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Published on: 01 Aug 2006 - Journal of Information Technology (Palgrave Macmillan UK)

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Research article

Hospitality, improvisation and *Gestell*: a phenomenology of mobile information

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Abstract

This paper reports on longitudinal research into the implementation and use of the first mobile vehicle mounted data system (VMDS) at a UK fire service. Using insights from Claudio Ciborra's work, the paper develops a phenomenological ontology for conceptualising the co-constitutive relation between organisational practices and information technology mediated practices. The paper sets out how the brigade's mobile data system can be understood in terms hospitality, improvisation and *Gestell*. It is argued that despite the seemingly innocent and potentially mundane replacement of paper-based practices by electronically mediated mobile information and communication, the VMDS is associated with significant and far-reaching outcomes, both empirical and ontological, within the brigade and for the modernisation of fire service provision across the UK. We suggest that the dynamic of hospitality between guest and host provides a way to think through and beyond the deployment information infrastructures as enframed by a technological mood. The paper concludes with some general implications for a phenomenology of information technology.

Journal of Information Technology (2006) 21, 140–153. doi:10.1057/palgrave.jit.2000063

Published online 1 August 2006

Keywords: *Gestell*; improvisation; hospitality; fire services; phenomenology; vehicle mounted data system (VMDS)

Introduction

In his work, Claudio Ciborra (1998b, 1999a, b, 2000, 2001, 2004) does not simply offer us a new set of normative models, guidelines or suggestions of how to develop and use information technology. He is not even suggesting that we 'go out there' and study in more detail the seemingly endless 'failure' of IT (Sauer, 1993). Rather, he is proposing that we rethink our very way of approaching the phenomenon of IT – to take more careful note of our assumed or explicitly chosen ontology. In his view our starting point was wrong from the start. In building and using tools we tend to think of these as 'objective' material things (separate from us) that we can simply use (or not) to do whatever we want to do. This view is rooted in our everyday intuitions in which the subject/object dualism is taken for granted, that is, in a form of naive realism (or the 'natural attitude' in Husserl's terminology). This relationship between us and our tools is often expressed as a means/ends relationship where technology is designed as a

means (or tool) to achieve a particular end (defined by the designers and users). According to this view, we need to understand and manage the 'impact' that IT has on organisations, or social practices more generally, as it is taken up and used in everyday situations. To do this, it is proposed that we study many different examples and then inductively build general models that are supposed to 'tell us' how to best manage IT. However, when we go into organisations these 'idealised' abstractions never seem to fit the messy specificity of everyday life (Ciborra, 1998b) – every example seems to be an exception to the model that is supposed to describe it. The route out of this is not more models, or more detailed descriptions, but rather a radically different approach, from the start. Ciborra proposes an entirely different ontology to the realist 'tool' paradigm or even the constructivist paradigm.

He suggests that we ground ourselves in phenomenology – mostly the work of Husserl and Heidegger – and also their



successors in the work of Derrida and Levinas. He suggests that we do not simply proceed to design and use our tools differently but that we reconsider radically our very way of approaching or making sense of the phenomena of IT as it reveals itself to us in everyday practice. To facilitate this new approach he puts forward a new language (quite unfamiliar to our Cartesian ear) – such as hospitality, care, *Gestell*, cultivation, drift, etc. This paper intends to give the reader an appreciation of the importance of Ciborra's work, to further elaborate this work, and to provide a sense of the intellectual tradition from which these ideas emerged.

The paper is structured as follows. First, we provide an account of a phenomenological understanding of technology that forms the background against which the paper as a whole should be read. Second, we put forward and discuss three concepts from Ciborra's work – hospitality, improvisation and *Gestell* – that will inform our presentation and analysis of the empirical context. Third, we present and interpret the implementation of a vehicle mounted data system (VMDS) at a UK fire brigade. From this, we provide a discussion of the case in terms of a phenomenologically based ontology of hospitality, highlighting how Ciborra's distinctive vocabulary allows us to see the VMDS in ways not possible through a traditional Cartesian ontology. Finally, we suggest some conclusions and implications of his work for researching information technology.

On a phenomenological understanding of technology

The problem with the 'tool' view of technology – where technology is seen as objective tools (or mere means) for us to use in order to achieve our objectives (or ends) – is that it suggests these tools are simply of our making and at our behest. More precisely, such a view believes that we can make and use these tools without them immediately and simultaneously (re)making and 'using' us. Phenomenologists (Heidegger, 1977a, b; Borgmann, 1984, 1999; Ihde, 1990, 2002; Dreyfus, 1992, 1993, 2001; Introna and Ilharco, 2004) would argue that technology and humans are each other's condition of possibility for being – that is, they always and already co-constitute each other. Let us consider an example to see what this means.

When a consultant takes up a mobile phone the consultant acquires a certain capability (to contact and be contacted) but that is not all that happens. We need to look at this seemingly obvious statement of 'consultant,' 'mobile phone' and 'taking up' more closely. The mobile phone only becomes 'a mobile phone' when taken up by the consultant. When it lies on the table it is a potential to be 'a mobile phone', but it only becomes an actual 'possibility for contacting' when it is picked up and one dials the number, and, of course, there is sufficient credit on the account, and it is possible to get a signal, and so forth. In taking up the mobile phone, both the mobile phone and the consultant become transformed. The mobile phone is no longer 'merely' an object and the consultant becomes a human that embodies the possibility to contact and be contacted at a distance. With the mobile phone in hand, the world, now and in the future, becomes revealed in new ways (for example, a person 'far off' is suddenly 'near'); previous possibilities not visible or evident at all suddenly emerge as possible possibilities – some intended, some unintended.

What this example shows is that the mobile phone and the consultant are each other's *constitutive condition* for being what they are as 'mobile phones' and as 'consultants.' Obviously, the mobile phone is just one of a multiplicity of constitutive relations that constitutes the horizon of possibilities for a person to 'be a consultant'. Phenomenologists argue that the realist or constructivist account of technology (and/or organisations) posit these phenomena (consultant and mobile) as if speaking about the one (organisation or technology) does not *already and immediately* draw upon the other for its ongoing sense or meaning – for its way of being what it is already taken as. In other words, they are each other's ongoing transcendental condition or possibility for being what they are taken as – 'not transcendental' is here understood as 'that which constitutes, and thereby renders the empirical possible' (Mohanty, 1997: 52). Thus, we and our technology are an indivisible unity *from the start*. Heidegger (1962: 297) argues in *Being and Time* that we humans (which he calls *Dasein*) exist in an ongoing structural openness 'towards' the world in which the self and the world is always and already a unity, a being-in-the-world in his terminology.

In our example, thus far we have limited our discussion to the relationship between the person and mobile phone. As such we have not yet revealed the full transcendental or constitutive horizon at work in our example. Recognizing the possibilities or affordances (i.e. the perceived properties of an artefact that suggests how it should be used (Norman, 1988)) of the mobile phone draws on *a priori* familiarity with a world where things like mobile phones and the act of phoning by using a device already makes sense – we can imagine many where it would not make sense. If we were to locate the mobile phone in a culture where such practices do not exist at all, the mobile phone will not even show up as 'a mobile phone'. It might just show up as an odd and strange object lying there. Thus, for our example to make sense at all – also for us as readers – it draws on an already present familiarity of a world in which such things and a practices already makes sense (Heidegger, 1962: 97–98).

Moreover, we do not simply take up a mobile phone for its own sake. We take up technology with an already present reference to our ongoing projects or our concerns. As human beings we are always already projected, we are always already ahead of ourselves – anticipating and actively shaping our future possibilities to be. By this we mean that we, in our everyday going about, are always already immersed in a nexus of concerns that constitute us as that which we are, as, for example, 'managers', 'consultants', 'academics'. The mobile phone will only show up or stand out as something potentially relevant and useful in a nexus of concerns where the possibility of contacting 'at a distance' might be a necessary condition to realise the concerns that constitute the 'who' that such a mobile phone assumes. Heidegger (1962) argues that we are always and already immersed in a whole nexus of concerns. This is why Heidegger (1962: 236) claims that our human way of being is care (care as in things already 'mattering' to us) – we always already care to be somebody in particular rather than just some body. We do not simply bang on keys, we use the laptop to type, in order to, for example, to write this paper, to send e-mails, and to surf the web. Moreover, the writing of this paper refers to the possibility of a

publication. This publication refers to an audience, which refers to a discipline, which refer to future audiences, which refer to other research, which refer to promotion, and so on. It is this prior and already understood nexus of references that makes this activity of typing on this keyboard, here and now, already obvious and meaningful. Heidegger (1962: 118) calls this recursively defining and necessary nexus of *projects* and *tools* 'the world' – as in the 'the world of acting', the 'world of business,' the 'world of the academy'. For phenomenologists, technology makes sense and has its being only as something always and already in-the-world. Let us now consider how Claudio Ciborra uses these insights of phenomenology to talk about our relationship with information technology.

