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‘Mobility, circulation and homeomorphism: Data becoming risk information’

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Mobility, Circulation and Homeomorphism: Data Becoming Risk Information

Introduction

Walking through the corridors of a Fire and Rescue Service headquarters in the North-East of England, you encounter an array of posters showing charts, graphs and tables containing a variety of different information pertaining to the emergency of fire. Affixed to walls, multi-coloured scatter graphs indicate the age of those most vulnerable to fire risk. Adjacent, a bar chart suggests which fire stations have attended the most fire incidents on a month by month basis. A few further steps along a map purports to show the distribution of fire incidents year on year. These posters boldly sit on the walls of the FRS headquarters as signs of how the dangerous but quotidian emergency event of fire can be known through digital technologies and the information they generate.

Although constructed through data on past events, the posters also suggest the risk of fire in the future. The posters represent a specific form of logic to reading disruptive events, one that underpins the enactment of what Collier and Lakoff, commenting on Foucault, refer to as 'population security' (2015, 22) in which past events accrue under the analytical gaze of those that govern them, and data sourced from these events are deployed to make projections concerning their probable and possible recurrence in the future. The posters in turn represent information which becomes actionable in its ability to shape, to mould and to justify interventions in the present but which are designed to attend to future emergencies. This emphasis on the ability to know, and to intervene upon, fire in anticipation of their occurrence represents a substantial shift in the operational and organisational priorities of the FRS, witnessed since the start of the 21st Century (2012) Since the *Fire and Rescue Services Act* of 2004 (2004), the FRS' strategic approach to governing fire has been one that has retained response to fires as and when they occur but equal significance has been laid on building capabilities to prepare for, to prevent and to protect from fire risks of the future.

The posters embody both the importance of risk information to the FRS whilst also implying the centrality of anticipatory modes of governing to these authorities. Ultimately, however, the posters are but surface products which emanate from a multitude of institutionally situated, day by day, organisational processes constantly taking place in the FRS. In recent times, much work within critical security studies and within social science goes under the veneer of information to inquire into how operable security information is generated in a way embedded within organisational processes. Bonelli and Ragazzi (2015), for instance, show the ongoing importance of paper-based memos to the functioning of French domestic intelligence services. Whereas Louise Amoore (2013, 2014) explains the ways in which information about the world is spun out by continual and emergent negotiations between

humans and data. Dodge and Kitchin (2005, 2011), alternately, trace the ways in which digital codes instantiate themselves ubiquitously across the everyday life of organisations and, indeed, whole cities. These data-based processes, as Daniel Neyland (2015) argues, speak of a broader trend by which algorithmic technologies, and algorithmic thought in general, come to structure organisational life at the same time as being instantiated in these organisations.

It is no surprise that this literature has developed simultaneously with the ever-deepening embeddedness of digital technologies and data-based processes within security organisations. Software and data are now integral to the deployment of all aspects of a broad security apparatus which includes secret intelligence agencies, emergency responders, border security and a host of other authorities (Amoore, 2009, Bigo, 2014, Chamayou, 2013, O'Grady, 2014). The everyday life of the Fire and Rescue Service in no way escapes this fact. A whole digital infrastructure composed of software, hardware, code, human operators and the processes which develop around these things now underpin the governance of fire. For the purposes of this chapter, this infrastructure works to generate information on fire risk. It does so through transforming data into actionable information which facilitates strategic decision making on how fire emergencies can be intervened upon before they have had the chance to occur.

This chapter contributes to the literature cited above by taking a closer look at how actionable information is generated for the purposes of facilitating the enactment of anticipatory governing measures on fire emergencies. Drawing on ethnographic observation of a Fire and Rescue Service and its digital infrastructure, the chapter looks at how critical information is generated through data gathered on fire. In other words, I concentrate how information is made out of data. I focus on two crucial processes of what i have called the frS digital infrastructure here. Concentrating on the role of Quality Assurance Officers who verify the data that the FRS source from fire incidents, I offer an account firstly of how data move through the FRS. Present at the scene of fires, the Incident Recording System (IRS) extracts data in the real time unfolding of fire incidents. This data are then circulated to the Quality Assurance Officer to verify. Upon verification, data are mobilised to different analysis software across the FRS. The capacity of data to generate actionable information relies, I argue, on its capacity to move and how this movement is conditioned within the broader digital infrastructure, in which it moves. To appropriately conceptualise the movement of data however, more nuanced and distinct definition of what movement is needs to be outlined. Thus, I outline three forms of movement which bring data to life and purpose in the FRS. Firstly, I discuss data as an entity which can be described by its mobility and circulation. Mobility and circulation allow us to conceptualise both the broad systems of flow which

