# Representing time: The humble timesheet as a representation and some details of its completion and use

## Barry Brown

This paper is an attempt to bridge theoretical and empirical accounts of the practice of representation. For the practice of 'representation', while prevalent in, and fundamental to, the organisation of the social world, has been described almost exclusively in abstract terms in the social sciences. There has been little discussion of the concrete practices which actually take place when representations are made or used. In this paper it is these practices which I would like to take as my starting point, by looking at the creation and use of a particular representation, discussing some observations on its constitution and use. The representation which will be discussed was a timesheet system, used by staff who worked in a large British Oil company. This system was used by staff to account for their time working on different projects by completing paper timesheets. During the time of the study, the system was computerised, highlighting some interesting issues about its composition and in turn its role as a representation.

As an object of study timesheets are, of course, fairly mundane. Anyone who has had to complete a timesheet would know that these neglected little forms can hardly be described with great excitement. Yet the practices around this system had considerable significance for those concerned. In particular, the timesheet system enabled the company studied to collaborate with other organisations in the expensive job of oil exploration and extraction. The timesheets were then used to exchange money between the different collaborating organisations, depending on who had done what in which organisation. This exchange of money, however, depended upon the timesheets being seen as accurate. As this paper will show, this accuracy relied on the work of the accountants, who ran the system, to accomplish the timesheet system as a representation. That is, the work of the accountants to have the timesheets be seen as a valid account, for the purposes at hand, of the organisation's activities. In this way a very specific set of practices around a somewhat mundane artefact caused something 'bigger' to happen - in the sense of large oil companies collaborating. Yet, if we follow the individuals involved we find that they never disappear; their practices never – as such – become 'macro', but rather the effects of their actions have larger scope than those actions themselves. In the discussion I will suggest that Latour's 'chain of transformation' provides an illuminating way of looking at this practice, and in particular the ways in which 'macro' actions appear in a description of 'micro' actions like this.

## Representation in Social Theory

As mentioned, there is a large body of work within social science which discusses representation both directly and in passing. To explain some of the context for the empirical study I will start by discussing some of these writers, specifically Callon and Latour's actor network theory, and Lynch's criticisms of their theory. This provides a interesting framework in which to develop the empirical material here, in particular the tensions

between a 'micro' and 'macro' account of the actions of those studied.

Within sociology, discussions of representation have been dominated in the main by considerations of a theoretical sort, in particular the influence of post-structuralist theorists [1] (for example, (Derrida 1976), or for a critical review (Potter 1996)). These writers have considered, in various different ways, how representation occurs as an issue for social theory. This has involved focusing predominantly on representation in the abstract as the topic of study, with little consideration for what might be called 'endogenous' representations. So, for example, the academic text has had considerable focus, in particular reflexive questions regarding its presentation and claims, as opposed to the consideration of mundane actions or objects (e.g. bus stops, timetables, etc.)

Without wishing to prejudice this large body of complex work, a recent example of this can be seen in Butler's notion of performativity. Performativity is currently something of a cause célèbre in the social sciences, being the subject of special editions of *Society and Space* (volume 18), and *Theory, Culture and Society* (volume 16, no. 2). The notion of 'performance' comes originally from Austin, with his observation that words do things rather than just being statements with fixed meanings. Austin christened these acts 'speech acts'. With Butler, the focus comes on how in speech, acts do things through drawing upon linguistic and other conventions (Butler 1989). Butler

talks about the 'force' of acts coming not from the individual, but from the 'effect of historically sedimented linguistic conventions' (Butler 1994, p. 137). More specifically Butler looks at the performativity of gender, the ways in which gender exists through social acts; yet acts not under our control. For our purposes, however, what is interesting about Butler's work is the ways it attempts to put 'the act' back into social theory. As Thrift puts it, performativity provides "a way of understanding meaning as not residing in something but as generated through processes and which does not therefore assume a realm of representation and a realm of the real" (Thrift 2000).

While there is much to be commended in this move, it still appears that 'representation' is an abstract object in this discussion, rather than a concrete one. Smith, for example, criticises Butler for attempting to smuggle the social into her descriptions of practice, without addressing it sufficiently (Smith 1996). In Butler's discussions of social action, what is essential to meaning dissolves into discourse, or 'the performance'. Butler's conjuring of text and discourse is still a 'social theory of representation', a move away from considering actual cases of representation. This abstraction still robs individual actions of their importance, and replaces them with a theoretical template which gives little import to the complexities and details of representational practices. As she argues

> the notion of performative reduces what can only be accomplished by people together in concerted action (ibid, p. 180).

