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Abstract. *In the era of an increasingly 'light' and 'liquid' modernity (Bauman, 2000) airports appear to be privileged and distinctive sites of organization, constitutive of what Castells calls a 'space of flows' that is helping to extend and integrate the so-called 'network age' of global economy and 'glocal' culture. This paper draws on original empirical research at Fulchester International Airport and studies the movement of various subjects and objects (including passengers, bags and aeroplanes) as they are assembled and disassembled by 'modes of ordering' to facilitate the flows of exchange and interaction that for Castells binds the physically disjointed positions of social actors in contemporary global organization. Our study explores the ways in which digital information and communications technology creates 'spectral' and uncanny phenomena that feeds back into the here-and-now of mundane, organizational reality.*

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We find that an emergent hybridity between the dimensions of the virtual and the real opens up an intensive space that seems to extend the becoming of a 'post-human' ontology; but in so doing it also provokes the return of a recalcitrant and unpredictable mass. ***Key words.*** *airports; digital reserve; flow; flux; modes of ordering; space*

Airports are said to epitomise much of what is distinctive about the ways we currently organize our world. Castells (1996) argues that airports constitute nodes in 'a new spatial form characteristic of social practices that dominate and shape the network society', a form that he calls the 'space of flows'. By the *space* of flows, Castells (1996: 412) draws attention to 'the material organization of time-sharing social practices that work through flows'; and by *flows* he understands those 'purposeful, repetitive, programmable sequences of exchange and interaction between physically disjointed positions held by social actors'. Modern societies, he claims are constructed around flows: flows of people, flows of capital, flows of information, flows of social and organizational interactions, and flows of symbols and images. For Castells, flows are the expression of the processes that dominate modern life providing 'material' foundations for the emergence of new connectivities and the spread of global or 'glocal' culture.

J. G. Ballard (1997) describes the world's major airports as being, in effect, the suburbs of a Calvinoesque 'invisible city', 'a virtual metropolis whose faubourgs are named Heathrow, Kennedy, Charles de Gaulle, Nagoya, a centripetal city whose population forever circles its notional centre'. Similarly, Augé (1995) sees airports as exemplary of what he calls the 'non-places' of 'supermodernity' characterized by emptiness, abstraction and the impersonal transit of a utilitarian 'lonely crowd' cocooned within the fantasy and simulacra of corporate designed culture. Pascoe (2001: 33) describes a darker reality; 'as soon as one drives into an airport carpark', he writes, 'one finds oneself integrated into an unparalleled conglomeration of communication and control systems which refuses any dissent'. Serres (1995) goes further still writing of a condition of complex socio-technical material mediation, translation and exchange, a condition that is understood to be slowly yielding to profound ontological dissolution in which our very understanding and navigation of organization is becoming increasingly reliant on phenomena described by Serres as 'angels'. For Serres, the airport is a privileged site of paradigmatic and trans-human change, a space of proliferating socio-material and technological intermediaries that in combination and assemblage helps re-draw and disrupt routine spatio-temporal co-ordination and comprehension.

Such imaginative and fatidical cultural narratives articulate the hopes and fears associated with new technological orderings of organization and

society. In this paper we explore the multiple 'modes of ordering' (Law, 1994) that airports mobilize in their efforts to construct and maintain this 'space of flows'. In this account of our empirical work at the UK's Fulchester International Airport[1] we seek to demonstrate how the complexities of airport organization can be usefully delineated and opened up for analysis when approached in terms of these modes of ordering. We find that these modalities co-exist, run in parallel, but also interfere and contradict one another.

We are interested in organization as the fragile product of various 'modes of ordering' performed and enacted by complex heterogeneous assemblages of materials, technologies, and people. It is important to note that complexity, as Law and Mol (2002) demonstrate, is a state that results when things do not quite 'add up'. In recent years Fulchester has sought to install and apply various digital and information-communications technology in an effort to integrate and synthesize elements of this complexity and to improve the flow of various entities. In what follows we explore socio-technical patterns and relations in contemporary organization that give shape to this failure to 'add up'. We set out specifically to examine the flow of passengers, luggage and aeroplanes in our research, but this paper shows how overlapping jurisdictions within management help generate a resistant or refractory force within organization that create the conditions of possibility in which various components fail to achieve a consistent form and outline.

In this excess or 'différance' of organization our research begins to attend to what we might call 'digital reserve', a phenomena that is brought into play by the increasingly co-constitutive 'inter-action' of the virtual and real[2] in contemporary organization. The term is something of a neologism and therefore requires some explication. Heidegger (1977), it will be recalled, described the distinctiveness of modern technology in terms of 'enframent', as the process through which the world and everything in it, human beings included, is harnessed as a 'standing reserve' or 'stock' (*Bestand*). Thus the mighty Rhine is 'enframed' by the power plant and utilized as a reliable source of hydroelectric power. Insofar as contemporary computer-mediated forms of ordering and organizing also involve the conquest of *tyche* by means of *techne*, they can be said to create their own versions of a 'standing reserve'. The creation of 'digital reserve' is thus a condition of possibility for the various wonders of 'information age' social organization, including Castell's 'space of flows'. At the same time, however *tyche* is not eliminated. Instead, we shall argue, this digital reserve is itself generative of its own forms of instability, its own forms of disorder. Whilst computer-mediated organization holds the promise that competing demands made by different 'orderings' can be harmonized we began to see that ICTs are complicit not only in the production of visions and possibilities of order and stability, but also in rendering them precarious and fragile. Between the virtual and real the airport opens up an experientially 'intensive space' (see Massumi, 2002) that seems to allude

to what some commentators may recognize as a 'post-human' ontology of information, identities, processes and procedures. The 'digital reserve' could be said to go hand-in-hand with a 'digital uncanny' (Waldby, 1997). It provokes the return of a recalcitrant and unpredictable flux that proliferates in delitescence and potentia behind the surface of everyday life and its 'paramount reality'. We conclude that the airport shows signs of becoming an emergent phenomenon that falls outside and between the control of agencies and their human and non-human delegates. The airport eludes and resists the control of any-one person in ways that help constitute the airport as a media of unpredictable transformation whose on-going assembly and repair is perhaps best described as a 'nervous system' (Taussig, 1992).

