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# Magistrates and voice recognition: reconceptualising agency

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## ABSTRACT

Exploring the introduction of speech recognition, an intelligent software system, in the ACT Magistrates Court prompted questioning of the notion of agency. In this paper we look to sociology for conceptions of agency that emphasise the materiality of agency, the mutuality of human and non-human co-constructions of agency, and the performativity of agency. Far from being marked by autonomy and independence, agency can more usefully be conceived as the outcome of the relatedness of human to human, human to non-human and non-human to non-human.

## Author Keywords

Automatic Speech Recognition; agency.

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H.5.3 Group and Organization Interfaces

## INTRODUCTION

As 21<sup>st</sup> century inhabitants of postmodern societies, when we think about speech recognition systems most of us will call to mind personal encounters with automatic telephone systems. Some of us may be talking to computers at work: my cousin talks to the paintshop computer to coordinate his team at a local car manufacturer, much easier than using a keyboard when his hands are smeared with paint and full of gear; my research assistant uses *Dragon Naturally Speaking* re-speaking interviews into the computer to get them into text; my friend works for the public service and a recent bout of RSI sent her to her occupational health and safety team to be set up with *IBM Via Voice* so that she can return to work; and I have heard about radiographers who regularly dictate their highly specialised reports to computers and then print them out (Kraal 2006). Whether it is talking to machines with limited vocabularies like those deployed for telephone bill paying or at my

cousin's paintshop, or using speech recognition systems that 'understand' natural speech, talking to machines is no longer something strange and futuristic. For the science fiction enthusiasts amongst us the practical space for speech recognition systems had already been prepared, their representations in films and TV series was ubiquitous from *2001 a Space Odessey* to *Star Trek*. Whilst our practical experience may not live up to these on screen representations, it is likely that we nevertheless imagine a future time when they will, when our speech recognition systems are smarter.

The imaginary invoked by both our fantasy and practical worlds is one of the 'transmigration of agency'. This term is Lucy Suchman's, coined to remind us of the challenge to the widespread conceptualisation of agency that represents agency as unique to humans, and according to which an individual human consciousness is always the originator of action; how often have you heard the slogan that it is people not guns that do the shooting (Suchman 2002). In western, popular, commonsense understandings of the world, agency is what separates humans from machines whose proper place is to be *used by* humans or *designed by* humans according to some prior intention. Agency implies the freedom humans have to make choices and to act. According to this way of thinking the boundary between humans and machines, machines are extensions of our physical capabilities, mere tools, and hence humans are responsible for both the good or bad outcomes that follow from the development and absorption into society of new technologies. That this imaginary structuring the human machine dichotomy and modern cultural understandings of what it means to be human is under challenge and that this shift stirs up anxiety is demonstrated by the success of films such as *I Robot*. The discourse of Artificial Intelligence (AI) emphasises the intelligent, interactive computer system that can converse with us, respond to our needs without being asked, interact emotionally with us, and can watch and learn without receiving specific instructions. These intelligent machines are represented as mimicking human cognitive processes and thus as having agency. Indeed as Suchman points out there has been a convergence in the language of cognitive psychology and AI with borrowings going both ways. Not surprisingly then, given the rhetoric of intelligent machines and their materialisation in the everyday worlds we inhabit, the idea that agency is unique to humans is losing its saliency. For many people the idea that humans uniquely author the action in the world no longer makes sense, and

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we are not surprised to be sharing our worlds with machines that appear to have the capacity for agency, that is for autonomous, rational action; hence the transmigration of agency.

This is not an abstract question. We became interested in new ways of thinking the association of humans and machines because of our experience in a practical project. This paper originated with an investigation into the workings of the ACT Magistrates Court with the long-term view of introducing automatic speech recognition to the Court.