A more general form of this criticism has been made by Mike Lynch in discussion of constructivist accounts of

[1] To a lesser extent representation has also been a topic of focus within cultural studies, in the form of the analysis of representations of groups or individuals in the mass media (Hall 1997). Although this work has also been strongly influenced by post-structuralist theories.

scientific practice (Lynch 1994). Lynch argues that constructivist work in the sociology of science contains a faulty description of representation. This comes from an attempt to detach different practices of representation from their sites of origin, and demarcate them as instances of 'representation' in the abstract. So, instead of the embeddedness of deeds in complex chains of action which could loosely fall under the rubric of 'representation', we are given a generalised description of representation. Specifically, Lynch highlights Callon and Latour's actor-network-theory (Callon 1987; Latour 1987). In actor network accounts of a particular situation we are often given a story of how particular actors speak for other actors – how they come to 'represent them'. To Lynch, the fatal move here is that this description is taken to stand for the activity of representation *in toto*:

> … the topic of representation […] is often elevated to a master status that covers a broad range of practical activities, together with their theoretical, instrumental and textual resources and products. (ibid)

Lynch's criticism focuses on a particular tension in Latour's work between grand social theory and local in-depth description. It is at this point where 'actor network theory' becomes a theory, despite Latour's protests (Latour 1999). For in this work the processes of representation, circulation, transformation are sometimes described not as attended features of a genre of description, but rather as fundamental discoveries about social action. In Latour's chapter 'Circulating Reference', for example, there is a particularly revealing discussion of some scientific fieldwork in the Amazon (Latour 1999). In Latour's descriptions we see

how the scientists translate soil in the Amazon, through a number of intermediate representations, into a scientific paper. Soil is measured, becomes annotates in a notebook and finally through movement both physical and mathematical, becomes a graph in a scientific paper. This movement from soil to document describes very clearly some of the transformations by which – in a series of small transformations – the very different world of the Amazon is spoken of in a scientific paper. Latour calls these transformations together 'the chain of transformation', where at each stage a different representation takes the place of the last one. At each stage each transformation seems reasonable – but the accumulation of these transformations results in a large final gap between 'reality' and 'representation'.

Latour's description is helpful in a number of ways. His prose lets us visualise the movements and connections between disparate objects. This understanding certainly can help in different settings; we need not assume that all representation is like Latour's descriptions to admit how we could understand better other representational practice having read Latour's descriptions.

**Figure 1: Latour's chain of transformation (Latour 1999a, p. 70)**
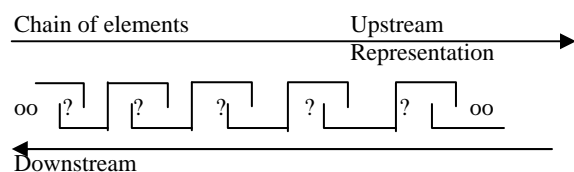


Yet Latour makes a twist in his argument that is perhaps less agreeable - he makes this description of representation stand for representation. Latour gives us a diagram (fig one) and explains this is the 'chain of

transformation'. This is how representation works, Latour argues. Just this. That is, Latour has decided what representation is, he has produced a detached description based on field work. From this account Latour finds grounds to describe the activities of the scientists as an instance of his abstraction, rather than his abstraction coming from the activities of the scientists.

It is this fundamental move which perhaps makes Latour of interest to mainstream social sciences – they are used to this form of description – yet it causes problems for an ethnomethodologist like Lynch. In countering this view Lynch argues that representation should be seen as a complex indexical activity, with much variety, rather than something simple and fundamental. Lynch argues that to understand representation we need detailed investigations of the actual uses of this familiar concept: 'examining what people do when they engage in an activity that makes some or more 'representation' perspicuous; learning some of their practices' (Lynch, 1994, p. 149) That is, an attempt to describe what variety of activities do fall under the rubric of representation, rather than instances of representation held up as examples of a theorised view of representation.

While there is much to agree with in Lynch's criticisms of Latour, Latour's work does pull off one particular move very successfully; Latour moves from what mainstream sociology would call the 'micro' to the 'macro', without loosing sight of the actions which make such a move possible. He argues this move is the result of his own transformations, just as it is for ordinary actors. The macro, then, is a local accomplishment, but not any more 'real' or 'false' for that: 'the fact that ethnomethodologists might manage to convince their colleagues that macro-actors do not exist proves nothing about their non-existence' (Callon and Latour 1981, p. 299). As he makes the same transformation himself, his work contains a knowing wink to reflexivity. As Latour points out many times, he himself is attempting his own transformation, his own transformation and reduction: building his own actor network. As such, his description stands as one which is always refutable; it is never the final world. In this reading, Latour is being more playful; his chain of transformation will perhaps stand for some readers/authors for some time. Under this reading Lynch's call for 'more detail' becomes another move. We have another theory of representation (another representation - although we might claim it is sufficiently concrete to resist the title of theory). Under this reading Latour is attending to similarities in descriptions of representational practice, whereas Lynch emphasises the differences.