Approaching Fulchester International Airport

Fulchester Airport has invested heavily in the development of various information and communications technologies in an attempt to solve its problems of ordering and coordinating the vast array of subjects and objects at play in airport space-time. All four of the authors were involved collaboratively and individually in the research conducted at Fulchester examining the role of ICT based applications in business-knowledge processes. We began to visit the airport and its employees in June 2004 and to date we have interviewed over 50 organizational actors, on at least one occasion, all of whom occupy different roles within various levels of the organizations that collectively make up the airport. We recorded all the interviews, apart from those where interviewees had explicitly requested that the interview not be recorded. Notes were taken during the interviews, which we used as a basis for analysis and group discussion amongst all members of the research team. A key feature of the methodology was our efforts to see and hear the interviews not simply as an exercise in information retrieval, but rather to engage with the interview as an occasion of 'practical reasoning' in which organization (as a verb) was being variously represented and 'accomplished' by its members and users. We were able to recognize that the nature of our own discourse with its concepts and categories helped to shape and co-create the reality of organization in its various instantiations. By attending to the interview as a reflexive component within the wider socially 'negotiated' construction of reality we began to work within more processual dimensions of organization where organization and its material flow reveals its contingent and unpredictable dispositions.

Our interviews provided entry into Fulchester International Airport and once there we were able to develop and exercise more ethnographic forms of research that on occasion allowed us to take on the role of participant observer. We 'rode' the baggage carrousel and took turns accompanying customer service agents as they toured the various spaces in the airport; we sat with baggage handlers and explored the secret tunnels and

passageways behind the scenes of the check-in concourse and airport lounges; we ate with staff in the canteen lounges; and watched air traffic control conduct its 'orchestra' of arrivals and departures from the air traffic control tower offering a unique panorama on the movement of subjects and objects around the architecture and space of the airport. The research team had some freedom to roam in our host organization where we were able to explore various objects and artefacts that helped us to make sense of the airport. We also worked an around-the-clock shift with air-traffic control that allowed us to participate in the 'real time' work of interpretation, improvisation and transformation where we began to understand how 'data' gets transformed into 'information' and then into 'knowledge'. Once again, however, we discovered that in many ways the ethnographer, as John Law writes (1994: 45), is never where the action is. As a consequence we learnt to attend to organization as it is happening out of the 'corner-of-your-eye'—in the seemingly trivial and marginal, the asides and the routine, the often unremarkable and everyday in organization. These methods proved crucial in uncovering the ways in which ICT based applications to business processes rely upon knowledge in organization that is always evolving, but also tacit, implicit, and highly skilful in its improvisational qualities.

Modes of Ordering: Customer Service at Fulchester International

The customer service agents who staff the various help and information desks in the airport are central to the translation and reconciliation of the multiple and often contradictory demands of airport management. 'Last Friday night, in Terminal 2, Angela had about 14 flight arrivals about 10 o'clock ... '. Patrick, one of the airport terminal management staff, is telling a story about a 'third party' baggage handling company contracted by one airline that illustrates this problem of management. 'Customers were waiting for 3 hours to get their bags back', he continues, 'we were inundated with complaints ... telephone calls from the chief executive ... all these sorts of things ... and our staff were getting lynched'. Patrick concludes by informing us that 'we ended up lashing out about seven hundred quid on refreshments just to keep them happy' but, as he explains, 'we don't have any influence over [the baggage company]' because 'we're not paying for their services'. In order to generate and retain a seamless 'flow' of passengers through airport space, CSAs find themselves having to subsume and embody the friction of 'boundary' disputes arising between different agencies and their various sub-contractors at work in the airport. Attempting to maintain a seamless 'flow' by eliminating or displacing the complex fractures of organizational boundaries, however, compromises the ability of airport staff to regulate the boundaries of their own job roles. The job of the CSA is characterized by constant interruptions, re-directions and demands as he or she is contacted by radio, text or Tannoy. They can be seen wandering around the airport in their blue uniforms, rushing here and there, sometimes solo and on occasion collectively in teams: the role

of the customer service agent might therefore be interpreted as an obligatory point of passage between order and disorder (overflow). CSAs are periodically stopped and petitioned in the concourse by lost or confused passengers and routinely called upon to, for example, move obstructive vehicles or mend broken escalators in order to keep the airport and its passengers moving. Hence, maintaining customer flow requires an 'overflow' of responsibility for CSAs—by carrying out tasks above and beyond the explicit terms of formal employment contracts and job descriptions. Their talk is constantly about being prepared for the unexpected, they tell us that 'anything might happen next' (Deleuze, 1989) and of how events can rapidly escalate and trigger off a series of repercussions cascading over boundaries and spatial demarcations to overwhelm management and organization.