The argument we present here is that new and richer conceptualisations of agency itself, the boundary between human and machine agency, and distributions of agency across that boundary are needed to make sense of life in our postmodern worlds, particularly for those of us working on technological change. In particular, we want to explore how new conceptualisations of agency and the human/non-human divide can inform our work in developing new technologies for specific organisational contexts. We will use speech recognition as an example of an AI system and a study of the feasibility of introducing speech recognition into the ACT magistrates court to test how new conceptualisations of agency can make a difference.

#### **THE ACT MAGISTRATES COURT**

Many things happen in the ACT Magistrates Court. But here we will restrict our concern to the act of sentencing, for it is for the act of sentencing that the ACT Chief Magistrate would like to use Speech Recognition to replace handwriting. In the ACT Magistrates Court magistrates write down their decisions after speaking them aloud to the courtroom. These decisions may be interim decisions in a case, for example, to release a defendant on bail pending more information, or final decisions, for example a jail sentence or fine. The current paper-based system for capturing a magistrate's remarks during sentencing relies on the bench sheet and the defendant's folder. A bench sheet is a piece of blank A4 paper that a magistrate writes on while sitting at the bench. The bench sheet will typically contain notes made during the case and the interim or final decisions in the case, or part of a case that the magistrate has just heard. A defendant's folder may come to contain many bench sheets as a case progresses.

The defendant's folder is a coloured manila folder affixed with a label with a case number, the defendant's name and the informant's name. The informant is typically the police officer who made the arrest and caused the defendant to appear in Court. A defendant will typically have one folder in use at any one time and efforts are made to ensure that new defendant+informant pairs are not created while a defendant's case is being heard. If it is at all possible, each folder is assigned to one magistrate to ensure continuity.

When a magistrate delivers their verdict, or announces a close to a part of a case, or sets a case over to another time, they speak the decision aloud to the courtroom and

write the decision down on a bench sheet which is then inserted into the defendant's folder for the case at hand.

For example, the Magistrate might declare loudly to the court:

Pursuant to section 402 of the crimes act, having regard to character and circumstances, without conviction the defendant will be discharged on recognisance self of \$2000 to be of good behaviour for six months. Included in that are court costs of \$52 and the CIC levy of \$50.

For long or complex sentences, this process of writing out sentences on the bench is very time consuming both for magistrates and for all other parties in court who must wait for the writing to be completed. There are also others in the court hurriedly scribbling down what the Magistrate has said; there is a 4 week delay before written copies of the sentence are supplied to those who need it — police, remand, mental health, community detention.

It would be easy to think of agency in the situation of the Magistrates Court as lying with the Magistrate. Certainly the defendant will breathe a sigh of relief and be free to walk out of the court and get on with his or her life if a sentence such as that above is uttered. A different sentence would see the defendant being led from the court to the cells ready for transporting to a prison where they would be required to serve a custodial sentence, or perhaps wait until a mental health assessment had been completed and a report lodged with the court for the Magistrate to determine the sentence at a later date. Sitting in court we are reminded by all the symbolics of power that the Magistrate holds the seat of power, all that rising when the Magistrate enters the court, the positioning of the Magistrate at a raised bench in the front from which the court and all that are seated there are gazed down upon, and the dressing of the magistrate in gown and sometimes wig.

#### **A SOCIOLOGICAL DIVERSION: THE AGENCY/STRUCTURE DEBATE**

There have, of course, been many challenges to the model of individual agency that came to dominate modernity, and this challenge has intensified under conditions of postmodernity, a term I will use here to refer to the post-industrial character of 21<sup>st</sup> century economically developed societies where capital expansion relies on workers in informatized, knowledge and cultural industries (Castells 1996). Intelligent machines have become ubiquitous, humans increasingly survive through melding with artefacts from pacemakers to stem cells and from the internet to mobile phones, and individual identities in everyday lives have become less stable and more fragmented as we juggle multiple roles - parent, student, worker, carer, environmental activist, drag-queen, car club secretary. All of these changes in our social worlds challenge the deeply rooted Western notion that agency is unique to the Cartesian mind, a singular, coherent mind fundamentally separated from its physical and bodily environment and its 'being-in-the-world'. This is not to say that challenges to the rationalist conception

of agency are new, indeed they have long been at the heart of sociology, certainly predating debates about modernity and postmodernity. It is beyond the scope of this paper to survey all challenges to the conception of agency as mentalistic intention. Rather the paper looks to sociology and to social studies of science and technology for conceptions of agency of value to the study of technological change in organisations.