Following from this reading, in this paper I would like to discuss a description of representation that is both sensitive to Lynch's call to look at the details of representation, but also uses some of Latour's insights to understand something of the practices involved. Of course, a combination of work like this has the potential to be problematic; ethnomethodologists have been consistently critical of Latour's work (for example, Button 1993). Yet this acknowledged, there is an extent to which Latour has attempted to remain true to the findings of ethnomethodology (Latour 2000) (even writing about the unique adequacy requirement), and there is some room to use Latour's descriptions within a more ethnomethodological project.

## The study

I now move on to the main part of this paper: my ethnographic study. In describing this ethnography I will focus on the nature of one representation that was used by the staff in that company, and some of the transformations to that representation which resulted from its computerisation. This description attempts to understand how a specific representation worked, and the activities around that representation, and to combine it with Latour's descriptions of representational practice.

The data which will be discussed here originated in a three month ethnographic study of Narajo Oil, a large British oil company based in the south-east of England. While researching Narajo, I participated in the information systems department as a part-time unpaid programmer working on various programming projects. My time at Narajo was formally divided equally between programming and observation. This gave me access to the different departments in Narajo which I used to conduct interviews with staff company wide. Narajo is a world-wide oil company with a number of oil rigs operating in the North Sea. The headquarters housed, at the time of this study, around three hundred staff including geologists, engineers, financial staff and upper management. Although fully owned by its American parent company, Narajo had considerable independence, with the running of the company being in the hands of its own managing director. While studying Narajo I was assigned to a project developing an electronic timesheet system - nicknamed 'timewriting'. This system was designed to replace an existing paper-based process for measuring the time

staff worked on various company projects. Staff had previously completed an account of their time on paper timesheets, and this system was now to be computerised using the Lotus Notes groupware system. [2] Here I will focus on how this timesheet system was used, and on some details about its operation and computerisation. In other work I have highlighted aspects of the above discussion with relevance to the politics of the computerised system, and in the way in which the system followed rules vis-à-vis the users of the system (Brown 2001).

## The paper system

Nearly every member of staff at Narajo had to complete a timesheet listing how they had worked that month. This information was used for a number of purposes, but primarily to charge other operating companies for work done on shared oil fields. Since oil fields are often operated by more than one company, there is a need to exchange money between the partners for the hours worked by each company's staff. At Narajo this was done by allocating each oil field a financial code, and staff 'writing time' against the codes for each field on which they had worked. Codes were also used to track time spent in training, meetings, and so on.

The paper timesheets (see Figure 2) were designed so as to break down hours worked on a day by day basis. Staff were asked to write valid finance codes along the side (right hand side),

---

[2] So in one example of an actor network analysis, Callon's account of the farming of scallops in St Briuc Bay, scientists attempted to 'represent' scallops which were involved in an experiment, and to describe and control the scallops for the other actors involved (Callow 1986).

a brief description on the left, and then fill in the hours worked on the grid. Once the timesheet had been completed, it would be sent to the timewriter's manager for approval, and if it was approved it would be forward on to the finance department. The finance department would then type the hours on the approved timesheets into the centralised Oracle financial computer system, and the hours worked would be calculated in the terms of each project and code. These numbers would then be used to make money transfers between the different organisations working on the shared oil-fields.

**How were timesheets completed?**

Being part of a team concerned with computerising timesheets was an opportunity to investigate how common artefacts like timesheets are used. Interviews were conducted with users to investigate how they completed their timesheets, and how the timesheets fitted into their work practice. Since a timesheet is a way of recording activity - what you do during your day at work - the first question to be asked when completing a timesheet is what activity should be put down on the timesheet. What is timewritable work and what isn't? As one timewriter remarked:

> Although, say, rearranging my office might be admin I will not actually bother timewriting this.

Staff had to decide what should and should not be put down on their timesheets, balancing different contingencies. Staff would not timewrite activities that could be considered 'frivolous'. Seldom has a timesheet been handed in which included activities such as 'making cup of tea', 'going to the toilet', or 'gossiping about colleagues'. It would be ridiculous to have a time code for 'extra long lunch hour' since no one would seriously use such a code. But this is not to say that such events were not common. It is not just that these activities are too short to be worth timewriting, rather it is that the timesheet was an 'account' of what went on. Other factors and conventions intervened. Staff had to choose what activities to timewrite that would help produce the timesheet as an appropriate, sensible and relevant account of their time.