Hospitality, improvisation and Gestell

Hospitality

Ciborra (1999a), drawing on the insights of phenomenology outlined above, suggests that technology is not a 'passive' actor, just there, but is rather an actor which already actively draws upon and *remakes* the world it inhabits. Moreover, as users draw upon technology much of this 'remaking' will surpass the intentions that the designers attempted to 'build into it.' It would therefore be more appropriate to treat this non-human actor in our midst as a sort of a 'stranger' rather than as a familiar servant. This important insight leads Ciborra to adopt the concept of *hospitality* suggested by Derrida (1999, 2000) as a way to make sense of our ongoing co-constitutive relationship with IT. Ciborra (1998b: 196) suggests that hospitality 'describes the phenomenon of dealing with new technology as an ambiguous stranger'. The adoption on this word seems relatively innocent, but it has very important implications for how we conduct ourselves towards IT.

According to Derrida (1997: 110), hospitality is the 'welcoming of the other; the invitation to the stranger'. However, in its Latin root hospitality also suggests something else:

hospitality derives from the Latin *hospes*, which is formed from *hostis*, which originally meant a 'stranger' and came to take on the meaning of the enemy or 'hostile stranger' (*hostilis*) + *pets* (*polis*, *poles*, *potentia*) to have power (Derrida, 1997: 110–111).

Hospitality, to be hospitality, also contains its opposite within itself: without the potential for hostility, hospitality does not make sense. Ciborra suggests, with Derrida, that hospitality is about crossing the boundary between us and the 'stranger' without abolishing this boundary. Hosting technology is about 'establishing a paramount symmetry between humans [the host] and non-humans [the guest]' (Ciborra, 1999a: 198). Nevertheless, it is a symmetry based on a fundamentally asymmetrical hosting relationship – asymmetrical since 'we want to honour the guest *and* keep him/her at a distance *at the same time*' (Dikeç, 2002: 229, emphasis added). Yet symmetrical because there is the ongoing possibility of a reversal in which the host becomes guest: host and guest accepts that they may need to

reconsider their practices, rituals and customs – not to simply abolish them or to appropriate wholesale those of the other (this would be imposition or assimilation), but to remain open to the possibility of needing to be generous. How does this hosting relationship manifest itself? Ciborra (2004: 114) explains:

technology, as a guest, presents itself to the host endowed with affordances. Affordances trigger a network of commitments by the host.... But that is just the beginning of an open-ended process: the guest also possesses its own dynamics and will begin to align the host according to certain needs and constraints ...

Ciborra argues that in this reciprocal hosting relationship a number of phenomena emerge that are important to attend to if we are to understand the subtlety of this relationship. He suggests that through hosting technology becomes 'humanised'. Affordances become constituted (or reconstituted) and situated in ongoing practices (see also Gibson, 1979). They emerge to those approaching the technology as obvious 'possibilities-to-do' this or that. Note, however, that affordances may seem strange (why would you want to do that?) or may not even show up at all. Indeed, they often show up as annoying features of the guest. This is because the guest brings with it its 'own world'. The host must also take heed of these 'needs and constraints' of the guest and not simply try and 'abolish this boundary' by trying to impose its world onto the guest – this would not be hosting, hosting requires that we accommodate the guest, as a guest. Ciborra proposes that in practice we find this accommodation of the guest manifesting itself through practices such as *bricolage*, tinkering and improvisation. Ciborra (1998b: 116) suggests that '[t]hese highly situated human activities are far from being the result of the practitioner as an artist, or a snob. They belong to the core of the human institution of hospitality. They express the thousands, subtle ways in which humans ingeniously discover, discern, interpret and act upon the shades of the encounter with technology as an ambiguous stranger'. Let us consider these in more detail.

Improvisation, bricolage and tinkering

Improvisation, *bricolage* and tinkering are not simply surplus or incidental activities 'added on' by incompetent users that ought to be targeted so as to bring the system 'back under control.' They are essential practices of hospitality. Obviously, they may not always be efficient and they may even look 'wasteful'. However, on closer inspection they may indeed be examples of skilful coping by actors that have a subtle understanding of what it means to host a guest. How does this skilful hosting happen? Can we give a more sophisticated account of them that goes beyond describing them merely as good or bad 'patches' or 'workarounds?' (see Robey *et al.*, 2002).

Ciborra (1999b, 2001) argues that improvisation happens as part of our *Befindlichkeit* (a term he takes from Heidegger). *Befindlichkeit* 'combines the idea of situatedness and of feeling and faring, of where and how one finds itself (Ciborra, 2001: 6). It reflects a certain *mood* in which we find ourselves. Mood is understood as a certain

attunement with the situation – such as the ‘sensing of the mood of the meeting’. Importantly, the ‘mood of the meeting’ is not something we choose, it is rather something we already find ourselves in when we become aware of it. Heidegger (1962: 172–179) argues that mood is not merely ‘feelings’ that accompany the ‘higher-order’ faculties of cognition, will and reason. It is rather the reverse. The so-called ‘higher order’ faculties have as their necessary condition the already disclosedness of the (im)possibilities of the world that mood as attunement already provides. As Heidegger (1962: 137, emphasis added) suggests: ‘[t]he mood has already disclosed, in every case, Being-in-the-world *as a whole*, and makes it possible first of all to direct oneself towards something’. Skilled actors, who are in tune with the disclosure of the mood, grasp ‘in the moment,’ as it were, the world as a whole with all its (im)possibilities.

Ciborra (2001) discusses the well-known Mann Gulch fire disaster first analysed by Weick (1993). He contrasts the behaviour of Dodge (the leader and a survivor of the disaster) with the smokejumpers who died. Dodge survived because he improvised in the moment – what Weick terms a ‘cosmology episode’. As a skilled and experienced fire fighter, Dodge realised immediately that he had to remove from his surroundings the resources (i.e. grass) that the approaching fire needed to burn. So he lit a fire and jumped into his own smouldering fire. Being attuned to the mood of the ‘world of fire and fire fighting’ *as a whole* the right thing to do was disclosed as evident. He did not need to think and work it out. In the moment he just ‘knew’ what to do, as Ciborra (2001: 9) describes:

The team members were victims of panic, and in this fundamental mood they interpreted what Dodge was doing [lighting a fire] as ‘going nuts’ and an explicit authorization by their captain for everyone to go mad. Panic determined their experiencing lack of time and being overwhelmed by the world, the forest on fire.

This is a rather dramatic example of improvisation. Ciborra suggests that the disclosure of the world, in mood, can overwhelm us and shift to a mood of panic or we can respond to it with resoluteness (see Heidegger, 1962: 296). Most improvisation, bricolage, and tinkering happens, however, as an integral part of ‘simply getting the job done’ – as we document in our study below. Nevertheless, they are all based on a certain attunement (Dreyfus, 1992).

Hosting technology and accommodating it does not reveal the full horizon of the meaning of technology in the world where it functions as such. There is another horizon that is relevant. This is the way the technology ‘sets up’ a world in which certain possibilities emerge as possible and others not. We now need to turn to Ciborra and Hanseth’s (1998a) use of the Heideggerian notion of *Gestell*.

Gestell as the enframing of technology

Heidegger (1977a: 4) famously claimed that ‘the essence of technology is nothing technological’. Technology is not a particular technical artefact or our relationship with this or that artefact. Rather, artefacts, devices, infrastructures – and our relationship with them – are *already* an outcome of a particular ‘technological’ way of seeing and form of

conduct that apprehends the world as something to be ordered and shaped in line with our projects, intentions and desires. In this ‘technological mood’ or ‘enframing’ (*Gestell* in German) problems show up as *requiring* technical solutions: ‘Enframing means the gathering together of that setting-upon that sets upon man, that is, challenges him forth to reveal the real, in the mode of ordering, as standing-reserve’ (Heidegger, 1977a: 305). Thus, in a technological age the world is already ‘framed’ as a world available ‘to be ordered’. Technology makes sense because we already live in the technological mood that discloses or reveals ‘our world’ as already enframed in this way – as available resources for the ongoing ordering. As Ciborra (2004: 73) explains:

The *Gestell* captures all that is extant and makes it available through a stock to be put in circulation. Machines are built and applied, science generates new solutions that get converted into new systems and applications because of the *Gestell*, not the other way around. Nature itself loses the property of being an object (*Gegen-stand*) and becomes *Be-stand*, i.e. standing reserve of available resources to be exploited in the process of circulation.

Ciborra and Hanseth (1998a: 321–322) suggest that IT is a good example of the manifestation of *Gestell*. IT infrastructures act as ‘formative contexts, [that] shape not only the work routines, but also the ways people look at practices, consider them ‘natural’ and give them their overarching character of necessity. Infrastructure becomes an essential factor shaping the taken-for-grantedness of organisational practices. Imagining, world views and reform initiatives, or new designs are moulded by the subtle and hidden influence of infrastructures’. As many organisations become increasingly dependent on IT more and more of our world becomes enframed as available resources. In the end, humans also become framed as available resources. How could we respond?

