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OVERCOMING RESTRICTIVE TECHNOLOGIES IN POLICE CALL CENTRES. A HUMAN AGENCY PERSPECTIVE

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Abstract

Call centres in the police force are restrictive information systems which tend to present call operators with constraints that they need to overcome using their experience in order to offer better services to the public. This paper is looking at how elements of human agency come in to play and help users' enactment against restrictive technologies. Information systems research on human agency has been mainly focused on the examination of whether agency lies within human or machines or both while in this paper we take a different approach and we clearly describe how human agency is enacted in practice. We use empirical data from contact centres and operational rooms of five UK police forces. After extensive observations we present how police call handlers manipulate digital information efficiently through human agency. The theoretical framework is based on the three elements of agency theory (iteration, projectivity and practical evaluation) The research findings assert that call handlers overcome the restrictions of the system by forming human-digital networks and using mental structures from their past experience in order to cope with the task at hand. The paper concludes by drawing implications for theory and practice and suggests future research directions.

Keywords: Human Agency,Ccall centres, Command and Control rooms, Police, Restrictive Technologies.

1 INTRODUCTION

The constraining effects of technology are a common understanding as information technology has been used to monitor human action, limit their choices and structure their responses. As technologies are the products of human action they can be inscribed with people's need to control the outcome of human interaction mediated by computer technology. In this paper we look at the constraining effect of technologies used in call centres and operational environments as they are notorious for their limiting effects to both callers and call operators. Call centres represent a new strategy used by organisations to reduce labour costs and offer better services to consumers. Nevertheless, current research shows that call centres put into place bureaucratic and constraining work settings while increasing employee surveillance (Frenkel et al. 1998). Additionally, the need for high levels of sustained interpersonal interaction with customers can lead to burn out and high employee withdrawal with emotional exhaustion reported as a common phenomenon in those settings (Deery et al. 2002). Thus, employee resistance has been suggested as a way to overcome overpowering technologies used in call centres (Bain and Taylor 2000).

This study is looking at call centres for events and crime recording in the police force. The settings where the public can report incidences are called Command and Control Rooms (CMCRs) and are operational centres for events recoding and resource dispatch within each police force. They represent the first point of contact for the public dialling emergency and non emergency numbers and make extensive use of several technological devices and applications to support their activities. CMCRs are complex systems where call operators need to use technology to provide an effective response to the public and to police officers. This is further strained by the real time performance that is expected from these centres and by the potential high critical nature of events that the CMCR's personnel have to respond to. Call handlers engage in a dialectic way with the available technology in order to provide the appropriate level of support to callers. In so doing the call handlers continuously interpret and reinvent the use of information technologies with the aim of achieving an organisational flexibility that the systems are not inscribed with.

Taking a human agency position (Emirbayer and Mische 1998) this paper argues that call centre operators use their freedom to enact technologies in different ways. This relationship between information technology (IT) and people has been a long standing debate in the information systems literature going to extremes between technological and social determinism giving the agency (the capacity to make a difference and overcome problems) to either the machines or humans or somewhere in between (Rose and Jones 2005). In this paper

we take a different approach and give a detailed description of how human agency is enacted in practice through a complicated human-machine interaction. The research aim is to increase the understanding of how humans use their unique skills (coming from the human agency perspective) in order to undertake actions (described with DCog) that *enact* technology in an efficient manner. The aim is achieved by the development of a theoretical model describing this complex relationship between human agency and technology use.

The paper is structured as follows. In the next section we give a detailed presentation of human agency the theory that represent the research's theoretical basis; while in section 3 the paper describes the research methodology. Section 4 includes the research findings and the conclusions are presented in section 5.

2 HUMAN AGENCY

The examination of diverse interpretations of technological artefacts is not new in social studies of technology. There is a lot of interest in how relevant social groups view the implementation of the artefact along the innovation diffusion process and how these views determine the final technological outcome. In these studies the term interpretive flexibility (Pinch and Bijker 1984) is used to describe the diverse perspectives on what a technology is and can or cannot do during the process of technological development. Although Pinch and Bijker talk about a "closure" when the technology has been completed and is ready to be used, it has become apparent that final technological products are still subject to individual interpretations. The malleability of IT artefacts and their cognitive organisation has been explained in IS literature as a basis for enactment of human agency (Kallinikos 2002).

