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ERP Systems and the University as a 'Unique' Organisation

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Abstract:

Enterprise Resource Planning (ERP) systems are widely used by large corporations around the world. Recently universities have turned to ERP as a means of replacing existing management and administration computer systems. In this article we provide analysis of the rollout of an ERP system in one particular institution in the UK, the particular focus being on how the development, implementation and use of both generic and university specific functionality is mediated and shaped by a fundamental and long standing tension within universities: this is the extent to which higher education institutions are organisations much like any other and the extent to which they are 'unique'. The aim of this article is not to attempt to settle this issue of similarity/difference in one way or another. Rather, it seeks to illustrate the value of taking discussions of similarity relationships surrounding the university and other organisations as the topic of analysis. One way of working with these kinds of issues without resolving them is to consider their 'distribution' and where ERP shifts the responsibility for their final resolution. This is a novel and insightful way of understanding how ERP systems are refashioning the identity of universities. We suggest, moreover, that ERP software is 'accompanied' by such tensions in which ever site it is implemented. The research presented here is based on a participant observation study carried over the period of three years.

Keywords: ERP, biography, standardisation, customisation, organisational identity

SIMILARITY RELATIONSHIPS

It is a truism that universities form one of the oldest established institutions in the western world - far older, for example, than the joint stock company or indeed the bureaucracy of the nation-state – and despite changes in form, function and fashion, the very latest universities retain some links, however tenuous, with their Medieval forebears. Equally, while bodies bearing the title university vary dramatically in terms of their structure, function and form, the very fact that they choose to label themselves as universities rather than any one of a number of other alternatives, suggests at least a desire to capture and share in that thousand year old tradition.

On the one hand, then, it is tempting to see the university as something different or set apart from other organisations – as a unique institution in the modern world. Frederick Balderston, for instance, describes how historically universities grew as a type of institution that was, and still is to some extent, 'distinctive' with an 'autonomous place in society and the right to choose its members, settle its aims, and operate in its own way' (1995: 2). On the other hand, it is also clear there are many similarities between universities and other organisations. As Geoffrey Lockwood has put it, 'universities as organisations face many problems common to most modern organisations' (1985: 29), including, for instance, the problems of co-ordinating resources, controlling costs, of stimulating and facilitating enterprise among staff, and so on. Thus, it might be argued, that since universities have problems common to a wide range of organisations, then the standard tools of contemporary organisational analysis and institutional management – including computer systems used by large corporations around the world, such as Enterprise Resource Planning (ERP) systems - can be similarly applied in universities.

Some have attempted to resolve this issue of differences/similarities in an interesting way. Lockwood, for instance, argues that universities are unique only to the extent they possess a certain *combination* of common characteristics which he lists as complexity of purpose, limited measurability of outputs, both autonomy and dependency from wider society, diffuse structure of authority and internal fragmentation (1985: 31-32). Whereas organisations in general might possess one or more of these characteristics or components, it is the particular combination of the components within universities that make universities 'unique'.

The aim of this article is not to attempt to settle this issue of similarity/difference in one way or another (as if that was at all possible), or try to offer a definitive account of the institutional identity and boundedness of the university. Rather, it seeks to highlight the value of taking the discussions of similarity relationships surrounding the university and other organisations as the object of study. One way of working with these kinds of issues without resolving them is to consider their 'distribution' and where ERP shifts the responsibility for their final resolution. In this article we present evidence from the implementation, and further development, of an ERP system within a British university (an institution we are calling 'Big Civic'). Here the construction of similarity/difference occurred not simply within the confines of the project team but was also the outcome of a set of relationships the University has with the system, its supplier, various internal departments, and other institutions involved in similar

implementations. This is a novel and insightful way of understanding how ERP systems are refashioning the identity of universities. We argue, moreover, that ERP software is 'accompanied' by such tensions in which ever setting it is implemented.

The ERP system we studied (let us call this system 'Enterprise') has a particularly 'mature' biography (Pollock *et al.* 2003). Initially conceived according to a narrow set of assumptions about how organisations operate (it has its roots in Manufacturing and Material Requirements Planning (MRP) systems), Enterprise has been continually applied to new contexts (i.e., financial services, public sector, healthcare and, now, higher education). In so doing, it has been expanded to include an ever-increasing range of organisational characteristics and functions (Parr & Shanks, 2000). These characteristics are embodied in the system as modules and ready made business process templates and, as is made clear in supplier brochures, are seen as being applicable to a wide variety of user organisations. In some senses, this might be thought of as the practical implementation of Lockwood's view: such systems are fundamentally based on the notion that organisations contain common elements and through combining the various modules or templates an organisation can create for itself its own 'unique solution', yet still have a fully supported computer system in which each individual component is 'best of breed'. As we will see, this is not or at least not for universities, the case.

Before presenting our empirical material, however, it will be useful to provide, first, some further background information ERP systems, second, the institution and the project underway, and, finally, a review of the theoretical notions and concepts that have informed this study, including a description of the identity of the university.

