grounded Theory, this paper summarises studies of acceptance of workflow systems and finds that user resistance is manifest in many forms. The paper also finds that previous divisions of this resistance are simplistic and fail to address the issue of data integrity. The paper attempts to add to the literature on user resistance to surveillance and to categorise the ways in which users work around systems resulting in information that is not a true reflection of actual activities. Thus management decisions are based upon an illusion of actuality and not on the reality of workplace activities. This leads to the usage of the Trompe L'Oeil, a decorative technique translating literally from French as 'trick of the eye' and used for example where a window with curtains and view is painted onto a wall to look like a real window and the observer perceives a window where no window exists.

Keywords: surveillance, resistance, workflow, workaround

1 THE BACKGROUND

There is a continuing resilience of managerial discourses that speak of 'culture', 'excellence' and 'enterprise', etc. coupled with information technology inspired rhetoric of knowledge management within systems of managerial thinking about the conduct of work. These systems of managerial practice which remain welded to the notion that IT intensively supported surveillance of labour operations coupled with the pseudo-emotive techniques of worker control suggest that such practice will continue to be prominent in the second half of the first decade of the new millennium.

From the perspective of IT supported surveillance capabilities of workforce operations there is now a substantial body of literature which likens the emergence of such surveillance capable technologies to the idea of the panopticon prison layout developed by Jeremy Bentham and adapted by Foucault (Foucault 1977). The all-seeing eye of surveillance technology has been described as 'rendering perfect' the supervisors power (Ferne and Metcalf 1998), and minimising or even eliminating worker resistance. Foucault's view has been that 'surveillance is permanent in effect, even if it is discontinuous in action (1977, p201). This view has been especially prevalent in studies of the call centre sector, and these have been referred to as 'new sweatshops'(Ferne and Metcalf 1998), as 'dark satanic mills', or 'bright satanic offices'(Baldry, Bain et al.1998). Several studies have been undertaken of call centres in the telecommunications support industry (Bain and Taylor 2000), in local authorities, banking and insurance (Kristofferson 1995; Poelmans 1998; Bowers and Martin 2000; Callaghan and Thompson 2001), and holiday bookings (Lankshear, Cook et al. 2001; Lankshear and Mason 2001). In addition a seminal study of the print industry is included here (Bowers, Button et al. 1995), and in contrast, a study of nursing practice (Timmons 2003).

As part the development of IT concepts of organisational surveillance there has been increasing use of network linked computers to allow organizations to decentralize information provision and improve technical communication links between the organizational membership. This functional emphasis is traceable in its lineage to the popular belief, characterized by Nonaka and Takeuchi (1995), that tacit knowledge can be converted into explicit knowledge *through* IT systems. By capturing knowledge, it can be more widely replicated and shared. By inserting human agency into the equation, these authors see possibilities to sort, convert, retrieve, and share knowledge actively. Henceforth, knowledge is transformed into a more tangible commodity. The interest in the information and communication technology/knowledge management linkage has promoted the concept of a 'virtual' organization in which employees may engage with each other and share information over networked-supported information technology and thus obviate the need for traditional location (Wilson, 1999). The result of the combination of these developments has opened up the perceived possibility to convert the tacit or covert knowledge of individuals and work-groups into managerially defined knowledge deployable for further iterations of organisational practice. The tacit 'hidden' knowledge of the workforce is no longer understood to be inaccessible and oppositional, to be prised from reluctant employees, but as a common resource willingly shared by all. In this way, personal knowledge, which includes propositional knowledge along with procedural and process knowledges, is assumed to add value to the organization. One can turn oneself (and be turned) into a 'knowledge worker' who is empowered to be capable of making 'positive deviations' in a manner which will compensate for any systems failure which were not perceived in the resulting IT implementation and may use this new knowledge to aid improvement in any upgrade of the system. Indeed, supporters of this perspective propose that organizational structures and processes, as well as institutional norms, beliefs and values, exert a strong influence on information technology 'by shaping the perceptions of individuals, their understanding of an information system and its potential, and the ways in which they would try to implement and use new information technologies and applications' (Fountain 2001: ix). However, as Fountain notes, the proliferation and complexity of these types of systems has unexpectedly led to new problems of information overload and of accessibility. Under these occasions the workforce becomes

