



THE VIRTUAL UNIVERSITY AS 'TIMELY AND ACCURATE INFORMATION'

Neil Pollock

University of Newcastle upon Tyne, UK

Abstract

This article investigates the implementation of an Enterprise Resource Planning System in a redbrick university in the UK. The first part is concerned with the way in which the implementation project team has come to conceptualize its task or mission and represent it both to itself and to the rest of the university. On one hand, the discussion is about the rolling-out of a rather mundane information system, purchased simply as a replacement for an out of date system called 'MAC'. On the other, for some people, the system amounts to a large, and complex – almost mythical – model of the university, a kind of 'virtual university'. Specifically, the article is interested in one particular phrase, script, or mantra that appears over and over as the accepted rationale, mission and justification for the project: the 'provision of timely and accurate information'. It is argued that the phrase helps to mediate the boundary between how the project team and others understand the university as a whole, and the ways in which it is, could be, and should be changing. The second part of the article is focused on the way in which those implementing the new system are attempting to move the university from an old (seemingly 'chaotic') model to a new (supposedly 'ordered') 'informational model'.

Keywords

information, informational mantra, virtual university, enterprise resource planning systems, change management

INTRODUCTION

It has become something of a commonplace to say that new information and communication technologies (ICTs) are transforming higher education. To date, much of this discussion has interpreted such change as something being added, as in the introduction of new actors, new forms of learning provision, new technologies and so on. However, while these technologies are – in an obvious sense – about the introduction of something new, they are also about the redefinition of many existing actors, activities, and processes within universities. The example being used here is 'information':

Currently most UK universities and colleges of higher education . . . are re-evaluating the way they gather, process and disseminate information for teaching, research and administration, for many this will mean radical change.

(Allen and Wilson 1996: 239).

Information has always been attributed a crucial role within institutions. However, it constitutes one of the aspects that – through a process of redefinition – has come to take on an importance out of all proportions to the past (Agre 1999). Indeed, in a recent high level report by the Joint Information Systems Committee (JISC), the body responsible for university computing in the UK, it was stated that information has become the very lifeblood of higher education institutions; as a resource on a par with labour, information should be considered as part of the very infrastructure of universities. So central is information that JISC argue for the conflation of the role of information with the very ‘vision’ of the university (JISC 1995).

In an attempt to critically analyse the information issue, this paper reflects on an information management project being carried out at a Big_Civic University in the UK. Narrowly defined, this project is concerned with the implementation of an Enterprise Resource Planning System. The system – let us call it Enterprise – is produced by a large European software producer and is widely used within commercial organizations. Enterprise includes a number of modules dealing with particular functions or aspects of the university, including finance, human resources, project management and (eventually) student records, which is meant to replace a number of existing software technologies that are currently grouped around the MAC system. The project involves a wide range of actors, including the university’s management and central administration, the software vendor itself and ‘third party’ consultants. At the heart of Enterprise is a very large and complex relational database that will eventually contain information on the status of staff, students, buildings, equipment, documents and financial transactions.

Particularly relevant is the way in which the Enterprise project team has come to conceptualize its task or mission and represent it both to itself and to the rest of the university. At one level, Enterprise is solely concerned with the provision of timely and accurate information throughout the university. Whilst it might be argued that this aim is hardly surprising – the provision of information is, after all, the central purpose of information systems – at another level there are further, more interesting, even sublime, aspects to the Enterprise project. In point of fact, such is the nature of the mission being built around Enterprise that some have come to think of the system as a kind of ‘virtual university’. It is seen as virtual for two reasons. First, within the system there is a large and complex model of the university, where there is the form of a university but without the thing itself.

Instead of the heterogeneity of an organization full of competing goals and interests, in the Enterprise model every issue seemingly equates to an informational issue. For some within the project team, the informational model embodied within the system comes to represent the actual university. Second, at a more analytical level, the notion of virtual captures the idea of different models that co-exist in a relation/tension, or that one model can effect power over another. It is because of the introduction of the new model, in other words, that the old is seen as problematic. The interesting theoretical move is in tracing the implementation of Enterprise as it begins to contribute to a shift from an old to a new model of the university. Indeed, it is through the very construction of Enterprise that a difference (between the old and the new) is achieved: the implementation of the system is simultaneously the construction of the new model and the destruction of the old.

