Biography of an ERP: Tracing the Fabrication of a Virtual Object

Alan Lowe* and Joanne Locke

*Corresponding author: 
Department of Accounting 
The University of Waikato 
Private Bag 3105 
Hamilton 
NEW ZEALAND 
Alowe1@waikato.ac.nz
Abstract

This paper presents some evidence on the way in which Enterprise Resource Planning (ERP) systems and ERP best practice solutions are developed over time. We trace the implementation of an ERP within a single organisation in order to follow the change to the ERP which took place as a result of imperatives which arose during the implementation at an Australasian client organisation. Our evidence is extended to a different time and place where the new release of the ERP software is being ‘sold’ to client firms in the UK. We theorise our research through a lens based on ideas from ANT (actor network theory) and the concept of biography. In particular we adopt the view that virtual objects such as ERP systems accumulate a past history based on the environment and organisational settings they come into contact with. The ERP develops a biography which influences its nature and the bundles of features that constitute it and may become seen as best practice. In this study we trace the development of ERP software through the addition of a CRM (customer relationship management) module. The addition of modules such as CRM demonstrates the fluid nature of the ERP as an object (Law, 2002).

Keywords: ERP (enterprise resource planning) biography
ANT (actor network theory) case study
qualitative research
Biography of an ERP: Tracing the Fabrication of a Virtual Object

Introduction

This paper examines the development of an Enterprise Resource Planning (ERP) package over time in parallel with an actual implementation. The paper presents selected extracts from the implementation of an ERP package at a small Australasian manufacturer. The researchers then follow the software vendor’s development of a new release of their ERP package to a presentation for a user group in the UK. The paper describes the opportunistic nature through which the package was developed. The theorisation of the paper is based in a combination of ideas drawn from Actor Network Theory (ANT) and the concept of the biography of the object.

An ERP is a packaged software system that allows an organization to share common data across functional areas of the enterprise and produce and access information in a real-time environment. Its signature is that it offers integration across functional areas that have traditionally operated disparate ‘legacy’ systems. ERPs are also modular so that organisations may adopt one or many for areas such as warehousing, production planning, financials, etc. and so pursue more or less integration. The integration imperative changes the balance in implementing ERPs. Instead of the system fitting the organisation, often the organisation is required to adapt its business processes to the ERP (Light, Holland & Wills, 2001; Lee & Lee, 2000). This is justified also in part by the claim that ERPs embody ‘best practice’ and that this is transferred to the adopting organisation (Moscove, Simkin & Bagranoff, 2003, p. 63-65). The increasing adoption of ERP systems of as a means of integrating a business’ operations and introducing organisational reforms around ‘business best practice’ is well documented (Allnoch, 1997; Boubekri, 2001; Chen, 2001; Palaniswamy & Frank, 2000; Gaboury, 1998).

Using ANT would locate ERPs as belonging to a broad sweep of technological knowledge objects. Objects or actants, ie non-humans, play a key role in stabilising social relations
according to ANT. This paper seeks to examine ERPs as an illustration of these objects the deployment of which is argued to play an increasingly important role in producing robust social relations (Law, 1999, Knorr Cetina, 1999).

ERPs may also be seen as an important example of a virtual knowledge object (Knorr Cetina & Bruegger, 2002a & 2002b; Lash, 2001). The biography of an ERP is often developed over a considerable period of time (Pollock & Cornford, 2004, Cornford, 2000; Cornford & Pollock, 2003). Over this time the software package is gradually changed and extended as it comes into contact with a greater number of organisational settings. Our object in this paper is to make use of some of these ideas to understand and help explain the development and deployment of the sophisticated control systems which ERPs constitute. In particular we aim to provide an appreciation of the manner in which we might better research the biography of ERPs and how they incorporate aspects of ‘best practice’. Our empirical material also demonstrates some of the tensions which occur between software vendor and client during a process which not only modifies aspects of the client’s business practices, but also transforms the ERP.

The idea of the biography of objects is not widely known within the management literature but it is supported by a significant literature in the social sciences and social studies of science in particular. One of the earliest users of the idea were, Appadurai (1986) on cultural biography of objects, and Kopytoff (1986) on the social lives of objects (see also Winner, 1986). Pollock & Cornford (2004; Cornford, 2000) apply the biography approach in their description of attempts to construct and modify elements of a large ERP package in order to make it workable in the context of a specific context. They examine the development of a package to suit large tertiary education providers.

The paper proceeds in the next section to outline a number of issues related to how we might best conceptualise an ERP system as a virtual object. The discussion is developed by considering ideas related to: the role of objects in society; the special case of virtual technologies; the contribution of ANT and finally the concept of biography. The third section of the paper presents the case evidence. The case section relates to research in two settings. The first part consists of accounts from the Australasian case company concentrating on exchanges which took place during project steering committee meetings. These meetings were attended by representatives of the ERP vendor in addition to internal users. The latter
part of the case material recounts observations from our attendance at a user group meeting held in the UK. This is followed by a discussion section which seeks to bring out the themes from the case material. The paper concludes with a brief summary section.

The Social Life of Virtual Objects

This part of the paper provides the context for the theorisation of our case research. The discussion we present in the following three sections introduces ideas about the impact of objects within society (Knorr Cetina, 1999; Lash, 2001) and considers the development of theoretical ideas which postulate the place of material and virtual objects within social relations. Our focus is the manner in which ERP systems effect and are affected by social arrangements within user organisations and between these organisations and the vendor. We use the ideas of the place of objects and related concepts from ANT (Latour, 1999; Law, 1999, 2002: see also Hassard, Law and Lee 1999; Lee and Hassard, 1999) to contextualise our case research. These ideas are combined with the concept of the biography of objects (Appadurai, 1986; Kopytoff, 1986) to provide an interpretive frame to examine the development of an ERP system over time.

An Object Centred Sociality - A number of authors have argued that objects, as mediating effects on social arrangements are ‘back in strength in contemporary social theory’ (Pels, Hetherington & Vandenberghe, 2002, p1; see also Knorr Cetina, 1999; Lash, 2001). Others provide conceptualisations of object-centred socialities (Knorr Cetina, 1997, 1999, 2001; Latour, 1993, 1999; Law, 1986, 1999; see also Calas & Smircich, 1999, for a review of the literature in organisation theory).