CUSTOMISING AN ERP SYSTEM, RESTRUCTURING THE UNIVERSITY

The acquisition of well-established, generic and corporate computer systems is increasingly common - and not just among universities. Firms and organisations, rather than commission and build bespoke systems and packages, are adapting general solutions to their local context (cf. Brady et al, 1992). Generic software packages, such as Enterprise Resource Planning (ERP) systems, cover the fullest range of organisational activities and processes and are adopted with the aim of achieving substantial cost savings as well as improved access to 'tried and tested' solutions, new releases, and an opportunity to update procedures and align them with perceived 'best practice'. However, while organisations choose ERP packages because of their economic

benefits they are potentially a costly and high-risk strategy. Firstly, whereas most early applications of IT were 'discrete technologies' applied to specific or closely-related functions, ERP attempts to integrate and link together the whole range of functions across and organisation (Davenport, 2000). Secondly, because ERP systems are built with 'generic users' in mind (cf. Bansler & Havn, 1996), systems seldom translate easily across boundaries, whether this is between organisations within the same sector, between industrial sectors or between public and private sector organisational forms (cf. Walsham, 2001, Ciborra et al, 2000). There is often a gulf between the system and the specific contexts, practices and requirements of particular user organisations. Amongst the many issues ERP systems raise, of particular concern to practitioners is the choice between conducting expensive 'customisation' work on standard solutions or undergoing unwanted organisational change in adapting their practices to models of work and organisational process embedded in the software.

Customisation and the 'Power of Default'

While proponents of ERP systems have argued that, in principle, such systems have 'universal applicability' (cf. Lozinsky, 1998), there is a growing body of evidence to the contrary. Adopters often find the assumptions embodied by these systems about the nature of organisations and the ways in which they operate run counter to existing structures and work practices. Davenport (1998), for instance, describes how one company had developed a practice of giving its most important customers preferential treatment, which included sometimes shipping them products that had already been allocated to other accounts. Under the new ERP system, however, it no longer had the flexibility to process orders in this way (see also Walsham, 2001).

   The suppliers of these systems will, in truth, often acknowledge and try to accommodate organisational variety through the continued addition of new and sector specific modules (Scott & Kaindl, 2000). Moreover, many of the more local incompatibilities between the system and the organisation, from the vendor's point of view, can be reconciled through customisation (Light, B, 2001). Indeed, these systems are marketed on the flexibility of their modular design, as well as the ability to choose from hundreds of 'business process templates', and the tailorability of the various parameters and settings. A supplier brochure describes this in more detail:

From a broad spectrum of functions and alternative business processes, you select the modules that you want to mould into an internally consistent organizational system for your company, depending on your specific requirements…We match its core processes to your needs by customizing additional applications, which we or our partners implement for you. Or your own IS staff can do the work simply and easily with the [Supplier Specific] Development Workbench, which is an integral part of the [Enterprise] system.

A user organisation is thus supposed to be able to choose from the 800-plus ready-made business processes, some of which have already been specifically tailored to match certain sectors, and then to customise locally the resulting assemblage.

Unsurprisingly, the reality of customising these systems is somewhat different. Pollock (submitted), for instance, notes some of the problems that arise when there are ambiguities regarding which parts of a system can be modified and those parts that cannot, or there are 'blurred' boundaries about the roles of designers and implementers (cf. Trigg & Bodker, 1994). Moreover, just as modifying the 'wrong' parts of a system can lead to problems, so too can customising industry standard systems 'too much' (Tierney & Williams, 1991; Brady et al, 1992; Hanseth & Braa, 2000). Heavy customisation can mean that a system in is taken away from supplier standards, meaning it will be difficult to make use of later upgrades or new system functionality, the reason why many systems are acquired in the first place (cf. Light, 2001).

Unregulated and excessive local customisation is at one end of the scale. At the other end, lies the problem of systems not being tailored at all. There is, for example, growing evidence to suggest that because of the sheer number of organisational and technological discrepancies that arise during attempts to customise (cf. Hanseth & Braa, 1998, Ciborra et al, 2000; Walsham, 2001), and the complexity and time-consuming nature of each modification, most adopters simply end up fitting their organisation to the system rather than the other way around (Koch, 1999; Markus et al, 2000). It seems that rather than attempt to reconfigure each and every aspect of a standardised systems (the various templates, system parameters, authorisation profiles and so on), implementation teams simply accept those 'default' features already embodied within the system - what one author has called the 'power of default' (cf. Koch, 1999).

<u>The University Setting</u>

Big Civic was a pioneer in its attempt to implement an ERP system both within the UK and further afield (cf. Pollock, 2000). On its website, for instance, it describes how once it had completed the project, and installed the ERP Campus Management module (see below), it would be the 'first in the world to have a fully integrated University ERP solution'. The rationale for Big Civic embarking upon the project, as given by the Pro Vice Chancellor in charge of the implementation, was both to replace existing systems that were seen as 'limited' and to support a fundamental restructuring of the institution's information management as recommended by a consultancy study. Related to this, it was also hoped that the new Enterprise system would encourage the development of procedures and practices more commonly found in large corporations, so called best business practice:

> I think the reason why all the bigger universities are beginning to go towards [Enterprise], is that it has come out of a multi-national environment where in essence what [multi-national companies] are involved in doing is having highly decentralised structures where you're giving your line managers a lot of autonomy and responsibility within a framework of an overall corporate entity; where the role of higher level managers is to have an oversight of the business as a whole and take strategic decisions and so on (interview with Pro-Vice Chancellor).