In the first part of this article, I focus on the way in which the aims of the Enterprise project – materialized in one slogan – are accepted (and repeated) by everyone. The latter part of the article analyses in more detail the ways in which the implementation constitutes the move from the old to the new model, particularly with reference to some of the rhetorical strategies deployed. Finally, I briefly reflect on the ‘burden of information’, or how, if Enterprise is to achieve some of its goals, the users must behave within the new informational model.

THE IMPLEMENTATION

At this Big_Civic University, they are currently in the process of replacing MAC with the Enterprise system.¹ According to Goddard and Gayward (1994), the University Funding Council MAC initiative, implemented in the early 1990s, was the most recent large-scale attempt to put in place (in a number of different institutions) a computer system both capable of handling the ‘needs’ of universities and capable of the production of standardized information that could be used to report to the main funding body (i.e. the UK Government). In 1995, Big_Civic University engaged the services of a well-known group of management consultants to carry out a technical review of the state of the MAC system. From the review a document was produced, *The Future State Vision*, which in common with the standard mode of consultancy reporting (Bloomfield and Vurdubakis 1994), combines technical detail with a ‘context’. For instance, before learning about MAC’s limitations, in the preamble we read about the increases in student numbers, the advent of auditing, extreme competition for research funding, and so on. The document details how all of this is leading to demands for ‘efficiency

gains', and that the role of the computer system is no longer solely the 'presenting and accounting' of the university to funding bodies. There is now a 'direct pressure' to spend more effort on 'management and administration' and to provide more data and information on 'relative performance'.

The importance of all this lies in the fact – and this is before reaching any of the technical detail concerning MAC's limitations – that the document can be read as an effort to signal that the university is working in a changing terrain, and that it should reconfigure itself – and its systems – in relation to this. The extent to which the notion of a 'changing terrain' was accepted as sufficient reason to replace MAC with a new system is made evident in the following extract. Here we are listening to the project director during an away-day meeting providing the history of Enterprise to the project team:

I'd like to say a few words about where we've come from . . . [T]he World was changing, but I think the view [here] was – well, we hoped it would go away and it wouldn't change. Historically through the eighties, we under invested in management information systems. Then MAC came along and it was seen as a panacea. It turned out not to be the magic bullet that many people had hoped, partly because the whole context in which MAC had been conceived was in the old model of higher education. The main funder was the government, and it was a 'command and control' system of reporting to government. Culturally and, also, probably technologically, it was an old model of the higher education system. And when we started moving into this new requirement for much more flexible information, MAC just didn't come up to scratch.

Interestingly, the project director is depicting a scenario where there is an effortless shift from the world and its external pressures, to the university, the model of the higher education system and finally to the MAC computer system itself, and a requirement for 'more flexible information'. In fact, to be precise, the picture he is painting here is not of a seamless shift but a series of dis-junctures. The university is 'out of step' with the external situation (the rest of the world): the assumptions embodied within MAC are based on an 'old model' of the higher education system – a model that is no longer appropriate for today's climate. All this has been highlighted since the University moved to this new need for flexible information. The response is apparently a straightforward one: bring all these factors into line through changing the system.

The interesting issue here is how the story that all of this can be provided for through the implementation of a simple management information system seems to make – at least in the institution where it was voiced – perfect sense. The argument I shall put forward is that Enterprise is successfully able to replace MAC as a result of the fact that various actors around the university began to accept the problematization as set out by the project director (particularly the notion that

there is now, within the university, a new requirement for information). Importantly, as I want to show, this is part and parcel of a larger discursive reorientation of the university as an 'information institution', where actors involved come to accept the inevitability of the model being offered (the informational model). To demonstrate the process by which everyone begins to speak (and think) in terms of 'information', I will be drawing on insights from a strand of thought that has emerged out of the Sociology of Science & Technology known as Actor Network Theory (ANT).