The role and effect of object relations on the social world have increasingly become a significant focus across a range of literatures. Knorr Cetina uses the term 'postsocial relationships' to refer to these bonds 'constructed between humans and objects’ (Knorr Cetina & Bruegger, 2002a; see also, Knorr Cetina, 1997). Early writers who considered the sociality of the material world examined the politics of commodity exchange (Appadurai, 1986) and ideas on cultural biography of objects (Kopytoff, 1986; see also Winner, 1986). These writers returned attention to concerns about the history and material embodiment of social objects and in doing so asserted that commodities, like people, had ‘lives’. The literature developed to
include examples dealing with such diverse areas as: information technologies (Turkle, 1995); the return of nature (Latour, 1987; Serres, 1990); consumer objects (e.g. Baudrillard, 1996); economic markets (Smith, 1999; Abolafia, 1996) and technology and scientific artefacts (Callon, 1986; Knorr Cetina, 1981; Knorr Cetina and Bruegger, 2002b; Latour, 1988, 1993; Pickering, 1995). Lowe (2001a & b, 2004a & b) has noted the importance of accounting artefacts as knowledge-objects and argued for a carefully constructed research programme to seek to examine these postsocial effects in accounting and organisation theory (see also Chua, 1995; Briers & Chua, 2001; Hansen and Mouritsen, 1999; Lee and Hassard, 1999; Lodh & Gaffikin, 2003; Mouritsen, 1999; Monro, 1999).

Knorr Cetina writes of the impact of post-social relations made up of humans and objects, while Latour speaks of actor networks which contain both human and non-human actants. In organization theory Czarniawska (2004) argues for the value of research which adopts an action net perspective which she distinguishes from Actor Network Theory. These authors all have in common a concern for the way in which objects impact the fabrication of social arrangements.

It is important ‘to follow the things themselves’ in order to establish how meanings become inscribed into material object through ‘their forms, uses, and trajectories’ (Pels et al, 2002. p6; Kopytoff, 1986; see also Latour, 1987). Only in this manner might it be possible to ascertain how material things are ascribed social meaning through human usage, interactions, transactions, attributions, and motivation. It is here that ANT can add much more to our ability to trace the critical events and elements of the biography of things. ANT can give us the sensitivity to look for the linkages which constitute the networks within which our target objects are situated. ANT would suggest that we need to follow the actors who make up the ERP both at the software vendor and within client organizations. ANT would not stop here but would also direct us to consider the objects themselves: which objects are implicated? How they are constituted? What role do they have in the network of relations that shape the ERP?

Pels et al (2002), suggest that the most intriguing feature of this ‘new constellation’ of ‘the objects we live, work and converse with, in which we routinely place our trust, which we love and hate, which bind us as much as we bind them … [is] ‘perhaps … our (re)discovery of the multiple new ways in which social and material relations are entangled together, blurring
conventional distinctions between the *software and hardware of our social lives*’ (Ibid, p1, emphasis added). Pels et al, appropriately from our perspective, employs terminology commonly used to describe aspects of electronic information systems. In contemporary society Information Communication Technology (ICT) provides many of the objects to which Pels et al refer. ERPs constitute an important category of these virtual objects that bind the ‘software and hardware of our social lives’, which we love or hate and in which we so often place our trust especially at the organizational level.

It is issues of the software and hardware of our social and commercial lives that are the particular concern of the research reported here. We deal in this paper with the complex interrelationships which affect ERP systems and the social spaces in which they operate and operate us. Our concern is to examine the development of the complex software packages that are constituted as ERP systems. We use the concept of knowledge objects as conceived within ANT and combine this with ideas of the biographical development of the object over time.

**Virtuality and The Role of Electronic Technologies** - Hetherington (2002) argues that technological objects act as mediators in that they are a device for managing boundaries between the social and the material. The academic paper is a form of presentation which mediates the manner in which the reader may conceptualise the object of study. The academic paper acts as a mediator between the reader and the subject material in which the author presents their interpretation of the object of study. Lowe (2004c) has illustrated that the author is complicit in this mediation by engaging and arranging allies and through the deployment of figurative devices (see also Latour, 1987, 1994; Cooper, 1983). By contrast Hetherington (2002) describes the museum as a space for seeing, such that ”what we see within a museum is performed by a material semiotics that constitutes it as a scopic space. How objects are placed; how they are ordered and classified help perform what we see” (Ibid, p 194). Given this interpretation it might be tempting to think of the social world as being mediated: yielded; filtered; constituted; enabled by a collection of elements drawn from the material world. These elements come to form part of our social arrangements as we come to rely more and more on them and incorporate them into our practices: our ways of acting and seeing the world.

Technology is one of these material elements which may be especially important in rendering organizational ‘realities’: impacting the organizing of the organization itself. In the case of
information technology there is an especially complex relationship between the material and the human actants.

Information communication technologies such as the Internet, World Wide Web, electronic surveillance, security systems and mobile phone technology are associated with ideas about dramatic changes in society. ICTs are claimed to be challenging our preconceptions about space, time and distance (Jones, McLean & Quattrone, 2004; Lowe, 2004b). The challenges these new technologies pose are about refashioning our conceptions of what constitutes the material and the social. The changes affect our ability to continue to separate the material from the social as we are continually faced with the virtual: virtual reality, virtual society, virtual communities, virtual organizations and virtual or artificial intelligence. ERPs are concerned with creating the virtual organization. Aspects of the organization are captured and represented in virtual form within the ERP software and hardware system (Pollock & Cornford, 2004). Technologies such as these are increasingly producing a society in which relationships of all kinds are increasingly electronically mediated. In some sense the material is displaced by the virtual. The new electronic technologies produce a rather incongruous result in which an ‘unbounded sociality’ is matched by the increasing irrelevance of the material (Pels et al, 2002).

This paper seeks to respond to the new visions brought about by changes in ICT such as ERP systems by investigating how they are used in practice and how they are fabricated through interactions with practice. Some interesting ideas are raised by Woolgar (2002a & b; see also Woolgar, 1997) in his rules of virtuality. Woolgar’s (2002b) third rule of virtuality states that ‘new virtual technologies tend to supplement rather than substitute for existing (real) technologies’ (as quoted in Woolgar 2002a p 267). An illustration of this rule is that of the paperless office that simply does not happen. What we experience is the addition of email and voice mail to existing carriers of text and visual messaging. There is little evidence that phone, fax, paper reporting and conversation are being supplanted by virtual communications. It is clear that initially (and this may appear to be a very long time), in many instances, new technologies sit alongside rather than replace the previous systems. In the case of ERPs the evidence is mixed. On the one hand, ERPs are introduced into organisations as a way of re-engineering their systems and process and are designed to disrupt and replace existing paper-based or computerized systems (Lee & Lee, 2000). In practice, however, the often enormous dislocation associated with this task means that it doesn’t happen in such a simplistic way
(Lodh & Gaffikin, 2003) and elements of the pre-existing real systems remain as ‘work arounds’ or informal parallel systems (Pollock & Cornford, 2004; Scapens & Jazayeri, 2003).