The project involves a wide range of actors, including the university's management and central administration, the software vendor itself, and a number of third party consultancy companies. At the heart of Enterprise is a large and complex relational database that will eventually contain information on the status of staff, students, buildings, equipment, documents and financial transactions. The Enterprise system is produced by a large European software producer and includes a number of modules dealing with particular functions or aspects of the University, including finance, human resources, project management and (eventually) student records. While the supplier had little experience of working in a higher education setting, it had demonstrated an intention to commit resources to re-developing its software for this new market, which included the development of the Campus Management module.

THE DISTRIBUTON & RESOLUTION OF UNIVERSITY IDENTITY

As yet, few fine-grained studies of the implications of ERP systems for universities have been carried out (but see Scott & Wagner (in press) who also employ an actor network approach). Cunningham *et al*. (1998) mention the potential of ERP for reshaping organisational aspects, but do not present empirical evidence to illustrate or substantiate such claims. Heiskanen *et al.*, by contrast, have conducted a detailed study of the use of software packages but conclude that such industry standard systems are inappropriate as universities as organisations are unique, particularly in terms of their decision making processes:

> It would seem that universities are fundamentally different from business organisations in their decision making processes. Consequently the standard IS development strategies developed for business may not be appropriate in institutions of higher education (2000: 7).

While we do not necessarily disagree with this view, we suggest that the significance of these systems would be better appreciated and understood if we were to resist viewing universities (or, for that matter, computer systems) as stable entities or as having characteristics that are 'given in the order of things' (in the manner of Lockwood or Heiskanen *et al.*). Instead, we want to explore some of the processes that might generate these characteristics – i.e., the identity of the university, its decision-making processes and so on - as 'effects'. Theoretically, this move has most famously been explicated in the work of Norbert Elias, Michel Foucault, and, more recently, in actor network theory, where it has been painstakingly shown how the development of scientific, organisational and bureaucratic *processes* and *practices*, simultaneously involved the development of scientific institutions (Latour, 1988), organisations (Cooper & Law, 1994), and the 'modern state' (Bowker & Star, 1999)[1]. With this in mind, let us now turn our focus to the identity of the university.

Where is the University?

The notion of 'the university' is a notoriously slippery one. The traditional university is conventionally, if mythically, though of as a band of scholars coming together in pursuit and dissemination of knowledge, governed by a more or less collegiate model of organisation, based

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[1] For a useful discussion of actor network theory and the construction of identity, see Michael (1996).

around a complex structure of committees and with a high degree of individual and departmental autonomy. In this sense 'the university' as an institution tends to lack a clear identity, primarily existing in the heads of people who constitute it and a myriad of locally negotiated practices and interactions. The central social role of the traditional university has been to provide a place-based 'rite of passage' for entry into middle class professions through its undergraduate, vocational and extramural provision, together with the provision of ideas-driven 'academic' research. In institutional terms, it has thus been described as an exemplar of a 'loosely coupled system' (Weick, 1976) characterised by a lack of clearly articulated policy and weak control over the implementation of policy (McNay, 1995). The traditional university as an institution, we might say, often appears to be only virtually present.

This ambiguity is apparent in the extent to which, as one moves around a university, the institution of the university is always, to a greater or lesser extent, 'over there'. Thus for the academics in their departments, labs and research centres, 'the university' generally refers to the senior management and, particularly, central administration. By the same token, for the senior management and the administrators, 'the university' which they are seeking to govern, manage and administer is very clearly 'out there' in the departments, labs and research centres. Meanwhile, for the students, 'the university' is seen as being comprised of both of these groups, but once again somewhat distanced and apart. 'The university,' even for those who work or study within one, is always 'them' and never 'us'. In many ways, this distancing is understandable. For the academic, both status and job security are dependent less on their current university and more on the 'invisible college' of academics in the same or cognate disciplines at other institutions. For the institutional manager or administrator, progress depends on interaction with a body which it is impossible to fully understand (for who can understand the physicist, the economist and the literary theorist equally well). And for the student, the duration of their sojourn in the university is typically still a fairly short-lived prelude to something greater.

Our own solution to the problem of defining the university is therefore not attempt a general definition acceptable to all, but rather to accept the complex and multiple meanings of the term. Following Lee (1999) and Rappert (2001), we argue that one way of working with such ambiguity without attempting to resolve it is to attend to its 'distribution' and to show where

responsibility for the resolution is located[2]. In this way, we are able to understand how, and where, these differences and similarities are brought into being, in what circumstances, and why. It is this that leads us to draw on actor network theory and the notion of 'biography' introduced below, which we think is useful in explicating this distribution.

Translation and Biographies

A number of terms and concepts are synonymous with the actor-network approach, including viewing the world in terms of the emergence of competing 'actor-networks', where various elements are brought together or 'enrolled' into an assemblage (Latour, 1987). We emphasise, for instance, how the successful realisation of differences and similarities depends on the struggles of actor-networks. By this we mean that similarity and difference between institutions do not exist out there waiting to be found but depend upon the two things as being constructed or translated in such a way (cf. Pinch, 1993). As part of this network building, there are continuous processes of multilateral change or 'translation', where one actor will attempt to channel the goals of others in new directions. And, in doing so, an actor will often find her own route re-directed when she encounters, for instance, a particular technological 'biography'.

