

# “SENT FROM MY BLACKBERRY® WIRELESS DEVICE”: A CRITICAL CONSIDERATION OF CO-CONSTRUCTING KNOWING VIA ‘SMART’ MOBILE DEVICES

Katrina Pritchard<sup>1</sup> ([k.pritchard@bbk.ac.uk](mailto:k.pritchard@bbk.ac.uk)) and Gillian Symon ([g.symon@bbk.ac.uk](mailto:g.symon@bbk.ac.uk))  
Department of Organizational Psychology, Birkbeck, University of London

Key Words: BlackBerry, Smartphone, Distributed Work, Knowledge Sharing

## ABSTRACT

This paper examines the use of BlackBerries within an engineering firm in the transport industry. We aim to move beyond the initial academic focus on the ‘impact’ of such devices on the work-life balance of corporate managers. Rather we explore the practice of ‘incident resolution’, in which four different groups participate: Mobile Operational Engineers, their Line Managers, more senior corporate managers and technical specialists. Specifically, we analyse how this ‘smart’ mobile device is depicted as influencing knowledge sharing within a complex and unpredictable distributed work practice. Maintaining a practice perspective, we examine the themes of: responding to incidents, knowing about incidents, getting advice quickly and extending opportunities for knowledge sharing. In concluding, we highlight the tensions created by emergent social and work practices centred on the BlackBerry device, suggesting that differing local interpretations and means of enrolment of the same device can both aid and hinder knowledge sharing.

## INTRODUCTION

‘Smart’ mobile devices, such as RIM’s BlackBerry, are increasingly seen as ‘ubiquitous’ in both social and business contexts (Mazmanian *et al.*, 2006). These ‘smartphones’ combine a range of functionality for voice and data communications (often including ‘push’ email, phone, camera and internet tools) within a portable device. In general however, the conclusion of the research literature is that mobile technologies are ‘Janus-faced’ (Arnold, 2003) or paradoxical (Jarvenpaa and Lang, 2005): that is we both ‘love’ and ‘hate’ our mobile devices.

More broadly it is suggested, not least by the manufacturers themselves and in the popular press, that such mobile technologies can enable increased flexibility at work while maintaining the connectivity so important to business functioning. A particular concern for academics has been the implications of these devices for work load management and work-life balance given their ‘always-on’ potential (Allen and Shoard, 2005; Mazmanian, 2009; Middleton, 2008; Wajcman *et al.*, 2008). While it is still very much a developing area, our review of the literature to date highlights that the initial research has concentrated on a rather homogeneous sample of senior corporate managers, particularly in financial and service sectors (Symon and Pritchard, 2009, 2010).

Since the broader impact of these devices on day-to-day work practices has been under explored, a key aim of our research has been to extend empirical investigation of

---

<sup>1</sup> Katrina Pritchard is the corresponding author: Department of Organizational Psychology, Room 309 Clore, Birkbeck, University of London, Malet Street, Bloomsbury, London, WC1E 7HX. Fax: +44(0)2076316750. Tel: +44 (0)2076316759.

smartphones at work. We argue that provision of smartphones within an organization has potential implications for the way people communicate, share knowledge and manage their organizational relationships, and requires investigation both to increase our understanding of the relationship between technology and working practices, and to inform continued organizational use of such devices. Given the potential of smartphones, such as the BlackBerry, to prompt reconsideration (both individually and collectively) of practices underpinning many aspects of knowing at work this must be considered an important research priority.

Alongside, it is important to recognise that there has been a long standing and sustained interest in technology's potential to enable and support knowing within organizations (Schultze and Boland, 2000) and increasing interest in the potential of new and emergent mobile technologies to provide more elegant solutions (Maier and Hadrich, 2007). However, while the smartphone has been considered in terms of functionality and capability, a more extensive investigation of the inter-relationship between the tools and their use within everyday work practice is now overdue.

Our research directly addresses this lacuna as we examine how knowing at work is co-constructed through the use of smartphones within a distributed work environment. Via an empirical examination of the use of BlackBerry devices by operational staff and their line managers within a large engineering firm, here called Rail Engineering, we explore the variety of ways in which different users engage with their BlackBerries as a means of knowing within the critical business practice of resolving engineering incidents.

“Rail Engineering” (a pseudonym) is a UK firm responsible for the maintenance of transport infrastructure. As a national firm it has a large and varied employee base, with an HQ in London, offices in other cities, and operational staff spread throughout the country at local hubs in towns and cities. Offices house senior management teams, project managers and technical specialist support staff. Out in the field, operational staff and their immediate line managers, are organised into regions and are available 24/7 (working shifts and on call) to ensure the safe running of the infrastructure and have a key role in responding to incidents. These incidents can range from relatively minor equipment problems, to weather related issues and even those requiring the involvement of the emergency services. Rail Engineering is characterised by a dual concern with safety (of staff, contractors and customers) and efficiency. In this regard it is important to note that the performance of incident response is measured in minutes of disrupted service and the clock starts ticking after three minutes of service disruption. Many management and support staff are in receipt of BlackBerries, along with mobile operations engineers (MOEs) in some regions (including those that were the focus of our study).