According to ANT, to understand just how a technology becomes (or fails to become) a success we must follow and observe various innovators as they attempt to enrol others into their 'networks'. Such enrolments are typically based on one actor raising problems about the identity of another. Callon (1986), for instance, discusses how back in the 1970s environmentalists began to problematize assumptions held by major car producers that consumers increasingly motivated by environmental concerns would still want to purchase highly polluting vehicles. They achieved this by outlining a scenario where new forms of battery-powered vehicles would be the only acceptable means of transport. In *Science in Action* (1987), Latour characterizes successful innovation as where one actor accepts and takes up the problem put forward by an innovator. In other words, the targeted actor has their goals and interests 'translated' to fit those of the emerging network. According to Callon then, the car producer shifted their interest from their current technology to those that were already being investigated by the environmentalists. Thus, for ANT, a technology (such as the battery-powered car) becomes a success when a sufficient network has been built for it (i.e. there are those willing to support it). Indeed, as Rudinow Saetnan (1991) points out, without such networks a technology is said to only 'partially exist'.²

The utility of the ANT approach is twofold. First, it coincides with my interest in 'redefinition', or the process by which certain (seemingly) stable actors and entities are problematized and begin take on new roles and identities. Second, it allows us to move beyond overarching general notions (such as technological determinism) to explain the way universities are changing. Rather, the purpose of this article is to show some of the intricate ongoing work going that makes it possible for one actor to convince others of the need for the university to change, and to modify its mode of working. Indeed, as I will attempt to show, the mechanism by which one model of the university comes to dominate (or replace) another is related to the very practical work of loosening some associations (i.e. rendering ineffective or problematizing an existing network) and the simultaneous introduction and production of others. In other words, I want to show how the construction of one new network is simultaneously the destruction of the old.

In particular, I will be drawing on (amongst other things) a fascinating article entitled 'Information Mythology' (1994) by the historian of technology, Geoffrey Bowker. This is a description of the early geology of some of the unexplored areas of Venezuela. Here he describes the intricate socio-technical processes whereby scientists are able to turn local, unstructured, knowledge about soil into 'global scientific information', which could then be read back in the labs of the Schlumberger Corporation. His argument is that the process whereby everything can be constructed according to the properties of information is not 'a pre-ordained fact about the world' but 'it becomes a fact as and when we make it so'.³ Indeed, it is the very method by which certain actors come to accept the 'need for information' – or, indeed, the process by which a 'space for information' is constructed (Porter 1994) – that I want to describe here.

FROM MAC TO ENTERPRISE

The MAC computer system is to be replaced by the Enterprise system. As mentioned earlier, a technical review was carried out in 1995 and a document was produced, the Future State Vision, describing how MAC was seen to be suffering from a number of inherent 'technical limitations'. Indeed, the report is wide-ranging and its criticisms are generally accepted by all as the definitive 'nail in the coffin' for the system. However, while the document lists in some length the systems limitations – for instance, that it appears 'old fashioned', it is slow, that it lacks 'system bridges' between the centre and the faculties, that it doesn't compare well to commercial software with which people are already familiar, and so on – it is not until at least a year later that we 'really' learn why MAC was to be replaced. One senior member of the project team describes how:

[Enterprise] software was chosen because it best suits our needs. It is flexible, easy-to-use and will provide timely, accurate and accessible information . . . MAC does not give us what we need to run efficient administrative and information systems . . . [j]ust one example is that it does not provide financial reports on-line to give people responsible for controlling budgets a real-time picture of their expenditure, instead they have to rely on paper reports, which are inevitably out of date. The difficulties this presents are well and widely understood. The advent of [financial devolution from the centre to departments] makes access to accurate, timely information even more important.

(University Newsletter)

Moreover, we learn it again, this time from an end-user seconded into the project team:

My job is made more difficult by the fact that we have two systems in the department, each

carrying account information that does not match. . . . One of our big problems is not knowing our exact financial position. For example, there are always accounts which have been paid but have not yet shown up in the budget. Obviously this hinders planning . . . [the new system] will give us the opportunity to improve the way we manage our money and our people – and from what I have seen it looks very promising. For me, the biggest single advantage of [Enterprise] is its ability to provide timely and accurate financial information on research projects. I believe it offers significant improvements.