unable to follow operational procedures and the managerial intent of maintaining control through the practices transparent surveillance become clouded as workers deviate in a non-managerially prescribed manner. Although on some occasions this may appear to be resistance or recalcitrance, on closer inspection, this type of behaviour is also revealed to be a way of overcoming the shortcomings of new technology which is genuinely unable to monitor, track and measure the smooth flow of work while allowing employees to work co-operatively and flexibly (Bain and Taylor 2000). Where a mismatch occurs between the expectations of technology and actual working practice, employees implement a 'workaround' allowing them to deviate from set procedures. A significant challenge for KM (and its accompanying systems) is therefore: how to get personal knowledge into systems (and products) that organizations (re)create and use without further overloading end users. At the same time there are legitimate concerns over any exploitation of an individual's tacit knowledge. Some research (Sewell and Wilkinson 1992; Delbridge, Turnbull et al. 1993), has suggested that resistance to management control is becoming less common due to changes in industrial structure, decline of trade union power, and more sophisticated technology. However on closer inspection, it appears that user compliance with new technology is not universal and that non-compliance, found to have a wide variety of background causes (Markus 1983) continues to rear its head in many forms (Bowers, Button et al. 1995; Thompson and Ackroyd 1995). This paper attempts to consolidate, categorise and augment these workarounds with reference to a new case study as outlined. In the case-study example attempts to isolate working practices as part of the IT development process have eroded and distorted the concept of formal working practices. The new IT based systems being perceived in the case-study as tending to distort the traditional practices of the workforce to the extent that it becomes necessary to 'work around' the formal system. To the extent that the precepts of the practitioners of knowledge management condone such actions in situations where formal systems are inadequate, the concept of 'work around' may be perceived as being a positive contribution. However in this analysis the practice of work around is argued to be detrimental in its effect on organisational systems and the need for its incorporation in working practices highlights an example of failure in IT led systems design implementations.

2 THE CASE STUDY

The organisation referred to as Garmentco throughout this paper engages in the hire of men's formal clothing including jackets, trousers, waistcoats, shirts, ties and other accessories. These components are put together in the required sizes and styles to form an outfit according to the specifications of the customer based on a printed catalogue of designs made available in the branch of the retail customer. These outfits are then distributed to the retail branch through which they were ordered. After the event, they are returned through the retail branch to the main processing warehouses. There they are checked, brushed, dry-cleaned or laundered as appropriate, and returned to stock to be available for the next order. When an order has been created, an order ticket is printed on the shop floor containing a barcode and all the necessary order details. The user uses a personal login and scans the order barcode to assign orders to that user. The ticket contains the garments that need to be 'picked' from that area. This ticket follows an automatic conveyancing system around the factory, in order, through all of the areas from 'Picking' to 'Despatch'. The automatic conveyancing system was implemented in 1995 and serves to transport the outfit through areas which contain individual items of clothing such as jackets, trousers, shirt, waistcoats, shoes, hats, and accessories. The accompanying ticket shows which style and size to pick from each area. The purpose is to contain the outfit as a single item and to transport it from area to area adding the required items at each stop. Each garment is bar-coded either with an iron-on or card label attached to the garment. Each shopfloor zone has at least one operative selecting (picking) garments, scanning the barcode and attaching them to the appropriate order. The outfit continues around the shopfloor until all items are picked and then it is despatched.

3 RESEARCH

Research commenced in July 2003 and since then has expanded to include other organisations. Research so far has included participant observation based on watching and listening and structured/semistructured interviewing. In addition associated documentation has been examined. Fifteen interviews of between twenty minutes and one hour have taken place with supervisors, managers and operators and field notes have been continuously taken throughout the study. Most of the information on workarounds was given by supervisors and operators and by systems analysts looking to improve the current system. In addition direct observation of workarounds was undertaken and was explained and sometimes justified and defended by the participants. This direct observation and the rationales given, along with the interviews with supervisors, operators and analysts formed the basis of the classification.