The interest in explaining the phenomenon of same technologies used differently by different actors has led to studies that use a human agency theoretical proposition. A human agency approach sees humans as relatively free to react to technological constraints in different ways according to their temporal circumstances and their unique individual disposition. In line with that human agency has been used, for example, to examine the enactment of integrated information technologies such as ERPs (Boudreau and Robey 2005), where users initially tried to avoid using the technology as much as possible and later when forced to use it they chose to "work around" the system in unintended ways. Other studies such as Barley (1986) have shown that imaging technologies with common technological features were enacted differently in different organisational settings. Similarly, Robey and Sahay's (1996) study shows that organisations have used identical geographic information systems in different ways.

One of the key elements to understanding agency within technology use is to question where the agency lies. In other words it is useful to realise whether agency is a technological feature or a human characteristic; it has been argued the "imbroglios" (relationships) of the two are "agentic" (inseparable) while any attempts to isolate them are artificial and inherently problematic (Salvador et al. 2004).

In information systems research many theoretical models have been used to address the origination of agency. These studies are focused on either detecting the manifestation of agency or determining where the agency lies between humans and artefacts (Rose, Jones and Truex 2005). The first school of thought is represented by studies using structuration theory (Giddens 1984) and sees agency as a uniquely human property. Agency is shaped by structure, while structure is produced and reproduced by the actions of humans in social contexts. In information system research the problem of agency has been predominately addressed in the work of Barley (1986; 1990), Orlikowski and Robey (1991) Orlikowski (1991; 2000) and DeSanctis and Poole 1994; Poole and DeSanctis 2004. The second school of thought is represented by studies using actor network theory (Latour 1999) and implies that machines can also exercise agency and be actors. As the theory has the stand of a general symmetry between the technological and social realms there is no distinction between the human and non-human actors (such IT). Thus agency is not attributed to humans alone but also machines or any other artefact (Jones 1999; Rose and Truex III 2000; Walsham 1997). Information system researchers see IT such as the Internet (Monteiro 2000) or large ERP systems (Hanseth and Braa 2000) as powerful actors that have the power to enact change.

While structuration theory and actor network theory have contributed in the understanding of the agency problem in information systems research, existing studies in the area are limited in providing attributing agency to humans and/or machines without providing a comprehensive account as to how agency materialise in price. In this paper without denying that machines, institutions and documents might be actors, we take an intermediate approach of social construction of technology (Bijker, Hughes and Pinch 1987) focusing on the manifestation of agency in human behaviour. Thus, we give a detailed account as to how humans use their capacity to transform restrictive structures and overcome technological and organisational constraints.

The problem of agency in IS research is a reflection of the lack of clear understanding of agency in social theory. Indeed Emirbayer and Mische (1998) talk about the "black box" of human agency, while Fuchs (2001) states:

> "Likewise, that persons "have" agency- together with minds, intentions, decisions and alternatives- does not contribute much to explaining any actual actions. Agency theorising just assumes that persons do, in fact, have agency. But no *particular* action follows from agency in *general*, nor have we explained such an action by deriving it from an abstract mental or intentional faculty" (p. 27)

One of the most recognised definitions of agency is, according to Barnes (2000), "the possession of internal powers and capabilities which through their exercise make someone an active entity constantly intervening in the course of events around him/her" (p. 25). The term frequently used opposite to agency is that of structure. Similar to micro/macro divides agency tends to be related to smaller, less durable entities such as actors, individual actions and small groups, whilst structure is related to entities of bigger scale such as organisations, states and markets. Thus, there are theories about agency and structure and others trying to integrate the two (Fuchs 2001).

An interesting way to remove this traditional distinction between agency and structure has been made by Emirbayer and Mische (1998) who emphasise that the temporal nature of human action is always related to structures of past, present and future experiences of the actor. In this way the structural elements of human action can both sustain and transform structures at the same time. According to Emirbayer and Mische (ibid) these temporal contexts of action are reproducing and transform existing structures through the interplay of habit, imagination and judgement. They in turn define the three different constitutive elements of human agency as: iteration (related to habit), projectivity (related to imagination) and practical evaluation (related to judgement). As these three elements will be an important part of the theoretical basis in this paper we now explain them further.

Iteration. Refers to the selective reactivation of past practices and habits thereby giving actors the possibility to sustain identities, interactions and institutions.

Projectivity. Refers to the use of actors' imagination to generate possible future trajectories of action, which include actors' hopes, fears and desires for the future.

Practical evaluation. Refers to the capacity of actors to make practical judgements among alternative trajectories of action depending on their temporal situations.