(University Newsletter)

The recurring theme coming from these two accounts is that simply listing MAC's limitations is insufficient to explain why the system is to be replaced. It is seemingly not enough to say that the system 'does not provide financial reports on-line', or that it cannot 'give people responsible for controlling budgets a real-time picture of their expenditure'. Nor is it adequate just to say that while using MAC nobody knows their 'exact financial position', or that account information 'does not match'. One way of addressing this is to say that such limitations are not convincing enough; in terms of enrolling others, they offer what Latour (1988) calls little 'explanatory power'. In other words, in order to understand the outcome of all of this it is necessary to consider the 'relational context' in and through which the story moves (Woolgar and Cooper 1999).⁴ Conceptually, this means that just what is to count as a sufficient explanation can only be understood as a result of 'usage' (i.e. the way explanations of the reasons for change are accepted and taken up by others). So, just how do others use this story?

Whenever we are presented with MAC and its limitations, the story is always centred around the aims of the new project; these appear to manifest themselves in one single phrase, script or mantra that is repeated over and over again. The mantra continuously appears in internal project documents, consultancy reports, communications from the team to the rest of the university and in team discussions, as the rationale, mission and justification for the project – 'the provision of timely and accurate information'. Ever present at every meeting and in every document, this phrase has become, as it were, a member of the team, an actor. What is more, while the phrase is widely used within in the team's strategy for communicating with the rest of the university when discussing the move from MAC to Enterprise. This very phrase has come to stand – through usage – as the reason for the replacement of MAC. For instance, to repeat the words from above: 'The advent of [financial devolution from the centre to departments] makes access to accurate, timely information even more important'. Similarly, 'the biggest single advantage of [Enterprise] is its ability to provide timely and accurate financial information on research projects'. The important question that needs to be asked here is how is it that the aims of the Enterprise project are

taken up so straightforwardly. In the next section, I want to elaborate on this by investigating the usage of the mantra within the project team.

WITHIN THE PROJECT TEAM

There is little doubt among the project team just what the Enterprise project is about. In internal meetings, for instance, when discussions concern the goals of the project, or when questions come up about just 'what' they are trying to achieve, we invariably hear the repetition of the mantra. In one meeting a senior administrator involved in the project, was asked what she expected her department would gain from the implementation, she replied how Enterprise would provide her staff with 'information which is timely and accurate'. Another senior administrator articulated how such things as the 'production of the annual accounts and the HESA returns [should] hopefully become easier because [Enterprise] should facilitate better information and more timely'. This would help those out in faculties or departments who 'will get more timely information looking at their own accounts and plans against actuals'.

Enterprise is conceptualized according to a set of priorities that are 'known' and seemingly 'understood' by everyone within the team. Here, in contrast to the less convincing limitations belonging to MAC, the power of explanation of the mantra is strong, holding in place the relationship between MAC and Enterprise (and, arguably, the university, the model of higher education and their relationship to the world). Indeed, such was the mode of use of this particular mantra, it was sometimes able to partially absent itself; the acceptance of the goals of the project were such that, at times, there was often little need to articulate the full vision, the project being concerned with the '. . . provision of all this timely and accurate etcetera, etcetera . . .'.⁵ In terms of ANT, we might describe all of this as a 'successful translation': everyone is saying the same thing about the Enterprise system and everyone has accepted the problematization of the MAC system (i.e. it does not provide the right kind of information). This begs the question as to why the informational mantra is able to work so well.