The spectre of imminent disorder stimulates a state of being alert and receptive amongst CSA staff, but more than simply stimulating the senses the airport creates a more fractious and heightened condition of vigilance and agitation that, following Taussig (1992), we have called 'nervous system'. Here the channels of media and communication are so multiple and diverse that it is often difficult to synthesize and make sense of all the signals. Patterns of movement and flow are incredibly detailed and complex requiring the coordination of multiple agencies to bring about the separation and then subsequent reunification of passengers, bags and aeroplanes. So interdependent are these multiple agencies of flow management that there is a degree of vulnerability and chaotic behaviour in which a minor interruption or defect in the processing of one strand in the multiplicity can rapidly proliferate and spiral out of control causing repercussions across inter-related activities. In one sense, for example, it is only the existence of a thin one-foot high plastic barrier that separates one item of luggage destined for Orlando, from another heading for Mumbai. Sometimes handlers may forget to load certain items or bags fall off the back of the 'tugs' (carts) used to drive them to and from aircraft. What we might call the 'virtual luggage' continues its trajectory into the 'space of flows' while the 'material' luggage is still on the floor. More frequently, luggage tags, the means through which 'real' luggage is harnessed to the 'virtual' become detached and the luggage temporarily (or some times permanently) lost.

As we spent increasing amounts of time at the airport we became aware of how 'immersive' an environment it is, a multi-media multi-sensory environment in which individuals such as the CSAs are hooked up to long lines of information and communication media processing data that is itself subject to complex webs of movement, translation and transformation that allows 'information' and eventually something recognizable as 'knowledge' to emerge. Separations between human and technology are progressively being eroded as the quality of this immersion deepens and extends within the airport. The CSA resembles a 'node in a network' of Tannoy announcements, mobile telephones, information storage and

retrieval systems, responding to requests in ways that combine different fragments dispersed through multiple media channels—at times instantaneously, but on other occasions in a flurry of activity that involves the chasing of missing information and the on-going repair of disconnections. Crossing boundaries between inside and outside, working both 'airside' and 'landside', dividing, separating and allocating materials and material flow to its correct location, these CSAs are perhaps, in Serres' (1995) terms, an example of 'angels' at work in organization.

The enigmatic activity of these agents seeks to resolve problems of order/disorder at multiple points of stress and strain that inhabit the texture of extended and dispersed multi-site contemporary organizations. However, Customer Service Agents mediate and translate data and information that inscribes subjects and objects in multiple and at times contradictory ways—*inter alia*, as security risk, or as a health and safety issue; alternatively, phenomena is perceived and indexed within airline jurisdiction or as an item consigned to airport commerce. Consider the choices that might face a CSA as they spot an 'item of luggage' sitting slightly out of alignment on a display stand in one of the duty-free shops. CSAs deal with people who might be either/or—or indeed both—airport 'customer' and airline 'passenger'; they also have to distinguish 'backstage' airport staff and its subcontract agents from 'frontstage' airport 'users'. At the intersection of multiple modes of ordering, with its crosscutting processes of world-making inscription (Joerges and Czarniawska, 1998), objects and subjects remain *in-potentia* and ill-defined, meta-stable and uncertain. An agent of this inscriptive world-making, the CSA is a component within the on-going unfolding of orderings; but the CSA is also having to make choices in their interpretation and inscription of phenomena, a decision-making process that reminds us of the existence of an 'absent-present' background possibility of uncertainty and ambiguity. CSAs are themselves constituted within these overlapping and mutually interfering orderings—too much movement of CSAs across security checkpoints around the airport puts pressure on security and surveillance; moreover, their responsibilities and capacities are defined by the reflex of an extended network of prosthetic and digital information-communication technologies that cut across the boundaries of formal organization (Hayles, 1999). We were told that the popular television broadcast of a number of fly-on-the-wall documentaries about airports, for example, which follow and highlight the activities of demanding customers, encourages passengers to look to CSAs to solve all kinds of increasingly complex queries. It is around these activities that the airport is enacted as the contingent outcome of on-going practical accomplishment. This all contributes to what we are calling 'nervous system' and as we go on to look at the airport in terms of passengers, luggage and aeroplanes, we begin to further uncover the work of these modes of ordering whose logic works towards the constitution of complex 'hybrid' assemblages of subjects and objects.

Information systems and their modes of representation allow us to follow the flow of airport traffic—in the form of passengers, bags or aeroplanes—as they are variously disassembled, made ready for their diverse itineraries, transported and later re-assembled in other times and spaces. However, the multiplicity of information systems in use in airport organization constitute objects and subjects in many different ways and so poses problems of identification and consistency that requires skilful acts of mediation and translation. As we follow these object-subjects in their complex journeys we discover an increasingly intensive use of space that exacerbates those conditions of possibility in ways that provoke the impression that as one of our CSA informants told us 'anything might happen next'. Tyche *returns* then, despite the promise of information technologies, but in surprising and novel forms, cross-cutting across subject/object, animate/inanimate, virtual/real, in strange hybrid compacts whose lineaments and tensions are intricate and complex, extending as they do across vast networks of assembly and maintenance.

Let us take a look at aeroplanes to illustrate these 'compacts' or what is called elsewhere 'heterogeneous assemblages'. Aeroplanes are inscribed with multiple identification codes and processed and regulated through different communication media by Air Traffic and Ground Control. The aeroplane that is 'known' to the airline passenger is not the same as the plane that occupies the screens of air-traffic control, nor the aircraft that is managed by ground control. Flight numbers used by passengers ('BA2032 to London', for example) are only one form of classification, which are supplemented by codes used by other agents in the airport including air traffic control. In circumstances of 'code shares', yet a third identification number—referring to the partner airline—may be used. Computer controlled docking information systems also use identification codes that carry information about wing span and fuselage length, which are critical in the allocation of correct boarding gates with sufficient space and clearance for the various respective aircraft types. The system becomes increasingly sensitive to accurate data coding as the remit enjoyed by automated information systems extends and multiplies. This means that conflicting information or errors in translation can have dramatic results. A recent event at Fulchester illustrates this catastrophic potential. Information relayed from ground traffic controllers to air traffic control prompted air traffic to advise the pilot of a Boeing 767 to proceed along taxiway 'Juliet' and to then turn right towards Runway 2 (cf. Weick, 1990). In this case, relying on air traffic control and their taxi instructions, the pilot believed there must be sufficient wingspan clearance between his plane and the next further advanced down the taxiway so that he could make his manoeuvre. However, as the pilot turned right off the taxiway and onto the runway, his left-side wing crashed through the tail of the stationary plane, only avoiding its vital fuel tanks by the narrowest of margins. Although there were no fatalities in this incident, there were