This sort of work can be seen more clearly in how staff coded their activities. The individual activities on the timesheet were coded using finance codes. This brought together all sorts of different activities and coded them not in terms of their inherent characteristics, but in the terms of a predefined standardised coding. This standardised formalisation made the work done by all the different people in Narajo comparable. The differences between different jobs were ignored and the work described in terms of similarity. For this to work all staff had to use the same finance codes. This list of codes was distributed to staff via the company notice board with the codes continually changing, being 'closed' as projects finished, or opened as new projects started. Enforcing use of only valid codes was a major problem for the financial staff. Staff would often 'write time' to codes which had been closed, or not even bother to write down financial codes.

For the timewriters, the choice of codes to allocate work to was often unclear. Staff consulted their colleagues to ask advice on how they had coded activities.

**Figure 2: A Paper Timesheet**

Sometimes, if an activity fitted more than one job then the hours would be divided between two (or more) codes and allocated equally between them:

> "Usually I get to the right code, but sometimes I split the amounts [hours] across a set of codes equally when he doesn't know what to do"

Thus what was written on the timesheet could be understood in terms of distributing money fairly between different organisations. It did not make sense in terms of a literal account of the working day. The distribution of hours was 'correct', in terms of financial accounting, but not in terms of a verbatim account of their time. This shows that what was a 'correct' timesheet was not defined out of what was verbatim, but was rather a local judgement. The issue is what is correct and appropriate to this timesheet.

Moreover, in composing the timesheet, hours would be 'juggled' so as to appear as a 'fair' account. Since

supervisors approved timesheets, concerns of presenting oneself as having correctly assigned one's time became relevant. One timewriter spoke about how he often worked weekends, but he did not write time at weekends - he would 'juggle the other figures':

> "Although I often work weekends I never timewrite it – I only timewrite eight. Any other activities get squashed outside the eight hours. I'm not interested in showing that I work long hours"

The concern was with consistency between timesheets - for the timesheet to appear 'just like the rest'. The juggling done for this is apparent by glancing through the timesheets. Timesheets show a consistency in the number of hours worked on each day. Although timesheets had different hours worked on each day for different projects, this was 'juggled' by the timewriters so that there would be a consistent numbers of hours spent working each day. The vast majority of

51

timesheets across the whole organisation would have 7, 8 or 7.5 hours written down for each day. But although the timesheets show this regularity, staff did not seem to work strictly nine, eight, or eight and a half-hour days. As shown above staff even worked weekends, although none of the timesheets I looked at in Narajo had time written down for weekend work. The timesheets were therefore not a verbatim representation of the work of the company, but rather one which was fashioned for the job at hand:

"timesheets are a partial account of my activity – it's sometimes downright incorrect."

Completing timesheets was a task which involved concerns such as 'does this timesheet look sensible and believable?', 'does it present a reasonable, professional, sensible way of employing my time?', 'how little time can I spend on completing this timesheet, without producing an incompetent report?' Since staff knew the intended purpose of the timesheet reports, they designed their accounts with this purpose in mind (Bittner and Garfinkel, 1967). They saw no need to produce a perfectly accurate account (even if such a thing was possible) since this would have taken time which could have been usefully spent doing other tasks.

**The electronic system**

The electronic system was completed and deployed during the main period of my ethnography. After this, I visited Narajo twice a week for another three months, both to help with the deployment and to observe its use. A picture of the computerised version is shown in figure. [3] The computerised system supported the same processes as the paper system, yet the process (in part) took place inside the computer system. Timesheets were to be entered and approved online, with the data being automatically imported into the Oracle financial system enabling money to be transferred between organisations. While the system was certainly used in this way, there were still a large number of important processes that took place outside the computer system. It will be these processes, on which the reliability of the computer system depended, which we will focus on later.

A number of changes and practices became apparent from working with the accountants and timewriters with the new electronic system. In particular, the system increased the control which the accountants had over the entry of the timesheets. For example, the system would only allow time to be entered for codes which had been validated by the system. This caused problems if work was done on projects which had not yet been officially opened or alternatively had officially been closed.

In these cases the accountants wanted generally to stop individuals using the invalid project codes. However, there were exceptions in cases where small amounts of work would be done prior to a project starting, or work would be charged at a later date to a closed project.

With the paper system, codes had originally been checked manually. This meant that in these exceptions the accountants checking the code could decide to allow these hours to be entered.

---

[3] For more on the staff use of Lotus Notes see (Brown 2000).