The suggestion is that the phrase operates owing to the very 'resonance of information' within the university, in that it appeals equally to what Bowker (1994) terms the 'mundane' and the 'mythical'. In using these terms Bowker is pointing to the way in which some theorists – i.e. those who talk about the so called 'information age' – have attempted to redefine all human history as the history of information processing. According to this view we thus have the most prosaic bureaucratic processes, the nature of society and, in some cases, the very meaning of life (i.e. living systems as information processors) all re-defined in

terms of information processing. Analogously, I want to suggest that, within the university, there is a discussion that characterizes Enterprise as both a simple information system and as the university itself. To exemplify what this means, we can return to the project director. Here, at the same away-day meeting he is reading from a document containing a number of bullet points:

I would like to spend a few minutes on the missions of the project . . . the first point: 'To provide consistent and timely information'. So this really is an information project. It is about information to run the business . . . Just going on to the various subheadings there so: 'Support the day to day'. The word day to day is an important word there. This is an information system that which is also concerned with routine activities. There is still the basic 'running the business which needs to be informed by, supported by, information systems.

Above, the project director is talking about the administrative processes that you might associate with any large organization. To continue with the quote, information is concerned not only with the day to day running of the business:

The second bunch of points is about the structure of the organisation: 'bind together a decentralised organisation'. Well this is the whole idea that the whole is more than the sum of its parts, that the university is not just a sheltered workshop where academics pursue their particular interests. It clearly has to be a supportive environment where people can do their own thing because if you really turn off those people then you are dead in the water. But, increasingly we're in a situation where we've both got to be entrepreneurial, but . . . good management is essential such that we do have processes which bind these entrepreneurial people into something which is the university of [Big_Civic]. And it's really a very important point where people have to have some sense of identity with the institution as a whole and some engagement, and agree to operate on the basis and principles that are there.

Here, we are witnessing the taking apart of one 'physical' model (the centralized administration) and the construction of another seemingly 'virtual' model. Once the project is implemented, much of the administrative activities currently carried out by the centre will be 'devolved' to departments; the centre is apparently not conducive to the entrepreneurial activity that is required. The worry, however, is that once the administrative centre disappears the university becomes nothing more than a 'sheltered workshop' for academics who are there only to pursue their own particular interests. Hence the need for a 'supportive environment' – a 'something' – that 'binds these entrepreneurial people' into this entity called the university. But what is this something? Seemingly, it is informational processes. Academics are increasingly doing their 'own thing', the physical institution being for them nothing more than a constraint. Here, the university is (re)made according to the needs of these actors. Thus, we have a definition of Enterprise as both a mundane system that processes information, and the basis for a new

model (mythology?) of the university, a 'place' – or, rather, a set of processes – with which certain people can identify. The resonance of information is thus this causal link from the banal to the sublime (Bowker 1994).

A second move leads from this. Not only is it a case of these 'entrepreneurial people' identifying with a university composed of informational processes: the actors themselves – and their relation to each other – are similarly constructed in terms of information. Indeed, according to the JISC report mentioned above, universities can be thought of as completely composed of 'Information Groups' (i.e. students, buildings, projects), 'information items' (i.e. teaching materials for a course) and 'information standards' (i.e. the attributes of groups and items).⁶ What is more, these are also all 'performative' roles. According to an internal document: '[a]lmost all organizational units, faculties and departments as well as central administration, will be collectors and generators, providers as well as customers of data and information', meaning that actors are conceptualized not in traditional terms (i.e. according to hierarchies) but according to their new 'de-layered' duties towards information. This signifies that actors across the university (whatever their existing allegiances) can – in principle – align with everyone else according to the 'nature' of information. In other words (picking up on what was being suggested by the project director), these new informational roles are 'integrative': they act to '. . . bind together a decentralized organisation'. What this is suggesting is that the hierarchy and nature of engagement of actors in this network are reconfigured; information has become the unifying principle in the university, the basis around which all actors are ordered.

FROM THE OLD MODEL TO THE NEW MODEL OF THE UNIVERSITY

Once established within the realm of the project team, the real work of implementing Enterprise begins. This entails extending the mantra out into the university. For this, a stronger explanation is required: the project team attempt to connect the mission of the project with a straightforward outcome. The assumption is that the Enterprise system will enable the university (with all its problems, see below) to move unproblematically towards the new model. In these final two sections, I will address some of the problems of the existing university model as depicted by the project team. I will do this by, first, investigating the images used and, second, briefly analysing the ways in which aspects of the new model have been taken up by the end-users within the university.