In the next section we present the methodology used to test the proposed theoretical model.

3. Research methodology

The scope of this paper is to increase understanding around the use of restrictive technologies through an interpretive empirical enquiry, by presenting an account of *how* human agency is enacted in a highly structured and pressured environment. In terms of data collection, interviews were conducted with chief inspectors responsible for the management of the contact centres and operational rooms, supervisors, operators (police staff and police officers) in contact centres (call handlers) and in operational rooms (dispatchers). The interviews lasted from 30 minutes with chief inspectors and supervisors and from 20 minutes with the operators. The interviews with the operators took place before the observations and were accompanied by activity related questions that occur in between calls or at the end of the observation periods.

The interviews were on a one-to-one basis using an interview agenda as the primary research method, which comprised of open-ended questions that allowed the interviewee to wander into unscripted areas. Taking notes during the interviews merely decreases interview time and increases the risk of data bias, therefore, we considered tape recording to be a more effective approach to eliciting the data. Every interview was tape-recorded and later transcribed, so that a full record of the conversation was obtained. To further avoid biased interpretations, at the end of the observations the operators were asked to describe and explain particular circumstances and issues. Telephone and e-mail were also used to clarify issues. In terms of ethical clearance, the interview agenda was approved through the University ethics board prior to beginning the study. Care and attention were taken during the interview process to ensure no overt signals were given by the interviewer, such as nodding one's head to express agreement with an expression or response to a question thus seeking to reduce the impact of interview bias. The data was analysed using the theoretical basis of agency theory and the three elements that were particularly relevant to this study namely, iteration, projectivity and practical evaluation.

4. Research findings

Command and Control Rooms (CMCRs) are complex systems where several individuals and information systems collaborate in order to provide an effective response to the public and to police officers. The operational nature of the work occurring in CMCRs is characterised by a high level of interaction and coordination between individuals and information artefacts, hence the distribution of information across them. This is further strained by the real time performance that is expected from these centres and by the potential high critical nature of the events that the CMCR's personnel must respond to. To be able to generate a meaningful account of the data according to the theoretically emphasis of the proposed model the socio-technical system has been segmented in three sectors depicted in figure 1. The research findings will be illustrated following the order of the sectors.

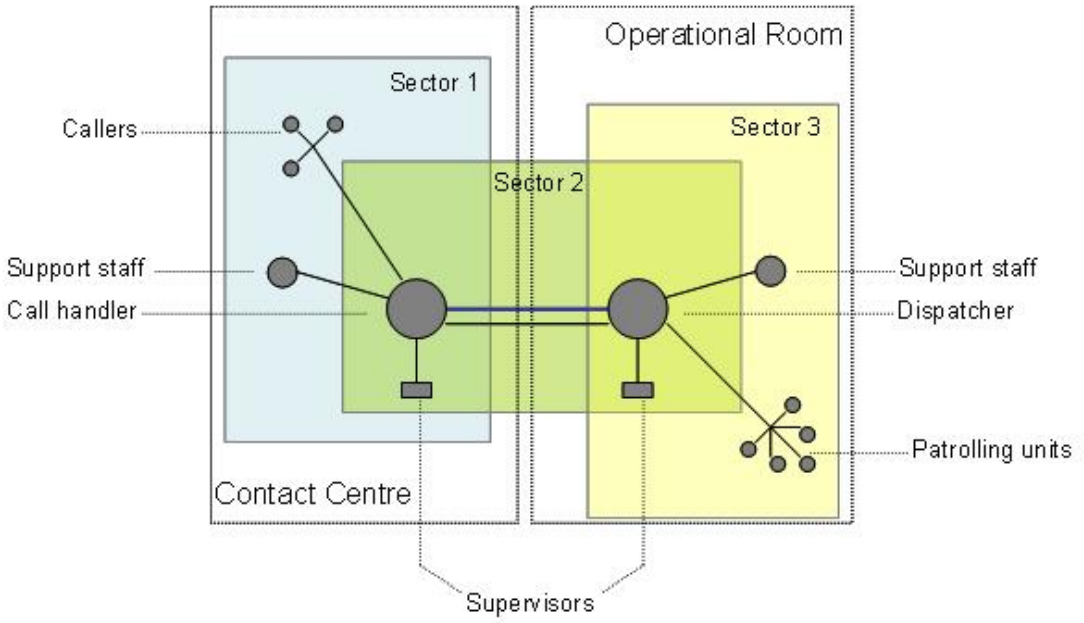

Figure 1. Functional sectors separation of CMCR

Ethnographic notes, interviews and observation transcripts are extensive narratives that for the benefit of the reader have been here reorganised and recomposed in scenarios grouped by these sectors.