over 80 passengers taken to hospital, some with severe neck and whiplash injuries. Contrary to his visual 'evidence', the pilot maintained his trust in air traffic control instructions—'always trust the instrumentation' remains a mantra in navigation. Together with the problem of multiple identification codes that trigger different responses and instructions it might even be said that planes are hybrid objects (both virtual and real), and at times, it seems, objects that simply do not know how to behave correctly.

Like aeroplanes, passenger luggage is variously labelled and coded through information systems that are used to monitor and regulate traffic flow. The baggage system at Fulchester is a complex series of automated conveyor belts that channels bags from the check-in desk to a subterranean three-dimensional transport structure composed of loops and escalators, gravity rollers, belt curves, 'pushers', plow diverters, angle-merge conveyors and trolleys which transport the luggage to the aeroplanes. At the beginning of the handling operation check-in staff place the bag—identified by a bar-coded luggage tag—upon a conveyor belt, which then feeds the item through a series of security checks and automated x-ray scanners. If the bag is deemed safe, it continues along the conveyor belt during which time it is repeatedly scanned by laser barcode-readers in order to identify its location. Ultimately the bag will be dropped into a predefined space on the transport system whose BRAINS[3] will 'know' on the basis of laser readings which flight the bag is destined for. At the correct moment the belt conveyor opens and tips the bag into a chute where it is picked up by a baggage handler who will again 'read' it using a bar code scanner before placing it upon the pallet trolley destined to be driven out to the correct aeroplane. If the bag is not read or does not pass the first x-ray, the conveyor belt drops it through to another level where it is fed through to a CT scanner that conducts a cross sectional analysis of the bag in question. This scanner is programmed to analyse the cross section and decide whether the bag is safe or not. If it is not deemed safe then security staff will analyse the cross sectional diagrams and will act accordingly, with the most dramatic outcome being the evacuation of the terminal and the destruction of the bag.

The whole baggage system is monitored by a 'flow controller'. Sitting in an office deep in the bowels of the terminal, the flow controller observes a VDU monitor that details the diagrammatic representation of the whole conveyor belt system. He is able to see if a bag has got stuck or gone missing because the system scans the bags at defined stages. If the bag does not get scanned then the diagrammatic representation of that section of the system turns red to alert the flow controller that there is a problem. He will then scramble over the conveyor belt to dislodge or relocate the missing bag. Baggage handlers claim that one of the main causes of blockage is check-in staff, often working for sub-contractors. During busy periods, in an attempt to deal with impatient passenger queues and time pressures, check-in staff will 'force' bags down the conveyor belt before the system permits. Each item of luggage on the system occupies an allocated

slot on the conveyor belt and proceeds through the transport system according to the logic and monitoring of ICTs that constrains check-in staff to wait and defer to 'system instructions' and indicates when the next piece of luggage can be safely loaded. Sometimes, during busy periods, as queues mount up in the check-in hall, staff take matters into their own hands and, rather than wait for clearance, physically force the bags into a slot already occupied by another piece of luggage. This is much to the ongoing consternation of the flow controller whose diagram ends up flashing red indicating repeated blockages and stoppages.

We were invited to view the baggage system at a quiet time of day when there were few bags travelling the system, but the flow controllers described to us the situation during the height of the summer season when the number of white dots 'look like a snowstorm'. 'Snowstorms' thus symbolize the return of the mass and the disordering potential inherent in what we have begun to identify as 'digital reserve' (with its shadow, the 'digital uncanny') that weighs upon the on-going practical accomplishment of organization and suspends its operations in an imminent sense of emergency and catastrophe where orderly flow mutates into disorderly flux. ICT technologies allow an ever greater intensive and multiple use of space enabling more objects to be processed at ever faster speeds, reducing margins and comfort zones deemed necessary under older and slower more human-centred systems of management and coordination. Like the CSAs and air traffic controllers in the radar room, under these conditions, the flow controllers must maintain a constant vigilance, aware that at any moment a collision or 'snowstorm' is possible.

Deferrals, Overflows, Proliferations

The scrambling gymnastics of the flow controller or the sometime frenetic activities of the customer service agent are typical of actions that remain hidden in backstage areas at the airport and in the 'seen but unnoticed' background furniture of everyday life. It is in these realms of organization where we find evidence of what we have identified as the co-implication of 'overflow' with Castellian 'flow' in the airport. Our research would seem to suggest that inefficient forms of disordering are not eliminated by ICTs; rather, disorder is deferred and 'differed' finding expression in other areas and other dimensions of organization. This in turn gives rise to further ordering efforts to recover flow and re-organize physical space and its passengers with ever-greater efficiency and rationality. Some commentators have argued that the expansion of information and media tele-technologies promotes a general 'intensification' of matter and potentiality (Mackenzie, 2005; Massumi, 2002; Thrift, 2004): matter is broken down and itemized through what is an increasingly forensic inspection of constituent parts before being variously re-assembled and hybridized to form novel, heterogeneous phenomena that is precarious and volatile by virtue of its complex, virtual-real assembly. Rajchman (1998) argues that the expansion