characterise the life of data in the FRS but also how this flow is structured through conditioning of different parts of the digital infrastructure of the FRS such as mechanisms like data circulation functions or human operators.

The capacity of data to become mobile and to circulate is not just a matter of anthropological and technological conditioning, however. Rather it is entangled in what, as a third category of movement, I call the transmission of data. Transmission describes how data is processed from one site to the next in becoming information. I argue that transmission is always accompanied by and inseparable from the homeomorphism of data; in which the form data take change as it is being processed. Transmission and homeomorphism refer overall then to how data are material entities whose form changes as it is processed through different organisational stages on its trajectory toward becoming actionable information. I show this process of transmission and homeomorphism in the second organisational process. Here, I look at how data which are mobilised are analysed through software called Active. A risk mapping software, Active receives data from IRS and analyses it to calculate future fire risk. In turn, Active facilitates what is called resourcing to risk; wherein the resources at the FRS' disposal are deployed according to the future possibility of fire. It is in this process of analysis that data mobilised transforms into actionable risk information. Through empirical material on the generation of risk information through Active Software, I argue that the process of transmission and homeomorphism are important to consider for two reasons. Firstly, it furthers our understanding of the mobilisation of data because it informs us as to who and what intervenes to make data move and become operable in the FRS. And secondly, I show how decisions around what data are mobilised actually effects how risk appears. The politics of transmission, mobility and circulation, in other words, effects what will come to appear as fire risk on those posters affixed to walls in FRS headquarters across Britain and, ultimately, how fire emergencies are governed before their occurrence.

Movement, mobility and circulation

Understanding digital entities by their capacity to move has for some time been a matter of crucial significance in work across the social sciences. 'The global information order' (323, 2006) within which the security apparatus now operates 'seems to be characterised by flow' (ibid) according to Scott Lash. It is through movement and flow that the technologies to which security agencies are now so indebted is brought to life (deGoede and Simon, 2015, Lash, 2006). Through studying its liveliness, we can grasp how, to where and with what licence, data moves across the global security apparatus. Even the manifestation of data as material (Hayles, 2005, Parisi, 2013) in some way is underpinned and actualised through movement. Following Castells, furthermore, Adrian Mackenzie (2011) suggests that the

supposedly static elements of a digital network are actually always enfolded in systems of movement, forming nodes and connection points to facilitate movement.

But the generic signifier ‘movement’ is far from sufficient for explaining the deployment of data and, later still down the line, how this data becomes actionable information which opens future emergencies up to governance in the here and now. As recent literature in geography (Adey, 2006, O’Grady, 2014), sociology (Urry, 2007) and critical approaches to security (Salter, 2013) show movement needs to be treated in more refined, nuanced and distinct ways if we are to properly appreciate its importance to wider practices of governance in a world of informational ordering. Movement can, for instance, be split between mobility and circulation. On one hand, circulation captures the broad systems of flow which consolidate as normal over time. One might think here, for instance, of the processes of normalisation which Foucault (2007) claims orients interventions made under modalities of power he calls security. Rather than being posited and pre-scribed as in disciplinary modes of governance, norms under the security apparatus emanate from within the population governed. A primary force of articulation of normalisation in populations is the serialised circulation of things, people, diseases and other events over time.