Our empirical project examines the various constructions of knowing that emerge and are enacted through the use of smartphones within this organizational context. Specifically we examine participants' accounts of their day-to-day use (and occasionally non-use) of a variety of features (including mobile email, digital photography, text messaging and phone) during the practice of resolving engineering incidents.

Conceptually our research builds on the foundation established by those interested in the material mediation of knowing, particularly those adopting a practice perspective (Patriotta, 2003). Moreover, it focuses attention on both spatial and temporal dimensions of knowing (Green, 2002) not least since the notion of ‘anytime, anywhere’ connectivity is central to the

marketing rhetoric of such devices. Indeed, RIM's current marketing speaks directly to BlackBerry's potential to effect (and affect) knowing over space and time by offering the opportunity to: *'act on inspiration'* *'do more, faster'*, *'carry your friends in your pocket'* and *'master your every day'* (source: <http://uk.blackberry.com/devices>). From this broad perspective we are interested in the enrolment of BlackBerries by different groups in the practice of incident resolution.

## **DISTRIBUTED WORK AND KNOWING AT RAIL ENGINEERING**

Distributed work covers a broad range of both social and technological contexts, being a term that is used to denote a diversity of mobile and dispersed work practices (Pyoria, 2003). The increasing prevalence of distributed work is in part attributed to technological development which is seen as both as enabling and restricting communication and knowledge sharing (Wilson *et al.*, 2008). This said it is important to remember that "the management of distance is an ancient art" (King and Frost, 2002, p5) and work on the railways has always been distributed by its very nature.

Moreover, it is increasingly recognised that broad categorizations (such as the label 'distributed') of work and working relationships may hide as much as they reveal (O'Leary and Mortensen, 2010). Hinds and Mortensen suggest that research needs to pay more attention to the "different dimensions of distributed work and how these dimensions shape team dynamics" (2005, p304). In particular, concerns have been raised that "treating proximity and distance in purely physical terms provides an incomplete view of how people experience it" (Wilson *et al.*, 2008, p980).

In sum, current debates highlight the need for researchers to map out their empirical context in some detail rather than simply label work and workers as 'distributed', 'mobile' or indeed 'collocated'. Therefore, below we examine the distributed nature of work within the key practice of incident resolution at Rail Engineering.

Mobile operations engineers (MOEs) work in small teams and work shifts to provide 24/7 coverage across the rail infrastructure. When on shift, each MOE is assigned responsibility for a specific geographical area. They perform a variety of routine tasks (primarily safety checks) and act as the first line response to incidents. Incidents are initially notified to the MOEs by a regional control centre (hereafter Control) by email message, which they may access via a desktop computer if they happen to be in the field office or via their BlackBerry. All MOEs in a region receive these messages, whether they pertain to their specific area or not. This is in part because of the potential knock-on effects of one incident to another area and also because MOEs may require back-up when major or multiple incidents occur. However, unlike the previous pager system which incurred a cost per message, there is no cost to adding an individual to the email distribution list so these messages are circulated widely within the organization.

Usually Control also telephone the relevant MOE to confirm they are attending the incident and when they will arrive, although as they may be driving en route or may not be in a safe location (e.g. are trackside) they may not be able to receive these calls directly. Control is the primary hub of communications regarding incidents and liaising with other agencies (including the British Transport Police and other emergency services) and organizations (including specialist contractors and train operators) as required. However, the MOE's immediate line manager (ILM) will also be involved in this process as they provide updates

to other Rail Engineering managers, particularly if incidents result in significant service disruption.

MOEs generally drive a company van to and from incidents and when performing routine safety checks. The van contains an array of tools and diagnostic equipment that enables them to assess and deal with a variety of engineering problems. Their primary role is incident assessment and to ensure the service disruption is minimised. They are often involved in temporary fixes and will then liaise with specialist operatives who may be required to resolve underlying faults or issues. The incident assessment and fix process is carried out under strict safety regulations that require individuals to be certified to work on specific engineering problems and/or use certain equipment.

During the initial stages of an incident the MOE is often working alone and in potentially hazardous circumstances. It is also during these initial stages that others (particularly Control and their own ILM) want to know what is going on and how long the incident will take to resolve. For MOEs, the BlackBerry (and potentially a separate mobile phone carried by some MOEs) is the primary means of communication during this time, with email, text, camera and phone functions being used to varying degrees depending on both the circumstances and, to a certain extent, individual preference. While individual use varies, BlackBerries are just one aspect of the MOEs toolkit and are often adapted (placed in rubberised black and yellow all weather cases) to increase their suitability to working outside and in all weathers. In this way the MOE's BlackBerries seem to be materially altered to make them 'blend in' with other engineering kit.

The ILMs, remote from the incident, are concerned with the performance of the MOE in the field, the impact of the incident and understanding responsibility for the underlying problem. Most incidents require a follow-up investigation which is usually coordinated by the ILMs and so they are also concerned with gathering evidence as the incident unfolds. Much of this evidence can be gathered remotely but the ILM may travel to the incident site. For more Senior Managers, an understanding of incidents across a region is a key part of performance management. In part, the magnitude and specific nature of individual incidents will determine the level of management interest but management are also looking at overall service levels and at incident prevention.