**Figure 3:  The Computerised Timesheet**
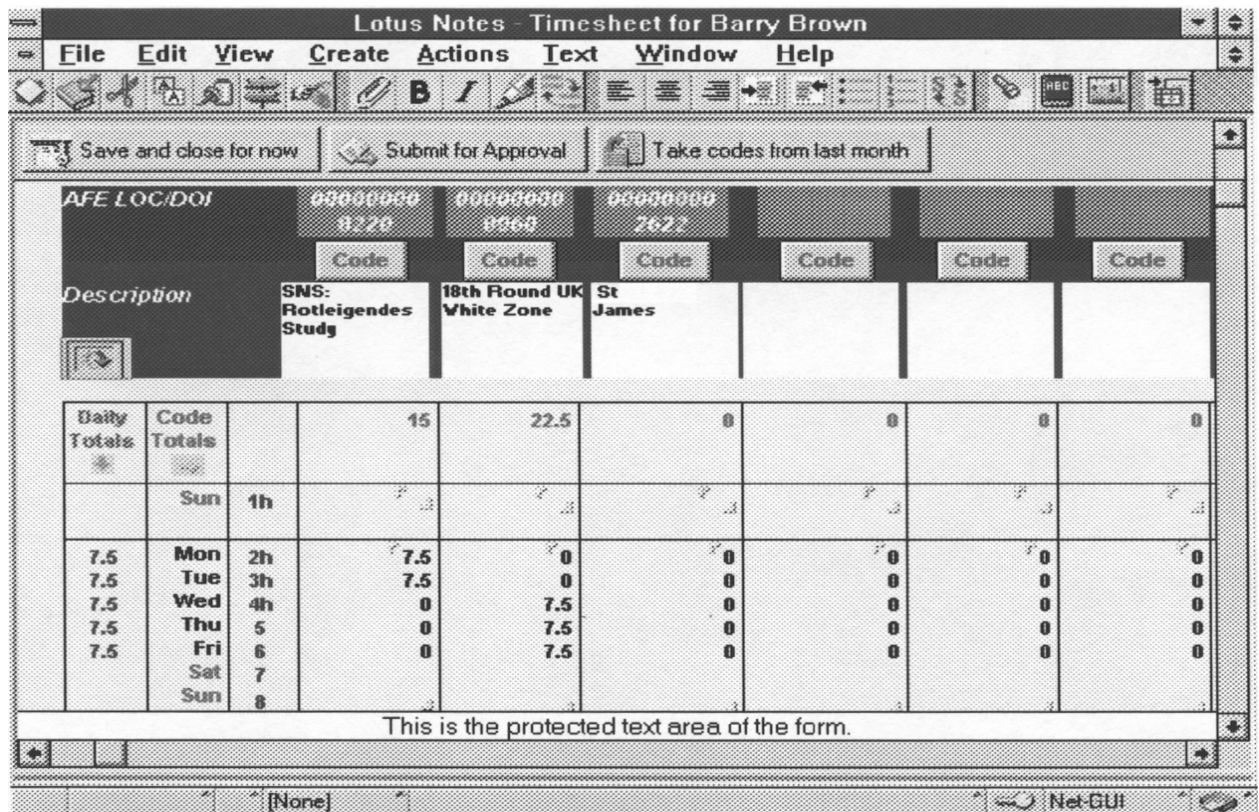


The computerised system showed no such intelligence, blocking what it considered to be invalid codes, necessitating phone calls between frustrated staff and the accountants. While this was seen as problematic for those completing their timesheets, to the accountants it meant that they would have to be contacted in these unusual cases, and they could control the situation. In this way, the design of the system made the system more suitable for the accountants, at the expense of the time-writers.

**Accomplishing accuracy**

These increased controls were important for the accountants in how they contributed to their attempts to establish the accuracy of the timesheet system. That is, that the numbers which the system produced were seen to be reliable and accurate measures for the purposes at hand. Since real money was distributed between companies based on the results of the timesheets, the accuracy of the timesheets was an important organisational matter. This meant that the accuracy of the system was essential to its success. However, making the time-sheet system 'accurate' was not a simple activity, since this representation had no simple 'referent' against which it could be checked. There was no 'hours worked by staff' as an object which could be pointed at. This made accuracy something which must be achieved and displayed using other means. Indeed, the whole timesheet process was annually audited and the results shared with the other organisations with which Narajo collaborated. Accomplishing the accuracy of the

system was therefore a major concern for all involved.