The actor-network approach has fruitfully suggested that it is not only human beings, but also 'things' that can undertake the required work of translation of interest necessary to build and sustain actor networks, and thus non-humans should also attain the status of actors (Callon, 1986). In this sense, we want to capture something of the history or 'biography' of these systems – both what they bring with them and what this means for the new sets of users. Appadurai (1992) and particularly Kopytoff (1992), writing from the perspective of material culture, use the notion of biography to describe established artefacts as they move around and are adapted and redefined according to the needs of each new place. As Kopytoff emphasises: '…what is significant about the adoption of alien objects – as of alien ideas – is not the fact that they are adopted, but the way they are culturally redefined and put to use' (1992: 67). The biography of a car in Africa, to use the example given in Kopytoff's paper, reveals enormous amounts of information about 'the relationship of the seller to the buyer, the uses to which the car is regularly put, the identity of its most frequent passengers and those who borrow it', and so on.

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[2] This discussion of 'distribution' is drawn from research on the ambiguities surrounding childhood (Lee, 1999) and the use of non-lethal weapons by the British police force (Rappert, 2001). The ideas presented in these papers are equally applicable to the tensions surrounding the identity of the university.

Crucially, all these details would 'reveal an entirely different biography from that of a middle-class American or Navajo, or French peasant car' (1992: 67).

Through building on Appadurai's and Kopytoff's notion of biography we attempt to highlight the 'accumulated history' of an ERP system and how this continues to influence the structures and practices of later adopters. In the following discussion we identity how this occurs in at least three ways: through its all encompassing nature, ERP overwhelms implementation teams such that they have little option but to implement 'default' settings; such systems are not simply 'put to use' but are, where possible, continually adapted though this is something of a burden; and because ERP suppliers' look for commonalties as opposed to diversity in organisations, systems are accompanied by tensions concerning similarities and differences. The benefits of a biographies approach, therefore, combined with the actor-network perspective, is that it sensitises us to these tensions as these artefacts move around (across national borders or the boundaries of several industrial sectors) and are adapted and redefined according to the needs of each new setting. This echoes Williams (1997) who has criticised those approaches that over emphasise the flexibility of technology, as well as its potential for re-adaptation to a new setting, without considering the role the history of the artefact plays in current usage[3].

METHODOLOGY

We conducted ethnographic research over a three-year period at Big Civic, a large red-brick university in the North of England and to a lesser extent at a large ERP supplier. The study was part of a wider Economic & Social Research Council study on virtual universities, where we were investigating the implications of ICTs for the reshaping of universities (see Cornford & Pollock, 2003). From our point of view, the virtual university is not just a matter of 'distance' or 'flexible' teaching and learning systems. As we understood it, the Virtual University is also very much concerned with mundane projects such as administration (finance, personnel, purchasing; estates, etc.); student recruitment and alumni management; research networks; library systems; and so on, and because of the way the Virtual University extends across every aspect of institutions, this has important implications for the very nature of the university. Readings

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[3] In this respect the notion of biography shares some characteristics with Bruno Latour's (1999) concept of 'chains of transformation', where changes to the technology might be seen as the actors leaving behind, and the selective carrying forward, of certain aspects of the system biography. For more discussion of the biographies approach, see Pollock *et al.*, 2003)

(1995), for instance, describes this, in broad terms, as a transformation from the 'cultural' to the 'technological' university.

A further assumption throughout the conception of this project was that, as ICT projects are introduced into the university system, their consequences are the outcome of a complex process of negotiation, involving interactions within a heterogeneous network of actors, artifacts, and systems. Our interest was in understanding the micro level shaping of new technological systems and the interactions between these and the wider processes of the university. In this respect, right from the outset, we considered the design and implementation of the ERP system to be concerned not only with narrow technical work (such as the writing of computer code), but also the production of the very university. In terms of 'what' and 'who' we looked at we drew lessons again from the actor network tradition. In terms of what should be studied, Latour has famously advocated that technologies should be studied not as finished artefacts but 'in the making', arguing that, by studying them in this way, the 'messiness' is still there for all to see (1987). By messiness he means not only those issues identified by the researcher but those that arise during the building and implementation of ICT projects. We studied, therefore, projects as they were actually being planned, built, and used. In terms of who we studied, Latour has also argued that we should 'follow the actors' whether they be human or non-human (*ibid.*). In this sense, our focus was directly on the ERP system.

During the research we employed a wide range of qualitative methods, which included direct and participative observation of 'strategy' and technical meetings and user testing sessions. Within Big Civic, we observed the weekly 'Sponsors Group' meetings where day-to-day technical and organisational decisions were made. The monthly 'Strategy Group' meetings were observed where issues more relevant to the future direction of the university were the focus. Project away days, comprising mainly those technical and administrative staff involved in the actual implementation of the project were also attended. Within the ERP supplier one testing sessions was observed, where technical teams and 'end-users' from the various pilot and early adopter sites gathered together to provide input and help shape the software. During this session, and at a subsequent workshop we also met and talked with programmers and analysts from the technology supplier as well as staff from the other participating universities. We were also able to conduct a number of individual and group-based semi-structured interviews, as well as more informal discussions with members of the Big Civic technical team and user community. A

number of focus groups were also conducted with the users of the system. Finally, supporting material, such as meeting notes, email exchanges and reports were also collected and analysed.