Heidegger suggests that we cannot ‘get rid of technology’ because it the modern mood in which we already find ourselves. It is *through* and *beyond* this mood that we must find a way to affirm technology. Once we grasp *Gestell* a possibility opens up for things to be otherwise. Ciborra suggests (2004: 77–78; see also Ciborra and Hanseth, 1998a: 322), summarising Heidegger and Dreyfus, that this can take different forms. For our purpose here we highlight the following:

- *The ability to jump, or switch Gestalt*: The jump is needed to get out of the calculative and instrumental thought [of *Gestell*], and approach domains where man [humans] can ‘start asking questions of being anew’.
- *Shifting fluctuations to the centre stage*: Taking up practices that are now at the margins of our culture and make them central, while de-emphasising practices now central to our cultural self-understanding.

We will show what this might mean though a case study below. Now that we have a different language to think about our relationship with IT, let us look at a particular case and

see if these concepts will enable us to give a new and innovative way to make sense of the actors in the case.

Contextualising the research

Studying mobile information at Hereford and Worcester fire brigade

The research took the form of an in-depth and long-term case study of a mobile data infrastructure for front-line fire crews. This methodological approach stemmed from the epistemological assumption that to understand the way mobile data was deployed it was necessary to understand the dynamics of IT implementation and use over a considerable period of time. Hereford and Worcester Fire Brigade was chosen because it had implemented a VMDS and offered high-quality research access. The VMDS was also the first of its kind in the UK fire service and was considered to have important best practice implications for the provision of information to fire crews across the UK. Researching the VMDS also provided the opportunity to research generic themes of IT and organisational change in an under-researched part of the public sector.

The research was conducted in four overlapping stages that began in 1997 and has continued to date. The *first stage* comprised 24 semi-structured and taped interviews conducted with all levels of the brigade's hierarchy during 1997–1998: the deputy chief fire officer, divisional, assistant divisional, station and sub-officers, watch commanders and firefighters. Interviews focused on the implementation, use and the trajectory of the VMDS. Interviews, which were recorded and transcribed, lasted between 45 min and a number of hours. Informal group interviews, which were usually not recorded, were conducted with nine crews plus individual firefighters. These usually took place during the 'stand down' time after 21:00 hours when fire crews could be interviewed at length. Initial ordering of research data followed interview themes but over time data was re-examined in a recursive relationship with theoretical interests.

The purpose of the *second stage* was to understand how fire crews used the VMDS. Observations were conducted for intensive week-long periods plus occasional ongoing visits at six of the largest stations. Observation included demonstrations of the VMDS and more typical ethnographic observation of crews' watch routine. The brigade's command and control centre and the brigade's Operational Intelligence Unit were also observed over an intensive 2-week period. Written notes were made in a research diary and written up with comments and reflections. The *third stage* involved the collection of documents about the brigade. This took place primarily at the brigade's head office and Operational Intelligence Unit and included: internal communications and newsletters; brigade policy documents and performance plans; training manuals; minutes from meetings; VMDS records and pre-VMDS records. The *final stage* involved archival research on the fire service and comprised of visits to the National Fire Service library. This provided access to Home Office, Office of the Deputy Prime Minister (ODPM) and Her Majesty's Fire Service Inspectorate (HMFSI) reviews and reports, White Papers, parliamentary debates and statutes, specialist

fire service publications, and publications from the union and the Chief Fire Officers' Association.

Contextualising UK fire service provision

Fire services respond to emergency fire calls and have a statutory duty to attend fire-related incidents and undertake fire safety work. The UK fire service is publicly funded, but brigades are directly accountable to local fire authorities, which receive funding, policy guidance and instructions from central government. Apart from a 7-year period of nationalised fire services from 1941 to 1948, local fire authorities have controlled the provision of fire services. De-nationalisation in 1948 led to local control by 141 city and county boroughs. In 1974, 62 large county brigades replaced city and county boroughs, and in the mid-1980s many county brigades were reorganised. As part of local government reorganisation during the 1990s, a number of brigades, including Hereford and Worcester, have become local and independent fire authorities.

In parallel to the local provision of fire services, there are national standards and performance criteria placed on fire brigades. The 1947 *Fire Services Act* specified national criteria for crews attending incidents (e.g. time to get to an incident and minimum number of firefighters), standards for building risk classification (e.g. classification depending upon type of density of buildings) and collectively negotiated working practices. De-nationalisation also established a corporatist practice of multi-stakeholder national-level decision making. Rhodes (1985) characterised such practices as the embodiment of the post-war assumption of the public sector as a model employer and negotiated change:

[W]e all know that the Fire Service is very standardised throughout the country.... in spite of the model standards of fire cover recommending a one appliance [fire engine] response everywhere except A and B risk areas, most brigades still send two fire engines to all property fires.... The make-up of appliance fleets is more varied than at first appears to be the case. For example, some brigades have provided all first line appliances with very comprehensive rescue equipment, while others meet the requirement by having a small number of specialised rescue units (Bassett, 1991: 17).

Throughout the 1980s and 1990s, challenges to national standards, corporatist decision-making and national and local practices have taken the form of central government reviews such as the Audit Commission's 1995 report 'In the Line of Fire'. This report concluded that although the fire service was generally well managed, significant efficiency gains were possible by regionalising local control centres, restructuring overprovision through flexible working practices and reducing absenteeism. Despite national reviews, there has been, according to Bain *et al.* (2002), a disconnection between the recommendations contained within reviews and the level of implementation of change from the 1970s onwards. Bain *et al.* (2002) explain this by the 'weak managerialism' and 'lack of strategic leadership' by senior officers and central government. Bain *et al.* (2002) recommended 'top to bottom' modernisation comprising of

a strategic shift from incident management to fire prevention, devolved conditions and working practices, the allocation of resources based upon changing levels of risk throughout the day, regionalised fire provision and greater collaboration between emergency services.

The Hereford and Worcester Fire Brigade

Hereford and Worcester Fire Brigade is one of the 50 brigades in England and Wales, and is responsible for a large geographical area of mostly semirural countryside but also busy motorways. Unlike the neighbouring West Midlands Fire Brigade, the brigade is comparatively small, non-metropolitan and not known for being a leader of fire service reform (see Cox, 1994: 27). The brigade is comprised of three districts and 27 stations. Five stations are crewed full time (i.e. day and night), 3-day-crewed and 19 retained/voluntary. The brigade has over 700 firefighters, plus over 100 control room and non-uniformed staff. Fire crews' shifts comprise of operational incidents, training, community fire safety, equipment maintenance and risk assessments. Stations have designated 'turn out' areas that set out the geographical boundary of station responsibility, but crews move outside these boundaries for major or concurrent incidents. In 1974 the fire brigades of Herefordshire and Worcestershire were restructured into the Fire Authority for Hereford and Worcester. This organisational structure remained in place until 1998 when Hereford and Worcester County Council was split into two counties, with the management of fire service provision replaced by a Combined Fire Authority covering both counties.

Information technology and the fire service

Policy statements and reviews of the public sector, such as the White Paper on 'Modernising Government' foreground 'joined up' working and collaboration through IT as a key driver of efficiency and public sector modernisation (Cabinet Office, 1999). In contrast, the role of IT has been remarkable by its insignificance in national reports and reviews of the fire service during the 1980s and 1990s. IT is mentioned in the Management Report that accompanies the Audit Commission's (1995b) report, for example, but only in terms of speeding up 'back-office' activities and upgrading mobilising systems at command and control centres. Front-line IT to support fire crews at incidents or the deployment of IT to foster efficiency is not evaluated. Similarly, Bain *et al.* (2002) only briefly mentions IT. A lack of strategic direction, tightening budgets throughout the 1980s and 1990s, year-on-year increases in brigades' funding gaps, and expanding demands for safety activities point to a lack of emphasis on IT. In the 1990s context of doubtful government funding for IT projects across the fire service, IT initiatives have been focused on individual brigades with little focus on standardisation between brigades or interoperability between emergency services.

Hosting mobile information: the VMDS

The brigade installed the VMDS on 36 fire appliances in March 1996. The VMDS is located in each of the brigade's fire appliances/engines and mounted on the front dash-

board. Screens provide access to risk information on buildings; first response tactical plans for large-scale risks; standard incident officer procedures; chemical information, and Ordnance Survey (OS) maps detailing water hydrants. Risk information, for example, comprises of 'address, station area, map reference, predetermined attendance, directions from the nearest main road, information regarding the structure and location of the premises, significant hazards, site location plans, building construction, water supplies, and any special features' (Goodwin, 1997: 39).