Mobility, on the other hand, provides conceptual and critical purchase from which to name the conditions of possibility enabling, regulating and making things move in specific ways. In recent literature, the role of ‘the mobiliser’ has been attributed to the border agent and their material devices (Amoore, 2009, Salter, 2013) or the lay-out of the airport (Adey, 2009) itself. Although distinct on the spectrum of movement, mobility and circulation are reciprocally bound to one another. Circulatory flows are characterised by the conditions by which things get mobilised. This might mean, to return to Foucault, how miasma are able to travel according to the roads and walkways embedded in town plans. Conversely, that which gets mobilised effects broader systems of circulation. According to Foucault and his example of diseases, broader systems of circulation will be disrupted if diseases become mobile.

I want to apply this nuanced distinction between mobility and circulation to data. For me understanding the movement of data as split between circulation and mobility is crucial. Circulation can capture the wider technological fixes which act as conduits for the massive flows of data across and indeed beyond an organisation like the FRS. In a way equally important, mobility allows us to highlight the different conditions and interventions which act as traffic lights for data; letting data move, making data stop. This dichotomy between circulation and mobility allows us thus to highlight two things. With circulation, we can speak of broad normative routines which underpin the movement of data. As a brief example, at every fire incident the FRS attends, data are captured in real time and will enter into the

wider normative routines of data circulation found in the FRS. For these normative circulatory curves to exist, however, conditions are put in place to regulate how data are mobilised. Data are sourced from incidents through import and export functions which connect software at the scene of the emergency to software in the FRS headquarters. As I show in more depth below, the decisions and experiential knowledge of human operators also mobilises data within wider systems of data circulation.

Other than import and export functions, we might further inquire into what supports the mobilisation of data and how this mobilisation is conditioned. The codification of data might be thought of as a technological support for the mobilisation of data. Codification refers to the process by which data on a specific event are articulated within a language legible within the software in which they are integrated. It is through codification, as Hayles reminds us (2005), that data taken on material form. Through codification, data appear for example as geographical coordinates, temporal units or equipment identifiers. Not only does this process render data material. Codes render data comprehendible rather, and amenable to action within a wider computational system. As part of the functioning of such a system, codification plays a part in making data mobile. By codification, data can travel through the conduits of the digital network found in the FRS. In other words, codification shows how the mobilisation of data is dependent upon, enacted through and manifested by the material becoming of data.

But in its facilitating and conditioning of movement, codification furthermore can hint at the different agential forces complicit in the mobilisation of data within wider circulatory flows. These agencies are not necessarily confined to inorganic technological components like the import and export functions described already. To return to Hayles instead; ‘code implies a relationship between human and intelligent machines in which the linguistic practices of each influence and interpenetrate the other’ (59, 2005). As a process which supports the mobilisation of data, codification does not only reinforce the fact that the mobility of data is moulded through technological interventions but suggests that the mobilisation of data is in part organised through human interventions. In relation to codification, this might mean how human beings write algorithms upon which software is based, perhaps what data are sorted into what category within software once sourced, even perhaps what data are accepted in analysis and what are not.

Both mobilisation and circulation work together to co-produce actionable security information from data. This is apparent in how data enters wider data circulation conduits in the FRS. What codification suggests additionally is that this movement is underpinned by data taking shape and materialising. Movement of data is thus inseparable from the transformation of

data. In the next section, I probe this relationship between movement and transformation more deeply through the concepts of transmission and homeomorphism.

The transmission and homeomorphism of data

Circulation and mobility present nuanced and distinct modes of movement by which data are enacted in an organisation in their path toward becoming actionable information which shapes and legitimates the actions of security agents. Circulation reflects and affects a normative system of data movement whereas mobility enables and regulates the movement of data within this wider normative system. Interventions take place to mobilise data. These interventions might be bound exclusively to the realm of the inorganic as is the case with the briefly mentioned import and export functions. Codification, on the other hand, is a process emblematic of the interventions that human operators make in the mobilisation of data. But codification not only exemplifies a process by which data become mobile. Implicit rather within codification are issues surrounding the form that data take, its material manifestations and the entangling of this matter of form with movement. In this section, I suggest that the dynamic movement of data and the emanation of information from this movement is intimately interwoven with how data change form in generating information.