Technical specialists (TS) may be called in to help the MOEs resolve individual incidents but also work on incident prevention and engineering improvement programmes in their particular specialist areas. Most TSs' also receive incident updates from Control and may be closely involved if there are monitoring a specific upgrade or aspect of service.

The work at Rail Engineering therefore represents a particular form of distributed work, which encompasses a mix of office based, mobile and shift work. The practice of incident resolution is fundamentally distributed yet it is also clearly embedded in specific times and locations i.e. where and when an incident occurs. Resolving incidents usually requires the MOE to undertake hands-on physical labour, whatever the weather or time of day/night, while being continually controlled and monitored by others who are remote from the site. Both manual and managerial work practices are therefore emeshed in the work of resolving engineering incidents.

This understanding of Rail Engineering is generated through a concern with practice within our research more broadly. As Jarazbkowski suggests, "practice scholars examine the way

that actors interact with the social and physical features of context in the everyday activities that constitute practice” (2003, p23). Despite becoming a somewhat trendy label (Corradi *et al.*, 2010), practice studies have long been adopted by those seeking to unpack relationships between work and workers, with knowledge and practice are seen as inextricably linked in a complex relationship. From this perspective, there is a complex relationship between notions of knowledge, knowing and individuals; a relationship which is constructed through and by the practices in which people are engaged (Schatzki *et al.*, 2001).

From the descriptions above, it can further be seen that materiality within the work practices at Rail Engineering is multiple, complex and often unpredictable and therefore requires further consideration. Firstly there is the fundamental materiality of the railway (including track, sleepers, power rails, points etc.). This is further implicated in the complex materiality of an incident, which in itself involves problematic combinations of different materials (such as, for example, livestock straying onto the track) and requires the material involvement of the MOE arriving in his<sup>1</sup> van with his toolkit (including the BlackBerry). As Styhre (2009) suggests, it is important to extend our academic investigation of practices to include those “where the material conditions are never fully known *ex ante* and where the operating of technology used in the work is never fully possible to predict” (p387).

As previously mentioned, technology, particularly computer mediated communications (CMC) has been positioned as both enabling and restricting knowledge and knowing within organizational life (Kraut *et al.*, 2002). Research into CMC in organizations has tended to concentrate on the implications of electronic mail as an impoverished communication channel for organizational collaboration, particularly in comparison to face-to-face encounters (Duchenaud and Watts, 2005). Initial concerns related to the potentially limited social cues available through email and the tendency for individuals to over-estimate the effectiveness of email communication (Kruger *et al.*, 2005). This mirrors well established concerns in the knowledge literature in relation to issues of sharing tacit and explicit knowledge (Nonaka and von Krogh, 2009). The perceived value of personal tacit knowledge is particularly problematic in distributed work contexts, with technological solutions being seen as only relevant to facilitating explicit knowledge exchange (Pyoria, 2003).

Much of the research to date has concerned the use of ‘static’ email communication which more resembled electronic memos with often long delays between rounds of communication. With advent of mobile communication technologies (including smartphones) email is no longer deskbound but it increasingly offered as one of a number of functions (which may also include voice, SMS or text, and instant messaging) within a single device. As already highlighted, accessibility and speed are key marketing messages and are depicted as essential to enabling knowledge sharing ‘on the move’ in today’s organizations. However, small screens and smaller input devices offer potential frustrations for both sending and receiving messages on smartphones (Wiredu and Sørensen, 2006). Coupled with the concerns regarding norms of responsiveness associated with mobile devices, there is a risk that smartphone use may result in superficial collaborations (Kraut *et al.*, 2002; Wiredu and Sørensen, 2006), though the variety of potential forms of communication offered by smartphone use have yet to be fully explored within an organizational context. Overall, issues associated with interruption, overload and absent-presence are consistent themes in the recent research literature (Allen and Shoard, 2005; Mazmanian, 2009) and therefore also need to be considered when examining smartphone use in relation to knowing within a specific practice. As already highlighted, Rail Engineering provides a new research context for examining these issues and extending our understanding of smartphone use in the workplace.

Furthermore, rather than viewing the smartphone (in this particular case the BlackBerry) as a predefined and independent ‘tool’ for knowledge sharing, we rather focus on the constructions of knowing that emerge and are enacted by different groups of users through their enrolment of smartphones in the practice of incident response.

## RESEARCH METHODOLOGY AND APPROACH

Our research approach was developed with representatives from Rail Engineering who were involved from the beginning of the initial research design. They also arranged access to two regions within the company and assisted in data collection and analysis. In the initial period, the two authors had several meetings with Rail Engineering representatives to understand the organization structure, work practices and use of BlackBerries across a variety of functions. As a result of these meetings an interview-based research programme across four main user groups was agreed (see table 1 below).