Mid-twentieth century sociology, as is well known, was characterised by a divide between micro- and macro-sociology, between the privileging of agency and the privileging of structure (Abercrombie, Hill et al. 2000). Macro-sociology privileged structure, arguing that sociology should concern itself not with individuals but with social facts – structures, institutions, roles and norms - since individual agency is a function of such established social patterns; micro interactions are the way they are because of the larger social forces that impinge on them. Micro-sociology privileged agency, seeing the action of individuals as constitutive of social structures that only appear to be fixed and enduring, to act as forces shaping the future, because they are continuously being recreated through the recurrent actions of free and creative individuals. There have been many ways suggested for resolving the agency/structure contradiction in sociology. Berger and Luckman (Berger and Luckman 1971) emphasise the dialectical interplay in which the shared meanings achieved through social interaction in one generation become institutionalised to shape the interactions of the next generation. Giddens's structuration theory emphasises the 'duality of structure', individuals are free to reflexively remake their social life, but they do so through mobilising and engaging with historical resources that determine, for example, whether and how an action will be interpreted by others, however these resources are not external to individual agents but are already and always constituted through social action (Giddens 1984).

These attempts to combine the macro (structure) and micro (agency) traditions in sociology point to, as Latour has more recently indicated, the dissatisfactions of a focus on local person-to-person interactions that omit the influence of the wider social context that make the situation and interaction what it is, and simultaneously avoid the dissatisfactions of a focus on the larger social picture that tells us nothing of how it is experienced and woven through local situations (Latour 1999). Latour suggests that rather than attempting to overcome and resolve this tension between agency and structure in sociology, that we by-pass it; rather than attempting to continue a sociological tradition of grand theorizing, of seeking 'the Big Animal' or 'anonymous field of forces' that stand behind and make sense of the local situation, that we recast social structures as a 'summing up' of various local agents, practices, devices and connections (Latour 1999). Making sense of agency thus becomes a matter of following the connections and transformations that make the exercise of agency possible. Latour urges us to investigate and follow 'what *provides* actants with their agency', the very word *actant* pointing to choice and intentionality not as individual human attributes, but as

being conferred on actors because of their position in a network. Latour is, as many will know, one of the major proponents of the actor-network approach to sociology, an approach that began in science and technology studies. John Law, also a proponent of actor network theory, demonstrates this deconstructive approach to agency in his discussion of managers and power (Law 1997):

...the powers of the body – or of the mind – are the least part of it. The least part of the power of the powerful.

The powers of the powerful manager ... these are extended. Spread out. Distributed. They are distributed through the arrangements of the organisation. They arise from those arrangements. The people who do the work of subordinating themselves. Secretaries. The tiers of under-managers. The clerks. The technicians. All those people. But not just the people. For the powers of the powerful manager lie also in the papers. The texts that fix the commands. That map the organisation, its financial health, its credibility. They lie in the funds that circulate through the narrow networks of finance, oiling the wheels, promising, persuading, seducing. And in the technologies which remember. Which calculate. Which write. Which talk to the other end of the business or to the other end of the world.