In terms of capturing how actors construct the existing model, the following conversation is illumination. It is a conversation between the project director and

the project manager (again taken from the away-day meeting). The project manager begins:

Here people are very, very parochial, and if we are deciding whether we should be putting in an extra bit of a finance system as opposed to an extra of a student system, [the finance director] is going to vote for a finance thing and the student guys are going to vote for the student bit.

Followed by the project director – who agrees by stating how he accepts: ‘. . . absolutely the part about being parochial, I think that’s the way it has been but in a way we’ve got to get away from this us and them model’ – the project manager replies:

The problem I found when I was on the [university’s Information Technology] Committee was that you had a whole raft of people who had their own vested interests, and actually chaos was the one word I would hate to mention.

According to the project director, in place of this ‘parochialism’, ‘vested interests’ and ‘chaos’, Enterprise will: ‘[g]uide the internal decision making at all levels’, meaning, the university will ‘. . . move into a situation where people make decisions on the basis of information rather than prejudice, hunch, rumour [and] all those other things by which we currently run the business’. From an analytical point of view, the key in all of this is the attempt to construct the university through the image of chaos. Information – it seems – will permeate ‘all’ aspects of the university, rendering decision making increasingly visible and therefore subject to some form of internal benchmarking. This increased visibility is expected to displace, or translate, the chaotic and parochial university, the assumption being that through the increased provision of information some form of ‘order’ will rise from the chaos.

It is clear that all of this needs substantial unpacking.⁷ Berg and Timmermans (1997) argue that disorder, for instance, does not precede order but is constituted alongside order as a ‘necessary and un-erasable parasite’. Their argument is one of the co-construction of problem and solution, meaning that the process is not the bringing forth of an established problem but the act of producing the problem with an eye to its eradication. In other words, through imposing the model onto the actual university, the order/disorder distinction is made possible. Within a university where information is seemingly freely and widely available, a ‘whole raft of people’ are readily seen as operating according to ‘vested interests’. The model, by its very presence, makes the university appear disordered or, to say this in other words, every order by necessity embodies its own disorder (Berg and Timmermans 1997). It follows that to be wrong in this university (that is to be

considered parochial, or chaotic, or self-serving and so on) is to take decisions that are not based on information (and, more importantly, information made visible according to the Enterprise system).

LIVING IN THE SPACE AND TIME OF THE VIRTUAL UNIVERSITY

If we were to take at face value the notion that the introduction of information will begin to permeate every aspect of the work done, then, a question that might arise would be how the new network space – where information is everything – might begin to reconfigure this university? In order to benefit from all this timely and accurate information certain forms of compliance would be demanded (Wildavsky 1983). One example concerned with administration is the processing of paperwork. In a new way of working – which entails that information is always timely – forms cannot be left to pile up on desks until the end of the week or month, to be dealt with at a later convenient time; all data must be instead entered when and where it is produced. An exemplification of what is meant by this can be seen in the attempt to automate the ‘student admissions systems’. According to the student system manager, the system: ‘will provide a workflow functionality so that we can get applications [for post-graduate study] in, we can scan them, we can send them around departments, selectors, selections teams, whatever. A decision can be put on which can be automatically coded’. Therefore, under the new system, applications: ‘. . . should be acknowledged automatically and at the same time applicants should be advised of response times for the notification of decisions’. This is in contrast to the current system where:

. . . There is no clear process. Every department does things differently. There are long delays. There is the old argument ‘do we lose postgraduate students because we don’t turn decisions quickly enough and this kind of thing?’ So you put a system in like this, provided you can monitor and control it, is one of the benefits that you turn around decisions more quickly. Do we actually increase our recruitment?

According to this, the old model is without a clear process and this leads to ‘long delays’. If we were to turnaround decisions in a real-time fashion, apparently we might actually increase recruitment. More conceptually, here, we can see that we are being presented with two images: the ‘slow to react’ student process versus a real-time system. What we are seeing here is the creation of a difference between the processes carried out under MAC and those that will be in place with the new system: this is achieved by explaining the former according to what might be said to have caused it (delays, every department doing thing differently, etc.), and the

latter in terms of what might be thought to result from it (quicker decision making, increase in recruitment, etc.). What is interesting about this, is that it assumes that: (1) as a consequence of the introduction of Enterprise the old time will move straightforwardly towards the new real-time; and (2) that each form of working practice is mutually exclusive. Further, it trades on the notion of Enterprise's diffusion into the university as akin to something like a 'blanket cover', whilst it would be more usefully thought of as one space, or network, co-existing with others. I shall expand on this in some detail, for I think it offers some interesting insights into the relation of Enterprise to the rest of the university, or how one model is in tension with another.