*Table 1: Sampling Strategy*

<p><b>Office &amp; Corporate Managers (OM)</b> N=12</p> <ul style="list-style-type: none"> <li>• Professional background</li> <li>• HQ-based</li> <li>• Automatic issue of BB because of seniority and mobility</li> </ul>	<p><b>Local/Immediate Line Managers (ILM)</b> N= 11</p> <ul style="list-style-type: none"> <li>• Operations background</li> <li>• Local offices</li> <li>• Automatic issue of BB because of geography (remote)</li> </ul>
<p><b>Technical Specialists (TS)</b> N=11</p> <ul style="list-style-type: none"> <li>• Professional background</li> <li>• HQ-based but mobile work</li> <li>• Make business case for BB issue</li> </ul>	<p><b>Mobile Operations Engineers (MOE)</b> N=12</p> <ul style="list-style-type: none"> <li>• Operations background</li> <li>• Mobile work (rapid response)</li> <li>• Automatic issue of BB because of mobile work</li> </ul>

The research project was advertised on the company’s intranet and volunteers were sought. In addition, contact was made with regional management to ask directly for participants from the target sample groups. In total, three researchers (the two authors and an internal Rail Engineering researcher) interviewed 46 participants across the organization concerning their use of and attitudes towards their BlackBerries (see Table 1). During both the interviews and the subsequent analysis, we adopt a broad practice perspective (Corradi *et al.*, 2010) which enables us to retain an analytic focus in the ‘work’ itself whilst also unpacking the ways in which the BlackBerry is enrolled within their work by different groups. As already highlighted, the attention in this paper is to the practice of ‘incident resolution’.

The majority of the interviews with MOEs and Local Line Managers took place within two regions in the South East of England as BlackBerries are not yet used by these groups county-wide. Interviews were conducted at central and field offices, enabling the researchers to visit a variety of Rail Engineering sites. All interviews were fully transcribed and entered into the NVivo qualitative data analysis package for analysis. In order to facilitate initial sense making a descriptive coding framework, consisting of 20 categories, was developed (Richards, 2009). These categories were jointly constructed by the interviewers based on initial reviews of their own transcripts and subsequently revised during team meetings so that a shared template was produced. The overall category ‘knowledge and information sharing’

is further explored here. This category was theoretically elaborated and refined in an iterative process of *analytical coding* (Richards, 2009).

## RESULTS AND ANALYSIS

As explained above further analytic investigation of the overall theme ‘knowledge and information sharing’ suggested differing accounts of BlackBerry use around four key aspects of knowing within the practice of incident resolution at Rail Engineering:

- **Responding to incidents:** The primary focus here is the communication between the MOEs who are out in the field and those centrally controlling or managing the incidents.
- **Knowing about incidents:** Related to the process of incident response is others’ concern with keeping up to date about what is happening in the field.
- **Getting advice quickly:** Participants accounts of how they share knowledge and ask for advice is explored, with a particular focus on whether the BlackBerry enables or restricts these practices
- **Extending opportunities for knowledge sharing:** Examining both the extension of the working day and notion of absent presence within accounts.

Each of these is explored below using data from across the four groups to examine the variety of ways in which BlackBerries are emeshed within different aspects of incident resolution.

### Incident response

As outlined previously, once alerted by Control, the MOE is first line response on the scene of an incident, as succinctly explained by one MOE:

*“Control will call us, we’ll attend, we’ll action what we need to do, tell Control. If we need to, we take photos and send them to the relevant people ... when it’s actioned we tend to come back and then write our report ... and then send it up to Control.”* MOE

In general the MOE’s use their BlackBerries (and in some cases an additional mobile phone) when attending incidents but use a desktop computer to complete the formal incident reporting process once they return to their field office.

The MOEs’ primary role is to establish what needs to be done to resolve the incident, and in the account below a MOE explains how he uses the BlackBerry as a means to establish the ‘facts’ about incidents:

*“when we had a train hit a buffers and I was getting all these horror stories about, you know, ‘oh it’s gone through the buffers and it’s done this, and it’s done that’ and I’m like ‘no it hasn’t, I’m standing here looking at them - hang on I’ll take a picture and send it to you and you can see what I’m talking about’. So it’s very good in that sense, you know, because Control ... we deal directly with Control, but Control deal with lots of other people so they sometimes get lots of information and they then come to us and say ‘we’ve heard this’ ... ‘oh no, no, no’.”* MOE

The ability to take pictures with the BlackBerry and directly email these to Control was mentioned as a key rationale for issuing these devices to the MOEs. However, some participants mentioned that as it was now possible to provide photographs almost instantly, these were increasingly demanded by Control and the MOEs own knowledge and assessment of issues was becoming less important and, maybe, less valued:

*“It’s a funny sort of thing because railway knowledge, we would know what we’re dealing with ... however they don’t always take our word for it, you know.”* MOE

In this way then, the photograph has become the embodiment of knowledge, the key information to be shared, as opposed to the MOEs’ personal assessment and explanation of the incident. Nevertheless, the ability to send photos directly was seen to save the MOEs’ time and effort in terms of sharing knowledge:

*“they get the picture and it helps, it saves writing a thousand words if you can just like “there you go, that’s the problem, that’s what’s been hit, that’s what needs fixing.”* MOE

From this perspective then, despite the tension created, the MOEs seemed to suggest that the BlackBerry was useful in that it saved time in explaining to Control what needed to be done to resolve an incident. The MOE could then be left to get on with their ‘real’ job of fixing things.