#### **ANALYSING THE AGENCY OF THE SENTENCING MAGISTRATE**

We began our studies of the ACT Magistrates Court by attending to the everyday achievement of sentencing. How is it that the reordering of the world is performed into being by the Magistrates utterance of the sentence? We had some clues from the work of ethnomethodologists such as Harvey Sacks (Sacks 1992). Analysing how the meaning of a word like "hello" is produced, Sacks argued that the meaning of an utterance does not derive from any *a priori* set of rules, but rather from its situated location, its relationality to a host of other elements. "Hello" is taken to be a greeting when spoken at the beginning of a conversation or to greet a new arrival, but uttered as an exclamation in the middle of a sentence – "well hello" – it takes on an entirely different meaning. **Lucy Suchman** Similarly, the utterance of a judicial sentence constitutes an act of sentencing only when it is organised in a particular way – it has to be pronounced by a magistrate, at the end of a hearing of the case, in a space constituted as a court, using certain words and phrases that would sound out-of place in any other setting. The agency of the magistrate to change the world, at least of the defendant but possibly also of the prison-warder and the drug counselor, is thus contingent and organized through interaction. The power of the utterance relies on the achievement of its inter-subjective understanding as a sentence by the magistrate, the police, the defendant, the prison system and so forth.

But our interest in how the agency of the sentence was constituted in the situated action of the court, in its world of mundane events and routines soon led us in a number of other directions. The power of the sentence, the agency of the Magistrate, were being constituted and reconstituted through myriad acts carried out unthinkingly, acts so taken-for-granted as just 'what we

do here' that they mostly went un-noticed and un-remarked by the magistrates, lawyers and law academics who talked to us about sentencing. We have already talked of some of the acts of non-humans mundanely incorporated into each act of sentencing – the bench sheet and the defendant's folder. The production of the written sentence might also be assisted by the use of a rubber stamp. Occasionally there is just the right stamp that simply requires the magistrate to fill in lets say the time period for which the defendant's license is to be suspended, or the time period of a custodial sentence and whether it is partially or fully suspended. But more often than not there are many details to be added by hand – a requirement that the defendant attend drug rehabilitation at a particular facility, or the lengthy detailing of the times during a week when the defendant can drive provisionally so as to allow them to attend classes and drive to and from work.

The magistrate sits in the court surrounded by people but also by objects. Where would he or she be without the police report, the case laid out by the prosecutor, the presentation of the defendant or of his solicitor, but also of the imposing bench, the benchsheet, the defendant's folder, the stamps and pen. And there is more. A mix of humans and non-humans.

There is the Magistrate's Associate. Before the Magistrates Court session opens the Magistrate's Associate has checked that all the defendant's folders are there, that they are complete, stacked in order, and that inside each one the documents are organized in the order most helpful to the magistrate – today's charge sheet, an affidavit setting out the evidence of a police interview in which an assault police charge is discussed, bail documents. Also ordered in the folder are the reports produced by a number of agencies external to the Court, reports that can encompass a defendant's mental health, drug or alcohol dependency and so on, reports that find their way into the defendant's folder and are ready for defendant's sentencing appearance. When the Magistrates Court is underway the Magistrates Associate is kept busy passing folders up to the Magistrate at the Bench, conferring with the prosecutor or the defendant's solicitor and retrieving additional documents from them for the Magistrate to consider and for adding to the defendant's file. There is an ordering in the court, defendants are called one after the other, beginning with those brought in from the cells. The order follows the list thumb-tacked to the pin-up board in the corridor leading to the front foyer. The Magistrates Associate has the files in the same order. How is this order produced? There are others whose work in the "backroom" has scheduled defendants to appear at this time in this court. It is the List Clerk's job to ensure that the court dates are filled as efficiently as possible. The List Clerk has worked with the monitor's list and court's computer system to construct the rosters for the hearings in a particular court on a particular day before a particular magistrate. The Monitor works in a small booth between the walls of the courtrooms. The booth looks in to two court rooms, one on each side, through one-way glass and seats, computers and closed-circuit

monitors. One of the jobs done by the Monitor is to note down the Magistrate's decisions, including decisions to schedule a return to court for a defendant.