After our extensive observations in the control room our findings show that call handlers have to overcome the disruptions created in CMCRs and generated by unlinked technological components and inflexible user interfaces. To maintain the performance level of the socio-technical system, call handlers perform back-up coordination processes and reinvent in practice the use of the systems available to them. In the following figure we have

summarised the nine scenarios illustrated in this section, emphasising the most predominant aspect of human agency displayed in each of the 3 different sectors in the command and control room.

	Iteration	Evaluation	Projection
Sector 1	Use human memory to retrieve information which is impossible to be found with common computer research mechanisms (Sector 1)	Judging the severity of the call by keeping notes of important information (Sector 1)	Using of previous experience to create intelligence for future reference (Sector 1)
Sector 2	Use their experience of sequence of events to display data on their screen (Sector 2)	Taking critical decisions by using their judgment to filter overload of information (Sector 2) Use their judgement to coordinate and supplement information from different human and digital resources (Sector 2)	
Sector 3	Use their previous experience on colleagues' skills in order to collect information from the right person (Sector 3)		Taking decisions about future actions by sewing together patched information (Sector 3) Decide possible ways to integrate information for future actions (Sector 3)

Figure 2. Synthesis of research results

Looking at the three dimensions of human agency it can be seen how actors practically use their memory, judgement and projection abilities to overcome technological restrictions.

More specifically when it comes to iteration, call handlers seem to extensively use their memory and experience in order to search, select and display information in a way that will be most effective for the task at hand. Interestingly enough, although information systems are mainly used as a way to store, retrieve and display large amounts of information, it seems that human agency is still a necessary element for digital information to be useful and effective. As for the evaluation skills it seems that call handlers constantly use their judgement to filter, supplement and categorise information in order to be able to take the right decisions especially when it comes to handling emergency calls when swift action is necessary. Finally, the projection trait of human agency plays a key role for integrating patchy information to create intelligence for future actions. Agents base their projections for the future on their "talent" to combine the right information at the appropriate time. Although figure 2 shows a particular taxonomy as to how human agency manifests in the different spatial and social structures, it is useful to mention that all three human agency traits were apparent to a certain extent in all different scenarios.

We believe that this field study is a particularly illustrative example of a number of restrictive technologies that need to be overcome by human agency. While call handlers had to use their experience and judgement to filter and classify information at the same time they had to network with their colleagues in order to cross-check and supplement vital information for future (frequently urgent) actions. The real time performance that call handlers have to show was actually another critical and highly relevant detail to this study as agents were working under limited time in a highly stressed environment where they had to provide immediate solutions to problems of missing or patchy information. The use of their human agency traits was more by necessity than choice.

5 CONCLUSIONS

This study contributes to the research of human agency in information systems as it has demonstrated in detail how human actors use their experience, judgement and projection to overcome restricted technologies. Although a number of studies in information systems research try to determine where the agency lies between humans and artefacts, this study takes a different approach by offering a better understanding of how agency manifests in practice. Considering that information systems used in call centres are notoriously inflexible posing restrictions to call handlers, the study demonstrates how users enact human agency in order to manipulate information in a more effective way.

The results of the study illustrate that users go beyond the restrictions of the systems by creating human-digital networks, in the form of various frequently overlapping systems, and social networks with their colleagues and the callers together. Their human agency traits of iteration, evaluation and projection are used in combination and in different degrees depending on the situation at hand. As call handlers "juggle" with information in various screens at the same time they create a social web where they consult their colleagues while trying to serve the public at the other end of the telephone line. This research confirms after Emirbayer and Mische (1998) that the dichotomy between agency and structure is indeed bleary as human action can both sustain and transform structures at the same time. As the call handlers participating in this study used their agency in terms of habit, imagination and judgment to overcome particular technological constraints at the same time they developed specific habits and structures in order to do so. In other words their past experiences with the system were giving them a mental structure that they could refer to when they had to deal with repeated situations or problems.

Finally, although this research has examined the particular working environment of the Command and Control rooms of police forces in the UK where specific information systems are used it can be viewed as a useful example of how people overcome technological restrictions in a highly pressured environment. The empirical investigation of peoples' attitudes towards restrictive technologies in different technological and social settings could provide very interesting results that could potentially verify or further enhance our theoretical model.

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