and advance of the 'virtual' into the (mundane) 'real' produces a general 'de-materialization' characterized by an increasing plasticity of form that dissolves the familiar content of artefacts in organization. Passenger luggage, for example, is 'known', inspected, and treated in a multiplicity of ways. We can say, therefore, that as an object, it lies in *potentia* and *in-between* all these different ways of knowing. At times this means that it can become the subject of dispute and contestation between different authorities and expertise; a sort of 'boundary object' subject to jurisdictional contestation waged through technological and digital media. This is not simply a case of representational difference; instead digital media can be seen to be having an increasingly constitutive role in the construction and on-going practical accomplishment of objects, subjects, and other organizational artefacts. As the virtual-real expands its constitutive force in organization, artefacts are beginning to be composed of unlikely and 'heterogeneous components', assembled from a variety of 'virtual' and what we conventionally call 'real' and 'objective' attributes. 'Charged' by potentia and invested with multiple meanings and potentiality this virtual-real introduces a 'meta-stable' (Hansen, 2001) dimension to organization that suspends artefacts in a reserve—a 'digital reserve' of potentiality. Against this backdrop, 'snowstorms' for example, are hybrid phenomena generated by a heterogeneous assemblage of elements provided by barcodes, scanners, software programmes, data abstraction, tele-visual representation, mediated observation, popular imagery and ritualized collective socialization and affirmation. A snowstorm is also a state of mental association and collective ambience, a media and outcome of organizational behaviour that remains vulnerable to the vicissitudes of components distributed across an extended and tangled network of socio-technical phenomena.[4] Here we see the basis upon which flow is always-already at risk of dissolving into a multiplicity of shards and fragments, a 'media explosion' that overwhelms and 'overflows' the capacity and logic of traditional forms and modes of representation and organization. The intensification of matter can be felt to impart a palpable resonance to artefacts and relations at work in the airport, an experiential phenomena that gives expression to what many commentators, drawing on Deleuze's (1990) reading of Spinoza, have begun to identify as an embodied 'affective dimension' within existential and social relations (Mackenzie, 2005; Massumi, 2002; Thrift, 2004).

The flow controller's concept 'snowstorm' provides but one example of this complex ambivalent symbiosis and interface between operator and technology, the real and the virtual. A snowstorm is, then, a hybrid phenomenon identified and labelled by human operators whose creative and imaginative designation, in tandem with the proliferation of information made available by new ICTs, inevitably generate novel forms of disorder in organization. Such hybrid phenomena often have properties of their own, much of which are unknown and yet to be discovered. As ICT systems mediate ever more of the day-to-day practical activities that accomplish organization, we can begin to appreciate how social relations are always

seeking definition and understanding in the context of ever-new, but in some ways always-unknown limits. This intensification of matter is the product of new ICTs that allow phenomena to be 'known' and broken down into microscopic detail and then re-assembled out of this fine-grained texture in ways that combine not only the socio-technical but in addition the virtual and the real. There are important spatial dimensions to this intensification. Integrated within broader systems and modes of ordering, new technologies of re-presentation (Cooper, 1993) obviously alter the way space is *perceived* in the airport; but it also changes the way airport staff relate to and understand space. More is present than can be seen or heard in organization and increasingly phenomena that cannot be seen or heard without the use of prosthetic and media technologies are having an ever-greater influence on the performance and accomplishment of organization.

We have seen how a single item of luggage leaves a series of traces in information systems that give birth to a virtual trajectory or a multiplicity of virtual trajectories. It is through the media of this 'virtuality' that activity and organizational behaviour is increasingly being constituted. The materiality of 'luggage' becomes, then, mediated by 'digital reserve': a suitcase is made into a combustible and highly charged object that from check-in through to departure, arrival, and the taxi rank at its destination, forms part of a network of inspection, coding and visibility. Information systems open up an extended 'virtual' space within which to think and enact organization rendering problematic the relation with organization as it happens in the 'real' places of situated practice—where the details and components out of which organization is assembled gets practically accomplished. What was once understood as a restricted or confined place becomes more voluminous and capacious as digital technologies introduce and then mediate new forms of spatial organization and awareness. In this media, as one boundary gets transgressed others are made apparent in their absent-presence. In this penumbral movement un-predictable phenomena might be expected to burst into life to intrude and interrupt operations that conceive of the airport as a smooth 'space of flows'. This is, in other words, the airport as nervous system.

Digital Oracles: TOBIAS, Faith and 'Smart' Buildings

Modes of ordering that enact the on-going work of object delineation and boundary construction reflects a ceaseless effort to repair what Mary Douglas (1966) calls 'matter out of place'—whether in the form of people or objects. Following Heidegger (1977) we might say that those technologies and practices designed for the orderly enactment of flow seek a correct 'placement' of organizational matter. Arriving at the airport passengers are immediately confronted with numerous means of technological flow-subjectification and management. Signage, for example, silently directs the passenger through space. As we have seen, customer service agents

are also mobilized to assist the passenger in flowing through the airport. The most important of these technologies is an information system called TOBIAS which is described to us by managers (with allusions to HAL, the computer in Kubrick's *2001*) as 'the heartbeat of the airport—it kind of drives everything'. Gates, flight schedules, departure and arrival times, fuelling and catering information, passenger-lists, the billing of airlines and statistics on service levels are all either fed-into or generated by TOBIAS. When TOBIAS stops, so does airport flow; however, as one of the IS managers explains:

> there is a certain momentum to the operation that sort of keeps going' but, inevitably, it then 'starts to slow, and the trouble is, because we are so reliant on it, manual backups in a lot of those systems don't exist... Yeah we revert to it in terms of telling passengers where to go and we can literately revert to something as crude as a white board.