The work of the accountants to establish the accuracy of the system could be called 'representational work' - work to establish and keep the timesheet system believable. This work took many different forms. First of all, it was important that the timesheets were shown to be reasonable in that what they said was 'a reasonable account' of the work in the company. With the timesheet system, one check was to view the average hours worked per staff member. A 'reasonable' figure, then, would be around seven or eight hours. [4] As mentioned earlier the timesheets in the system did show a remarkable consistency in the hours worked per day.

The numbers in the timesheet system also had to corresponded with other representations of the same or overlapping phenomena. In this case, these other representations could be completed documents, verbal accounts or first hand observations – e.g. an employee came into work or the work on a particular project was done. These observations had to tally with the timesheet representation or it would be seen as inaccurate, bringing into question the reliability of the whole system and the potential financial damage that might result.

The timesheet system also had to be seen to be updated. When a phenomenon is likely to change, the representation must also be seen to change, otherwise it will lose credibility.

Representations gradually lose credibility: statistics which are reported yearly, for example, are seen as increasingly out of date and less

accurate as the year progresses. Making the updating publicly visible can help to establish the credibility of a representation by helping to show that a database is 'up-to-date' and thus accurate. For the timesheet system, this entailed monthly deadlines for processing timesheets, demonstrating the 'freshness' of the data held in the system.

After computerisation, the rhetorical superiority of computerised records was also another prop which helped the accountants to establish the accuracy of the system. Computers are often presented as more accurate than the vagaries of paper records. Computers present representations as authorless. As Nagel puts it, they typify the 'view from nowhere' (Nagel 1986; Porter 1993), in that any sense of authorship included within them is deleted. This makes the information included in them appear objective and accurate, detached from the situation of their production. This is at the heart of objectivity, since objectivity is to not be not attached to any particular individual's viewpoint. An automated computer record deletes the author to the extent that it is the computer that appears to be the author. Records are calculated and updated by the computer, and appear authorless.

Lastly, and most importantly in the case of the timesheet system, the workings of the timesheet system could be explained, and reliability could be asserted by referring to these workings. If a representation is known to be updated in a reliable manner then it follows that the contents of the representation must be reliable too. This is the appeal of standardised procedures - they give the appearance that the representation is a regular, reliable entity. Controls play a similar role, since they enforce the 'regularity' of how the representation is updated. For this reason, the accountants who

---

[4] Members of a few departments, such as IS and administrators, did not have to complete timesheets since their services were not charged out to other companies.

worked on the project put considerable effort into displaying the controls and checking which was done to timesheets. When demonstrating the system in a presentation to other accountants, the accountant in charge of the system emphasised that the new system: 'has enhanced controls because the controls are computerised. Just now [a user] can scribble anything on the timesheet'. With an electronic timesheet it was impossible to write outside the boxes on the timesheet. Moreover, the computerised checks demonstrated how the mechanism of the system would enforce the data's reliability. Timesheets with errors or corrections would be printed out and filed away, with attached printouts of emails, to provided an 'audit trail' establishing the accuracy of the record. The accountants would also often make reference to 'the auditors', who theoretically could descend at any moment and demand to see how the process worked, or where the numbers from a given timesheet had gone. [5]

## Chains of Transformation

The description can be compared to Latour's description of the 'chain of transformation'. As Latour puts it, with scientists their concern is with establishing a clear link between each representation they produce as part of their work. So, if a scientist presents a graph in a scientific paper, they want to be able to link it with, for example,

the soil sample the graph refers to. They need to be able to keep the chain of representations intact, linking 'the world' with their account of it. This chain provides a number of steps whereby, if anyone were to ask, the numbers discussed in a scientific paper could be linked to the original samples from which the numbers were obtained. So, a number on a graph can be connected to a set of numbers in a lab book, which can be linked with a set of soil samples, which can be linked to a particular soil sample, which finally can be connected to the soil in a particular part of the world. Latour calls this a 'chain of transformation', in that at each step a small, reasonable transformation is made from one artefact to another – from a soil sample to a number, for example, the end result linking together objects which are distant. 49

As with the scientists, the aim of the accountants was to produce a reversible chain between the representation and the represented – to keep a link so that, if required, numbers could be traced back to individual timesheets, as indeed would happen when auditors visited. The timesheet system, then, was a way of chaining together the work of staff at Narajo, and the data which caused money to be swapped from organisation to organisation. At each stage in the chain the numbers moved further and further away from individual timewriters, helping to establish timesheets as anonymous numbers. Latour calls this 'the cascade of ever simplified inscriptions that allow harder facts to be produced' (Latour 1999b, p. 17). At each stage of this chain different representations are combined. The hours in the timesheet system were transformed from 'by person' to 'by cost code' to 'by the company as a whole'. This re-