However, some MOEs also mentioned using the BlackBerry’s camera facility to challenge Control and assert their (correct) knowledge of events, as in the example below:

*“they would say ‘it’s about 10 metres off the end of the platform’ and you end up walking half a mile, and you’ll take a picture and you’ll say ‘look, this is how far I’ve had to walk’, because Control might be on the phone saying ‘are you there yet, you’re only 5 minutes away’ and I’m like ‘well look’.”* MOE

Since the photo has become established as a means of proof, of establishing facts, the MOEs can now use this same functionality to challenge Control’s knowledge of the situation, in this case related to the time taken to arrive on scene.

Similarly, the MOEs describe how they attempt to manage the communications process with Control as an incident unfolds. In particular, if an incident is taking longer than anticipated to resolve or is particularly severe, the MOEs are likely to receive ongoing and repeated requests for regular updates from Control (usually by phone). Many MOEs reported this as being a frustrating aspect of their work. MOEs’ discussed how they attempt to balance their role as information providers with having the space and time to do the manual tasks required to resolve the incident. Much of this work may require the MOE to wear protective clothing or work in environments where it is either impractical or unsafe to stop and respond to a phone call or email. In the main, the MOEs described how they fitted their BlackBerry use into ‘gaps’ around these practical tasks:

*“you know, if they’re saying ‘can you get some photographs’ you say ‘yeah, when I can’. I mean you’d never sort of stop everything just to take a few photographs, you’d do it when you can, that’s my attitude you know. Whilst I’m going about, I don’t know, taking statements or whatever ... I’m also getting my BlackBerry loaded up, talking to people, finding out what’s going on and taking pictures, you know ... and then when you get time....and you always do ... ‘when are the [contractors] going to be here’, ‘not for another 20 minutes’, we’ve now got 20 minutes to do what I’ve got to do.”* MOE

The majority of MOEs reported that contact between themselves was by phone rather than using email or text message, on the whole the rationale here was the urgency of communications while on the ground at an incident but other explanations were also provided:



*“It tends to be verbally, on the phone really, because you get enough e-mails.”* MOE

*“I would use the phone. I’m a bit of dinosaur really.”* MOE

Dependent on the location, some MOEs have a mobile phone in addition to a BlackBerry issued to them personally. Using the phone enables them to leave the BlackBerry in the van or a pocket and so resist enrolling it within the incident resolution process.

On occasion MOEs reported that it was possible to ‘fend off’ Control and use practical and /or safety issues as reason for being out of communication, although there were also concerns expressed regarding the impact of this on the MOEs’ reputation:

*“there are individuals that just won’t make that effort to show us in a good light, you know, they argue the toss about going to jobs, and they’ll be standing there chatting to the blokes doing the repairs but they’re not feeding the information back. And that’s what we have to do ... if we don’t do that then what are we there for? ... Management then look at the log ‘well nothing’s coming up’ ... ‘why is nothing coming up’. So they then ring up the controllers ‘what’s going on’”* MOE

It is particularly interesting to note here the links made between the MOE out in the field and “management” monitoring their own BlackBerries for updates, which is explored further in the section below.

The incident response process is one of the key operational activities at Rail Engineering and therefore the MOEs accept that there is a keen interest in their activities. However as we explore further below, ‘knowing about incidents’ has expanded to become a pervasive characteristic of work within the organization.

### **Knowing about incidents**

Rail Engineering is often referred to as a 24/7 organization, though in terms of our sample groups this only really relates to the front line MOEs who work shifts, with their immediate line managers sharing on call arrangements. Nevertheless, the 24/7 depiction carries through to the way in which participants describe the information and knowledge sharing environment; information about incidents is always circulating and flowing and there is a concern amongst participants from all the groups that they might miss out if they don’t keep in touch with this flow via their BlackBerry:

*“I always tend to have a look at it no matter what time it is or where I am, I always look at it because it might be something interesting.”* ILM

On the positive side, participants comment that the speed of information flow and accessibility of information enables them to react and respond quickly. Below, a TS suggests that the flow of information about incidents enables him to adjust and review his work on incident prevention projects, thus aiding both effectiveness and efficiency:

*“Because we know about it, and it might impinge on one of our projects, and when we go in the morning we know a bit more about it, we can go straight in and gather the information and speak to the people involved, what happened.”* TS

However, because much of the information, including operational reports and incident summaries, is circulated widely via email to many different levels within the organization, there is no longer a process of escalation up through the different levels of line management.