We now turn to Big Civic's engagement with Enterprise, where we organise our discussion around various aspects of the system's biography. First, we consider how the University (its hierarchy, senior management team, and various committees) attempted to take customisation decisions. Our argument here is that these systems complicate this process such that it is difficult to avoid implementing a system's default settings (i.e., accumulated history).

DEFFERING DECISIONS

When the chips are down and you've got to deliver, the collegiate model doesn't work
- Enterprise Project Director

When we conducted the first part of our research, Big Civic was in the process of implementing the financial, human resource and project management modules, prior to adopting the student management module. As already mentioned, the implementation was being handled by a project team made up of University staff and external consultants from small organisations specialising in the implementation of Enterprise. On a number of occasions, members of the team met with the 'faculty support team' (members of central departments, such as finance, attached to the faculty) and representatives of academic departments where they were going to pilot the new system. We directly observed some of these meetings.

During one of the sessions, the consultants had a set of 'workflow process diagrams', which describe the proposed sequences of events by which tasks, such as setting up a research account, raising a purchase order or issuing an invoice, would take place within the new system. Each step of the process was described in detailed flow diagrams, indicating which parts of the process take place 'on the system' and which take place 'off the system', as well as constraints on who can undertake which tasks. Each of the workflow process diagrams is discussed with the departmental representatives and faculty team. The aim of the session was to clarify the workflow processes, iron out any problems which arise, and identify who does what.

As the meeting moves through the workflow diagrams a number of basic rules of the system are made clear (for example, two separate logins are required to complete each and every

external transaction – the same 'login' cannot order and receive goods). At some points the workflow diagrams are amended to better reflect the current practice (although this amendment tends to happen more with 'off system' events). At a number of points in the process it becomes clear that there is more than one way, in current practice, in which a particular step in the process was being handled. If the issue cannot be resolved one way or another, the consultant leading the meeting identifies the issue as 'a matter for policy', a matter on which a definitive ruling must be given by the university centrally.

What appears to be happening here, as the computer system is rolled-out is a standardisation of working practices and roles. Moreover, as Enterprise makes visible the variety of local practices and where these cannot be reconciled with the system (and thus with each other), this goes onto generates a constant flow of 'demands for policy'[4]. Indeed from later interviews with members of the team we know that there were hundreds of such requests for a central policy decision; these were logged by the team in a database and passed onto the senior management to resolve. In principle, then, the process not only sees the 'tightening up' of roles and procedures but it also demands a tightening up of policy which will apply not locally, but across the whole university. We might say that these customisation procedures involve both the building of a university specific system and the re-building of the university: the roll out of Enterprise is requiring the simultaneous rollout of a new (and more standardised) institution to host it (Cornford, 2000).

This 'co-production' of system and university is a complex process, however. As we found out in a later phase, these demands for policy were so copious that many of the requests simply remained on the database without senior management ever having the time to deal with them. The Committee overseeing the system roll-out (made up of a number of Pro-Vice Chancellors, the Registrar, Bursar, various Deans, and senior administrators) met once a week intending to resolve these demands but, as described by the project administrator: 'the Committee were getting 20 issues a week to resolve and therefore usually did not get past the first or second one on the agenda'. In other words, as the rollout of the system begins to highlight the variety of local practices around departments and these cannot be reconciled within the system, the sheer number of issues generated provides a problem for those attempting to decide on the future direction of the University. As a result, most of the issues have to be resolved within the project

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[4] Hanseth & Braa (2000) make a similar point by arguing that ERP systems 'create issues' that have to be resolved.

team on more technical grounds, meaning the team had to deploy its own criteria whilst configuring the system. And, in many cases, this meant just accepting the default settings (discussion with Project Administrator).

Here, then, is a first example of how the status of the university is distributed: because the committee cannot decide on the details of the system, responsibility for resolving the decision is deferred and then pushed down to the project team who, in turn, are unable to do anything other than shift the decision onto the system itself. What implications does this distribution have for the university? This question takes us onto a discussion of how the Big Civic actually began to live with Enterprise, where we suggest that users attempted developed novel ways to live with the system's biography.

TRANSLATING BETWEEN TWO DOMAINS

The period following the implementation of Enterprise revealed the extent to which the new system implied changes in established ways of doing things. More specifically, this period provided insights about how Big Civic assimilated the 'tightening up of roles and procedures' required by Enterprise's default settings. As it turned out, university staff found such assimilation quite 'uncomfortable'.

We can say that the system has stretched out across the University - its terminals, for instance, sit on the desks of several hundred support staffs and managers across the institution. Yet, its actual integration into people's everyday practices has been more equivocal. For instance, many of those based in the centralised administration departments reported that they 'like' Enterprise and that the system (and its defaults) had become part of their daily work routines[5]. Nevertheless, for others, especially those in outlying academic departments, the system has not had the immediate take-up that was initially anticipated, and still remains 'outside' of everyday practices. This was in part a result of the incommensurability of the system with existing and entrenched practices in departments. Some of the new processes put in place have been described as 'laborious', 'inflexible', 'inadequate' and the 'source of much frustration'[6]. One feature that has been subject to much change is 'procurement'.