Once again we see how ICT, in this case the TOBIAS system, not only replaces older methods of management and organization but also simultaneously becomes part of a supplementary 'absent-present' of improvised contingency and possibility. The technocratic advocates of new technology, however, tend to argue that it provides additional and more secure ways of reinforcing a management of bodies through space. To this effect, online technologies and automated check-in facilities have been recently introduced in an attempt to speed up the check-in process and reduce queues whilst making further economies on the numbers of check-in staff. The introduction of automated check-in desks may speed-up or slow-down the punctuated flow of passengers at the check-in stage, but increased efficient flow in one place, however, may create overflows elsewhere, producing long queues at passport control or security that requires further downstream remedial action and further adjustments to the spatial layout of the airport. This can also have knock-on effects for retail outlets, restaurants and cafeterias who instead of a steady trickle of customers now face a more concentrated mass of passengers wanting somewhere to sit down and eat. This displacement of repercussion and the cascading of unforeseen consequences can be seen as further examples of 'overflow', but this overflow is made more complex by the fact that passengers are continually being 'pulled' in a number of contradictory directions. The individual airport user is sometimes 'customer', sometimes 'passenger', and sometimes security risk, and is encouraged to move through the airport space in specific ways designed to conform to the ordering efforts of different agencies with very different interests. Airlines, for example, are concerned with the extent to which passengers' experiences reflect favourably upon their service, whilst also aiming to reduce the cost of processing each passenger. Retailers, on the other hand, view delays differently as they are not so much concerned with individuals as passengers, but as *customers*.

Twenty automated customer information kiosks have been recently installed in an attempt to prevent mass congregation and to enhance smooth

people-flow through the airport. When a passenger approaches the kiosk, a virtual avatar named 'FAITH'[5] walks onto the visual display unit from left to right and knocks on the screen asking if she can be of any help. The user-interface screen offers a series of windows and menus, icons, tools and various controls. Modelled on one of the human CSAs who works at Fulchester, and complete with 'feminine attributes' and regional accent (Gustavsson and Czarniawska, 2004), FAITH is a way of relieving crowd build-up and pressure around customer service desks. The kiosks have been installed to answer routine customer information requests about facilities in the airport, flight information, train information and details on local accommodation and sights. FAITH can offer recommendations and even draw your attention to special offers on sale in the various shops within the airport. She is designed to 'detect' user confusion and responds to hesitation or uncertainty with a series of help functions which guide and train the airport passenger to use the system to its full capacity.

FAITH provides an uncanny mimesis of the customer service interaction and extends the reach of the 'virtual organization' into the physical. Passengers/customers are increasingly, so to speak, taken into the virtual realm where they can, for example, explore space beyond the immediate physical geography perceptible to the airport user. By touching base with FAITH and by plugging into its human-machine symbiosis, the space or mapped-space of the airport is redistributed and reoriented according to different identified needs and itineraries. Unlike static maps, FAITH makes the passenger the central reference around which the airport is digitally represented; in tandem, airport users are re-inscribed as subject [made object or 'subjectile' (Deleuze, 1993)] so that they can be redirected along various lines of flight that traverse the airport.

FAITH offers further examples of the way the airport is being diagrammed and reshaped by new information systems and communications technology in relation to the calculation of movement, forces and flow: as we shall see, the airport itself is both author and subject of this flow. However, instead of a smooth translation of the 'real' into the virtual and then the disciplinary reorganization of the real in line with the calculations of abstract software modelling and programming, we see here how technologies of ordering and flow become sites of overflow and disorder. The kiosks are designed to provide customers with information that they need in order to keep them moving as an element in the wider economy of flows. The location of the kiosks is therefore important for managing this flow. People who refuse this enrolment by the virtual can become awkward nodes of recalcitrance and in some cases the kiosk can, by virtue of its visibility, be 'hijacked' and re-appropriated for more traditional functions within social relations. Indeed, there have been a series of unintended consequences and unforeseen repercussions arising out of the use of FAITH. Christine Newsome, an IT manager at Fulchester Airport, tells us of a recurring problem in terminal two where FAITH is located.

This is a high volume passenger-flow area ...

> ... just before you go through security in departures. We would get a PIA (Pakistani International Airlines) flight and there were just so many people in that area, and because they all have to walk through, past the FAITH kiosk, they all come with all of their families, and they are usually very very big families and that whole area is just absolutely swamped ... the kiosk is either going to be an obstruction for those people, or it is just completely hidden anyway for any other passengers that want to use it. So we are looking at moving that one.

As the virtual increasingly folds itself into our world there are a number of supplementary dimensions of organization through which this overflow becomes apparent. We know that physical experiences and consciousness is being altered (Mackenzie, 2005; Negroponte, 1995; Thrift, 2004) in ways that often find expression in imagination and fantasy revealed in subtle mutations in language with its mixture of anthropomorphic and science-fiction style phraseology. We have explored the phenomena of 'snowstorms' at the airport, but consider what is being said and what is being reflected of the condition of being-responsible-for-organization at the airport in the use of the terms 'inundation', 'BRAINS', 'TOBIAS', and 'FAITH'. The phrase 'pushing tin' used by American air traffic controllers to describe their control of aeroplanes is also suggestive of the hybridity of the virtual and real and is indicative of some of the effects this hybridity engenders in the collective mental space of the airport (see also Massumi, 2005).