Rather, the same information is available to all levels at the same time. As one office manager comments:

*“I’m preparing in case my boss will text me or e-mail me on the train on the way up, he knows what time I get the train, saying “what happened last night on so-and-so”. Well the last thing I want to do is not be informed of what happened, so I will read through that, hopefully before he’s read it.”* OM

A similar concern was reported by one of the MOE’s line managers:

*“we had a new manager who it was clear to us she was a lot more finger on the pulse than our last one, she seems to like the detail a bit more. My colleague and I were concerned that if we have an incident we were exposed, because we could get a phone call from her at any time saying “what’s going on” and we probably wouldn’t know.”* ILM

The wide circulation of incident reports together with the potential for these to be easily accessed via the push email functionality on the BlackBerry, appears to have contributed to a need to be in the know, particularly since not knowing potentially exposes more junior line managers. Given the availability of information, there appears to be no excuse available to them to justify why they might *not* know what is going on.

Some participants suggested that this need to be seen to be ‘in the know’ prompted particular behaviours in relation to BlackBerry use:

*“it’s like if an incident kicks off right now, you know, it will be a race to the BlackBerry to see who can tell the boss what’s happening first, you know. So that’s a bit of a macho thing as well, it’s a bit like kind of thumping your chest type thing, you know.”* ILM

*“some of my colleagues, they really have to be in the know, if you know what I mean, who’s doing what and who runs what. I think it’s as much to hold an intelligent conversation with the manager and making out they know more than they do”* MOE

This particular MOE was rather scathing about this practice and drew a clear contrast this sort of activity and the ‘real’ (engineering) work that was described the MOE’s primary role.

Many participants commented that these sorts of exchanges (particularly the ease of ‘reply all’ options) contributed to the volume of emails that they received and that the quantity of emails being exchanged did not necessarily lead to an improved quality in the knowledge sharing process:

*“Sometimes its information overload and you miss the important one because it’s in between all the dross.”* ILM

One manager, who had resisted having a BlackBerry, raised concerns about the constant focus on operational incidents and suggested that this could distract managers from other work priorities:

*“do I really need to know minute by minute what’s going on in a strategic job like this?”* OM

We are not suggesting that the BlackBerry itself has ‘caused’ these tensions relating to knowing about incidents, but rather the enrolment of the BlackBerry, and particularly its use by Senior Managers, has impacted expectations and norms regarding sharing knowledge

about incidents. From this perspective we suggest that ‘knowing what is going on’ has become a fundamental knowledge practice within the organization.

### **Getting advice quickly**

As highlighted above, the MOEs tend to use phone functionality (either via a BlackBerry or sometimes via a separate mobile phone) to ask for advice (usually from other MOEs) when out in the field. However, here we examine participants’ broader accounts of asking for advice.

There were a variety of concerns related to the use of email for requesting advice, some of which applied irrespective of the device used:

*“the trouble with an e-mail, there’s no opportunity to ask questions, to clarify, to expand, so what you’ve put may actually trigger more questions.”* OM

Other participants commented on the particular issues associated with BlackBerry use for knowledge sharing. This included some functionality restrictions such as the difficulty of opening attachments and looking back through email chains to understand the genesis of a discussion:

*“I find that I respond to somebody and give them information they’ve already got, and somewhere in that e-mail chain they’re asking me for something else.”* TS

*“probably 50% of the people will read it on a Blackberry and therefore won’t read the attachment”* TS

As already discussed previously, the use of distribution lists and ‘reply all’ tendencies were also mentioned as practices which, while seeming to aid knowledge sharing, also resulted in increasing volumes of emails. The tendency of managers in particular to forward emails for information or action was also mentioned in this respect:

*“If my boss - if he saw the word “track” he’d just forward it to me, regardless of whether it’s actually relevant.”* TS

More broadly concerns also related to increasing expectations of speed of response:

*“With this now, the tendency is the e-mails come in, you respond to it, and sometimes I think “actually yeah, probably should hold back on that one and sleep on this” but sometimes I think there’s a tendency now to respond quickly. And because more people have got the BlackBerries everybody expects a quick response.”* TS

*“Like if you got an e-mail on the BlackBerry and you were always going to respond to that request immediately then you’d end up quite a scatterbrain, because you’d always be at the beck and call of this. So I think....and that is a danger, you lose your ability to concentrate on one task at a time.”* MOE

However other participants commented that they were unlikely to request advice via email but would use other functions provided by their BlackBerry, particularly text messaging:

*“it’s not airing your dirty linen in public is it”* OM

*“It’s about forwarding. There’s people tend to forward e-mails on and no-one ever forwards text messages on.”* TS

Both these participants described examples of parallel discussions in which ‘official’ communications taking place by email ran alongside ‘unofficial’ text exchanges. Some participants also discussed their use of the BlackBerry’s own facility (called ‘PIN messaging’ by RIM since it relies on the unique personal identification number associated with each device).

However at the same time it was acknowledged that the more formalised process of exchanging knowledge via email also served certain purposes within the organization:

*“people want things written down, they want this audit trail of ‘well I asked you at this time on this date’ rather than having that trust in people that says ‘well I phoned you’, if you’ve had a conversation. From the performance background ... every minute means a cost to Rail Engineering, and they work to a strict timeline. So to have that physical e-mail that said ‘well I told you on this date and you didn’t do it’.”*  
ILM

The BlackBerry provides the potential choice of communication media within a single device however as we can see this choice is also a complex matter. In particular, the audit trail associated with emails appears as a double-edge sword within the process of asking advice as the audit trail can be both useful and incriminating.