Tiziana Terranova, in her book *Network Culture* (2004), encapsulates in some ways the reciprocity between movement and the changing form of digital entities like data and information in describing the process of transmission. Transmission for Terranova is the process by which information is communicated within and across a network of digital technologies. This process of transmission is characterised by entropy. Entropy serves initially to indicate the finite set of connections through which information might be communicated from one place to another. The mobilisation of information for Terranova, just as is the case with data, is always undertaken within specific conditions, whether this conditioning is anthropocentric or technocentric. But entropy here suggests that with the conditioning of movement comes the reduction of possibilities of what information can actually mean. Terranova claims then, that; ‘The transmission of information implies the communication and exclusion of probable alternatives’ (2004, 20). In the act of transmission, in the act of moving information from one place to another, the significance and meaning to which information might be attributed is reduced. Transmission is thus organised by entropy.

Taking the work of Dodge and Kitchin as an example, transmission and entropy can be spread out across the different digital entities seen to move across coded spaces and which feature in organisational processes. For instance, the authors map out a spectrum of forms that feature in the processing of bar-codes. Bar codes are affixed to different objects. These bar-codes allow the identification of one object from another but also enable the generation

of data on these objects. By the instantiation of data generated from bar-codes in local organisational contexts, these data become what are known as capta. Capta are the end results once data have been sifted through and selected according to their relevance for a specific task. These capta become information after they have been subjected to different forms of calculative processing. With every stage in this process, entropy becomes more prominent because the stuff moving continually decreases in volume and the possible meaning and significance of that which is produced declines.

The spectrum of transmission that Dodge and Kitchin present suggest that alongside the process of entropy through which information arises are processes by which data changes its form. So data becomes capta which in turn becomes information. The binding of transmission with homeomorphism, through which information comes about is enabled by a plenitude of organisationally situated processes and a multitude of interventions therein. Calling forth the 20th century's conceptualisation of information as the thing which mediates between 'living organisms and physical systems (2009, 286), Terranova claims that information needs to be understood primarily as that which gives shape and form to matter. Reiterating this point, Galloway (2012) argues describes information is a point of coherence and beauty in a chaotic, self-fulling operations of the digital world. If we were to apply this to the spectrum Dodge and Kitchin have developed, information combines scattered data to create meaning. To reiterate, this process is aptly described by Terranova as an process of entropy in which large volumes of data are gradually reduced in scale and become more refined. Large data turns into small, discrete and meaningful information.

Transmission thus describes the movement of data from one place to the next. In transmission, as with codification, it is evident that data bears upon it both the human and technological hands which condition its movement and a homeomorphism where data changes shape and form on the road to becoming information. With transmission too, however, the conditioned movement and homeomorphism is inflected by a process of entropy; whereby the quantity of data reduces as at becomes information. A homeomorphic attribute of data in its mobilisation is thus that it reduces in quantity. In the next section, I show how data becomes actionable information in the FRS in a way characterised by conditioned mobility, transmission and homeomorphism. I argue that it is through conditioned mobility and transmission that data can morph into information. However, these processes which enable the generation of information are shaped by a number of interventions which effects how fire becomes understood as a risk. The coherence and beauty that information embodies according to Terranova and Galloway thus only affords a skewed perspective on the reality it purports to represent.

IRS and the selection of data

Since its introduction in 2009, the Incident Recording System (IRS henceforth) has been a seminal data repository for the FRS in Britain. IRS stores data on all incidents attended by the FRS. From its mainframe in FRS' headquarters, IRS includes data import and export functions to two key sites of fire governance which submit data as fire incidents unfold. On one hand, IRS is connected to an FRS control room which oversees and coordinates response by coordinating with both the public and operative FRS response personnel. The control room generates for IRS what are called narrative logs which are a recording of all data communicated to the control room. By recording the time of public 999 calls, data includes the time at which the FRS were alerted to fires. Tracking the time fire engines were mobilised and their arrival at the scene of the incident, the response time of the FRS is recorded. Coordinating communications, any resources requested by the FRS as they respond to fires such as the need for Ambulances for injured people or the Police are also captured. On the other hand, IRS collects data from operative staff responding at the scene of the incident. This data come in the form of proforma reports which offer a retrospective account of the incident attended. These proforma reports will include data, for instance, on the damage a fire resulted in and,what resources and personnel were used at the scene of the incident. These forms will include also data that are recorded through narrative logs too such as data relating to injuries caused by the incident.