In order to develop a conceptual framework for the research data analysis using inductive coding and the Grounded Theory approach was undertaken (Glaser and Strauss 1967; Strauss and Corbin 1994). The aim is to allow a conceptual framework to emerge during the course of study as the data is gathered, this facilitates an open minded approach to analysis, although it is '*impossible to embark upon research without some idea of what one is looking for and foolish not to make that quest explicit*' (p.157) (Wolcott 1982). Our generalizations are drawn from analysis of nine case studies, eight of which are reported in other literature, the final case study being GarmentCo. The eight studies are: 1. *Workflow from within and without: Technology and co-operative work on the Print Industry Shopfloor* (Bowers, Button and Sharrock, 1995); 2. *Bright Satanic Offices: Intensification, Control and Team Taylorism*, (Baldry, Bain and Taylor 1998); 3. *Not hanging on the telephone: payment systems in the New Sweatshops* (Fernie and Metcalf, 1998); 4. *A failed panopticon: Surveillance of nursing practice via new technology* (Timmons 2003); 5. *Entrapped by the Electronic Panopticon? Worker resistance in the call centre* (Bain and Taylor 2000); 6. *Edwards revisited: Technical control and Call centres* (Callaghan and Thompson 2001); 7. *Call centre Employees' Responses to Electronic Monitoring: Some research findings* (Lankshear, Cook, Mason and Coates); and finally *Within the panopticon? Surveillance, privacy and the social relations of work in two call centres* (Lankshear and Mason 2001). The classification and analysis includes all nine case studies.

The analysis was conducted by firstly identifying key terms and concepts within the case studies, these terms were then restated to ensure that they remained as descriptive and literal as possible. Two researchers cross validated the terms to ensure the meaning was maintained, where appropriate paraphrasing was used. An iterative clustering process was then performed with different clustering permutations being trialled, the researchers undertook the clustering process independently and then collaboratively. Clusters were then named (or coded) and combined to derived '*meta-clusters*'. Comparisons were made at cluster boundaries to test the cluster coherence. Mini-theories (or '*memos*') were generated for each cluster. At the highest, most abstract, level the core category is a summary of the grounded theory which is the concept of disengagement. The central theme of our conceptual framework is therefore '*workarounds are manifestations of employees disengagement from the monitoring technology, such disengagement threatens accurate data capture*'. It is expected that this initial framework be revised during the course of this study, in particular with regard to nomenclature and prediction for future additions to the framework. At the time of writing, the study has been expanded to include other organisations and fieldwork in those organisations is currently in progress, probably until July 2007.

4 WORKAROUNDS

The case studies mentioned have pointed out the existence of workarounds and identified these as behaviour that deviates from prescribed procedures and rules. The seminal work has been a study of a commercial print shop (Bowers, Button et al. 1995) which revealed that users of a new workflow

management system found it so obstructive and disruptive to their normal operative working practices that their solution was to ignore the system and to continue using manual systems, supplementing this with occasional system usage to provide the records required by management. The identified workarounds in this study were creative and organisationally productive, resulting in more efficient working practice, and thus were referred to as ‘positive’ divergences.

Other research reveals ‘negative divergences’ where the goal is work avoidance, surveillance evasion, or even deliberate sabotage (Sewell and Wilkinson 1992), (Webb and Palmer 1998). In addition ‘resistance’ has been defined as where the operator has intention to resist, and where this resistance is critical to the operation of a system (Markus 1983) and has been studied and classified by Kling (1980) and Markus (1983). Another study of a large financial corporation (Poelmans 1998) classified workarounds as either ‘harmless’ in that they had no negative consequences for other users, or ‘hindering’ if they had negative effects on other users or if the goals or process were jeopardised. These previous classifications have focussed on the resistance of the user or operator and have ignored more benign misuse. This paper attempts a new classification of workarounds which ignores this over simplistic division, arguing that whatever the motivation, all workarounds result in incorrect data generation. The new classification is shown in figure 1.