The VMDS integrates a wide range of operational information that was previously held on paper, was based at stations, communicated by radio or kept by watches into a standardised and real-time IT infrastructure. Real-time access to the information was often described as 'universal access'. The brigade's Chief Fire Officer describes the functional requirements as comprising of the storage capacity for 2000 risk records; easy, quick and secure access to information by fire crews; the availability of multiple copies; ease of updating; and the ability to audit information placed on the VMDS (O'Dwyer, 1996: 33–34). In addition to real-time access, the management of information was moved from stations to the newly formed 'Operational Intelligence Unit', which is responsible for maintaining risk records, allocating safety inspections and amending operational procedures.

An invitation to the stranger or welcoming of the VMDS?

Hospitality cannot begin with hostility. The guest needs to be welcomed and the guest must present itself as something worth inviting in, even as something needing inviting in; and when it came to the inviting in of the VMDS nothing was as compelling as the death of colleagues. On 6 September 1993, two of the brigade's firefighters died at a major fire incident at a large poultry processing factory called Sun Valley. This incident was a major event at the brigade with over 20 fire appliances attending the incident. In response to the fire, and after an investigation into the deaths of two firefighters, two Health and Safety Improvement Notices were served on the brigade in May 1994 – one for breathing apparatus procedures and the other for *inadequate provision of information*. The latter Notice, which led to the implementation of the VMDS, stated that the brigade was in contravention of the Health and Safety at Work Act (1992) because:

the information held by the Brigade and available to fire crews and officers on particular hazards associated with the design and materials of construction of buildings is insufficient to ensure as far as reasonably practicable the health and safety of firefighters ('The Grapevine', Hereford and Worcester Fire Brigade, 1997: 8, emphasis added).

The basis for the Improvement Notice was the statutory requirement that obliges all brigades to provide information and instructions to firefighters about significant risks they may encounter. At the time of the Sun Valley fire, the brigade's practice, which was common to all UK fire brigades, was to hold a series of paper-based risk cards held

in A4 folders (known as 1.(1).D risk cards or '084s' – written, typed and diagrammatic risk information), which were kept in fire appliances. The Improvement Notice served on the brigade set out a two-fold failure of these practices. The first failure was not to have taken advantage of the benefits of IT: fire services lagged behind other emergency services, which had introduced IT. The second, and related, information failure was that paper-based records did not afford quick access to information by all fire crews.

In response to the Improvement Notice, the brigade's newly formed Operational Intelligence Unit concluded that there were considerable constraints with the existing paper-based system and recommended the replacement of paper with electronic records. Problems with the system of A4 folders included the spatial dislocation of folders, the problem of storing paper records and the temporal problems of accessing risk information before arriving at an incident, especially for crews attending incidents outside of turn out boundaries (see 'The Grapevine', 1997: 8).

In a fire news magazine the brigade's Chief Fire Officer quotes the Improvement Notice in order to assert that coordination post-Sun Valley necessitates the provision of *better information*. The Health and Safety Inspector:

was surprised that a fifth and subsequent appliances which arrived at the scene did not have information that was required to ensure crews' safety and that because of this the Officer in Charge was 'fighting the fire with one hand tied behind his back'.... *the Officer in Charge cannot issue instructions or supervise employees without information* (O'Dwyer, 1996: 33, emphasis added).

Fire crews often acknowledged that before the VMDS there was a flexible but somewhat arbitrary practice of station-based A4 folders, but the above quote directly connects the loss of life with flawed information management practices. Framing the implementation in terms of managing information constitutes the VMDS as a tool to improve record keeping and access to information. This is why the Chief Fire Officer states that:

The system has met all of the criteria set by the brigade and the reaction by firefighters to the introduction of the computer into appliance cabs has been one of cooperation. The system is seen by all ranks ... as a valuable tool which will assist them in their difficult task and provide them with immediate on the spot information both on screen and in hard copy (O'Dwyer, 1996: 37).

There were few voices of dissent from the association of the VMDS as a useful device for front-line fire service work. In addition to the framing of the VMDS as a tool for managing information, the failure of the previous paper-based folders and maps is an important pre-condition for constituting the VMDS as a welcome guest. By this we mean that the framing of the previous practices 'as faulty and inadequate' constituted a technological mood that was important for inviting the VMDS in as the obvious and right thing to do.

Welcoming the stranger and forgetting the distance

Ciborra (2004: 114) has suggested that the act of welcoming often 'trigger a network of commitments by the host ... But that is just the beginning of an open-ended process: the guest also possesses its own dynamics and will begin to align the host according to certain needs and constraints'. In constituting the VMDS as the solution for the inadequacy and failure of the paper-based system, it became possible to forget the potential hostility of the VMDS – to forget its limits. As Dikeç (2002: 229) reminded us, hospitality requires that we 'honour the guest *and* keep him/her at a distance *at the same time*' as if there is a safe boundary between host and guest and exchanges do not reconfigure the identities of host or guest. The deaths of two firefighters in the mid-1970s illustrate how information failure depends on practices through which information was maintained, shared and consulted before the VMDS. However, it also provides a reminder of the limits within which choices about future information practices can be considered. Framing of the VMDS as the solution for providing 'the right information at the right time' has its limits that need to be remembered if the VMDS is also to be kept 'at a distance at the same time.'

Firefighters were sometimes reluctant to talk about the death of colleagues. One reason for this was that there were few practices apart from formalised records which sustained collective remembering (see also Orr, 1996). Nonetheless one sub-officer, who had been with the brigade for over 25 years, recounted the death of two firefighters in the mid-1970s, five days after several risk assessment inspections and widespread communication of the risks of the site. His account emphasised the situated realities of fire incidents that cannot be known completely in advance and that demand improvisation, but also that information failure is marked out by absences. In a passage from the interview, being able to account for the loss of lives in terms of the failure of the management of information is challenged:

Firefighter: [We] lost two firefighters in 1974 [at Hurcott Mills].... they died on a Friday.

Researcher: So they had actually been there almost that week; ... it was that week.

Firefighter: ... a crew from another watch went there the previous week, looked at it – shock horror – better let the other watches know ... because of the concern expressed by the crew who had visited the place the previous week on the Monday.

He continues that subsequent to the risk assessment there was a fire with two firefighter fatalities caused by a massive flashover:

that fellow that died in the incident, went [with two others] off on Monday morning to go and have a look at it ... they went along and said there's definitely a need here to get risk visits on it so luckily we did have a fair bit of knowledge about the building before we went in ... we also found out they had disconnected the sprinkler system.... No matter what information – sometimes you could provide people with every scrap of information that

is available on a particular risk, but there is the occasion when no matter how much knowledge you've got tragedies will still occur ... [fire] places people in situations that you can't always train either physically or mentally for.

The firefighter's account of an incident over 25 years ago evokes a failure of information in two senses. The first is the impossibility of complete and *a priori* knowledge of the future. The second is that the absence of this firefighter's account of this tragic incident is also an instantiation of information failure that demonstrates that what counts as information failure is evaluated against existing practices and how this delimits what is considered thinkable, speakable and doable in the future. Narratives from long-serving firefighters, the exchanging of 'war stories' between fire crews, for example, are absent from records comprised of formalised, single sentence bullet points. The adoption of the VMDS presupposes a comparison with existing paper-based practices because this is the technological mood through which pre-VMDS practices are evaluated.

Boundaries, autonomy and the forgetting of hostility

Even if fire crews remembered the limits of the technological framing of front-line information, it still seems odd that they were so totally welcoming of the VMDS – senior officers often found this hard to understand too! Did crews not see or anticipate the affordances that the VMDS might suggest in terms of the standardisation of their work practices and the potential for subsequent rationalisation once the VMDS was in place? Maybe this welcoming attitude was to do with their understanding of autonomy and of boundaries – the boundaries of where the VMDS will be hosted and who it was a guest for. Furthermore, the VMDS might also have become framed as the very means to consolidate important boundaries. It is this ambiguous boundary crossing and boundary making that might have contributed to the forgetting of the potential hostility of the guest.

The implementation of the VMDS was framed, from the start, to coincide with existing organisational boundaries, particularly in terms of access, control and manageability of information vis-à-vis other brigades (see Monteiro and Hanseth, 1996; Bowker and Star, 1999). The VMDS provides information that is available to all fire crews across the brigade, but access and control of information remains centred within the brigade and is compatible with the established brigade boundary for incident responsibility. Demarcating VMDS access to the brigade – that is as essentially a local matter – means that a range of actors within the brigade can be aligned with the scope of the VMDS because it does not pose a significant challenge to long standing bases of brigade level authority and autonomy. Even the formation of an Operational Intelligence Unit that constituted new forms of control did not significantly undermine the social organisation of watches. Fire crews are expected to submit to new forms of surveillance, but risk assessments are still undertaken by fire crews and managed within the brigade.

Neighbouring brigades do not have the VMDS nor does the brigade provide IT management services for other

brigades (throughout the 1990s West Midlands Fire Brigade was interested in standardisation *qua* inter-operability between brigades and providing IT services for other brigades). Standardisation of access, control and manageability is best conceptualised not only as a technical matter, but it also presupposes particular organisational practices that are inscribed into a technological infrastructure – in this case, standardisation is not associated with challenging watch practices or with inter-operability of IT between brigades.