Both the narrative log and proforma are transmitted via export and import functions to the mainframe of IRS in the FRS' headquarters. Collated together, they have the capacity to possess data which relates to 197 variables on the incident. Along with those variables mentioned above, these include whether the incident was considered accidental or motivated by malicious intent, whether the fire took place in a building or outside or, for example, if anything formed an obstacle to FRS response. These potential variables serve to classify, order and categorise the data accrued from an incident. How this ordering manifests itself is through the mobilisation of data. Data will thus be sifted and moved into its relevant category or variable. This mobilisation of data is organised in a way co-produced between human operators and automatic export and import functions. In responding to the incident, FRS staff at the scene or in the control room choose where data should be categorised. In turn, export functions transmit the data to the IRS mainframe and to the category chosen.

On first encounter, the incorporation of both proforma reports and narrative logs would appear to offer the most comprehensive, thorough and efficient form of data collection at the FRS' disposal. Rather than one data sourcing technology, the FRS doubles their data

collection capabilities by having two accounts of the same fire. In reality, this double handed process of data sourcing is severely problematic. Along with accruing large volumes of data, the proforma reports and the narrative logs offer two different renditions of the single incident attended by the FRS can be generated. Collated together, as I will show, the two reports are rife with contradictions where they overlap and report on the same variable concerning the fire. They offer a rendition of a single fire but from completely different perspectives and temporal positions. Whereas the proforma report gives a retrospective account of a fire from the scene, the narrative log records data as the fire incident unfolds in real time but from the detached position of a central control room.

Accommodating for contradictions in the different data based renditions of the same incident, the data mobilised are subject to quality assurance once they arrive at the IRS mainframe within the FRS headquarters. This assurance role, played by a human operator, serves two key roles according to its protagonist. Firstly, the role identifies and eliminates discrepancies between the two different sites of data collection, making sure the right data appears in the right categories. It was stated by the Quality Assurance Officer that, for instance, the narrative log generated from the control room perspective regularly over-stated the number of injuries. In contrast, the proforma produced retrospectively at the scene of the incident would be correct in accounting for injuries. Data from the proforma report would be incorporated into IRS rather than data from the narrative log. This judgement on behalf of the Quality Assurance Officer was underpinned by a normative claim deriving from experience of both monitoring IRS and fire-fighting. Taking precautions deemed necessary, this contradiction in data will have been generated when operative staff responding to a fire have called for resources for dealing with casualties but have not used them once it is confirmed that the fire has caused no casualties This call would appear on the control room narrative log. The proforma, being produced after the incident, would show that no injuries were accrued in the incident. By choosing data from the proforma report over the narrative log, to return to Terranova, the Quality Assurance Officer enacts an entropic process by which large volumes of data are reduced and refined.

But the Quality Assurance Officer is not only a role confined to that of adjudicator. Instead, the Quality Assurance Officer supplements IRS with additional data that could not be acquired during, or in the immediate aftermath of, the incident. The Quality Assurance Officer defined his role here as ‘filling in the gaps’ left by attempting to record data in real time. The cause of fire, for instance, is frequently omitted from both proformas and narrative logs as the cause is not always known as response takes place. In this case, the Quality Assurance Officer will consult the Fire Investigators who examine the wreckage a fire has inflicted to determine the cause of the fire. Alternately, the Quality Assurance Officer

described a situation in which the name of someone killed by a fire was omitted from the IRS database. The fatal victim of the fire was identified not through queries in the FRS digital infrastructure but by a local newspaper article.