**Biography [Tracing the Social Life of Things] and ANT -** Pollock and Cornford (2004) use the idea of the biography of an ERP system to explore its transformation for a ‘unique’ setting – universities. These authors draw on Appadurai (1986) and Kopytoff (1986) to support their use of this approach. Kopytoff writes of the way in which objects become meaningful as a response to their ‘lives’ within society so that in order to appreciate their role within their social context it is necessary to establish the path their development and use within society has followed. The biographical analysis that Appadurai and Kopytoff describe is closely related to the call from writers on ANT to ‘follow the actants’ in order to understand their role in society and be able to ‘trace the networks’ of which they form part (Latour, 1987). Appadurai (1986) suggests in very similar way “that we have to follow the things themselves, for their meanings are inscribed in their forms, their uses, their trajectories” (Ibid, p5).

Theorists who use the ideas of actor networks and those writers (Appadurai, 1986 and Kopytoff, 1986) who concern themselves with the ‘social life of things’ note the importance of temporal and spatial location on the ‘nature’ of the object. So that Kopytoff is concerned to develop a cultural perspective on those things that are classified, from time to time, as commodities.

Where does this leave us in relation to how the object itself is constituted? Both perspectives emphasise the importance of objects, the material, on the way society is organised and the important role that objects play in that organisation. The social is an amalgam of human and non-human elements. There does appear to be a distinction between the two perspectives as to changes in the nature of the object itself. ANT makes explicit the idea that the object itself is typically the result of a network of relations, the coming together a heterogeneous collection of elements (Law, 1999, 2002). This leaves considerable opportunity to investigate changes in the objects themselves, rather than simply examining the different ways in which they are taken into the social realm.

In this context Kopytoff (1986) writes that “from a cultural perspective [as differentiated from the economic], the production of commodities is also a cultural and cognitive process … the same thing may, at the same, time, be seen as a commodity by one person and as something
else by another [so that] … shifts and differences in whether and when a thing is a commodity reveal a moral economy that stands behind the objective economy” (Ibid, p.64). The ANT view is different. In this conception rather than the emphasis being on re-conceptualizations of the object within society over time and across different locations the object is seen much more centrally as needing to be evaluated in order to establish what it is and how it is made up. Complex objects which are likely to have been constructed are intricate amalgamations of elements which are brought together only after much work (Latour, 1987). From an ANT perspective objects as well as social arrangements become solid when they hold, or when they are sufficiently stable.

This difference is particularly important when regard is given to the category of objects which we wish to consider in this paper. Many objects are fluid in character (Law, 2002; De Laet and Mol, 2000). This certainly includes electronic technologies and knowledge objects. Information systems are largely ephemeral and large contemporary ERP and business accounting systems are good examples of this. Though they require a good deal of computer hardware to operate this hardware is rather ancillary to their capability. Both the software and hardware may be replicated or substituted. It matters little just where the hard elements of the technology are based. Distributed ICT systems and data processing are now commonplace. Indeed it is not unusual for data processing to be outsourced by modern corporations and public sector organisations. It is in the nature of these systems to change over time and to be different in different implementations. In these contexts an ANT perspective commends itself as a tool of inquiry. An ANT view ought to sensitise the researcher to the fluid nature of the objects which form part of any study of information systems, while also emphasising the constitutive effect of such pervasive virtual systems on social arrangements.

An ERP package certainly does have a biography, but this is not simply in the sense in which Kopytoff envisages the defining nature of an object in society. Kopytoff argues that:

… an eventful biography of a thing becomes the story of the various singularizations of it, of classifications and reclassifications in an uncertain world of categories whose importance shifts with every minor change in context … societies constrain both these worlds [of people and of things] simultaneously and in the same way, constructing objects as they construct people (Kopytoff, p90).
We can apply this conception to an ERP. The purpose of the ERP is seen as different within each different context, each installation. Users give meaning to an ERP through their interactions with it. In one instance the users may emphasise the contribution of the ERP to their financial management activities, while in another they may look for production planning or quality management outcomes. Within any specific implementation the emphasis is likely to differ so that although an organisation may employ aspects of a number of ERP modules it is likely that the operational attributes and managerial actions which may be stimulated by the ERP reporting system will be quite unique.

ANT would take a different perspective on how the ERP is constituted as an object. This view would emphasise the nature of the network, or context, or environment, within which the ERP operates. It would be interested to examine the context within which the ERP is placed but in addition would view the ERP itself as a network of heterogeneous relations. Indeed it is not clear from an ANT perspective that something which could be called an ERP would be separable from its context, its environment. ANT would seek to establish the extent of the network of relations that constitute the ERP. In an organisational context this would necessarily include the human actors who interact with the software that makes up the ERP package. An ANT view would seek to explore the effects of the ERP as it is situated in the organisation. Any research using an ANT theoretical base would aim to trace the network of these heterogeneous relations both within and beyond the organization’s boundaries. On the other hand it would be possible to isolate the technical aspects of the system to a degree. This might be done in order to establish what elements of the ERP are black boxed. The extent to which the ERP software is offered to user organizations as a stable entity is a measure of how successful it might be regarded as a product.

We would see an ANT view as adding the detailed ground work that would enable the researcher to produce a convincing biographical representation. ANT provides the imperative to trace the elements of the network to establish what seem to be the critical nodes within the network – identify the key actors and actants and their critical interactions.

If we take this latter view then it makes sense to examine the material elements of the ERP. In doing this we would look to establish its biography, to track its trajectory so far. Using ANT this tracing of the trajectory would necessarily be in some detail and involve the collection of evidence aimed at explicating not what the ERP has become but how this these changes came
to be effected rather than some others. How has the ERP come to occupy the space it does – in the market place or in the scope and nature of its technical elements? What problem is it said to solve? Who speaks for the ERP and what do they and have they said? What problematisations have been successfully linked to the ability of the ERP technology? How have these problematisations attended to the interests of potential users? In the machinations that have accompanied its trajectory through the market of organisational problems how has the ERP changed in order to bring in its users, its allies? One of the researchers’ concerns at this stage would be to track the way the modules which form the basis of the ERP have been developed over time. How has the system been reconfigured as the market has been formed, users expanded and the network extended? Why CRM is not at first a focus? Why does this change? What sort of CRM becomes a focus and how does this happen?