Attempting to maintain control over the boundaries of the brigade through the VMDS, in the context of national reviews that emphasise regional fire services, can also be understood as an attempt to enrol the VMDS as an agent of organisational power. The VMDS marks out a means of catching up with other brigades, particularly the neighbouring 'high-tech' brigade, and denotes an attempt to integrate the brigade into the select group of IT-led brigades. To the extent that the VMDS and the Operational Intelligence Unit becomes an institutionalised 'centre of calculation' (Latour, 1988), the brigade is in an enhanced position to shape the boundaries, timing and content of future modernisation.

Improvisation and bricolage: spatial and temporal (dis)connections
Welcoming a guest, in our house as it were, also means adjusting to its modes of being – in some way accommodating it. This might mean developing some 'work-arounds' in order to live with this ambiguous stranger, rather than just talking to it at the door. Often this means improvising 'around' the visitor in the flow of everyday activity. This is not necessarily 'deviant' or resistant behaviour, rather, as Ciborra (2004: 116) suggests, it belongs to 'the core of the human institution of hospitality. They express the thousands, subtle ways in which humans ingeniously discover, discern, interpret and act upon the shades of the encounter with technology as an ambiguous stranger'.

The brigade was often involved in demonstrating the VMDS to other fire services. The brigade's stand, which was part of the first 'IT village' at the 1997 Fire Service exhibition, illustrated how carefully planned presentations construct access to information as disembodied. Demonstrations were popular and comprised of presentations with delegates standing round a mock-up VMDS. The brigade's officer described the 'full availability for the first time' of previously dispersed paper records, maps and chemical information. Demonstrations centred upon interaction with the VMDS with the emphasis upon showing the speed and simplicity of accessing information. At a particular point in the demonstration, the officer would press the print button on the keyboard, point to the screen and the printer would begin to print.

Contra formal demonstrations, the situated and collective character (see Suchman, 1987) of fire crews' work was made visible through informal demonstrations undertaken as part of observation of firefighters' work. Usage of the VMDS gave rise to a number of spatial and temporal effects that crews described as compromising their readiness on the way to incidents. Before the VMDS was implemented, each fire crew had a formal and informal division of labour

(i.e. one firefighter reading risk records, another locating water hydrants, another navigating, and so on) on the way to incidents. The VMDS made this collective structure of interaction much more difficult if not impossible. Bolted to the dashboard, only the Officer in Charge could access risk, map and tactical information on the move. Inside fire appliances this centralised activity to the officer and restricted access to information to interaction between the Officer in Charge and the VMDS.

A further practical problem related to temporal pressures on the Officer in Charge while on the move and the collective ability of fire crews to check with each other 'how things are going' on the way to an incident. Temporal pressures on the officer intensified because of the compression of interaction within fire appliances around the VMDS. Officers described the not insignificant difficulty of putting on fire clothing, boots, accessing the VMDS, helping the driver to navigate, watching out for other vehicles, deciding upon an initial 'incident plan' and attending to radio communication to the control centre. The addition of 'pressing buttons' on the screen to initiate prints of VMDS records, map directions and hydrant locations was not a simple matter of retrieving information 'ready to hand' for officers under these temporal pressures. As a result of the spatial and temporal configuration associated with the VMDS, and the new mobile division of labour, fire crews described how the VMDS led to communication problems within crews. For many crews the spatial and temporal effects meant that VMDS would not be accessed until the fire appliance reached the incident and was stationary.

The Operational Intelligence Unit undertook the task of transferring paper risk records to the VMDS. Stations sent their paper 1.(1).D records to the Unit for transferring onto the VMDS. It was quickly noticed by fire crews, however, that a significant proportion of records had not been transferred onto the VMDS. 'Nor would these paper files be put onto the VMDS in the future', said a sub-officer at the Operational Intelligence Unit, and 'they're now in the process of being thrown away'. Although stations were told to throw out their spare paper records and maps a number of stations were reluctant to do this and many crews kept copies of records and maps. Fire crews held these 'in reserve' in fire appliances as 'back-ups' (see Faia-Correia *et al.*, 1999). Not only had an attempt to remove paper records not occurred, but crews also consulted concealed 'out of date' records and accessed the VMDS screens as they attempted to maintain the collective practice characteristic of pre-VMDS fire appliance collaboration.

Rationalising the number of risk records meant that although fire crews had 'universal access' to records for the entirety of the brigade's area of responsibility, and the overall number of risk records fire crews could access increased, the number of risk records for a particular station's turn-out boundary was often reduced. The problems of arbitrary, unsystematic and often out of date station-based records were replaced with absent records. For fire crews, the small number of records for a particular station was not, however, related to a lack of computer memory, but associated with the brigade's difficulty of recruiting a CAD/CAM specialist and a lack of resources at the Operational Intelligence Unit.

Informal demonstrations problematise the spatial reach and real-time temporality with which the VMDS was associated. Crew usage also foregrounded how the 'joined up' access to information on the move also created spaces and times of disconnection. Situated activities (Brown and Duguid, 1991) illustrate how ongoing ambiguities associated with IT infrastructures have to be resolved – acceptance of the VMDS by fire crews is possible because 'full functionality' is deferred to the future. In this way, fire crews can remain committed to the VMDS even while they continued to use 'out-of-date' paper records and maps. The ambiguities associated with use of the VMDS, and the consequent enrolment of other actors by fire crews, foreground two points. First, while paper back-ups underpin the functionality of the VMDS, fire crews simultaneously demonstrate how their work is important. Through the enrolment of an array of materials in support of the VMDS fire crews attempt to construct their identity as a 'centre of discretion' (see Munro, 1999) through which they can shape the future trajectory of practices for managing incident information. Second, within their particular structural location, backing-up the VMDS with paper records and maps is what fire crews can do to maintain the workability of this leading-edge IT infrastructure—this is a requirement of hosting it.

Gestell and the technological mood that (re)constitutes the VMDS On 17 October 2002, the brigade's budget Working Party set out the initial cost for the 'second generation' VMDS, allocating a budget for 2003/04 of £250,000 (Hereford and Worcester Fire Brigade, 2002: 13). Upgrading the VMDS demonstrates how the procurement of mobile data systems is an ongoing rather than one-off initiative – technology begets technology. The remit of the VMDS has also now expanded to be a central feature in the brigade's strategic response to local e-government initiatives. The brigade fire authority's 'Implementing Electronic Government' Return (Hereford and Worcester Combined Fire Authority, 2003/4: 1–2) remarks on the second generation VMDS, but also connects the VMDS to 'improved outcomes for citizen' and the brigade's own 'e-strategy':

Hereford and Worcester Fire Brigade's e-government strategy is already demonstrating its ability to deliver improved services and outcomes for citizens in the community. In 1996 it was the first brigade in the country to introduce a fully e-enabled mobilising and mobile data.... The brigade is currently replacing its VMDS, learning from its significant experience as one of the pioneers in this area of new technology.... In summary, the brigade sees e-government not only as the e-government initiatives but part of a complementary and natural evolution of its own internal e-strategy.

From this statement it can be suggested that, on an empirical level, the VMDS can be characterised by expanding local mobilisation. Many other fire brigades have also now implemented mobile data systems. From the late 1990s onwards, brigades in Cumbria, Devon, East Sussex, Lancashire, Norfolk, Nottinghamshire, Northamptonshire, South Wales, Strathclyde and Surrey, to name a

few. Significantly, some brigades, such as Nottingham and East Sussex, have started to collaborate to procure and develop inter-brigade VMDS infrastructures.

Recent investment in the electronic provision of local authority services through central e-government initiatives also demonstrates a shift away from a brigade approach to IT implementation. In November 2001, the Chief Fire Officers' Association submitted a bid to the ODPM for a national e-government project (CACFOA, 2001; see also Department for Transport, Local Government and the Regions, 2002). The subsequent national project, termed 'e-fire', was 'made up of five streams of work to develop 'products' designed to help the Fire Service meet the government's 2005 e-government target' (LFEPA, 2005: 2). Significantly, one of the streams, 'Risk Knowledge Management and Data Sharing' draws upon brigades' VMDS initiatives. Here the ideal of information provision has been reworked from brigade level to 'joined up' inter-brigade and inter-agency collaboration at a national level. In January 2005, the ODPM announced that the data sharing stream of e-fire would be dropped due to the timetable of other e-government initiatives (LFEPA, 2005). Nonetheless, such initiatives demonstrate a pervasive technological mood of inter-operability and standardisation between brigades.

