



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Department of Accounting

Working Paper Series

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

By

Alan Lowe and Joanne Locke

Number 93

May 2007

MANAGEMENT SCHOOL

Te Raupapa

The *Working Paper Series* is published by the Department of Accounting, University of Waikato, and is intended to provide staff, visitors and postgraduate students with a forum for publishing developing research. The opinions expressed in the various papers in the Series are those of the author(s) and are not necessarily endorsed by the Department. Working Papers are preliminary in nature; their purpose is to stimulate discussion and comment, and any feedback from readers would be welcomed by the author(s).

Correspondence concerning the submission of manuscripts and the receipt of copy may be addressed to:

The Editor - Working Paper Series
Department of Accounting
University of Waikato
Private Bag 3105
Hamilton, New Zealand
Fax: 0064 (0)7 838 4332

Correspondence concerning the reproduction of, or comment on, any part of a Paper should be addressed to the author(s) concerned.

ISSN 1177-7230 (Online)

ISSN 1173-7182 (Print)

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

Alan Lowe
Professor
Aston Business School,
Birmingham, UK
University of Waikato, New Zealand
Alowe1@waikato.ac.nz

Joanne Locke
Senior Lecturer
Waikato Management School
University of Waikato, New Zealand
Jlocke@waikato.ac.nz

Abstract

This paper provides an account of the way Enterprise Resource Planning (ERP) systems change over time. These changes are conceptualised as a biographical accumulation that gives the specific ERP technology its present character, attributes and historicity.

The paper presents empirics from the implementation of an ERP package within a single Australasian organisation. Changes to the ERP take place as a result of imperatives which arise during the implementation. Our research and evidence then extends to a different time and place where the new release of the ERP software was 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. The paper seeks to contribute an additional theorization for ANT studies that places the focus on the technological object and frees it from the ties of the implementation setting. We contrast this approach with Dechow and Mouritsen's (2005) path dependency. The research illustrates the opportunistic and contested fabrication of a technological object and emphasizes the stability as well as the fluidity of its techno-logic.

Keywords: ERP (enterprise resource planning) biography
ANT (actor network theory) case study
qualitative research

Acknowledgements

The authors would like to acknowledge the contributions of participants at the Critical Perspectives on Accounting Conference in New York, 2005 and the lively and helpful discussion at a seminar presentation at Said School of Business, Oxford. The insightful and constructive suggestions of two anonymous reviewers are also gratefully acknowledged. All remaining errors and omissions are the responsibility of the authors.

1. INTRODUCTION

This paper tells the story of a slice of life in the development of an Enterprise Resource Planning (ERP) package. Our aim is to highlight the manner in which ERP systems are fabricated over time. Our research data are drawn partly from an implementation in a small Australasian manufacturer and partly from an ERP user group meeting in the UK. Here the researchers attended a presentation of a new release of the ERP package.

The theorization of the paper is a combination of a biography perspective (Appadurai, 1986; Kopytoff, 1986; *cf* Mueller and Carter, 2005) and Actor Network Theory (ANT; Latour, 1987, 1999; Law, 1999, 2002) to provide a focus on the extended historical development of a technology object. ANT studies of accounting or information systems place an emphasis on within-organization implementations (Bloomfield, Coombs, Cooper and Rea, 1992; Bloomfield and Vurdubakis, 1997; Briers and Chua, 2001; Dechow and Mouritsen, 2005; Lowe, 2001). This approach studies the technology as an object with features and characteristics that emerge in each implementation episode. Instead biography cultivates a focus that emphasises the changes in the object occurring across time and occasioned by multiple organizations (Hanseth, Aanestad and Berg, 2004).

The contribution of the biography perspective in ANT research is usefully demonstrated in the context of ERP systems. 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 (Davenport, 1998; Klaus, Rosemann and Gable, 2000). Its signature is that it offers integration across functional areas that have traditionally operated disparate 'legacy' systems. Instead of the system fitting the organization, often the organization is required to adapt its business processes to the ERP (Davenport, 1998; Light, Holland and Wills, 2001). It is claimed that ERPs embody 'best practice' which is transferred as part of the package's 'techno-logic' (Dechow and Mouritsen, 2005) to the adopting organization (Moscove, Simkin and Bagranoff, 2003: 63-65; but see also Wagner and Newell, 2004).

Dechow and Mouritsen (2005: 693) ask "how is [the ERP] ... an actor; how does it play with other actors ...? (see also Hanseth, Aanestad and Berg, 2004). In this paper we consider actors

and network nodes beyond the implementing organization. In this sense we extend the actor network beyond the immediacy of the implementation to trace the links between the ERP vendor and potential multiple users over time. Our research indicates the relevancy of an ANT view enhanced with ideas of the biography of the object. The biography of an ERP is developed over a considerable period of time (Pollock and Cornford, 2004; Cornford, 2000). Over this time the software package is gradually changed and extended as it comes into contact with a variety of organizational settings.