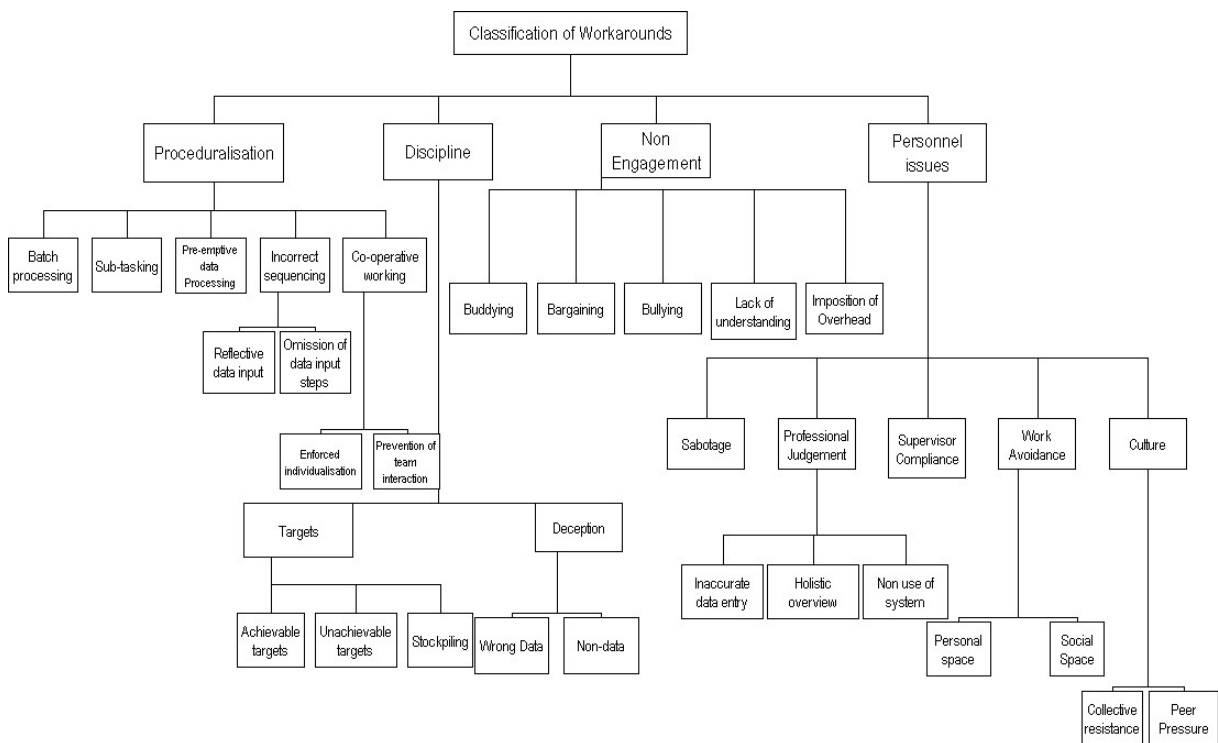


Figure 1 Classification of workarounds

4.1 Proceduralisation.

The next major reason for workarounds is to avoid the enforced proceduralisation imposed by workflow management systems which often assume that the same jobs were always done in the same order. These practices include **batch processing**, operators in the GarmentCo shopfloor carry a pouch around the waist for the order ticket they are working on and to hold processed orders. They often ‘batch process’ tickets by scanning several at a time and then compile several orders at once. Most of the orders will contain the most common standard sizes and to pick two pairs of same size trousers at once will not take as long as to pick each pair separately and walk back to the conveyor hangers, this