ANT would offer a structured approach to the research process from which to construct a biographical account of the object. The concepts of ANT would provide a focus for research activities that should provide clarity to how the research would begin and what the researcher would seek to uncover. The ANT perspective would focus attention on going beyond an explanation based simply on the ‘social’ interaction to consider the role of object and indeed perhaps most importantly to identify and foreground the objects which provide stability to the network of relations which constitute the ERP.

In this paper we seek to illustrate the nature of a single change to a constantly changing ERP package. We do this in the context of a case study through which we are able to provide some idea of the anecdotal extension of the ERP package to incorporate a customer relationship management (CRM) module.

**Biography of an ERP: The Emergence of a CRM Module**

In the following sections we present a discussion of the relevant elements of our case research. The discussion contains a necessarily abbreviated selection of accounts from the research sites. In the first section we recount a series of exchanges from our Australasian case
company, which we will call Barramundi Ltd\(^1\), where the ERP software is about to ‘go-live’. This is followed by some material from a meeting held in the UK organised by the software vendor and attended by representatives about 10 adopting companies. The discussion in this section seeks to illustrate the transformation of a client specific modification (customisation)\(^2\) to the ERP package into an important enhancement to a module within the software package.

This section of the paper aims to set the scene for the reader to appreciate the movement of the ERP object through time (its biography or the nature of how a knowledge object changes/develops over time). In this instance the illustration concerns the enhancement of a CRM module in an ERP system. We track here the early stages of a new set of attributes designed for a single client company, in the Antipodes, through to the point at which the enhancements are being ‘sold’ to a meeting of adopters of the software in the Britain. The period we describe from the development of the initial concerns of the Australasian client to the UK meeting is only about eight months and yet the emergence of the transformation to nature of the object, the ERP – CRM module, and its representation in another setting is quite striking.

Our research evidence is partial as all case evidence is. But more particularly we do not have all the data we’d like to enable us to claim that we have done justice to an ANT theorisation of the biography of our ERP. It would always be difficult to provide complete analysis in a journal length paper. We deal with this through a number of strategies. One of these is outlined above. We have only taken a slice out of the biography of our target ERP software in order to illustrate the construction of an ANT based biography. This is partly because of necessity but it also makes sense in terms of space constraints. The necessity concerns the fact that the ERP has been around for many years and our access to the implementation process

---

\(^1\) We wish to thank all the participants in this research who generously gave of their time. All participants, including the software vendor, wished to remain anonymous so we have masked some identifying information and used pseudonyms.

\(^2\) An ERP incorporates standard approaches to business applications from which the adopter may choose. This configuration of the system leaves it essentially unchanged and is known as a ‘vanilla’ system. Adopters may wish to make changes to the system to extend its capabilities or change its processes. These modifications, undertaken for a single adopter, are known as customisations. They are costly for the adopter, since the vendor must program them, and they mean that every time there is a problem with the system, the vendor support is more equivocal because customisations are not generally supported. The additional problem for an adopter of customising the ERP is that new releases of the ERP cannot be implemented in a straightforward way – the customisation needs to be re-configured for any changes in the new release – an ongoing expense and time issue. The final type of modification to an ERP is one which becomes part of the standard system. This ‘enhancement’ of the system is good for the vendor if it is likely to be a ‘selling point’ with other potential adopters, but vendors are constrained in how many changes they can make to the system because of the difficulty in handling their increasing complexity and the problem both the vendor and the current adopters not wanting new releases of the software too frequently because of the time, disruption and cost involved.
was only for a recent short segment of its history. In theory it would be possible to extend our analysis through a broader study using a combination of historic documents and interviews but this would be difficult and introduce significant dangers to the data we might construct. ANT stories have been successfully constructed from archival material (Latour, 1988; Law, 1986) but there is a concern to track interactions as they occur, live as it were (Latour, 1999, Bloomfield et al, 1992).

What are we left with? Our case material can be seen as an application of ANT - we identify a network of relations which are central to the development of a CRM module for the ERP. But there are problems. Our network is partial in that we have much better data on some aspects of the network than others. At this point, just prior to the case section of the paper, it may be valuable to indicate what we see as the areas in which our study is lacking. While we have good material on the machination that took place in the client firm and we are also able to trace the network from one side of the globe to the other we lack any detail of the technical nature of the software development itself. From an ANT perspective it would have been valuable to have had access to the software programming team so as potentially to be able to see how they applied the knowledge they had. What shortcuts they took. What errors were made. How determinations of attributes to include were effected. What effect deadlines and time pressure had on them. Unfortunately our access did not allow us to follow these socio-technical arrangements. Given the usual limits on a research team and the need to respond flexibly to developments during a high pressure ERP implementation access to the software vendor, even if we could have obtained it, might easily have provided a distraction and compromised our research project as we try vainly to keep abreast of simultaneous happenings in real time.

**A Brief Look at the Biography of the ERP** - Our case study is set in a medium sized Australasian manufacturing company during the implementation of a new ERP up to ‘go-live’. We track and describe some of the network of human relations and interactions which lead to Barramundi Ltd deciding to agree to the incorporation of their in-house design for a CRM into the standard ERP system. This was achieved by basing the CRM specification on Barramundi’s requirements and specifications for what was initially scoped to be a

---

3 The period of ‘implementation’ is used in the terminology of the vendor and literature on ERP implementations (Lodh & Gaffikin, 2003; Parr & Shanks, 2000) as the time from the decision to adopt through to ‘go live’ – that is when the system is in operation in the organisation. This is distinct from the more common use in management literature of ‘implementation’ as the point at which the system goes into operation.
customisation. The case evidence we present indicates that the decision to select this solution rather than some other solution was not predictable. In the event Barramundi management chose an option which provided them with a solution that they believe ought to work and ultimately save them time and money. The context of their decision is interesting since it was made under considerable time pressure following the somewhat late realisation that the ERP they were implementing was not capable of adequately dealing with their customer relationship requirements. In itself this is an interesting illustration of the complexity of ERP systems. This company used a very well developed selection process when choosing an ERP and ERP vendor. The advance planning and documentation was exemplary. The process was started over 12 months prior to go-live and over six months prior to implementation of the package. The implementation of the project originally scheduled for about six months (March to August) was extended by one month when the project go-live was delayed.

The initial developments for the CRM enhancement are very tentative during the middle stages of planning for the implementation of the ERP. It was not at all clear that Barramundi would commission the ERP vendor to produce a CRM ‘modification’ initially planned as a customisation just for the Barramundi site. Yet by November the attributes of the new CRM module are being represented to users as of appreciable benefit in the new release of the ERP software. What we try to do in this section is emphasise the very tentative nature of the early developments. Later we pick up the way in which the ‘finished article’ is introduced as an enhancement to the ERP.