In one important sense, Enterprise does begin to extend itself throughout the university when the users also begin to acknowledge that there is a need for a new system which produces more timely and accurate information. One might imagine that, when they repeat the mantra, however, this would be voiced with varying levels of commitment, enthusiasm or, perhaps, irony. Nevertheless, whenever we were present at meetings, the mantra was still repeated.⁸ In other words, in perpetuating the mantra, the users begin to perform in this network. However, as will be seen below, their commitment to the system is more ambivalent, as they do not perform the role that is expected of them. The following quote is taken from a focus group, where a member of the support staff, having attended some of the initial training courses, is beginning to think how the system will work in her own department:

Now when [Enterprise] comes in, the academics are going to have to conform to quite a lot of rules and regulations that they don't now. How on earth I am going to get my lot to do it, I do not know. Whether the centre has realised this, and is just not telling us what they are going to do about it, whether they are just going to trust to luck and hope that it works I just don't know. But, I am quite concerned about that. I mean it does create bad feeling if you are saying to somebody look you just can't just make an order on the phone, I won't pay for it if you do. It must come through the office, that's the system. . . . And I can see that they are going to start screaming, as soon as I say to them 'sorry, you can't do that anymore you have got to do that now, that's what the system is supposed to do'.

What we have here is a powerful description of the way in which the Enterprise project is conceptualized as a mere mechanism for change, with the administrator portraying herself simply as a conduit for that change. The order embodied within Enterprise is expected to be reproduced throughout the departments displacing existing modes of working with lots of new 'rules and regulations'. While this type of account should not be disregarded, it seems that in practise, things were very much more interesting than this.⁹ For instance, in one of the departments,

it appeared that many of the new rules and regulations rather than reconfiguring existing networks were themselves 'worked around' in order to slot into existing practices.

In the case of purchasing (i.e. stationery requirements, new equipment and travel tickets) the procedures had always been to obtain a new item or service through the production of a number of forms. In urgent cases, the practice would be flexibly adapted so tickets could be first purchased and the appropriate forms would be raised later. Under Enterprise, this *ad hoc* practice is impossible as all suppliers have received written instructions allowing them to supply goods and services only for those orders which are: (1) printed on an appropriate form (i.e. the one generated by Enterprise); and (2) bearing an unique order number (again, generated by Enterprise). In urgent cases therefore, the administrator would generate the paperwork and a ticket, for instance, could be bought the same day. When the administrator is not available, however, the remaining support staff is faced with a problem. The administrator who has designed a copy of the Enterprise order form on her word processor has circumvented this, however. The form can be printed out at any time, and adorned, not with the Enterprise order number, but with something she calls a 'pseudo number' or the 'secretarial requisition number' (a physical list of numbers kept by other members of the support staff). After this workaround has been carried out, the administrator is then free to process the order through Enterprise in her own time.¹⁰

What do these workarounds tell us about what is going on?¹¹ At the very least, they teach us that the implementation would not be possible without such *ad hoc* modifications. At most, they indicate the nature of the new model and its relation to the old, that the real-time university where information is always 'up-to-date' is very much a performative notion. For all the centre knows, the departments are working according to the real-time procedures, and as long as the users maintain these intricate workarounds, the university might as well be considered real-time. Thus, while the work of implementing Enterprise has involved both the production of a new model and the seeming destruction of the old, in many ways, the established routines, practices (i.e. the old model) carry on as before. However, this is not to say that the university is the same as before.