---

[5] In Harper's ethnography of a finance department (Harper 1988) he writes about how costs coming from branch offices would be judged by a process of 'looking for the right numbers'. Staff had various expectations for the costs coming from branch offices and looking for anomalies was an important device to find errors. Even if errors were not found, contacting the branch offices to discover the cause of the 'unusual' numbers would help to inform head office of the underlying circumstances.

inscription brought together hundreds of different timesheets and threaded them into an ever more powerful new account. It is more powerful since the contingencies and problems of individual timesheets are hidden in the authorless numbers for each department. The final step in this 'representation building' was when the timesheet hours were exported into an Oracle database. The Oracle financial system was jealously controlled by the finance department since it was the Oracle system which caused real money to be paid out. Oracle had the status of being the 'final representation' - the bottom line. This was not a simple case of impression management - the numbers which entered the Oracle database were accurate, for the purposes designed (Figure 4).

**Figure 4: the chain of transformation for the timesheets**
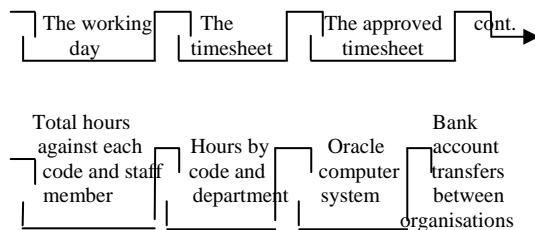


Both the work of the accountants, and the work of the scientists, in building and supporting this chain can be seen as 'representational work', work behind the scenes which made their particular representation work. This work is often not visible, and has not been discussed in the research literature – it has been 'invisible work' to use Nardi and Engestrom's phrase (Nardi and Engestrom 1999). Without this work it would be impossible for systems such as databases to work. These processes, which take the form of 'audit trails', 'random checks', and such like, are

widespread. This representational work establishes the fact that - for the matters at hand - a representation can be said to be linked to what it is purported to represent. For scientists the matter at hand implied careful methodology, for the accountants a process which was seen to be rigorous and auditable. It is this work which establishes representations – such as computer databases - as accurate and reliable.

It should be emphasised at this point that these 'representations', while recognisable features of practice, do not somehow float above the work of those involved. Returning to Lynch's argument above, it was in the everyday practices of those workers that these representations had stable and reliable meanings. However, in thinking about the 'chain' attention is brought on the broader effects of the representation. Large organisations could collaborate with the timesheet system being trusted to correctly allocate millions of pounds between the different organisations. Without the 'objective' view of the work of the company which the system offered, this exchange of money would have been hard to justify and maintain. The movement of timesheets around the organisation allowed the numbers which came out of the system to 'back box' (Latour 1987) the organisation and to reduce all its complexity for the purposes at hand.

Considering how the timesheets work as a chain like this brings the focus on the 'macro' effects of the system – the effects it had in terms of transfers of large amounts of money. As Latour puts it:

> Once files start being gathered everywhere to insure some two-way circulation of immutable mobiles, they can be continued until a few men consider millions as if they were in the palms of their hands. (Latour 1986, p. 28)

And indeed, the significance of the system was substantial to many who knew little of the system. Staff in different oil companies would collaborate on projects with little concern for the timesheets they filled in at the end of every month; yet it was these timesheets that caused the money to pass from organisation to organisation which paid for their wages. Looking at the system in this way lets us see some of its power, in the simple sense of its effects on others. The representation assisted the configurations of labour, money, land and oil.

It is possible to see these effects as 'larger' than the system itself – as 'macro' effects. Certainly, the millions of pounds that exchanged hands could seem as more important that the mere details of the paperwork. However, no specific actions in these processes were bigger than others. We still have the accountants moving paper, money and computer codes about, there is no 'leap' to a larger scale when the money is transferred. Yet this is not to downplay the appearance of scale which takes place when we look at the representation detached from the sites of its production. The system could easily be described simply as a system for the flows of money between organisations. Indeed, this is the way that representations are considered in much of the social sciences, discussion starts at this 'macro scale'. That is, the discussions of representation fail to take into account the details of actions, and instead see only effects. This move, however, leads power to be exaggerated, and the details of operation to be ignored. The fragility of specific representations, and the work which is done to make them work is lost.

## Conclusion

This paper has discussed the use and computerisation of a fairly mundane artefact – the timesheet. The aim has been to show both how it is that a timesheet comes to be used, and the role it plays as a representation. The focus has been on the 'accomplishment of representation', and the work which was put into having the timesheet system work as a valid representation of Narajo Oil. An important aspect of this was the computerisation of the timesheet system. The major motivation for computerising the timesheets was so as to be able to control their production and distribution more effectively. That is, for the timesheet process to be more rigid. It was through this rigidity, through the tight control of what was put into the timesheet, that the accountants could show the accuracy of the timesheets. In this way, controls on the timesheet helped to make the timesheets appear more accurate.