The ERP vendor seemed to be happy to ‘take advantage’ of the development of a system at a single company and package it in the system for other users. The module is essentially the distillation of the more basic elements of a system developed at the Australasian originating company which was then extended into more of the modules than originally intended by the client. The legacy CRM system had run in Barramundi’s pre-ERP days and was reliant for its supporting technology on a very old accounting package, together with an email communication system and reporting and coordination out of a database using Microsoft Access. It is unclear to us as observers how the software vendor determines the format of the software package but it is interesting to note that the development that we observed seemed to follow an opportunistic track.

The development we describe also poses questions about the power relations in the ERP vendor/client relationship. There are many elements involved in this, of which we examine
just those surrounding the decisions which led to the incorporation of the CRM enhancement. Our case evidence suggests that it may be common for client companies to contribute to the technical development of ERP system … voluntarily paying the vendor for the system while also contributing toward the ‘upgrading’ of the vendor’s ERP package (Scott & Kaindl, 2000; see also Cornford, 2000; Cornford & Pollock, 2003).

Interestingly during the course of one of the steering meetings we attended the company owner referred to the intellectual capital that the software vendor was gaining from his company. In instances such as the one we observed, where a client company is engaged closely with a vendor in the detailed planning stages of an ERP implementation it seems that they have very little room for challenging the vendor. Once a contract is signed and the process to replace existing systems is engaged the client company is as far as we are able to judge in a very weak situation. They quickly become very dependent on the vendor and seem obliged to seek to maintain any goodwill during what is typically a very high pressure process. During the implementation planning phase even more so than immediately following implementation the client company’s staff often find themselves under enormous pressure to keep their existing systems working while struggling to adapt to and learn what is more often than not the quite foreign practices and procedures of the vendor’s ERP package (Ciborra, 2001; Cornford, 2000; Lodh & Gaffikin, 2003; Pollock & Cornford, 2004).

The Event System: the Beginnings of the CRM Module in Australasian – this section provides some background on the origins and development of the CRM enhancement. The location of the beginning of the adaptation of the ERP is with Barramundi. The event system was seen as a central contributor to the company’s success. The system had been established as the coordinating mechanism through which the company managed its customer relations – dealing with ‘events’ such as complaints, returns, quality issues, and feeding into product development.

This system represents the first of our knowledge objects (Knorr Cetina, 1999: Lash, 2001) or network nodes. Other actors and actants are channelled through the event system in its capacity as a centre or calculation … an obligatory passage point (Callon, 1986; Latour, 1987). The event system as we describe in the following paragraphs impacts on people inside an outside the organisation. It exists in a network of relations that joins customer with quality controller, sales reps with production planners while drawing information from many of the
other information systems in the company. The system affects the actions of actors throughout the company as it highlights aspects of their responsibilities whether fairly or otherwise.

The existing system involved a complex arrangement of a phone-in desk and system of electronic reporting that involved all the key players in the organisation to establish who would deal with any specific problem. The owner/chief executive championed the scheme and would regularly access reports and deal with resolving queries personally. There was evidence of a downside to this as some organisational members clearly felt the pressure of the system and its surveillance aspect (Foucault, 1977; Miller & O'Leary, 1987).

One of the early indications of the nature of the event system was provided in an interview with the supervisor of the Customer Services unit, within the sales department. This is a small unit consisting of between 3 and 5 people. The unit is responsible for taking calls from customers dealing with orders, order queries and complaints (events). In relation to incidents which trigger the event system the following is typical description.

We have customers ringing up saying that they haven’t received the correct product, or they’ve incorrectly ordered products, they’ve received products that have been squished, anything like that, broken bags … we fix the problem. We go straight into the system, load [a description of the item and customer details] into our event system straight away. [This enables us to respond to the customer immediately and tell them] … their credit number, [possibly what the problem is] … and what we’re doing to fix the problem (Supervisor Customer Services).

The customer service unit would deal with many of the queries directly. In a typical instance “customers [ring] … to say that they … haven’t received their freight on time, so we get in contact with the freighter and find out where it is (Supervisor Customer Services). Even in these circumstances the incident is entered into the event system, in order to maintain complete electronic records of such events. In other cases the problem might be clearly internal and possibly more complex, or harder to resolve immediately. In these instances the customer services employee who takes the call enters the event and makes a judgement as to who ought to deal with it within the organisation. The person or persons would then be emailed a document describing the event.
The progress of any queries entered into the event system would be tracked through email in combination with an Access database report written specifically for this purpose. The IT consultant working for Barramundi (Harry) had designed customised reports which would be circulated to key members of the management team. As indicated earlier these reports were paid particular attention by the owner/CEO of the firm who had established a reputation for taking these indicators of customer service very seriously.

In March, right at the beginning of the planning process for the move to an ERP from the firm’s existing legacy systems concerns were expressed about the ability to maintain a system dedicated to customer service. Some uncertainty was expressed by a number of individuals.

We don’t know whether we’re going to keep our event system … yeah, so no use worrying about something we don’t know, may not happen (Supervisor Customer Services).

More specific concerns were expressed about the nature of any replacement system that would need to be flexible enough to enable the customer service staff to have a “system … accessible quickly … okay [for a simple query] it’s going to take five minutes to find this out you know, the customer’s on the phone, nine times out of ten they are paying for the call, so you want to [sort their query and] get them off the phone as soon as possible and then try not to have to ring them back either you know, keep annoying them all the time” (Supervisor Customer Services).

The above quote shows, in a rather anecdotal manner, a very clear expression of the appreciation of customer requirements and the simple and in some sense trivial ways in which goodwill in business relations is maintained. In these interviews most staff reported a very high level of satisfaction with the event system, though there were indications that it was considered intrusive by some. Some staff were unhappy about the emphasis placed on responding very quickly to events that they considered were unavoidable in the normal course of business and the specific identification of who was responsible for the ‘problem’. It appeared that staff sometimes felt under pressure to drop other activities to deal with these instances because of the interest of the owner/CEO.

During the first steering committee meeting in the middle of March, the event system became a focus. Comments were made in support of the system by the operations manager. He suggested that the CEO would want to be able to continue to track the kind of information,
referred to here as key performance indicators, that he had available from the event system. The internal computer consultant made a commitment to obtain the views of the CEO.