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[5] This was one of the findings from an internal review of Enterprise commissioned by the University's management team.

[6] These were findings from the same internal review.

Working-around standardised processes

The procurement of goods or services throughout the University officially commenced with the raising of a 'purchase requisition' and this is then authorised by pre-identified individuals. However, this process was often flexibly adapted within various departments; non-authorised staff often made orders over the telephone, and the appropriate paperwork was raised much later in the process. Under Enterprise this informal practice was proscribed, as this was not the procurement procedure operating within the system. Moreover, as a method of enforcing this proscription, the University's major suppliers had received written instructions informing of changes to procurement policy, and that they were to supply goods and services only for orders detailed on the appropriate paperwork and bearing a Unique Order Number, both of which were generated by Enterprise. The quote below is from a focus group conducted with support staff directly affected by this aspect of the implementation. Here, one member of the support staff is describing her worries in relation to some of these new procedures:

> 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 of 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'.

Indeed, while support staff have pushed through many of these new rules, in many instances we also found many of the most inflexible processes were often ignored or 'worked-around'. In one instance, and we do not imagine this is the only case, we observed how staff in one research centre developed 'strategies' to live with the new procedures. As in other departments, procurement procedures here were often flexibly adapted to deal with urgent problems, such as the need for a travel ticket. Once Enterprise was implemented, this flexibility was no longer possible and this created problems. If the centre administrator was unavailable, which often

happened, the other staff did not have an appropriate 'login' or 'user profile', and thus could not generate the paperwork when it was required. To circumvent this, a copy of the Enterprise order form was designed on a word-processor (available to print out at any time by the remaining support staff) and this was adorned not with the Enterprise Order Number but with what the staff called a 'pseudo number' or 'Secretarial Requisition Number'. Tickets could thus be ordered and the correct paperwork dealt with at a later date.

Janus-faced Users

What does this tell us about what is going on? At one level, described here is a practice known and well understood within the sociology of science and technology and other allied disciplines – implementation would not be possible without numerous ad-hoc modifications (cf. Gasser, 1986; Trigg & Bodker, 1994; Star, 1995; Ciborra, 1999). This said, at another level such work-arounds indicate the nature of Enterprise and its relationship to the University (cf. Appadurai, 1992; Kopytoff. 1992). True, the system has been 'fully' implemented within the university, but for many people (i.e., the majority of academic staff, for instance) many procedures have carried on as before. Pivotal to this is the inter-mediation role undertaken by certain users, typically, administrative staff working at the 'interface' between old and new ways of working. Under Enterprise, these staff have become 'Janus faced' (cf. Latour, 1987), facing both the Enterprise system and their academic colleagues at the same time[7]. As long as these workarounds are maintained, the departments, for all the central University knows, are working according to the new procedures, and, equally, as those out in departments see it, traditional methods carry on much as before.

In summary, through the added work of maintaining a system that does not reflect the department's working practices, various users are obliged to translate between, we might even say 'perform', their specific part of the University to the system, and, simultaneously, translate the system back to departments. These users, in other words, bear the burden of reconciling the tension between universities as unique organisations and as generic organisations – what we might describe as a process of *pretending to live with defaults*. This leads us to ask the question Could it have all been otherwise? Might not the university have found a better way to manage

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[7] Latour employs the notion of the Roman God 'Janus' to describe the two faces of science & technology: one where techno-science, to use his term, is depicted as a 'black-box' where all the uncertainty and controversies are hidden; the other where conflicts and tensions are brought into the open. Scientists, he argue, continually switch between these two views.

the implementation or, indeed, procure software more suitable to its particular setting? These questions take us onto the final two empirical sections and considerations of the building of the Campus Management Module.

WHERE DO DEFAULTS COME FROM?

Thus far we have looked at the system according to the way in which the University is forced to implement and live with defaults, but as yet we have not discussed in any detail where these defaults come from. The biography of Enterprise systems, to recap, are based on the practices and processes of many different organisations, and, because of this, they are often described as embodying 'best business practice'. One element that is not available within Enterprise, however, is templates for one of the core functions of universities: *the management and administration of students*. In recognition of this, the suppliers are currently developing new functionality that can be integrated into Enterprise, a module called Campus Management, which will hold data about student records. Big Civic, along with a number of other 'pilot sites' from around the world, were involved in the shaping of this new software.

The 'Self-service' student

What is interesting about the design of the student module is that it is conceived around the idea that students are to move from being passive objects of administration to becoming one of the main groups of 'active users' (for more details see Pollock 2003). This draws on a model that the supplier refers to as the 'self-service' student:

> For students, self-service functions improve the quality of information and ease the burden on administrative staff. Instead of having to wait for appointments and documents in long lines by the financial aid and admissions offices, students will be able to access a wide variety of services at Campus Management's electronic kiosks (intranet) or from their residence hall via the internet. Additional services will also be provided, for example, students can apply for on-campus housing, request additional balances on their tuition, inquire about their current academic standing and look-up facility changes for current classes – all over the intranet (Supplier Brochure).