This account of the use, and computerisation, of the system was discussed in the terms of Latour's notion of the 'chain of transformation'. This account brought out the efforts of the accountants at building a steady link between different objects – in Latour's terms building a 'chain of transformation'. While a description in these terms bring attention to many of the practices of work involved in making the database work, it also points out the power and effects that the database had on others. However, this can lead to a view of representations detached from their sites of production and use.

To conclude, this paper investigated some of the ways in which a mundane organisational device – the timesheet – enabled broader actions than itself. This example, although mundane in itself, points us in the

direction of investigating the details of other mundane organisation devices. Go into any organisation and you will find numerous devices like timesheets: reports, files, records are all mundane devices for stabilising 'what is going on' in organisationally accountable ways. In uncovering the details of how these devices are used, one is given a view on the details of organisational life, and something of the everyday mechanics of organisations.

**Acknowledgements**

**References**

Bittner, E. and H. Garfinkel (1967). Good organisational reasons for bad clinical records. *Studies in ethnomethodology*, Prentice Hall.

Brown, B. (2000). 'The artful use of groupware: an ethnographic study of how Lotus Notes is used in practice.' *Behaviour & information technology* 19(4): 263-273.

Brown, B. (2001). 'Unpacking a timesheet: formalisation and representation.' *Computer supported collaborative work*, In Press.

Butler, J. (1989). *Gender Trouble*, Taylor and Francis.

Butler, J. (1994). For a careful reading. *Feminist contentions: a philosophical exchange*. S. Benhabib, J. Butler, D. Cornell and N. Fraser. London, Routledge: 127-143.

Button, G. (1993). The curious case of the vanishing technology. *Technology in Working Order*. G. Button. London, Routledge.

Callon, M. (1986). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Briuc Bay. Power, *Action and Belief*. J. Law. London, Routledge & Kegan Paul.

Callon, M. (1987). Society in the Making: The study of technology as a tool for sociological analysis. *The social construction of technological systems*. W. Bijker, T. Hughes and T. Pinch. Cambridge, MA, MIT Press.

Callon, M. and B. Latour (1981). Unscrewing the big leviathan: how actors macrostructure reality and how sociologists help them to do so. *Advances in social theory: towards an integration of micro- and macro-sociologies*. K. Knorr-Certina and A. V. Cicourel. Boston, MA., Routledge.

Derrida, J. (1976). *Of Gramatology*, The Johns Hopkins University Press.

Hall, S., Ed. (1997). *Representation: cultural representations and signifying practices*. London, Sage/Open University.

Harper, R. (1988). 'Not any old numbers: an examination of practical reasoning in an accountancy environment.' *The journal of interdisciplinary economics* 2: 297-306.

Latour, B. (1986). 'Visualization and cognition: thinking with eye and hands.' *Knowledge and Society: Studies in the sociology of culture past and present* 6: 1-40.

Latour, B. (1987). *Science in action*. Cambridge, Mass., Harvard University Press.

Latour, B. (1988). 'Mixing Humans and Non Humans Together: The sociology of a door-closer.' *Social Problems* 35 (3): 298-310.

Latour, B. (1999). Circulating Reference. *Pandora's Hope*. B.

Latour. Cambridge, Mass., Harvard University Press: 24-79.

Latour, B. (1999). On recalling ANT. *Actor Network and After*. J. Law and J. Hassard. Oxford, Blackwell: 15-25.

Latour, B. (2000). 'When Things Strike Back a Possible Contribution of Science Studies to the Social Sciences.' *British Journal of Sociology* 51(1): 105-123.

Lynch, M. (1994). 'Representation is over-rated.' *Configurations* 2(1).

Nagel, T. (1986). *The view from nowhere*. New York, Oxford University Press.

Nardi, B. and Y. Engestrom (1999). 'A web on the wind: the structure of invisible work.' *Computer supported collaborative work* 8: 1-8.

Porter, T. M. (1993). Information, power and the view from nowhere. *Information acumen: the understanding and use of knowledge in modern business*. L. Bud-Frieman, Routledge.

Poster, M. (1990). *The mode of information: post structuralism and social context*, Polity Press.

Potter, J. (1996). *Representing Reality*. London, Sage publications.

Smith, D. E. (1996). 'Telling the truth after postmodernism.' *Symbolic Interaction* 19(3): 171-202.

Thrift, N. (2000). 'Afterwords.' *Environment and planning D: space and society* 18: 213-255.