In 2003 the government's White Paper 'Our Fire and Rescue Service' (ODPM, 2003) was published. This set out the government's commitment to modernisation fire services based on many of the recommendations made by the Audit Commission (1995a, 1995b) and Bain *et al.* (2002). For instance, one of the central provisions of the 2004 *Fire and Rescue Services Act* is a shift toward regional fire services plus central government power to merge fire and rescue authorities 'where authorities fail to work together through voluntary regional management arrangements' (ODPM, 2004: 2). As part of this move to regional fire services, and in the interest of public safety and 'national resilience', the act also provides powers for the central government to direct authorities on the procurement of equipment in order to ensure a standardised approach: 'Generally, it is considered that the maximum gain can be achieved by procuring at a national level and to a common output-based specification those items that are service specific' (ODPM, 2004: 16).

The Draft National Procurement Strategy document (ODPM, 2004) categorises 'command and control, mobilising and e-fire' information infrastructures as of strategic importance and high cost. This document, together with the 2003 White Paper, sets out a significant shift from a local brigade level to a national and regional approach to IT procurement. One of the first instances of the national drive toward regionalisation was the announcement in 2005 of the closing of 46 local command and control centres and their replacement by nine regional and 'state of the art' centres. In late 2005, the ODPM also announced that a new nationwide digital radio system, to include both voice and data communication (including data held on mobile data systems), would be implemented by 2009. This national system will enable interoperability between fire services and other emergency services. We cannot predict the future of mobile data systems as the 'fate of technology', to paraphrase Latour's aphorism, 'lies in the hands of future

community'. However, as the boundaries between IT and organisational practices are renegotiated, and mobile data system are constructed out of local, regional and national practices, these outcomes will not be determined by IT. Rather it is the mood that requires technological solutions that will shape and constitute the development of IT.

The UK fire service is, at the time of writing, beginning to be constituted by inter-brigade mobile data systems, regional centres, national e-government initiatives and national/regional practices for IT procurement. Although the practices of electronic information sharing across brigade's remains underdeveloped and for some unwarranted, over the last decade mobile data systems, implemented at first at a brigade level, have become an institutionalised and important context for the future trajectory of fire service provision. Mobile data systems now represent the future of the fire service, but we would suggest that the deployment of the VMDS as part of local, regional and national e-government initiatives, and the possible alignment with the nationwide radio system, suggests that mobile data systems are best understood as constituted by a 'technological mood'; a mood through which information and communication increasingly becomes enframed by IT and which in turn shapes the UK fire service's conception of the future reality of fire service provision.

Hosting the VMDS and Ciborra?

Ciborra's (1999a, 2000) emphasis on hospitality foregrounds the possibility of the guest becoming the host. We suggested a guest is most usefully understood as a stranger rather than a familiar servant, but how might this apply to our study? The VMDS was implemented to rectify a lack of information 'at the right place at the right time,' but it also simultaneously reaffirmed access to information at the brigade level, top-down implementation of change, the existing watch structure, and was mostly considered to be distinct from government reforms and senior officer interests. From this perspective it might be concluded that IT infrastructures are often appraised by users against existing preoccupations and information management practices. Should we therefore conclude that this is an example of the incorporation of IT infrastructure within a highly institutionalised context?

The VMDS was assimilated into an existing formative context, but drawing upon phenomenology, we would suggest that brigade's reality and actors' identities cannot be taken as fixed *a priori* or unchanging. With the implementation of the VMDS and the formation of the Operational Intelligence Unit, the management of records, maps, chemical information, etc., and the criteria for information held on the VMDS, is altered in significant ways from previous practices. VMDS records are similar to paper records, but with the introduction of brigade-wide management of information, we need to ask anew what counts as brigade 'hierarchy'; 'standardised' practice; 'communication' between stations; 'risks' to firefighters; and the 'boundaries' of the brigade. Phenomenology suggests that within the horizon of intelligibility of the VMDS these very categories become reconstituted. For example, that which is understood as 'hierarchy' becomes

connected to the bureaucratic practices set up by the Operational Intelligence Unit not just the organisational hierarchy of officer rank. Similarly, 'standardisation' becomes associated with the management of information and not only with collectively negotiated employment standards for workplace practices. Once it is understood that standardisation can become associated with information, we can begin to evaluate how the VMDS might expand and/or contract connections to local and national e-government initiatives, regional management and access to mobile information. Given this new horizon of intelligibility how might we change perspective from a taken for granted approach, in IS literature, that foregrounds *alignment and assimilation*?

Derrida (2000) suggests that hospitality is premised on a double-bind: to welcome a stranger requires the host to have the power to host, but unless the host surrenders their own power, there cannot be hospitality because the guest is subservient to the host's wishes – it is more like assimilation than hospitality. By contrast, hospitality can only begin to occur when host and guest begin to unravel their understanding of one another – only by going *beyond* hospitality would the guest really experience hospitality. For our purposes, although fire crews may consider their willing adoption of the VMDS in the 1990s as 'hospitality,' it is only when the VMDS shifts from its taken for granted functionality and surprises fire crews that hospitality becomes an issue to be responded to.

In our research, the future trajectory of the VMDS was constituted by conceptions of the IT infrastructure as an information resource. Ciborra (2000: 30) suggests, however, that IT can never be completely domesticated (see Haddon, 2004) because practices of 'coping, use or reinvention occurs simultaneously': there is an irreducible tension and unending instability within hospitality because hospitality can turn into hostility. Ciborra's definition of hospitality follows Derrida in proposing the two-fold etymology of hospitality as incorporating the possibility of hostility. Without this ongoing tension, IT implementation would, Ciborra (2000: 30) writes, become 'totally 'disambiguated', univocal in producing its effects and impacts, hosting would consist of straightforward adaptation and alignment ... systems are objects ... the world of business reengineering models'. *Contra* the assumption that hospitality is completed when the guest 'feels at home', we suggest, following Ciborra, that hospitality can never be finally accomplished – it is our ontological relation with technology as such. Nearly a decade after the VMDS was implemented the 'problem of hospitality' remains prescient at the brigade.

Ambiguities and surprises also feature in Ciborra's sense of improvisation. Our research has demonstrated the considerable degree of work fire crews undertake to underpin the functionality of the VMDS – to make it 'work' as that which it is supposed to be. However, Ciborra's (1999b: 87–89) sense of improvisation goes beyond workarounds to suggest that:

The world constituted by procedures, methods and systems is suddenly 'up for grabs'. Conventional meanings attributed to 'things', 'actions' and 'events' are re-defined, re-registered and bent to acquire new ones ...

during the 'kairos', or '*Augenblick*', the moment of vision, that is the moment in which our Being is conscious of itself and the possibilities vis-à-vis the world, rather than being dispersed in the ordinary chores and interests of everyday life.

Our research demonstrates little evidence of this sense of improvisation, so how might we account for Ciborra's *Augenblick* and understand fire crews' response to the VMDS? Kamoche *et al.* (2001) provide a distinction between conditions for improvisation. They differentiate between improvisation that is considered as a 'solution to a problem' and improvisation that is considered an 'opportunity to learn, change or develop' – the latter a closer sentiment to Ciborra's 'moment of vision'. Our research suggests that fire crews embody the former condition – in their minds and practices the VMDS is not working as it should so some *bricolage* and improvisation is needed to rectify this until current problems are resolved – but why should crews have this reaction? Why not simply reject the VMDS?

For Ciborra (1999b, 2000, 2001) improvisation problematises assumptions about the possibilities and limits of rational decision-making, disembodied information, equivocal communication and managerial competency. In terms of our study, it would also challenge the hopes attached to the implementation of what was considered a leading-edge infrastructure. We have argued that across organisational levels, and across the UK fire services more generally, the VMDS is considered 'a success'. For the VMDS to be evaluated as successful, improvisations must be conceived as temporary workarounds within the longer-term trajectory of the VMDS as the way to be a modern fire service.

Improvisation also foregrounds a taken for granted way of being, the way we are supposed to be. Unlike the Mann Gulch fire described by Weick (1993), the work that crews do to underpin the functionality of the VMDS has not, as far as we know, been a matter of life or death. But of course it could become a matter of existence at any moment – some might argue the work of backing-up the VMDS makes crews' work less safe! Questioning the veracity of the VMDS would presage questions such as: what does the VMDS tell us about the (un)certainities of knowledge, who or what makes decisions at incidents or how are risks evaluated? For Ciborra and Hanseth (1998a: 322) quoting Dreyfus (1993), inducing such 'moments of vision' expresses something akin to Derrida's sense of hospitality. In this aporia the 'take up of practices that are now at the margins of our culture' and 'de-emphasising practices now central to our cultural self-understanding' become possible courses of action. For the brigade this might include the recovery of practices for remembering *not* associated with paper risk cards or the VMDS, understanding the deployment of VMDS at other brigades and evaluating how over the last decade the VMDS has become connected to the future of fire service provision and not just with the better recording of the past. From the perspective of hosting we might conclude that fire crews' attempt to adapt and 'feel at home' with the VMDS has made them 'blind' to the hostility of the VMDS – indeed one might say they have been bad hosts. This has created the condition in which alternatives ways of

thinking and doing are rendered illegitimate as well as making it impossible for them to understand a future that 'could be otherwise.'