This raises the following questions: if students are to be one of the system's primary groups of users, then, how did designers understand their role and identity, as well as their relationship to the university and its staff? Moreover, in conceptualising the student as a user, were they to assume that students had the same competencies, needs and interests as, say, an employee working within a commercial organisation, the typical user of the Enterprise system? How, in other words, did they manage this difference between the typical users of the Enterprise system and the student as a unique type of user. Indeed, was there a difference?[8]

As part of the process of learning about students, a requirements analysis phase was conducted. This entailed a series of visits to pilot universities where key actors were interviewed and observed whilst carrying out their work. In addition to this, hundreds of questionnaires were dispatched, asking more specific questions about system access for those students based on campus, what information was relevant to them, what they could and could not see, and so on. In other words, in developing this new functionality there is a recognition that Universities are not after all like other organisations. And, in this sense, it is not accurate to simply say that universities face problems common to other organisations. Clearly, within the biography of the Enterprise system there is no element to deal with the specific issue of students.

No default, however, is completely remade anew. Even though the suppliers are in the process of designing and writing software for the new student module, 'new' is meant in a loose sense here. The module was in fact a reworked version of the Training & Events Management Module, a system used to run internal training programmes within commercial organisations, and the Real Estate module. As such, Big Civic found many aspects of the software incompatible with existing institutional structures, processes and the characteristics and identities of actors. In one part of the system adapted for the management of accommodation on campus, for instance, the student was in effect conceived of as a *special type of employee*, one who was undertaking a long-term training course and thus permanently renting a room. University staff rejected this conceptualisation pointing out that it did not capture the complexity of the student-university relationship; at some pilots, for instance, students do not 'rent' rooms but receive accommodation as part of wider aid packages:

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[8] For a discussion of the identity of students, see Silver & Silver (1997).

Until now the Real Estate module has always been referred to for student housing. This only contains the functionality to 'let' rooms (very commercial). For some universities this is not enough. Student rooms are often part of student aid. A lot of extra activities have to be organised in association with this (e.g. meals) (email from a Belgium University involved in piloting Campus Management).

Examples such as this led to tensions among prospective users, some of whom described the system as simplistic and overly commercial. In terms of the supplier's understanding students are something of a 'residual category' (cf. Bowker & Star, 1999), in that they do not fit any of the available templates. On the one hand, there is an explicit recognition that universities are different: they have components not found in other organisations (students). On the other hand, there is also a feeling that, at a basic level there are lots of similarities, that students are, or should be, or could be made to be, very much like the more familiar (to the supplier) category of employee. More generally, we might say that despite this recognition that students (and thus universities) *are* different, they are, nevertheless, always being rolled back towards a default, i.e., the biography of Enterprise appears to win through.

THE DUAL REQUIREMENTS OF LOCAL & GLOBAL APPLICATION

There is one more aspect that we wish to expand on here and this is how in the initial stage of Campus Management's biography where the aim was to build a module that met the dual requirements of local and general applicability. In other words, the module was intended for Big Civic, the other pilot sites and, in the near future, the idea was to market the package around the world to other institutions. In order to do this the supplier regularly tested the system with the pilots and early adopters so as to ensure that all the needs of the participating universities had been captured. For this testing, university personnel would periodically travel to an arranged venue where they would sit in a large classroom and work through test versions of the system. We observed one such meeting (see Pollock *et al.* (2003) for a more detailed discussion). Most of the session was devoted to demonstrations of new software, with consultants asking for comments whether this or that aspect of the system was appropriate to each institutions. A second aim was to ascertain the particular needs of each university and, if possible, to translate these into a set of 'common needs' or functionality that was relevant to all sites. Such a process was extremely difficult, however. From the discussion, it was clearly evident that the pilot

universities each had very different ways of doing things. Indeed the participants were becoming increasingly frustrated by the supplier's attempts to understand each and every difference among all the universities present and to reconcile these with the needs of the others present.

For the suppliers, such a process is useful as it allows the default to become more robust and, thus, applicable to the widest variety of higher education institutions. For the pilots, the process, while drawn out, appeared to be similarly useful as it ensured that all of those present would be able to find their own unique solution within the standard module.

In a later stage, however, a process of closure begins to set in around the extent to which each pilot could continue to shape the module. In contrast to the search for common needs conducted during the workshops, each time a university now makes a request the Supplier rejects it on the grounds that it is functionality that is needed by one university and therefore cannot be included in the common system. Low Country University, for instance, reports in a series of emails to the other pilots how:

> We have the feeling that it's becoming a strategy to try to label issues as 'university specific until proven differently'. Should it not be the other way around? Should [the supplier] not search for generic concepts behind the specific situations at the different pilot universities?

Moreover, it had recently been announced by the Supplier that there were to be no more pilot workshops as they were becoming time consuming and not wholly productive (cf. Pollock *et al.* 2003). Therefore, it was becoming increasingly difficult for the universities to prove their needs were not simply specific to one university:

> Now we have to prove that we are not the only one needing something, and that is not easy if we don't come together anymore in workshops. The basic concepts seem to be fixed (based on past roll-in?), and 'sacred'. Everything that doesn't fit in is 'specific'. An example of this is timetables per program and per stage. This is labelled as '[Low Country University] specific reporting issues', although we see them also on the websites of [Big Civic] and [New Town universities].