### **Extending opportunities for knowledge sharing**

Whilst we are not specifically focusing on the issue of work-life balance, it is worth highlighting the concerns regarding the extended timeframe for knowledge sharing. In particular, whilst the 24/7 operational nature of Rail Engineering was frequently mentioned, several participants commented that forms of communication were also being extended, often without such a clear rationale:

*“it allows people who don’t prepare and don’t plan to impact on other people ... you know, getting a panic phone call “I’ve got I’ve got to do this tomorrow and I’ve suddenly realised I haven’t got this information”. And you think “well that’s your failure to plan, not mine” but because he can get hold of me now there’s that expectation that I will muck in and help.”* TS

In addition to offering the potential for knowledge sharing beyond the working day, participants also discussed the impact of the BlackBerry on face-to-face communications, particularly meetings:

*“all the people that had BlackBerries were constantly on them, constantly twiddling with them and it’s really annoying when you’re trying to have a meeting and trying to get people’s attention and focus and innovation and get things going and people are distracted by it.”* TS

Another TS commented:

*“I mean you tend to find in meetings that the more senior the people are, the less attention they’re paying, which is a terrible thing to say”* TS

However, others suggested that carrying their BlackBerry to a meeting was beneficial, not just in terms of increasing their availability to others, but also during face-to-face meetings:

*“Only this morning I was actually in a meeting and I do turn it off when I’m in meetings but somebody asked me a question and I said “oh I had an e-mail about that” pulled it out, there it was, there’s the answer to the question. Rather than saying*

*“oh come back after the meeting, come back to my desk and we’ll see if we can find it” it was there and the information was available.” OM*

Furthermore, in an interesting twist on absent-presence, some participants who spent a lot of time travelling mentioned that the ability to deal with their emails while on the train or in other ‘dead’ time, meant that they felt more ‘present’ when returning to the office. As the TS below describes, the BlackBerry is enabling him to free time and space for knowledge sharing via other means:

*“the thing is that it’s tended to de-clutter my day and it means that I can do better quality stuff when I’m in the office rather than just bureaucratic stuff I’ve already dealt with.” TS*

In this way then we see that BlackBerry use is presented as both potentially enabling and limiting opportunities for knowledge sharing.

## DISCUSSION AND CONCLUSIONS

Through our analysis we explore the differential enrolment of BlackBerry devices in the management and enactment of engineering work within the practice of resolving incidents. In exploring the four themes of responding to incidents, knowing about incidents, getting advice quickly and extending opportunities for knowledge sharing we see the complexity of issues surrounding BlackBerry use by the different user groups. For each, there appear to be tensions surrounding the way in which the BlackBerry is enrolled within their work, tensions which are interrelated as the practice of incident resolution involves participants from all four groups at different times and places.

In this materially complex practice, the BlackBerry may initially appear as an insignificant and almost irrelevant device, after all it is not of direct engineering use. However, for the MOEs we can see how the emailing of photographs from site has become a central, yet problematic, aspect of their practice. More broadly the availability of information about incidents has seen a change in the way management come to know about (and question those who resolve) incidents. Being in the know seems to be essential to avoid being ‘caught out’ by your manager (at whatever level), since there seems no real defence to offer for not knowing. The impression that information is flowing 24/7 further impacts the ways in which advice is sought and the opportunities for knowledge sharing. Tensions emerge around the audit trails of emails and the public opportunities for claiming knowledge via using ‘reply all’ functions. The extent to which the use of BlackBerries may distract individuals appears a concern both in relation to ‘real’ engineering work (resolving incidents) and ‘real’ management (being strategic).

It is not our intention to suggest that the BlackBerry has caused these issues, but rather to unpack the ways in which resolving incidents has altered as BlackBerry use (and indeed non-use) has become more widespread amongst those who are involved in different aspects of this practice. We have highlighted the tensions created by emergent social and material enrolment of the BlackBerry device, suggesting that differing local interpretations can both aid and hinder knowledge sharing.

In conclusion, we suggest that while the introduction of smart phones may enable new opportunities for knowing, such devices may also exacerbate existing (but previously hidden) tensions within organizational practices. So, while the marketing messages suggest the

potential to 'do more, faster' we suggest this creates emerging tensions between responsiveness and thoughtfulness and have considered the impact of not only being able to 'carry your friends in your pocket' but of having your boss in there too.

#### ACKNOWLEDGEMENTS

The authors wish to thank the British Academy for funding aspects of this research (SG-54143) and all those from 'Rail Engineering' who supported and participated in this project. We would also like to thank Elizabeth Brockman for her valuable assistance during this project and the participants of BAM 2010 and IWP 2010 for their feedback on our earlier findings.