In order to further understand the conditions for the various improvisational acts associated with the VMDS, we need to reintroduce our third term from Ciborra – *Gestell* or technological mood. Our study of the VMDS has demonstrated how people, organisation and technology shape each other and hold each other in place: the VMDS illustrates how brigade actors are concerned with framing understanding of reality and imposing these understandings on each other. The VMDS is not simply a medium for access to information 'anywhere and anytime' but is implicated in the constitution of reality and identities – IT does have power, most importantly the power to transform what counts as important (see also Brigham and Corbett, 1997). From this we suggested that the VMDS enframes information and communication by defining it as technological and as such improvisation itself is set within a calculative and instrumental form of thought.

During the 1990s and early 2000s, the VMDS was considered to be a closed and controllable system that functions at the level of the brigade. The VMDS was, we have argued, not associated with a radical break from previous technological, organisational and social practices and was judged as successful in these terms (see also Dahlbom *et al.*, 2000). The top-down implementation, and centralised management of information by the Operational Intelligence Unit, similarly assumes that the development of the VMDS can be planned and controlled by the brigade's senior officers and delimited to change driven by the brigade. Additionally, the deployment of the VMDS is connected to front-line fire crews understanding of what is important in firefighting – supporting crews' work at incidents, even though it has been known for over three decades that emergency calls to fires is around 10 per cent of firefighters' work (Home Office, 1971). Some might suggest that in the context of innovation in networked and open IT systems, the IS and management literature on the temporal and spatial flexibilities afforded by IT, and the discourse of disjunctive change, that the VMDS is a rather 'old fashioned' infrastructure deployed narrowly to help fire crews. From this perspective, the VMDS might be seen as a missed opportunity rather than a success. On an empirical level, we might ask, then, how long can the stabilities associated with highly institutionalised boundaries, long-standing national practices, and a demarcation of the VMDS with front-line incidents be sustained? We might ask what this 'local controllable' approach to the VMDS tells us about the *Gestell* of the brigade in the context of broader debates such as modernisation and its relationship to information technology?

Despite reform initiatives throughout the 1990s, it was not until the early 2000s that brigades have become subject to the modernisation agenda and central government intervention that has been a feature of the UK public sector for the last two decades. Although the role of mobile data systems in modernising fire services cannot be predicted in advance, our longitudinal research has shown how the VMDS has been strongly associated with the provision of relevant and accurate information to crews en route or at incidents. Demarcating the VMDS as a device

for enhancing the provision of information and communication between fire crews has particular consequences, however. It neglects, for example, how universal IT-mediated access to risk records can mean that local knowledge is considered less embodied in fire crews. Fire crews have access to the same information and in principle they can be located anywhere or mobilised to any incident.

To the extent that debate and reflection about the future of mobile data systems is delimited to framing the role of IT as bringing forth a world to be ordered more comprehensively and efficiently, then modernisation of fire services is likely to be premised upon the continuation of an ontology marked out by a Cartesian approach to IT. This is not to say that the VMDS has determined the current emphasis on technologically-driven modernisation or that there is some kind of inexorable logic that connects the VMDS to e-government initiatives. It demonstrates, rather, how the boundaries between organisational practices and IT infrastructures are renegotiated on a terrain defined by a technological mood. Problematising this mood was one of the central preoccupations of Ciborra's scholarly work. The 'ability to jump, or switch Gestalt' that Ciborra (2004: 77–78) discussed in his last full length book, demands taking the particularities of IT seriously because, as Ihde (1990: 200) suggests, 'any larger Gestalt switch in sensibilities will have to occur from *within* technological cultures'. It also requires of us that the culture of technology that enframes organisational, professional and social issues as technological be questioned anew through a 'releasement' or 'comportment' toward IT that willingly takes up innovations in IT, but is simultaneously not enframed by a technological mood.

This paper has demonstrated a pervasive technological mood in the provision of fire services at one UK fire brigade. Our analysis should, however, be taken as illuminating the general cultural trajectory of information and communication technologies and, as such, has implications for recasting the study of IT. The presentation and discussion of the VMDS concerns, of course, a particular technological artefact in a part of the public sector, but our ambition, echoing Ciborra, is to contribute to how we might rethink our contemporary disposition to IT in the broadest terms.

The analysis of the VMDS described in this paper is inspired by a phenomenology – an approach that is significant because it argues that IT is constitutive of the human condition. IT is an 'original supplement' in Derrida's terms. Information and communication technologies have, of course, long been associated with bringing about discontinuity in organisational practices, but the phenomenological approach set out in this paper provides an important and subtle twist on such truisms. We have argued that the essence of IT is not the technological rationalisation of tasks, its assimilation into formative contexts or the disjunctive change brought about by IT as it reorganises existing practices. More radically, for phenomenologists, the 'figure' of IT dynamically alters and remakes the 'ground' on which the demarcations and distributions of rationalisation, assimilation and disjuncture are made. On this point, Levin (1999: 126) writes that the 'enframing that is typical of *Gestell* interrupts the figure-ground interplay.... Instead of a dynamic, spontaneously flowing

interaction between figure and ground, a loser, freer, softer differentiation between the periphery and the centre of focus, there is a 'freezing of the flow', interrupting the work of time'. Recovering Levin's 'work of time' is Ciborra's ability to switch Gestalt – the recovery of the ongoing emergence and dissolution of relational configurations that challenges and works through and beyond the ontological primacy and reified effects so often associated with information and communication technologies.

Conclusion and implications

Claudio Ciborra provides us with a wholly new way to make sense of the 'problem' of information technology as a mode of organising. However, his legacy will be lost if we do not pay careful attention to what he is saying. If we merely assimilate his 'words' (hospitality, *bricolage*, *Gestell*, *kairos*, to name a few) we will not be hosting him. He is not just suggesting that we replace our old words (strategy, alignment, implementation, use, impact, and so forth) with new ones, although learning to speak a new language is important in order to engage with the world in new ways. Ciborra is suggesting that we take a careful look at our ontology – that horizon of intelligibility that conditions our 'taking up' of these words is as important as taking them up in the first instance. If we do not understand, or take seriously, the co-constitutive relationship that phenomenology proposes, we will not be able to understand the radical shift that his words makes possible. It is this possibility to be truly 'disturbed' that is most important if we are to host Ciborra. We need to stay open to the hostile possibilities in our guest as we take up these ideas.

Through this new phenomenological ontology of hospitality we see that we can never become comfortable with our technologies because of the paradoxes, ironies and ambiguities they afford (see also Arnold, 2003). They will take us, one could say frame us, in unexpected ways as we draw upon them because technological change is not reducible to a calculating and cordial framework of reciprocity and repayment between host and guest. This paper has argued that one of Ciborra's long-lasting legacies should be a phenomenological ontology for the study of IT, an argument we have pursued in this paper by demonstrating how the horizon of effects associated with the VMDS cannot be controlled over time and space. From this we can conclude that the 'normal science of IT' research is the ongoing (re)co-constitutive relationship through which we are destined to always be the hosts/guests of our technology – we are always already enframed. The VMDS, a seemingly innocent replacement of paper records, has shown us that technology's (re)framing cannot simply be located and controlled as managerial theories often suggest. Through the VMDS a new way of seeing, thinking and doing became possible. As these new possibilities emerged they became incorporated into discourses and practices of modernisation in ways never anticipated by those that originally conceived them. Finding ways to live with this guest/host is the challenge, and Ciborra has helped us on our way. If hospitality is continually renegotiated, it is because the guest surprises the host and this shifts their mutual horizons of intelligibility. For this we will remember this generous guest who is no longer with us.

Acknowledgements

The empirical research was supported financially by the Economic and Social Research Council (ESRC number: R00429534042). Thanks to Hereford and Worcester Fire Brigade for generous access to research the deployment and use of mobile information. We also thank the comments of three JIT reviewers.