To navigate the increasingly complex and digitally constituted spaces that characterize modern airports passengers must increasingly defer to the (hybrid) logics of symbiotic human-machine technologies (Gray, 1995; Harvey, 1996). Websites, mobile technologies and hand-held communication devices increasingly relay automated navigation instructions that direct individuals how to use space and where to go and what to do. A complex architecture of automated security technology also discreetly monitors, regulates and channels the flow of the mass, opening doorways or closing off exit gates, or sending signals to loudspeakers if it is necessary to broadcast further warnings and instructions (Adey, 2004). Cutting-edge airport design no longer aspires to the modernist utopias of flight and travel that once inspired the construction of Saarinen's TWA terminal at JFK. The avant-garde designs of architects such as Kas Oosterhuis, Lars Spuybroek, Stephen Perella, and Marcus Novak, help teach us about the processual and indeed 'mutant' nature of space and affectivity being opened up in airport organization (Zellner, 2000). Here we see designs that experiment with 'liquid' and 'soft' building 'materials' such as active inner skins, animated textures and data driven structures that make architectural form increasingly revisable and contingent. This creates complex and porous, uncertain boundaries. Whilst lending considerable flexibility to organizational form this is going to complicate the preoccupation with stability and security sought by the various ICT mediated orderings we have been discussing. Embodying sentient technologies that act and react to human behaviour and other environmental forces, the designs of

Perella and Novak, in particular, seem to enable a complex co-evolutionary growth of architectural form and user-subject (Beckmann, 1998; Perella, 1998). The space of the airport is becoming increasingly more 'plastic' and variable, responsive to various forms of digital media that are embodied within the 'sensate' qualities of emergent hybrid human-machine 'actants'. The implications of this heterogeneity and development are not always known and the uncoordinated growth of personal mobile ICTs alongside the multiplicity of innovations and initiatives promoted by different 'interest groups' makes the space of 'the airport' a kind of heterogeneous-becoming itself. All kinds of new borders and boundaries, zones of transition, and mutual interference across 'virtual' and 'real' dimensions in organization are emerging to complicate the Castellian dream of flow. The intrusion and 'play' of a whole series of virtual presences in the interstices of these borders, from 'snowstorms' to 'security alerts', turns flow into flux and helps destabilize the sense of a predictable and enduring reality as organization is rendered increasingly fragile and tense.

Conclusion

Fulchester airport used to promote itself with the slogan '*bringing you closer to the world'*. Indeed, the official (business) mission of any airport is the performance of connections. Airports are judged by where they connect to and by how speedily and efficiently they can process passengers and goods to those destinations. Unlike Castells we find that this 'space of flows' and its logic(s) of organization is challenging the spatial and social categories through which objects, subjects and organization are normally described and in ways that disrupt and disturb flow. We have seen how the boundaries, content and definition of subjects and objects become increasingly fissiparous and uncertain as they pass through what are multi-dimensional spaces of an airport. Suspended in the technologically mediated realm of the virtual, we have argued matter becomes 'charged' with volatility and uncertainty. Sometimes a bag or a passenger will suddenly become a security alert, or a security threat might become a 'customer'.

Our paper has traced a series of objects, subjects and artefacts as they are processed and constituted through modes of ordering and as they are passed from one mode of ordering to another. This ongoing assembly and disassembly of phenomena is performed by various information-communications and digital technologies designed to facilitate order and enhance 'flow'. We have explored the implications of these orderings for the management and performance of various entities and space in organization. Always-already situated in tension these modes of ordering ceaselessly stage and renew the clash of forces of order and disorder in organization, but to understand the patterns and lines of tension in contemporary and future organization one needs a conceptual grasp of something akin to what Heidegger (1977) labelled a 'standing reserve'. We

found that the enactment of the airport through multiple modes of ordering produces forms of heterogeneous assemblage inextricably intertwined with—or 'supplemented' by—complex regimes of signification, segmentation and emplacement that brings to bear the space(ings) of what we have identified as 'digital reserve'. The collapse of any distinction between the virtual and real helps explain the increasing volatility in phenomena and social relations generating what some might recognize as a 'fractal-like' patterning to organization and space (Tsoukas and Hatch, 2001). Inside the ambience of the airport one can literally hear the static of this 'digital reserve' as people, bags and aeroplanes are broken down into the zeros and ones of abstract digital information and then reassembled and processed in ways that aspire to the collective synthesis of 'flow'. We have seen how flow can very rapidly become sticky and congealed or 'delaminated' degenerating into flux instead of the ideal of fluidity and smooth transformation conjured by the Castellian image of a 'space of flows'.

Order(ings) and stabilities, we have argued, are (inevitably) temporary, incomplete and prone to noise, interference and overflow. This is perhaps best demonstrated by the ongoing 'state of emergency' that has been ushered in by the present 'age of terror'. The discovery in August 2006, for instance, of an alleged plot to detonate planes using explosives disguised as harmless liquids produced paralysis in Fulchester and other UK airports as both human subjects and material objects (from mobiles to soft drinks) suddenly become 'security risks'. Suddenly anything could be a bomb component, and anyone could be a bomber. Airport concourses overflowed as luggage and people were exhaustively searched. For days airport shops were closed as there was nothing they could sell that was above suspicion and flights failed to take-off as would-be travellers could not disentangle themselves in time from the airport quagmire. Flow suddenly turned into overflow as neither 'customer' nor 'passenger' could be effectively performed any longer (Knox et al., 2007). We have seen how objects, subjects and meanings are rendered more volatile as they become 'over-determined' by the constitutive and inscriptive work of modern information and communications technologies that make the 'digital reserve' an obligatory point of passage in the day-to-day practical accomplishment of organization. Today, media and surveillance technologies in combination with various forms of expert systems fuel novel dreams of order(ing) by means of smart buildings, automation, virtuality and remote control. Space is the medium of their co-evolution, but space in organizations such as airports is no longer a well-bounded stable container, and its 'contents' no longer containable or secure in terms of the categories and expectations of a mundane ontology. Airport-organization is increasingly more akin to a heterotopia or fractal of 'virtual' and 'real' topoi. Circumscribed and conjoined by hybrid networks of borders and boundaries this heterotopia inevitably introduces new limits and transgressions as the airport strives to fulfil its mission to *bring the world closer*. Castells' vision of flows is seemingly shadowed by an alien-nation of strange forces and hybrid becomings bringing in their

wake new forms of flux and instability. In the 'age of terror' and the 'war on terror' airports are the sites where the contemporary state of emergency is most visibly enacted—which provides a disturbing twist to Ballard's (1997) claim that the extension of Heathrow airport transforms Britain into the 'ultimate departure lounge'. Perhaps, as Pascoe (200: 10) suggests, airports should no longer be viewed as 'the sterile transitory zones' with which we are familiar, but rather as 'vessels of conception' for the societies passing through them ...'.