Conceptually speaking, the process of data mobilisation, transmission and homemorphism are all components which are inseparable and enrolled into one another in the case of IRS. Along with being a data storage and sourcing device, one of IRS' key functions for the FRS is its ability to mobilise and transmit data. IRS itself is a technology that is scattered across the two sites coordinating response to fire and the FRS' headquarters. It is only through this disparate configuration that IRS can source data from two crucial sites of fire governance and export data back to the FRS headquarters. The mobilisation and transmission of data are conditioned by both hardware, in the form of export functions, but also by human operators. As I have suggested, this can be seen through decision making processes about what data properly reflects the incident and what data does not. These processes themselves are the subject of reappraisal in quality assurance. But in the mobilisation of data and its transmission from the site of response to the FRS headquarters, homeomorphism on the register of the continuum outlined earlier by Dodge and Kitchin is also evident. As data are categorised they are simultaneously being reduced and selected for specific variables, variables which, as we shall see, are considered pertinent for particular kinds of analysis. In this process, data are selected for specific purposes and, as such, transform into capta. How data, in the form of selected capta, are analysed is a matter I turn to in the next section.

Turning Data into Information

IRS does not only function to mobilise data it has acquired from the scene of an incident and to transmit data to the FRS headquarters. To reiterate instead it is a key data repository for all data used by the FRS. Once sourced, transmitted and ordered, IRS serves to mobilise data to different analytic software which play a part in generating the risk projections through which the FRS enact anticipatory modes of governance on fire. As data advances into the capillaries of the digital infrastructure of the FRS it is further conditioned by those export and import functions mentioned above. IRS can be imagined as a hub emanating from which are multiple conduits to different software. IRS transmits data to these software automatically and without recourse to human sanctioning as and when it is requested.

Active software is one site to which data from IRS are transmitted. Active is supplied to the FRS by Total Software Solutions ltd (TSS). A software developer based in the United States, TSS sells programmes to organisations across the world. According to promotional literature, their 'product and services are proven in the market to enable operators (to) increase revenues, reduces costs and increase operational efficiencies' (www.totalsoftware.com, my

brackets). Once acquired, tailored and customised for the purposes of the FRS, Active is deployed with the hope of both bringing down costs and making the service more efficient operationally. Individually, regionally controlled FRSs across the country are configured by fire stations strategically placed across the region. Active software will inform the FRS as to which of its stations require what kinds of resources according to the type and frequency of fire incidents found in different areas. As noted in the Chief Fire Officer Associations (CFOA) *Spending Review for 2010* (2010), Active aids the FRS in resourcing to risk. In other words, Active produces risk projections on the type and frequency of fires from previous fire incident data which in turn inform the FRS as to what resources are needed and where.

Active makes its risk projections spatially through risk mapping analysis. On first opening the Active programme on a computer desktop a map of the region in which the FRS operates appears. Drawing on data sourced from the Ordinance Survey, visualised on the map are the circuits of transport running through the region, clusters representing areas of dense human population are rendered, within which are indicated buildings of significance such as hospitals, schools and major industrial sites. The towns and cities fade into brownfield sites, gradually turning into green rural areas. The natural topography and terrain of the region underpins this data, indicating areas of elevation and decline such as valleys and hills which, in the case of region studied, lead out to the North East English coastline.

Heretofore the map described has no specially distinguishing features which suggest a map used by the FRS. The map is customised for the specific purposes of the FRS when Ordinance Survey data are integrated with data from IRS. Export functions from IRS automatically transmit data on all fire incidents to have occurred in the region over the last three years. This data are uploaded by their geographical distribution and superimposed onto the map. Past incidents of fire appear as flame symbols across the space governed. The capta uploaded does not just show the location of fire incidents however. Within the flame symbols across the map, rather, is a plethora of data on each fire. To pinpoint> zoom in > click on an individual fire symbol would reveal for instance data on whether the fire occurred within or outside of a building, what resources were used to respond to the fire, if any casualties were caused by the fire or the damage the fire caused to the wider environment. Relating back to the previous section, in other words, flame symbols include all data checked, verified and indeed modified by the Quality Assurance Officer. The hand of the Quality Assurance Officer, in deciding both what data to mobilise and what data should become capta for the purposes of analysis thus affects what appears on the map, and what does not.