We are now in a position to start to trace the network of relations that delineate the ERP implementation process. As we do this we will be extracting aspects from what might be seen as separate networks. As our attention moves to the ERP package we begin to draw on events that influence actions within the client company and later will lead to a change in the functionality of the proprietary ERP package. We might characterise this in the following manner. The biography (Appadurai, 1986; Kopytoff, 1986; Pollock & Cornford, 2004) of the ERP changes as a part of the internal network within the client firm comes to influence and then alter the characteristics and functionality of the ERP. Eventually after a couple of months the ERP is altered to incorporate an extended CRM system that reflects the needs of Barramundi but will become the standard application for other clients with the imminent new release of the ERP package. In the meetings we describe first the actors help to problematise customer relations as an issue. In the process the event system is slowly translated into a CRM module within the ERP (Latour, 1987).

In May the discussions had moved somewhat. The sixth steering meeting was about to take place at Barramundi, again involving the management team and representatives from the software vendor. Prior to this meeting the third of a series of internal user group meetings had been scheduled, which we were able to attend. The company was within a month of the first pilot testing of a full scale version of the ERP system. Several other internal and external meetings were still to take place and many of the users were beginning to feel the pressure of work. We describe an exchange which took place regarding the CRM system. This is heavily edited to reduce the length of the extracts. Harry, the internal IT consultant and project leader describes what sounds to those present as a partial fix to ensure the company has some way of dealing with customer complaints:

… we’re still working on finalising it [the CRM system] but yesterday we got through a big chunk … the design is pretty much done. We need to agree here whether we want to take it to that next level so we can put everything through … or not … at the moment I’ve put my design in specifically for a [basic] customer complaint system.
Harry is describing what some perceive as a rather limited system which will provide much less information than the old system. The response, from the company accountant, indicates some anxiety:

Well how much longer is it going to take and how much [will it cost]?

The response from Harry rather avoided the direct question and for a few minutes the discussion centred on concerns about how the company could make the present system work if the required modifications to the new ERP package are not available in time. This proved somewhat inconclusive. After several minutes the accountant asked the question again in a slightly different manner. This time Harry is rather more forthcoming and describes the situation in the following way. He expresses some reservations about the slippage between design and any actual system to indicate that his remarks should be taken based on his assessment of the design.

… it’s never as good as [the] design. [So far] Most of it’s revolving around dealing with the customer complaints, coming back … [to] the way that we do things.

At this stage it becomes clear that significant further discussions have taken place between Harry and the ERP programmers and at least the vendor’s project manager (Rick). It is also becoming clear that the head of the ERP software sales and development has decided that he’d like to make the CRM module a standard part of their ERP software package. This is illustrative of what we indicated earlier is a gap in our ability to locate and observe all of the network traces that we’d like to in order to provide a complete biography. So we present what we have and our interpretations and hope to fill these gaps convincingly.

In the initial exchanges the company accountant is asking Harry to update the group on progress on the CRM deliberations.

Its [the nature and scope of the modifications are] still fairly flexible to a degree. … … we had to make a call on whether we wanted to let them put it in [their ERP package as] standard and we made that call initially … he’s agreed to put it in … [this means that] it will cost us less in the long run and be easier to maintain. But they’ve [gone for] … a design that [basically] we’ve come up with [but there are] … some changes that won’t be in the standard … so we need to decide whether
we’re going to make it [work with this system]. [Some of the] things they handle, well we don’t want to go through … [they have] a different way of handling. I haven’t sort of got my mind around that and made that decision yet. But that will be done in the next few days.

… they were also saying it takes twenty man days to do it, to create the thing. It’s going to cost around $20,000, but we put aside ten for it. But Nevil (the CEO) okayed that, but because it’s going to take so long as that they think it’s probably not going to be ready at Go-live.

At the end of the meeting which was less than a month from the first scheduled ‘conference room pilot’ to iron out problems before Go-Live, no final decision had been made in regard to the CRM system. There was a clearly expressed need for such a system but at this stage the only commitment was expressed in the following terms.

… we’ll have to … revise the planning … and we may need [ERP software specialist] to come back down and give us another week if we decide to use the CRM … just say get some events out and run them through. Maybe with the second conference room pilot we can do that, test it, using the standard CRM.

The next steering meeting was held at the end of May, now only a month from the timetabled Go-live date. The company user group had met immediately prior to this meeting in order to ensure that they were updated on progress against the numerous deadlines to which they were working. Both meetings were quite animated with a good deal of discussion over each of several significant agenda items. There were some surprises but good progress was reported in most areas. At this stage one of the most significant related to the transfer of data between the new and existing systems and the design and input of revised inventory and product coding frameworks. One of the interactions which surprised the researchers follows:

Rick (vendor project manager): Event report specification … that still hasn’t been signed off, has it? … I guess!

Harry (Barramundi, IT consultant and project manager): No, I had a talk to [vendor programmer] last week just before I left. The spec that he sent me is a bit hard to follow. But I’ll talk to him about it. I went through a few details with him and I’ve just got a little bit more to go through it and I’ll talk to him. He’s
probably going to produce another spec. It just didn’t flow very well … sort of … hard to follow. He realises that he rushed them through. We’re working on that together. Is there a time we have to have that nailed by … [a date] when we get a chance to [have it] for … go live. You haven’t been given a date?

Rick: … until we get it signed off we can’t … plan it in, so we don’t see it being available to go [at Go-Live date] … there’s 20-odd days [programming] work there and as I say until we get sign-off we can’t schedule it in … so realistically I can’t see it being ready for Go-Live. So we’ll have to talk seriously about what we can do.

Harry: Well what say the spec didn’t change … [that] what he [vendor programmer] sent us that’s alright, what day would you put on that? Can you give us an idea on how [and when] it would be scheduled?

Rick: Have you any idea at all? Have you thought about whether you were wanting to sign-off?

Harry: I guess we will give it [sign-off authorization] to you then.

This exchange came as a surprise in the context of the implementation process and the progress of the firm toward Go-live. The exchange can be read in a number of ways (Alvesson, 2003) but on most readings the implications are that there was a significant communication lapse between the software vendor and Barramundi staff. This is not such a surprise given the high pressure environment of the final stages of an ERP implementation but it does give space for concern over the difficulty of managing such implementations. One interpretation of the interchange indicates the apparent lack of control of the client company when faced with the late recognition of a required customised change to software part way through an implementation process. The client is placed in the unenviable position of trading-off concerns about the lack of an effective CRM system and its careful and precise design. Here Barramundi staff had shown their commitment to the information supplied through the existing ‘event’ CRM system and had good reason to believe that a make-do system might not work well as the existing underlying systems could not be effectively run beyond Go-live for the new ERP system. The in-house IT consultant (Harry) had formally indicated that running
both systems in parallel was not a viable option. As a consequence Barramundi management were placed under some pressure to make a decision quickly, if not within this meeting then within a day or two.