References

- Arnold, M. (2003). On the Phenomenology of Technology: The 'Janus-faces' of mobile phones, *Information and Organization* 13: 231–256.
- Audit Commission (1995a). *In the Line of Fire: Value for Money in the Fire Service*. The National Picture, London: HMSO.
- Audit Commission (1995b). *In the Line of Fire: Management Handbook on Value for Money in the Fire Service*, London: HMSO.
- Bain, G., Lyons, M. and Young, A. (2002). *The Future of the Fire Service: Reducing Risk, Saving Lives. The Independent Review of the Fire Service*, London: ODPM.
- Bassett, T. (1991). Would Larger Fire Controls Covering More Than One Brigade be More Efficient? *Fire*, September 84: 15–17.
- Brigham, M. and Corbett, J.M. (1997). Email, Power and the Constitution of Organisational Reality, *New Technology, Work and Employment* 12(1): 25–35.
- Borgmann, A. (1984). *Technology and the Character of Contemporary Life: A Philosophical Inquiry*, Chicago/London: University of Chicago Press.
- Borgmann, A. (1999). *Holding on to Reality: The Nature of Information at the Turn of the Millennium*, Chicago/London: University of Chicago Press.
- Bowker, G.C. and Star, S.L. (1999). *Sorting Things Out: Classification and its Consequences*, Cambridge, MA: MIT Press.
- Brown, J.S. and Duguid, P. (1991). Organizational Learning and Communities of Practice: Toward a unified view of working, learning and innovation, *Organization Science* 2: 40–57.
- Cabinet Office (1999). *Modernising Government White Paper*, Command Paper No. 4310, March, London: HMSO.
- Chief and Assistant Chief Fire Officers Association [CACFOA] (2001). *e-Fire: The Fire Service and e-Government: Guidance for Electronic Service Delivery*, November, Tamworth: CACFOA.
- Ciborra, C.U. (1998b). Crisis and Foundations: An inquiry into the nature and limits of models and methods in the information systems discipline, *Journal of Strategic Information Systems* 7: 5–16.
- Ciborra, C.U. (1999a). Hospitality and IT, in T. Käkölä (ed.) *Proceedings from the Twenty-Second Information Systems Research Seminar in Scandinavia (IRIS 22)*, Finland: Keuruu, August, pp. 195–202.
- Ciborra, C.U. (1999b). Notes on Improvisation and Time in Organizations, *Accounting, Management and Technologies* 9(2): 77–94.
- Ciborra, C.U. (2001). In the Mood for Knowledge: A new study of improvisation, Working Paper 94, Working Paper Series, London School of Economics and Political Science, London [WWW document]http://is2.lse.ac.uk/wp/pdf/WP94.PDF (Accessed 1 December 2005).
- Ciborra, C.U. (2004). *The Labyrinths of Information: Challenging the Wisdom of Systems*, Oxford: Oxford University Press.
- Ciborra, C.U. Associates (2000). *From Control to Drift: The Dynamics of Corporate Information Infrastructures*, Oxford: Oxford University Press.
- Ciborra, C.U. and Hanseth, O. (1998a). From Tool to Gestell: Agendas for managing information infrastructure, *Information Technology and People* 11(4): 305–327.
- Cox, J. (1994). How Wiltshire Set About Selecting New Command and Control 'Kit', *Fire*, July 87: 23–27.
- Dahlbom, B., Hanseth, O. and Ljungberg, J. (2000). Conservative Success: Organization and infrastructure evolution at SKF, in C.U. Ciborra and Associates (2000) (eds.) *From Control to Drift: The Dynamics of Corporate Information Infrastructure*, Oxford: Oxford University Press, pp. 87–104.
- Department for Transport, Local Government and the Regions (2002). *e-Gov@Local: Towards a National Strategy for Local e-Government. A Consultation Paper*, Great Britain: Department for Transport, Local Government and the Regions.
- Derrida, J. (1997). Community without Community: Hospitality, in J.D. Caputo (ed.) *Deconstruction in a Nutshell: A Conversation with Jacques Derrida*, New York: Fordham University Press, pp. 106–112.



- Derrida, J.** (1999). *Adieu to Emmanuel Levinas*, in Pascale-Anne Brault and Michael Nass (trans) Stanford, CA: Stanford University Press.
- Derrida, J.** (2000). *Of Hospitality*, in Rachel Bowlby, Stanford (trans) CA: Stanford University Press.
- Dikeç, M.** (2002). Pera, Peras, Poros: Longings for spaces of hospitality, *Theory, Culture and Society* 19(1/2): 227–247.
- Dreyfus, H.L.** (1992). *What Computers Still Can't Do: A Critique of Artificial Reason*, Cambridge, MA: MIT Press.
- Dreyfus, H.L.** (1993). Heidegger in the Connection Between Nihilism, Art, Technology and Politics, in C. Guignon (ed.) *The Cambridge Companion to Heidegger*, Cambridge: Cambridge University Press, pp. 289–316.
- Dreyfus, H.L.** (2001). *On the Internet*, London: Routledge.
- Faia-Correia, M., Patriotta, G., Brigham, M. and Corbett, J.M.** (1999). Making Sense of Telebanking Information Systems: The role of organizational back ups, *Journal of Strategic Information Systems* 8(2): 143–156.
- Gibson, J.J.** (1979). *The Ecological Approach to Visual Perception*, Dallas/London: Houghton Mifflin.
- Goodwin, P.** (1997). Vehicle Mounted Data System: Building on success, *Fire Engineers Journal*, September 57(190): 39–41.
- Haddon, L.** (2004). *Information and Communication Technologies in Everyday Life: A Concise Guide and Research Guide*, Oxford: Berg.
- Heidegger, M.** (1927/1962). *Being and Time*, in John Macquarrie and Edward Robinson (trans) New York: Harper and Row.
- Heidegger, M.** (1977a). *The Question Concerning Technology and Other Essays*, in William Lovitt (trans) New York/London: Harper and Row.
- Heidegger, M.** (1977b). On the Essence of Truth, in D.F. Krell (ed.) *Martin Heidegger: Basic Writings*, San Francisco: HarperCollins, pp. 113–141.
- Hereford and Worcester Fire Brigade** (1997). Vehicle Mounted Data System, *The Grapevine: The Official Journal of Hereford and Worcester Fire Brigade*, September: 8–9.
- Hereford and Worcester Fire Brigade** (2002). *Budget Working Party Agenda*, October. Hereford and Worcester Combined Fire Authority.
- Hereford and Worcester Combined Fire Authority** (2003/4). *Implementing Electronic Government*, IEG3 Return. Hereford and Worcester Combined Fire Authority.
- Home Office and Scottish Home and Health Department** (1971). *Report of the Cunningham Inquiry into the Work of the Fire Service*, Great Britain: Home Office.
- Ihde, D.** (1990). *Technology and the Lifeworld: From Garden to Earth*, Bloomington and Indianapolis: Indiana University Press.
- Ihde, D.** (2002). *Bodies in Technology*, Minneapolis: University of Minnesota Press.
- Introna, L.D. and Ilharco, F.M.** (2004). Phenomenology, Screens and the World: A journey with Husserl and Heidegger into phenomenology, in J. Mingers and L. Willcocks (eds.) *Philosophy and Social Theory for Information Systems*, Chichester: Wiley, pp. 56–102.
- Kamoche, K., Cunha, M.P.E. and Cunha, J.V.D.** (2001). *Organizational Improvisation*, London: Routledge.
- Latour, B.** (1988). *The Pasteurization of France*, in A. Sheridan and J. Law (trans) Cambridge, MA: Harvard University Press.
- Levin, D.M.** (1999). *The Philosopher's Gaze: Modernity in the Shadow of Enlightenment*, Berkeley: University of California Press.
- London Fire and Emergency Planning Authority [LFEPA]** (2005). Progress Report on the National Fire Service e-Government Project ('e-Fire') and Implementing e-Government, LFEPA Authority Meeting Minutes, Document No. FEP 657, 13 January.
- Mohanty, J.** (1997). *Phenomenology: Between Essentialism and Transcendental Philosophy*, Evanston, IL: Northwestern University Press.
- Monteiro, E. and Hanseth, O.** (1996). Social Shaping of Information Infrastructure: On being specific about the technology, in W.J. Orlikowski, G. Walsham, M.R. Jones and J.I. DeGross (eds.) *Information Technology and Changes in Organizational Work*, London: Chapman & Hall, pp. 325–343.
- Munro, R.** (1999). Power and Discretion: Membership Work in the Time of Technology, *Organization* 6(3): 429–450.
- Norman, D.A.** (1988). *The Psychology of Everyday Things*, New York: Basic Books.
- ODPM** (2003). *Our Fire and Rescue Service*, Command Paper No. 5808, June, London: ODPM.
- ODPM** (2004). *Draft National Procurement Strategy for the Fire and Rescue Service: A Consultation Document*, London: ODPM.
- O'Dwyer, D.** (1996). The Design and Implementation of a Vehicle Mounted Data System, *Fire Engineers Journal*, September 56(184): 33–34, 37.
- Orr, J.E.** (1996). *Talking about Machines: An Ethnography of a Modern Job*, Ithaca, New York: ILR Press.
- Rhodes, R.A.W.** (1985). Corporatism, Pay Negotiations and Local Government, *Public Administration* 63: 287–307.
- Robey, D., Ross, J.W. and Boudreau, M.C.** (2002). Learning to Implement Enterprise Systems: An exploratory study of the dialectics of change, *Journal of Management Information Systems* 19(1): 17–46.
- Sauer, C.** (1993). *Why Information Systems Fail: A Case Study Approach*, Henley-on-Thames: Alfred Waller.
- Suchman, L.A.** (1987). *Plans and Situated Actions: The Problem of Human-Machine Communication*, Cambridge: Cambridge University Press.
- Weick, K.E.** (1993). The Collapse of Sensemaking in Organizations: The Mann Gulch disaster, *Administrative Science Quarterly* 38: 628–652.

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