#### NOTES

<sup>1</sup> All the MOEs interviewed were male, as was generally the case throughout the organization. There were occasionally female MOEs, but this was very unusual and we were not aware of any within the regions accessed for this study.

#### REFERENCES

- Allen, D. K., & Shoard, M. (2005). Spreading the load: Mobile information and communications technologies and their effect on information overload. *Information Research 10 2 Paper 227*, available from <http://informationr.net/ir/10-2/paper227.html>
- Arnold, M. (2003). On the phenomenology of technology: The "janus-faces" of mobile phones. *Information and Organisation, 13*: 231-256.
- Corradi, G., Gheradi, S., & Verzelloni, L. (2010). Through the practice lens: Where is the bandwagon of practice-based studies heading? *Management Learning, 41*(3): 265-283.
- Duchenaud, N., & Watts, L. A. (2005). In search of coherence: A review of research human-computer interaction. *Human Computer Interaction, 20*: 111-124.
- Hinds, P., & Mortensen, M. (2005). Understanding conflict in geographically distributed teams: An empirical investigation. *Organization Science, 16*: 290-307.
- Jarvenpaa, S. L., & Lang, K. R. (2005). Managing the paradoxes of mobile technology. *Information Systems Management, 22*(4): 7-23.
- Jarzabkowski, P. (2003). Strategic practices: An activity theory perspective on continuity and change. *Journal of Management Studies, 40*(1): 23-55.
- King, J. L., & Frost, R. L. (2002). Managing distance over time: The evolution of technologies of dis/ambiguation. In P. Hinds & S. Kiesler (Eds.), *Distributed work* (pp. 3-26). Cambridge, Mass: The MIT Press.
- Kraut, R. E., Fussell, S. R., Brennan, S. E., & Siegel, J. (2002). Understanding the effects of proximity on collaboration: Implications for technologies to support remote collaborative work. In P. Hinds & S. Kiesler (Eds.), *Distributed work* (pp. 137-164). Cambridge, MASS: The MIT Press.
- Kruger, J., Epley, N., Parker, J., & Ng. (2005). Egocentrism over email: Can we communicate as well as we think? *Journal of Personality and Social Psychology, 89*(6): 925-936.
- Maier, R., & Hadrich, T. (2007). Designing portals for knowledge work. In A. Tatnall (Ed.), *Portal technologies and applications*. New York: Hershey.

- Mazmanian, M. (2009). *Understanding the blackberry spiral*. Paper presented at the Academy of Management Conference, August 2009, Chicago.
- Mazmanian, M., Yates, J., & Orlikowski, W. (2006). *Ubiquitous email: Individual experiences and organizational consequences of blackberry use*. Paper presented at the Proceedings of the 65th Annual Meeting of the Academy of Management, Atlanta, GA.
- Middleton, C. A. (2008). Do mobile technologies enable work-life balance? Dual perspectives on blackberry usage for supplemental work. In D. Hislop (Ed.), *Mobility and technology in the workplace* (pp. 209-224). London: Routledge.
- Nonaka, I., & von Krogh, G. (2009). Tacit knowledge and knowledge conversion: Controversy and advancement in organizational knowledge creation theory. *Organization Science*, 20(3): 635-652.
- O'Leary, M. B., & Mortensen, M. (2010). Go (con)figure: Subgroups, imbalance and isolates in geographically dispersed teams. *Organization Science*, 21(1): 115-131.
- Pyoria, P. (2003). Knowledge work in distributed environments: Issues and illusions. *New Technology, Work and Employment*, 18(3): 166-180.
- Richards, L. (2009). *Handling qualitative data: A practical guide* (Second Edition ed.). London: Sage.
- Schatzki, T. R., Knorr-Cetina, K., & Van Savigny, E. (Eds.). (2001). *The practice turn in contemporary theory*. London: Routledge.
- Schultze, U., & Boland, R. J. (2000). Knowledge management technology and the reproduction of knowledge work practices. *Journal of Strategic Information Systems*, 9(2-3): 193-212.
- Styhre, A. (2009). Tinkering with material resources: Operating under ambiguous conditions in rock construction work. *The Learning Organization*, 16(5): 386-397.
- Symon, G., & Pritchard, K. (2009). *Formulating a research agenda for understanding mobile email use*. Paper presented at the BAM, September 2009, Brighton.
- Symon, G., & Pritchard, K. (2010). *Blackberries and mobile work: Fruitful and frustrating?* Paper presented at the Tensions and paradoxes in a virtual working world symposium at IWP 2010, Sheffield.
- Wajcman, J., Bittman, M., & Brown, J. (2008). Families without borders: Mobile phones, connectedness and work-home divisions. *Sociology*, 42(4): 635-652.
- Wilson, J. M., O'Leary, M. B., Metiu, A., & Jett, Q., R. (2008). Perceived proximity in virtual work: Explaining the paradox of far-but-close. *Organization Studies*, 29(7): 979-1002.
- Wiredu, G., & Sørensen, C. (2006). The dynamics of control and use of mobile technology in distributed activities. *European Journal of Information Systems*, 15(3): 307-319.
-