Here we are beginning to see an army of invisible workers to whom work is delegated and whose work makes sentencing possible. And there is an invisible infrastructure too – the courts scheduling interface system that makes it possible for the list Clerk to do their job, the pre-produced list of cases that allows the Monitor to quickly record decisions and the shorthand and cryptic stock of phrases use to do so because they are intersubjectively understood by others who rely on them to do their jobs. The agency of the magistrate does not exist in isolation. The sentence is *distributed*, it is decentred – the effect of a network of relations (Law 1994), an outcome of the ordering of the court, of the coordination of many small acts – acts of workers, acts of things, and acts of symbols, marks on paper, digital signals, spoken words<sup>1</sup>. As Haraway's cultural studies of the history of science have taught us, agency is an outcome of the intermeshing of materials, meanings and practices (Haraway 1997). The power of the sentence is the outcome of the co-ordination of the work of multiple inter-dependent humans and non-humans, located in different but overlapping situations. Moreover, all too often in the hypervisibility of the one positioned as the decision-maker, as having agency centered on their utterance, their act of judgement, their floating brain, the work of the administrators, the clerks, the technicians, and of the carefully crafted materials circulating in an organization disappears, and it is not incidental that this division has a gender dimension (Bowker and Star 1999).

Then of course, there is the defendant. How did each one get here, and most with a lawyer, either their own or the Court's duty lawyer. Perhaps there has been an arrest, and a defendant was held for the weekend in the police cells only now being brought before the Magistrate. Certainly there has been a summons served by a police officer following an incident where police were called or were present – a speeding charge, driving over the limit, a theft, an assault. More people, more things, some big, some small – the police-officer, the State budget allocation that pays the police officer's salary, the breathalyzer, the summons, the cell in which the defendant has been restrained, the police station, the computer at the police station on which the defendant's statement has been typed with 2 fingers. All of this stands behind the presence of the defendant in court, makes it possible. And without the defendant there would be no sentence.

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<sup>1</sup> This resonates with Hutchins work on 'distributed cognition' Hutchins, E. (1995). *Cognition in the Wild*. Cambridge, Ma, The MIT Press.

Some of these elements fit the modernist conception of structure but they are not abstract entities following a trajectory, a grand narrative – police acting in the interests of capital, the State protecting people’s freedoms and advancing their progress. They are present in the organization of the Court, the Police standing around, bored, not available for other duties because they may be called, if the case is heard today, if the defendant pleads guilty. There is ambiguity here, contradictions, not a monolithic actor coherently and externally organized and standing outside the situation. There are other ‘Big Animals’ too but they are not equivalent to the social structures that macro-sociology saw as determining the action and agency of individuals and organizations. There is the Magistrates Court building, modern, dignified without being overly imposing. On the front is a Coat of Arms: ‘for the queen, the law, and the people’. Big actors – the State that paid for the building, the laws passed by Parliament and interpreted in the heavy tomes of case law that we occasionally saw the magistrate pull from the shelf beside the bench, not even the Constitution with its codification of the powers of the judicial system and rules for appointing the judiciary, but we cannot simply move from the Magistrate to one of these Big actors to account for the power of the sentence to change the world, shifting agency from individual to society. These bigger actors are inside the Court, are embedded in its ‘modes of ordering’ (Law 1994), but they too are distributed, decentred and fragmentary. Rather than lying behind and accounting for the agency of the Magistrate, they are embodied, partial and constituted in the agency of the Magistrate. Their agency in relation to that of the Magistrate is itself a matter for empirical investigation.

To return to the matter of agency, our first lesson, to use Suchman’s terminology, is that the modern ‘imaginary’ for agency in which the magistrate is ‘configured’ as autonomous mind needs to be ‘re-figured’. The agency of the Magistrate is not contained within a single individual. Separated from the Court building, the Constitution, the beautiful blonde wood-paneled bench, the heavy tomes of case law, the bench sheet, the defendant’s folder, the reports, the affidavit, the Magistrate’s Associate, the List Clerk the magistrate’s power to act disappears. The Magistrate utters the sentence and it changes the world, but the sentence is a node in a network, and so too is the magistrate, his memory, his calculus, his capacity to project the sentence into the world in the court, but also for instance to the roadside when the defendant is driving his car after his license is suspended.