Once fire incident data have been integrated and layered onto the map, a number of different geographical boundaries are imposed onto the map. Visualised as red lines, boundaries are shown which indicate the different areas of responsibility for FRS stations. What these areas of responsibility show are the spaces in which, if a fire should occur, what specific fire station would be primarily responsible for attending it. Further boundaries cut across these boundaries. These additional lines indicate the areas of responsibility for other emergency responders. Regularly incorporated into Active risk maps used by the FRS, for instance are 'police beats' which delineate the specific areas in the region patrolled by local Police stations.

The mapping of a distributed security apparatus in Active is of interest in itself. But what is of primary importance in this chapter is how Active is used by the FRS to tailor the resources at their disposal to particular types of fire incidents prevalent in specific areas of responsibility for different fire stations. The first step in doing so with the map created involves identifying where fires happen most frequently. By the initial integration of fire location data onto the map, areas of high fire frequency are apparent. However, a further level of granularity can be enacted by zooming in closer to any area. Upon zooming in, the flame symbols grow larger. As the process of zooming is repeated over and again, the symbols blur into each other until they collectively form one large, multi-coloured symbol. The symbol overall remains red in colour but different gradations of red appear within it. The centre of the symbol is dark red and the strength of the colour fades as moves away from the centre are made. What these grades of red indicate are the areas of highest fire frequency in the centre and the decline in fire frequency over space.

It is not only the amount of fires which occur in each area that the FRS wants to access through Active. Instead, the FRS wish to use Active to tailor resources present in individual fire stations to the particular types of fire incidents which are prevalent in different areas. To do so, analysts in the FRS must collate all together different variables found in fire incidents. A lasso function inbuilt in Active is used to draw circles around all fires occurring within a specific area. All incidents captured within the lasso tool's span are then transported onto an Excel spreadsheet. Once transported, what is called a V-lookup function in Excel is deployed. This function allows analysts to group together the same variables present across fire incidents. Across the span of different fires, what now appears together are variables such as what casualties were caused by the fire and how long the service took to arrive at the scene of the incident.

Data on the same variable has been selected and integrated. Ultimately what is accessed by analysts is information regarding what kinds of variables are most prevalent at fires occurring

in a specific fire station's area of responsibility. The same graphs and charts found affixed to walls in the FRS headquarters are generated through the Excel spreadsheet to show, for instance, how many casualties result from fires in specific areas, what resources have been heavily used in response to fires or if fires happen more frequently inside or outside of buildings. In regard to the function of Active risk mapping, the information found here becomes actionable information when it shapes, facilitates and conditions decision making on what resources are needed to anticipate and mitigate fire risk in specific areas. From the analysis it performs, Active might influence what types of equipment will be invested in for specific fire stations. It might alternately lead to an escalation in preventative Home Fire Safety Checks wherein fire-fighters work with residents in an area to plan evacuation routes from potential fires. In some cases, the information generated by Active could lead to a wholesale relocation, or even withdrawal of, fire stations altogether.

The chapter at hand, however, is less about the decisions made from information generated and more instead about how data transforms into specific kinds of information on fire risk. Rather than being about how information is actioned it is about how and what kinds of information become actionable. As I have argued above, the emergence of specific forms of information on fire risk is entangled in the issue of how data are mobilised, the kinds of data that are transmitted from one place to the next and how, in its movement, data morphs into information. The sources for IRS data are, as noted, both the narrative logs derived from FRS control rooms and the proforma forms filled out by operative staff at the scene of an incident. They represent two different data renditions of the fire incident from the perspectives of two crucial sites of fire governance. The role of the Quality Assurance Officer is to make decisions as to which data generated from the two sources properly accounts for the incident and is pertinent for analysis and which is not. Judgements over the pertinence of different data are enacted in what data becomes mobilised within broader systems of data circulation and what data does not. As Terranova notes, the judgement made by the Quality Assurance Officer follows the logic of an entropic process, whereby the volume of data is decreased as it becomes more refined and mobilised for the purposes of analysis. By deciding what data are mobilised and what data are not, the Quality Assurance Officer ultimately influences what kind of information can be generated on fire risk.