breakdown of order components can be seen as **sub-tasking**. **Pre-emptive operating** is also an issue, in the print industry, operators knew of regular upcoming jobs which had not been assigned tickets, they would begin work prior to being assigned a number or ticket. They would even go looking for the work through an additional 'print-on-demand' memo system which meant they could process work that had not even been assigned. This was also manifest in the financial corporation study where managers started jobs they had been informed of by email half a day before they formally received the decision to do so via the workflow application, which had to go through several other procedures after it left the decision maker. A similar type of workaround occurred due to **incorrect job sequencing**, sometimes entire steps were missed out, or alternatively, as in the print industry, data had to be input retrospectively as the system was too slow to keep track. In the financial institution study, contrary to rules, managers circumvented the system by postponing input until after negotiation with a client because it only became clear at this point which implementation modalities were feasible. To input at the earlier stage would lead to many small, but unnecessary time consuming modifications later on. In addition, in the print industry, operators might process all those jobs requiring pink paper at once, instead of in job number sequence. In addition, many workflow systems assume that each job is carried out by only one operator from start to finish. Thus operators could not provide cooperative support that involved logging onto someone else's system, for example to stop print due to a paper jam, or to restart a job once a paper tray had been refilled. An unexpected relationship has emerged here supported by other studies (Sewell 1998; Lankshear and Mason 2001) in that in many situations, individuals work as a team although this may not be a part of their formal work description. Many workflow systems do not recognise this and systems **enforcing individualisation** often prevent this type of co-operative working.

4.2 Discipline

The next group of workarounds covers reward and punishment issues and divides these into those involving **targets** and those involving **deception**. An interesting observation from the GarmentCo case study was that each task has a target of how many garments should be picked in an hour and in a day. These were fairly easily **achievable targets** and made allowances for anomalies such as stoppages. As the operators are not paid a bonus for exceeding targets, when they have achieved their target they slacken off and create diversionary workarounds to give themselves personal or social time. In addition, the system does not allow the same garment to be scanned twice by the same operator in the same time period and so to ensure their count goes up and they are closer to daily target, operators sometimes scan each other's garments. In the nursing study, the target of every patients case being kept up to date was seen as **unachievable**, and thus was not even attempted; one hospital ward system had a record of only six patients in the month they were audited. Using deception to fool the supervisor was common in all studies. In one of the call centre studies (Callaghan and Thompson 2001), operators used particular key-in codes to signify activity other than dealing with calls. They soon learned that there was no check on what they were doing during these times. Operators also identified manual inquiries as opportunities to avoid work by not relinquishing a call. Operators simply do not hang up and instead chat to other operators for '15 minutes', often when supervisors are in a meeting or otherwise unavailable (Bain and Taylor 2000). In this way they would use **wrong data** or **non data** to obtain personal or social time. In addition, although Foucault's analysis of the panopticon concludes that partial surveillance has the same effect on employees as full surveillance, (Foucault 1977) this may only be the case when it is truly unknown whether surveillance is taking place. Operators knew, through observation and experience of supervisor patterns, whether they were likely to be under scrutiny, and planned their own small periods of rest during least likely surveillance times.

4.3 Non-engagement.

One of the major ways that workarounds are manifest is in refusal to engage with the system. Many systems are unable to employ and utilise the flexibility common to human interactions and in particular those supporting group or team related activity. Indeed not only do such systems not fully utilise flexible problem-solving, but on occasion they actively inhibit such skills and only work well when circumvented by skilful users. This may be a feature of workflow systems in general as they often require processes to be prescribed, defined and modelled without accepting that 'on-the-hoof' co-ordination of work is in itself part of the work, and that the complexity of this activity is one which underpins most of the problems in this area. One of the major features of workflow management systems is that the definition part of the model is placed outside *and before* its enactment (Dourish, Holmes et al. 1996). This is in line with Lucy Suchman's (Suchman 1987) 'plans and situated actions theory' which showed the importance of differentiating between work and representations of work. Suchman's work emphasised action as essentially situated in context, and that *ad hoc* improvisations and *post hoc* reconstructions are part of the process. Indeed the imposition of procedural plans ignores the thorough, high-level overview of the work (Timmons 2003). This is not to say that plans should not be made, but rather that these plans should allow for, anticipate, and support situated actions such as altering, sharing, executing and correcting activities in a co-operative manner (Bardram 1997). In all but the nursing study, users had no choice but to use the system, but they often missed out steps and used each others login identities. At GarmentCo, it was common and acceptable practice to use each other's login name and password. Further research is necessary in this area, but initial suggestions reveal three main reasons for this namely **buddying**, **bargaining**, and **bullying**. **Buddying** is where an operator will process some orders for another operator under that other operators login and password for reasons of friendship. According to interviews with operatives, this may happen on a day when the other person has mild illness, emotional upset or tiredness, and would seem to add credence to the socially supportive and nurturing nature of some work based relationships (Marks 1994). The second reason may be **bargaining** – lengthening each others break times by processing a few more orders or perhaps repaying a favour; a third reason may be **bullying**, which would appear to be an extension of bargaining. This involves doing someone else's work for them under coercion, where the two sides of the bargain are not equally weighted and one person is too timid to negotiate strongly. Other reasons, where no bonus is paid or feedback is done, is **lack of understanding** about the usage of data generated by the system, and the avoidance of the **time overhead** of logging out and back in again. Users in the print industry study had to log the start and end of each job, regardless of length, and thus introduced additional workload with a number of small jobs. Operators could have used each other's identification numbers, but as each operation was recorded by the system, targets and wastage figures could be affected and this increased accountability would bring in elements of doubt and mistrust.