An alternative reading could take a more political line. From this perspective we could see the exchange as part of a game or power play. Harry, who is highly computer literate seems to play the vendor’s project leader along to see how he may respond to alternative scenarios in a face to face situation. Harry asks for a time line for the incorporation of the ‘CRM modifications’, but Rick counters by providing a partial answer together with stating the imperative for making these changes a priority … “until we get it signed-off we can’t … plan it in. Harry’s ploy is rather unsuccessful as Rick makes the right moves and puts the responsibility back onto Harry by pointing out that Harry’s question is essentially circular. How can he, Rick, provide an accurate estimated date for completion without knowing when the required authorization to go ahead would occur? The exchange culminates with Harry effectively providing the agreement for Rick to go ahead with the programming even though it had seemed Harry was not ready to do so initially. The internal company person basically backs off when faced with the threat of delays.

We can draw a number of conclusions from the case material presented. Discussion of issues related to the ‘event system’ and its place among the company’s systems indicate to some extent the reliance which various people within the organization placed on the information the system provided. At the commencement of the project implementation the decision to go with a modification to the ERP package which the company is implementing appears to be only one of several options under consideration. The options varied from a more independent system consisting of in-house developed modules, through a customisation to the ERP to fit the Barramundi system requirements, to a fully integrated enhancement within the standard ERP package. At the meetings we attended as we indicate no strong preference is expressed about which option seems to offer the best result for Barramundi. What is clear is that the decision to go with the integrated CRM/ERP solution was made under intense time and work pressure. The period was also one of tension between client and vendor as specifications for system requirements were being finalised with a degree of difficulty. The decision was also made in spite of reservations that this option entailed giving away the intellectual property ‘invested’ in the event system. The Barramundi CEO was persuaded that the immediate cost
of paying for a customisation and the associated future costs of reworking it every time the ERP system has a new release was a rational trade-off against this loss of an intellectual asset.

At this stage in our presentation of the case material we have tried to sketch out the network of relations that underlay the move from the event system at Barramundi though to the translation into the CRM module in an extended ERP package. In doing this we have chosen to foreground human interactions … primarily exchanges in meeting settings. This has enabled us to see fleeting glimpses of some of the actors but we have rather neglected the technology itself (see Law, 1986), the knowledge objects which are also important actants that make up the networks that we seek to explain.

**Changing Spaces: from One Australasian Client to the UK Client Base** - The enhanced CRM module became an element in the marketing of the new release of the ERP system in the UK. One of the researchers was able to attend an interest group meeting for users of the ERP package in the Britain in early November of the same year. The meeting went for a full day involving about 20 representatives from user firms and eight representatives from the software vendor. Ostensibly the user group get together was an opportunity for the users to get access to the software vendor and gain the benefits of others’ experiences. The agenda scheduled sessions to ‘encourage’ the adoption of the new release of the ERP and complimentary packages. The meetings are also an opportunity for the users to identify what they perceive as problems and shortcomings in the present construction of the ERP for possible future resolution in ‘enhancements’.

This latter element of the dialogue occurred in at least two ways. First, in response to a particular topic being mentioned (for example dispatch) user representatives raised issues about its difficulties in their experience. This was either confirmed or ‘work arounds’ offered by other users. The difficulty with this style of discussion is that it becomes very detailed and not everyone’s concerns could be covered in a single day session. Similarly, not everyone has the same concerns – so the more vocal users tend to dominate the discussion and the topics may not be of general interest. There is also tension between the users (perhaps just an individual or a broader sub-group) about what needs to be changed in the standard system and what is an individual company ‘customisation.’ The users have a vested interest in having their concern solved in the standard system and the vendor has motivations to reduce the number and scope of ‘enhancements’. So while four or five of these issues were raised and
discussed, the vendor representatives provided a mechanism that had already been constructed to diffuse this discussion. This second way of dealing with perceived problems with the system was organised around the dissemination of a list of possible ‘issues and enhancements’ distilled from queries and problems arising during the prior period and additionally compiled from submissions made by individual user organisations. The list of issues was prepared in advance to indicate the key areas by category, the users who had an interest in the issue and some very brief additional commentary. The list consisted of 20 categories. The areas with most issues listed included; inventory with 11 items; purchasing with 18 items; sales order processing with 11 items; MRP \(^4\) and forecasting with 13 items and production control with 11 items. The categorisation was not entirely exclusive, often very closely related issues would be listed in different areas. Notable overlaps were clearly evident across areas such as: MRP and forecasting; production control; sales order processing and CRM. Each issue was given a single line on an eight page document. Any additional comments were very brief consisting of a maximum of eighteen words – the majority of items having no comments attached beyond the introductory brief description. Discussion of this list was not given any significant time but the process was managed by asking the users to respond offline from the meeting primarily by allocating votes according to a formula to indicate the relative priority each of the users felt should be given to each issue.

The adoption of this voting technique could be rationalised in various ways as a political as well as a democratising device. From an ANT perspective we might see this device as an interesting way to channel the participants in ways such that they become allies or at least allied to some changes rather than others. In this manner the ERP vendor is able to seek to control the problematisation and translation process by influencing the identification of client concerns. It is quite evident from the way in which client concerns were presented that many of the concerns are very closely related and consequently the initial parts of the process are open to manipulation by the vendor to channel attention to some concerns as opposed to others. It is never possible to assure the outcome of such a process of course. A different interpretation would allow room for resistance by the client firms (see Lowe & Doolin, 1999). From this perspective the list of concerns opens up avenues for action by the client to try to ensure that their issues become problematised and addressed. Given the contact among user group members it would be possible to engage in strategic action to try to engineer voting

\(^4\) Materials Requirements Planning
support for a limited number of items. Nevertheless this is not easy for the client firms since the ERP is supported by an international vendor who is supporting, selling and designing a package for global consumption. The effect of regional interests would be limited which makes it all the more remarkable to have observed the incorporation of ‘best practice’ as defined in our Australasian research site into the new release of an internationally sold ERP package.

The list and ‘voting’ mechanism provides control over the open forum discussion of ‘grievances’ with the system and potentially shares control with users over the developing biography of the ERP. The power rests with the vendor – but the voting system provides at least the potential for the vendor to need to be accountable to the users regarding decisions made about ‘enhancements’ to the system.

What was of particular interest during this meeting was the emergence of the enhancements to the module designed to increase the capability of the package to provide CRM functionality. One presenter referred to the experiences of an Australasian user with the new CRM module. This was Barramundi which as we indicated earlier was largely responsible for the design and specification of the CRM module. Interestingly Barramundi had only taken possession of the software module in October, less than a month previously. Effectively we saw the user group meeting in the UK encouraged to update to the new release, at least in part, by reference to the experience of a small Australasian company.