The effect of quality assurance decision making on information generated about fire risk can be exemplified if we return to the issue of casualties which are recorded and what resources were called upon to deal with these casualties. As noted, narrative log renditions of fire incidents will include casualties which resulted in the deployment of resources to deal with casualties. In the proforma report, these casualties will only be recorded if the resources deployed were actually used. If data from proforma reports are transmitted to Active rather

than narrative logs , as is common practice, the fire incidents described in Active will only record resources used not resources deployed but not used. Although a detailed account of fire incidents is afforded in Active, then, the messy, often mistake laden, aspects of FRS response to an incident, captured in narrative logs but not in proforma reports, is eliminated. The rendition of fire risk generated by information from Active is thus skewed by the process of entropy which underpins decision making as to what data should be mobilised and, ultimately, what data turns into information.

Conclusion

The information security agencies now continually generate facilitates and is a symptom of the fundamental changes in the actions that they take, the interventions they make and how they legitimate and rationalise their existence. But information is far from where the story starts in enacting and facilitating the types of risk based governance that are now central to authorities like the FRS discussed in this chapter. As a combination, an ordering and a comprehension of scattered flows of data, information is only a surface product. To furrow underneath this information and ask from whence it derives is to encounter a plethora of minute and intricate organisationally situated and locally instantiated data based processes. These processes cannot be conceived as merely everyday laborious chores which bored personnel undertake in a mundane routine. Generating the very material by which different agents of the security apparatus come to decisions about how to intervene, these techniques are part of the very mechanisms by which security is enacted and practiced nowadays.

Issues concerning movement exist in the midst of these processes, In this chapter, then, we have seen how movement has characterised, instigated and influences a variety of processes such as data sourcing, selection, integration and analysis. But as our gaze on such processes become ever more minute, revealing the complexity of manoeuvres and different stages which comprise them, the statement that organisationally situated processes by which information on risk emerges are characterised by movement becomes increasingly obsolete of meaning. Instead, the generic signifier of movement needs to be broken down and compartmentalised into different modes. In this chapter, I have drawn on the dichotomy between mobility and circulation established in other literature (Adey, 2006, O'Grady, 2014, Salter, 2013) and applied it to the case of how data becomes actionable information. If circulation designates and accounts for broad normative systems of data flow, mobility conceptualises the conditions of possibility by which data are moved. Through the language of mobility, not only have the techniques prevalent in creating information been identified but their inner workings have been documented. On one hand, the conditions of mobility are

automatic and self-regulating, embedded in hardware and enacted through software commands. On the other they operate through incorporating human-based decision making.

But happens to data as it is mobilised? I have argued here that, on its way to becoming actionable information, the mobilisation of data is inseparably entangled with its material transformation. The transmission of data from one place to the next is accompanied by the homeomorphism of data. What homeomorphism allows us to think of is the multiple form shifts which data undergo in becoming information. In an age of Big Data, it might be expected that the amount of data used in the FRS would enlarge in volume and variety as it travels further and deeper into the bowels of the FRS digital infrastructure. In fact, the opposite is witnessed. Rather than growing, the mobility of data is organised by a process of entropy. Through its transmission and in its becoming information, the volume of data shrinks and becomes more refined to suit the specific analytic purposes of the software to which it moves. As icons of the minute processes discussed, the posters affixed to walls in the FRS testify to this process of entropy. The posters are the result of a continual downsizing of the digital entities that the FRS accrue and deploy. It is the generation of small, discrete actionable information not the generation of Big Data that, at least for the time being, matters to the FRS.

But if this process of entropy has told us anything, it is that the transmission and homemorphism of data are bound to one another in a way that bares the trace of the different conditions mobilising data in the first place. In mobilising data, as shown in relation to IRS, human operators do not just face a question of making sure the right data are categorised and moved to the right places. Instead, this act of mobilisation shapes and conditions what things are made accessible to analysis and what are not. It influences heavily what information can be generated and also mediates how this information reflects the future to which the FRS increasingly orient themselves strategically.

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