Notes

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1 A pseudonym.
2 A fuller account of the methodology pursued in this research can be found in Knox et al. (2007).
3 'Baggage Reading And INformation Systems'
4 The language used to articulate this phenomenon, namely 'snowstorm', is also indicative of certain pressures and strains of systems working at or beyond full capacity, ever-ready to spill-over into panic or paralysis.
5 'Fulchester Airport Information & Travel Help'.

References

Adey, P. (2004) 'Secured and Sorted Mobilities: Examples from the Airport', *Surveillance and Society* 1(4): 500–19.
Augé, M. (1995) *Non-Places: Introduction to an Anthropology of Supermodernity*. London: Verso.
Ballard, J.G. (1997) 'Airports', *The Observer*, 14 February 1997. Available at http://www.jgballard.com Accessed: 27/05/2005.
Bauman, Z. (2000) *Liquid Modernity*. Cambridge: Polity.
Beckmann, J., ed. (1998) *The Virtual Dimension: Architecture, Representation, and Crash Culture*. New York, NY: Princeton Architectural Press.
Castells, M. (1996) *The Information Age: Economy Society and Culture Vol I.* Oxford: Blackwell.
Cooper, R. (1993) 'Technologies of Representation', in P. Ahonen (ed.) *Tracing the Semiotic Boundaries of Politics*. Berlin: Walter de Gruyter.
Deleuze, G. (1989) *Cinema 2: The Time Image*. London: Athlone Press.
Deleuze, G. (1990) *Expressionism in Philosophy: Spinoza*. Cambridge, MA: MIT Press.
Deleuze, G. (1993) *The Fold: Leibniz and the Baroque*. London: Athlone Press.
Douglas, Mary (1966) *Purity and Danger*. London: Routledge and Kegan Paul.
Gray, C., ed. (1995) *The Cyborg Handbook*. London: Routledge.
Gustavsson, E. and Czarniawska, B. (2004) 'Web Woman: The On-Line Construction of Corporate and Gender Images', *Organization* 11(5): 651–70.

Hansen, M. (2001) 'Internal Resonance, or Three Steps Towards a Non-Viral Becoming', *Culture Machine* 3.
Harvey, P. (1996) *Hybrids of Modernity: Anthropology, the Nation State and the Universal Exhibition*. London: Routledge.
Hayles, N. K. (1999) *How We Became Posthuman*. London: University of Chicago Press.
Heidegger, M. (1977) *The Question Concerning Technology and Other Essays*. New York, NY: Harper and Row.
Joerges, B. and Czarniawska, B. (1998) 'The Question of Technology, or How Organizations Inscribe the World', *Organization Studies* 19(3): 363–85.
Knox, H., O'Doherty, D., Vurdubakis, T. and Westrup, C. (2007) 'Knowledge Traffic and the Performance of Organization: A Study of Knowledge in Flight', paper presented to the 3rd Organization Studies Summer Workshop, 7–9th June, Crete, Greece.
Law, J. (1994) *Organizing Modernity*. Oxford: Blackwell.
Law, J. and Mol, A. (2002) 'Complexities: An Introduction', in *Complexities: Social Studies of Knowledge Practices*, pp. 1–22. London: Duke University Press.
Mackenzie, A. (2005) Problematising the Technological: The Object as Event?', *Social Epistemology* 19(4): 881–99.
Massumi, B. (2002) *Parables for the Virtual*. Durham and London: Duke University Press.
Massumi, B. (2005) 'The Future Birth of the Affective Fact', Conference Proceedings: Genealogies of Biopolitics. Available at: http://www.radicalempiricism.org/biotextes/textes/massumi.pdf (last accessed August 2007)
Negroponte, N. (1995) *Being Digital*. New York, NY: Alfred Knopf.
Pascoe, David (2001) *Airspaces*. Reaktion Books: London.
Perella, S., ed. (1998) *Hypersurface Architecture (Architectural Design, n.133*. London: Academy.
Rajchman, J. (1998) *Constructions*. Cambridge, MA: MIT Press.
Serres, M. (1995) *Angels: A Modern Myth*. Paris: Flammarion.
Taussig, M. (1992) *The Nervous System*. New York, NY: Routledge.
Tsoukas, H. and Hatch, M. (2001) 'Complex Thinking, Complex Practice: The Case for a Narrative Approach to Organizational Complexity', *Human Relations* 54(8):979–1013.
Thrift, N. (2004) 'Intensities of Feeling: Towards a Spatial Politics of Affect', *Geografiska Annaker* 86(B):57–78.
Waldby, C. (1997) 'Revenants: The Visible Human Project and the Digital Uncanny', *Body and Society* 3(1):1–16.
Weick, K. (1990) 'The Vulnerable System: An Analysis of the Tenerife Air Disaster', *Journal of Management* 16: 571–93
Zellner, P. (2000) *Hybrid Space: New Forms in Digital Architecture*. London: Thames and Hudson.

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