What we had observed as the somewhat last minute result of the helter-skelter development a system modification to meet what emerged as a critical system element for our Australasian company was now being re-presented as a best practice type improvement to UK users, emphasising the integration with accounts receivable that was a feature of Barramundi’s system described in part in the quotes above. One user from the UK meeting later described her interest in achieving more value out of the ERP system that they had implemented in ‘vanilla’ form, by “making it work for them” now that they had worked to get the basics going. Part of that was an interest in the extended CRM system which offered something new to the company – an approach to an issue they were aware of but for which they hadn’t developed a solution. With the UK company’s implementation of the upgrade (new release) scheduled for two months’ time the migration of the idea and the virtual object across the globe and into many companies would have commenced. The nature of the ERP begins to
change in this manner as new black boxes are added and the network is potentially extended to new clients who may well make selection decisions persuaded by the CRM functionality of the package.

In the next section we will take up the issue of the development of the ERP package and the CRM module. We will try to show that the idea of the ERP coming to incorporate ‘best’ practice can usefully be seen as a function of its history and biography. The biography of the ERP accumulates over time as the software comes into contact with other objects: programmers, client organisations and new management techniques.

Discussion

Our aim throughout this paper has been to illustrate the way in which ERPs may usefully be seen as fluid objects which have a distinct temporal character. The ERP package develops and is added to over time as a result of its biography, the trajectory it follows. We have sought to theorise our research by combining the evidence from our research sites with ideas derived from ANT and the concept of the biography of the object. Pollock and Cornford describe using the idea of biography as an attempt to “highlight the ‘accumulated history’ of an ERP system and how this continues to influence the structures and practices of later adopters” (2004, p. 38). The research evidence we describe above is intended to focus on the trajectory which the ERP we examined followed during a brief period of its history. What we have documented demonstrates how the biography idea can be used to explain how software systems like ERPs develop.

From the perspective of the Australasian client it is clear that the developments over the period during which our observations of the company took place could have been resolved in an alternative way. Barramundi could have decided to go with an integrated system solution or some other choice using a best of breed approach. In the latter scenario a new accounting package would be purchased with other information systems making use of existing in house customisations.

We wish to emphasise the chance nature of the ERP software development that we witnessed. The development of the CRM module by the software vendor appears to be the result of the
anecdotal developments at a single client company. Indeed the specifications for the CRM module are built around those supplied to the software vendor by the IT consultant employed by Barramundi. This is not to express a judgement on the features the new CRM module added to the vendor’s ERP package. We have no reason to believe the module is not useful. An assessment of the performance of the CRM features is beyond this research. Our objective was to show the temporal development of the package and to show in this case how the biography of the ERP has brought together a small Australasian company and the software developer in a particular way which led to the unanticipated development of a CRM module within the updated ERP system software. The development was unanticipated by both parties: the Australasian client and the ERP software vendor.

This also raises the issue of the presentation of material sourced from one company (that had no particular expertise in CRM and within which there had been concerns about the system) as ‘best practice’ to existing and future clients. The CRM module certainly incorporated useful features and functionality that had been described to us by users at Barramundi. Without a system of expert input into the development of the systems, it is possible that the programmers very accurately modelled the system as presented to them by Barramundi, but this is not necessarily ‘best practice’ either for the originating company or for any of the client companies that will eventually be presented with the functionality in the ‘new’ ERP module.

The ERP system changes its shape in order to incorporate the CRM system. The fluidity which may be seen as part of ERP packages comes to play a role as the package comes to be something a little different to what it was before. The package trajectory has brought it by chance into the path of a small Australasian company. The package and vendor that we refer to here was one of nine vendors who tendered for the supply of a system to Barramundi and one of three who were invited to present their software and proposed solution directly to Barramundi management. The extent to which the biography of the ERP system is unpredictable and based on the, at time chance, coming together of organizations, people and other objects (existing software systems) can be seen from the trajectories we describe above.

The proliferation of ERPs and the continued expansion of their functionality is seen as a concern by some authors (Cooper & Kaplan, 1998). Issues have been raised over the problematic nature of usefully combining different management techniques within a single system. Cooper and Kaplan suggest that combining some ‘advanced’ accounting techniques
within an integrated real-time ERP system can lead to problems. In particular the techniques being implemented but incorrectly applied to available information within the organisation. Cooper and Kaplan argue that some accounting systems require similar but very different information. They suggest that operational control systems and ‘strategic’ costing systems, such as activity based costing, require very different information. They contend that an ERP system is likely to fail to differentiate between the nature of the information needed without careful customisation and care during implementation.

Concluding Comments

Several of the themes of our paper come together here. Firstly we can now see something of the development of the CRM module of the ERP package. It is now traceable through time and space from its origins in Australasian to becoming a part of the ERP software and being used as a selling point of the new release of the ERP software package to a user group in the UK midlands. We are able to appreciate something of the nature of the biographical development of modern ERP software. Of course none of this is entirely clear for instance the Australasian history of the system would require us to follow its creation and development over perhaps the previous five or ten year period during the growth and organisational change of Barramundi.

Secondly we can discern something of the fluid nature of the ERP as a technological object (De Laet & Mol, 2000; Law, 2002). An ERP package is not fixed over time but changes constantly as updates are issued, modifications made and new modules added. This is a necessary feature of ERP packages. It is not possible for such software to remain fixed without appearing to become outdated. There are positive and negative effects of the changes which are brought on by such adjustments to what constitutes the ERP package for both the software vendors and the users. For example the user is often occasioned significant dislocation in responding to the need to retrain staff and alter systems to accord with the software as new releases alter the proprietary ERP package. The vendor at the same time has the opportunity to market the package with a new verve in terms of its new features while at the same time having to accept the approbation of some users who were happy with the old system and were not inclined toward change.
Thirdly we can see the nature of the ERP as a black box made up of a series of black boxes. To paraphrase Latour (1987) as the techniques and practices which contribute to business practices becomes more settled they are incorporated into ‘instruments and machines’. In this case the software technology comes to reflect ‘best practice’ as the software incorporates ideas and systems often developed by users or across groups of users. In this case we would maintain that the new CRM module reflects the ‘practice’ of a single Australasian firm. Nevertheless the technology soon becomes opaque to other users as preceding software technology has done before. As modules such as MRP, dispatching or receiving, inventory control and accounting modules such as debtor control are accepted they become black boxes – accepted as ‘best practice’ and deployed as such by multiple users.
References