4.4 Personnel Issues

Another major classification for workarounds covers issues of personnel. One of these is typically **sabotage** – the 'spanner in the works' approach is apparent in GarmentCo where operators deliberately put hangers in the conveyor system the wrong way round which causes a system halt, and gain a 10 – 15 minute break while offending hanger is located by the supervisor and placed correctly. This tends to happen in late afternoon when targets are met and operators feel they have done enough for the day. Another important issue here is that of **professional judgement**; often employees will resist and, if possible, ignore a system which does not allow them the level of discretion and autonomy they see as part of their profession. This is especially manifest in the nursing study (Timmons 2003) where a more **holistic** view of the situation may be expected, and was reflected in **non-use** or **inaccurate** use of the system, but also even in the call centre studies. Many call centres are preoccupied with call handling times, competitive individual worker profiles, and meeting quantitative targets. However even these would sometimes relax target times, allowing operators to take more time with customers to improve service and emphasize courtesy. **Compliance** of management in

these workaroud strategies is widespread, particularly at supervisory level. The attitude of the supervisory staff in GarmentCo was that data capture was a secondary, or even trivial consideration and didn't matter 'as long as the job gets done'. This was also true in the call centres where supervisors regularly turned a blind eye to time related workarounds. In addition, call centre managers appeared to actively accept **social** and **personal** interaction as contributory to a compliant workforce (Lankshear and Mason 2001), and this leads to the issue of **work avoidance**. Absenteeism and time wasting are typical examples of work limitation and avoidance and have been identified in earlier studies of work practices and termed 'soldiering' (Taylor 1912), 'fiddling' (Gramsci 1971), or 'goldbricking' (Roy 1952). The emergence of new technology may reduce traditional time-wasting techniques, but new and improved ways of reappropriating time are invented by workers in need of a break. There are several studies (Benson 1983; Westwood 1984; Marks 1994) which draw attention to the importance of social relations in the workplace, and supervisor acceptance is likely to increase this. The final issue under this heading is **workplace culture**, and peer pressure. In the nursing study, those who would use the system were demotivated from doing so by the fact that other nurses would not. This **peer pressure** made them feel that there was 'no point' in them doing so. In some of the call centres there was **collective resistance** against the systems and certain elements were not used or used incorrectly. Alternatively the data gathered was refuted and workers often used representatives, or supervisors to explain anomalies in their personnel profiles where they felt that data reflected badly on them in terms of average times. Often this data was skewed by a particularly complex interaction and operators would ensure that bonuses were still reached by explaining these and having data overridden. This collective action has also been highlighted by Webb and Palmer (1998), who pointed out the individual and collective action used to evade surveillance and make time.

5 DISCUSSION

The case study described in this paper suggests that the deployment of IT supported workplace surveillance is more complicated than the proponents of the electronic panopticon would suggest (Bain and Taylor, 2000). Though the technology implemented in the case study organisation was surveillance-capable, and while the management of the organisation had an interest in extending surveillance of the workforce, this to a great extent was not happening. This was because the workforce were able to ignore or circumvent the surveillance capability of the computer systems, as they knew there were few effective sanctions that the management were prepared to use to secure full compliance with the system since this compliance would ultimately lead to collapse of the operational system.