In order to prove their needs were more generally required, they begin to look for commonalties with other universities by checking websites, holding discussions during testing sessions, and so on. One strategy discussed by some pilots was negotiate individually with the supplier – but this presented some further dangers. If the universities were to build Campus Management around their own specific needs, this would lead to difficulties in the future:

> If from now on they only talk separately to each university and look for solutions for their specific situation, my fear remains that we will all end up with separate products, and we can start planning a 'back to the standard' project after a couple of years.

In other words, they want a system that matches their current practices but at the same time they increasingly became aware that ending up with a 'separate product' would be counterproductive. Would their customised version be supported? Could they make use of later upgrades? The answer, they fear, is probably 'no'.

Here we see how the development of Campus Management has pushed the discussion of the identity of the university from one where the issue was simply the extent to which they were similar or different from other organisations, to one where the question concerns the similarities among universities themselves? In other words, the university formulated their needs with one eye on their own institution and the other on the 'standard product'. Indeed, this gave rise to a new form of similarity relation where they recognise the *need* to identity commonalties among the group of universities participating in the development of the system.

CONCLUSIONS

It is clear that there are 'fuzzy' or unclear boundaries between universities and other kinds of organisations, and while it is widely accepted that they engage in many of the same activities as others, they are still thought of as something a 'bit different'. Rather than try to put forward a definitive account of the identity of the university, we have described how ERP systems create tensions regarding this unique identity. The article has focused on how responsibility for the resolution of this similarity relationship is distributed during attempts to customise the system. Once we pay attention to these processes it is possible to see how (and where) such issues are resolved. In particular, we have emphasised the antagonistic as well as contingent nature of this

process of customisation – i.e. the extent to which their successful realisation of differences and similarities depends on the struggles of various actor-networks – using notions such as *translation* and *biography*.

Central to the whole process was the Pro Vice Chancellor in charge of the project, whose initial goals were to make the university *less organisationally specific* through emphasising the similarities between the structures of universities and multi-national companies, and through importing the best business practices embodied within the system. As a result, there was thus a general pressure for staff to rethink many of the existing procedures and concepts according to new business process terms and Enterprise terminology, even when such a process caused confusion and irritation.

While there was often recognition of the specificity of universities, this was difficult to realise and decisions regarding customisation were often deferred or distributed. First, Enterprise threw up so many 'demands for policy', that implementation decisions could never be properly discussed among the overseeing committee, and they were thus pushed down to technical teams and then onto the system itself. In other words, change (in the sense of this realisation of the university's identity) often occurred through a process of default rather than choice. This suggest that university decision-making processes find it difficult to resolve similarity relationships.

Second, the burden of resolving these conflicts is then passed onto the users. The proliferation of work-arounds was one example of the distribution processes underway as users attempted to bare the burden of reconciling the universities idiosyncratic practices with the generic practices embodied within the system. Third, where Enterprise could be customised, we found that this was increasingly at the level of the sector. With the development of Campus Management a university's specific needs would be incorporated only if they could be proved to be common to the others involved in shaping the new module. Also, there were concerns about ending up with a product that was too far from the standard (and therefore unable to make use of the benefits of packages such as upgrades and the release of new functionality). The universities, in other words, were increasingly forced to think as a 'community' or 'sector' when identifying their needs. This has obvious implications for organisational shaping (see below) as well as future procurement strategies, where presumably the university will have to negotiate and struggle both with suppliers *and* other higher education institutions.

We have identified that if universities are to make the most of standardised software they must learn to manage a number of complicated *translation* processes. This concerns the *biography* and history of these systems and the tendency to implement *defaults* (the 'power of default'). The benefits of the biography approach is that it pays particular attention to the similarity relationships that accompany ERP systems, and the way suppliers, consultants, implementers etc., attempt to render the institutionally diverse organisationally similar. Of course, we must add that these dynamics are hardly unique to ERP or, for that manner, universities. Translating generic software whilst avoiding translating organisations is a tension that many implementation teams are attempting to manage (Pollock *et al.* 2003). Moreover, the manner in which such tensions are framed and resolved can have detrimental effects on institutions (i.e., in terms of unwanted organisational change and the process Powell & DiMaggio (1991) have described as *institutional isomorphism)*. These are, to be sure, difficult problems and not ones that will go away. In summary, the process of adopting these forms of systems will clearly highlight and refashion, the boundaries between universities and other types of organisations, and what the university understands its uniqueness to be. We wonder, to use the sentiments expressed by one member of the implementation team excited by the future possibilities that the system might offer, to what extent is Big Civic now beginning to think its uniqueness is centred on the fact that *it now has an Enterprise system*[9].

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[9] This was an observation from one project team meeting where the discussion centred on the current review of the Student Office, where the Registrar (and others) were carrying out research to compare themselves with the practices and procedures in Student Offices elsewhere. For one member of the project team this seemed nonsensical: 'What they are doing is looking at other universities, but it will not be accurate because we have [Enterprise and the Student Module] and no other [British] university has that – *we are unique!*'

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