To describe what this means I want to turn again to Bowker's work on the early geology of some of the unexplored areas of Venezuela. Writing about how the Schlumberger Company searched for oil, he describes the building of a network of roads and pipelines through jungle country: 'The old state was often a mass of impenetrable jungle: the network rendered it, at key points, visible and accessible to the oil companies' (1994: 243). Bowker goes on to describe how, within this network space, the companies were able to produce a 'local order' in the

disordered space of the old state; this meant that no global picture was possible, as the scientists were only able to understand 'small pockets' of the jungle. Also, because the local order existed only in the places where the roads and pipes were physically located, this network would throw into stark contrasts everything around it (i. e. from the point of view of the road, all the rest really was a jungle). If we apply this to the Enterprise example, it might be said that the system, through the requirements that all decision-making activities are represented as information processes, is making the university, and the way that it works, visible and obvious to everyone. Further, because of the presence of the system, everything (not already included within the system) appears dis-ordered – or much like a jungle (based on prejudice, haunch, and rumour). In other words, through establishing the informational model throughout the institution it is possible all that activities, practices, and processes not carried out according to the system will be found wanting in various ways.

CONCLUSION

This article has attempted to show the means whereby a university is redefined as an 'information institution'. In doing so, it has also wanted to demonstrate that the processes by which a large institution begins to think, talk and redefine itself according to the properties of information is not a fact about universities but it becomes a fact 'as and when we make it so' (Bowker 1994). Empirically, this paper has focused on the replacement of one management information system with another, the reason for its replacement being that one does not provide the same type of accurate and timely information as the other. However, as argued in the paper, it is only through bringing together people disciplined enough to repeat an informational mantra, that a difference between the two systems is actually achieved and a new information model is established throughout the university. While the complexity of the implementation allow for a certain amount of flexibility in how the users take up the various parts of the system (hence the discussion of workarounds as the continuation of the old model), now that the new model is established, all activity will be measured against this, and (of course) found to be wanting. To conclude, through the process of bringing everything together under the metaphor of information, Enterprise seemingly begins to allow the production of order in the chaos of the university.

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Neil Pollock
Centre for Urban and Regional Development Studies
University of Newcastle upon Tyne
Newcastle upon Tyne
NE1 7RU, UK
Neil.Pollock@Newcastle.ac.uk

NOTES

- 1 The material for this paper was gathered during a participant observation carried out over a two-year period. As well as sitting in on meetings, presentations and talking to members of the project team and users of the system, various documents concerning the Enterprise project were also collected and analysed. A number of focus groups were also conducted with the users of Enterprise.
- 2 In other words, ANT view technology as a network made up of technical and social elements. For a good example of a technology that only partially exists read Latour's *Aramis* (1996).
- 3 His argument is that soil does not naturally translate in information terms but was constructed as such by scientists.
- 4 Woolgar and Cooper draw on Latour (1987) here and his so called First Principle: 'the fate of what we say and make is in later users' hands' (p. 29).
- 5 This was the Project Manager. After finishing his sentence with 'etcetera etcetera', there is a brief silence before he finally adds '... information to make business decisions at all levels'.
- 6 Within Enterprise, staff are conceptualized according to the supposed attributes of information as 'informational actors'. For instance, where we might have once thought about the university in terms of the Vice Chancellor, administration, academics, support staff and students, and so on, we are now encouraged to think in terms of the 'information manager', 'information custodian' or 'information users'.
- 7 A further example of what is being suggested here can be found in James Beniger's *The Control Revolution* (1986). According to Beniger, the world is chaotic unless managers impose order on it through various technologies. Thanks to Phil Agre for bringing this work to my attention.
- 8 See the paper by Brown and Capdevila (1997) for a fascinating discussion of the repetition of the phrase 'the customer is king'. The only occasion when we were able to hear someone elaborate on the genesis of the phrase was during a conversation with a senior member of the project team. He describes how the mantra originally started with the project director.
- 9 The previous quote is taken from someone just about to implement Enterprise in her department. We also conducted research in a department where the system was already being implemented.
- 10 This is a classic example of the some of the 'interfacing work' carried out by individuals who span differing networks (Gasser 1986).
- 11 For a detailed discussion of workarounds, see Pollock (1998).

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