Management and organization techniques broadly construed are, in this way, constitutive of the 'moral technologies' (Foucault, 1991) that govern psychic dispositions and structures of recognition constitutive of subjectivity. How aspects of corporate culture are designed and personnel respond will often be a result (at least in part) of specific strategies of discursive formations. As an example of Foucault's (1979) notion of governmentality at work the concept of self-management, the combined presence of IT and KM methodologies provides key features of contemporary 'regimes of detail' (Foucault, 1979). For Foucault, regimes of detail, or the political anatomy of detail, are those disciplinary standards and values that produce and closely attend to the production of normative 'useful individuals.' Individuals are controlled through the power of the norm and this power is effective because it is relatively invisible.

6 CONCLUSION

The division of workarounds into positive and harmless or negative and hindering fails to address an important point. The purposes of gathering data on work-based activity are multiple and complex but

generally cover four main areas. Firstly, the time to complete specific tasks can be measured and thus data on target times can be generated. Secondly, employee performance profiles can be produced against which appraisal, reward and punishment can be metered. Thirdly, the flow of tasks through the organisation can be monitored and tracked. Fourthly, profiles of particular products can be built up, whether these products are calls dealt with, advice given, nursing care or hired garments.

Technology in itself does not supervise workers, it collects and presents data to be interpreted and utilised by supervisors and managers. Clearly the data captured during workarounds provides distorted information in all of these areas and may have far reaching consequences for management decision making. Where workers use codes to take time out from answering calls, or at GarmentCo batch process order tickets, average times taken to perform tasks are distorted as are individual employee profiles. Operators in all of the case studies except nursing know when they are nearing target and can afford to take a break, and they use a variety of mechanisms to do so. Further research is necessary on the extent of this resistant action and the effects on performance measurements, benchmarks and ultimately profitability.

Similarly, where operators double scan garments, information is then passed to the garment history file and will show that an individual garment has been hired more times than it really has, eventually enforcing an early inspection as to whether the garment is suitable for disposal.

Whatever the rationale, whether the motivation is sabotage or supportive, the information produced, on which management base long term planning and decision making, is likely to be at least flawed, and in the extreme, bear very little resemblance to what is really going on. Transparency of activities is vastly reduced where systems are bypassed, cheated and avoided, so that management have no true picture of any of the four purposes of workflow. Workflow management systems are constantly being upgraded and redesigned (Dourish, Holmes et al. 1996) in an attempt to capture difficult to map activities such as informal group work and non-procedural work and encapsulate them within the system. GarmentCo is about to implement a more sophisticated system and further research will confirm or contradict the supposition that this may create a 'cat and mouse' effect where operators find new workarounds to support their informal activities. Further research to investigate the effects of professionalism and autonomy, and of task complexity and variability could extend and augment this concept and investigate links with socio-technical theory and task contingent models (Van de Ven and Delbeq 1974). The development of socio-technical theory from the work of the Tavistock Institute in the 1950's led separate researchers to maintain that a lack of consideration of human issues gave "sub-optimal" results (Cherns 1976; Mumford 2000). Further proposals were that organisations should not be formal and rigid but flexible and capable of learning and dealing with change and self-regulation at work, and should reflect communication and participation.

Taking into account that data generated by workflow systems can be effectively tampered with in so many different ways, the information generated may be said to be insubstantial, fragmented, incomplete and incorrect. This leads to the assumption that management decisions based on that information can also be said to be poorly founded. Ideally future research would construct a comparative study of a situation where several of these workarounds are in place and compare this to the same situation where workarounds have been totally eliminated. This would then reveal the extent to which these workarounds affect and distort management data and whether this is substantial and significant or trivial and unimportant. However, the possibility of creating such a comparative study could be argued to be idealistic – could the utopian systems be developed that fully supports all anomalous situations and has complete user acceptance? Hence we suggest that all management information systems will exist under the spectre of Trompe L'Oeil.

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