### **ANALYSING THE AGENCY OF SPEECH RECOGNITION**

Speech recognition systems are figured as intelligent and interactive, as able to respond intelligently to verbal instructions, to learn from mistakes so they improve in accuracy when spoken to by a particular human, and to engage in conversation with us. In this Artificial Intelligence (AI) imaginary it is the autonomous agency of the modernist imaginary, previously thought to be unique to humans, that developers of speech recognition systems configure as migrating into their machines.

Speech recognition is assumed to be a more “natural” way of interacting with a computer because speech is one way in which people interact with each other. Using a speech recognition system is imagined as one rational autonomous agent interacting with another. The largest problem with speech recognition systems is that they are error-prone in their interaction. Usability studies of speech recognition systems have tended to focus on the rates of recognition errors. Users in several studies have reported that they did not like using a speech recognition system because of its errorful nature (Karat, Halverson et al.; Lai and Vergo 1997; Antiles, Hornberger et al. 2004).

The focus for developers of speech recognition systems has been largely on improving recognition rates. Useability has been seen as a relatively straightforward task of overcoming the limitations of the machine by improving the algorithms used to govern the autonomous action of the agent in carrying out functions of search, recognition, learning and problem-solving. Certainly creating reliable speech recognition systems with improved accuracy rates has been important. However as accuracy rates are now approaching rates where improvements may not be detectable until they are 100% (Van Buskirk and La Lomia 1995), it is perhaps timely to re-look at earlier work on the importance of factors external to the speech recognition software (Rollins, Constantine et al. 1983). Treating the speech recognition system as a separate, self-contained, autonomous agent has favoured a focus on the algorithms of speech recognition and error correction, to the exclusion of situational factors and the task at hand. Perhaps this tendency to keep large vocabulary speech recognition systems in the laboratory has in part been influenced by transmigrating the modernist notion of human agency to the AI system of speech recognition. Early on in our research we became aware that the question of integrating speech recognition into the ACT Magistrates Court was not a question about the agency of the system as an autonomous, discrete entity able to seamlessly turn the magistrate’s speech in sentencing into flawless written text.

Speech Recognition Systems are often represented as enhancing human lives because they mimic human agency, at least its modernist autonomous image. For instance Alister Rennie, a vice president of IBM Pervasive Computing attributes a car based speech recognition system with the capacity for autonomous, interactive agency – interacting with the system while driving is presented as if it were no different from conversing with a fellow human: ‘If you ask for directions to an Italian restaurant, it can find the restaurant, display the review on a screen or read the review back to you while you drive’ (Murray 2004). When Polanyi claimed that Speech Recognition Systems are ‘the court technology for the 21st century’ (Polansky 1997), he is not imaging the awkward systems still used in some U.S. courts which require their users to respeak every word so that it can be turned into written text, and to do so whilst wearing an awkward gas-mask like contraption that protects the system from other noise in

the court, and even then has a far from perfect accuracy rate (Buckley 2002). He undoubtedly envisages a system able to understand and respond to human conversation as flawlessly as HAL, the computer from *2001 a Space Odyssey*, who might be mad and so autonomous as to commit murder, but who never makes an error in either recognizing speech or producing it.

In this vision of Speech Recognition Systems the containment of agency within a single individual – even a machinic individual – obscures the assemblage of human and non-human elements that make agency possible, whether that agency is human or machine. What disappears is the materiality and relationality of the sentence. Speech recognition systems seek to hide this – the translation of sound-waves into electronic impulses, their matching against an existing sound bank and conversion into clean black marks on white paper are deliberately hidden from view. All kinds of materials and practices are made invisible. It is not that we have a problem with this hiding of the huge assemblage of algorithms, semiotics and engineering, our plea is more modest: That in delegating the agency of the Magistrate's spoken remarks to the written agency of the Speech Recognition System that we keep sight of the backroom workers and existing material networks that produce the Magistrate's agency. We may then be able to get some assistance in ensuring that any notoriously disobedient Speech Recognition System introduced into the Magistrates Court might remain faithful, and we might avoid the notoriety of HAL not being blinded by misguided visions of agency.

## CONCLUSION

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