The paper proceeds in the next section to outline a number of issues related to how we might best theorize ERP systems as objects with social lives. The discussion is developed by considering ideas related to: the role of objects in society; the contribution of ANT and 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. In the following section we discuss some of the differences between our use of biography and the ideas of path dependence developed by Dechow and Mouritsen (2005). The final section provides brief concluding comments.

2. ANT, BIOGRAPHY AND THE SOCIAL LIFE OF OBJECTS

This part of the paper provides the framework for the theorisation of our case research. The section will review literature which gives prominence to the role of objects in society. We introduce ideas about the impact of objects within society (Engeström and Blackler, 2005; Knorr Cetina, 1999; Lash, 2001, Lowe, 2004a) and consider the development of theoretical ideas which postulate the place of material and virtual or knowledge objects within social relations. Perhaps the most controversial aspect of ANT is the agency it affords to objects (Amstradamska, 1990; Chua, 1995; Collins and Yearley, 1992; Engeström and Blackler, 2005: 309; see also Hassard, Law and Lee, 1999; Latour, 2003; Law, 1999; Lee and Hassard, 1999). Our aim in this discussion is to bring out the linkages and similarities across the

somewhat disparate literatures we review. These ideas are combined to enrich and provide a sensitising focus for our interpretive research frame.

A number of authors have argued that objects, as mediating effects on social arrangements are 'back in strength in contemporary social theory' (Pels, Hetherington and Vandenberghe, 2002: 1; see also Engeström and Blackler, 2005; 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 and Smircich, 1999, for a review of the literature in organization 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 and Bruegger, 2002a; see also, Knorr Cetina, 1997; cf Suchman, 2005). 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 (Abolafia, 1996; Smith, 1999) and technology and scientific artefacts (Callon, 1986; Knorr Cetina, 1981; Knorr Cetina and Bruegger, 2002b; Latour, 1988, 1993; Pickering, 1995). Lowe (2001b and c; 2004b) 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 organization theory (see also Chua, 1995; Briers and Chua, 2001; Hansen and Mouritsen, 1999; Lee and Hassard, 1999; Mouritsen, 1999; Munro, 1999). Pels et al (2002: 1), 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* (emphasis added).

Pels et al, appropriately from our perspective, employ terminology commonly used to describe aspects of electronic information systems. ERPs constitute an important example of these information systems that bind the ‘software and hardware of our social lives’ and in which we so often place our trust both as individuals and at the organizational level.

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: 5) 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.”

ANT can add much more to our ability to trace the critical events and trajectories that explicate aspects of the biography of things. ANT encourages the researcher to look for the networks and linkages that form these biographies. Biography provides us with the concepts to follow the actors who make up the ERP objects beyond the user organizations, explain the trajectory of the ERP over time, at the software vendor and among 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 or indeed constructed? What role do they have in the network of relations that shape the ERP?

Where does this leave us in relation to how the object itself is implicated in social relations? Both perspectives emphasise the importance of objects, the material and virtual, on the way society is constituted and the important role that objects play in this process. 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 of 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 (Latour, 1994, 1999).

In this context Kopytoff (1986: 64) 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.

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 socio-technical objects 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 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 (Information Communication Technology) systems are now commonplace. Indeed it is not unusual for data processing to be outsourced by modern corporations and public sector organizations. It is in the nature of these systems to change over time and to be different in different implementations (Briers and Chua, 2001; Cornford, 2000; Dechow and Mouritsen, 2005; Lodh and Gaffikin, 2003; Pollock and Cornford, 2004; Quattrone and Hopper, 2005). In these contexts an ANT perspective commends itself as a tool of inquiry. An ANT view alerts 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.

ERPs like other information systems, combine fluidity with other more stable characteristics. It is the manner in which these elements are influenced and balanced over time and space that produce the biography of the software product. Our research aims to give attention to the manner in which the ERP is changed over time as it encounters different organizations and groups of clients. We argue that these encounters produce changes not only in the user organizations but also contribute to how the ERP is fabricated as a consequence of these events in its life. Some of the changes which may accompany these encounters with organizations or indeed with changes of policy and programmers within the ERP vendor may be insignificant while others may produce major changes in the trajectory of the ERP.

An ERP package certainly has 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, 1986: 90).

We can apply this conception to an ERP system. 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 organization 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 seek to establish the extent of the network of relations that constitute the ERP. In an organizational context this would necessarily include the human actors who interact with the software that makes up the ERP package. Research seeking to add a biographical enquiry to ANT would aim to trace the network of these heterogeneous relations both within and beyond the organization's boundaries. One aim for an ANT study could be 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 boxed¹ (Latour, 1987; Lowe, 2001a). The extent to which the ERP software is offered to user organizations as a stable entity is one way to assess how successful it might be regarded as a product, a definable software package. We could see such effects, such stability, as being at least in part the result of the biography of the ERP. The ERP software package is from a biography perspective the result of its engagement with social entities at any point in time. The ERP is constructed over time through its encounters with other entities, primarily user organizations.

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 describe its biography, to track its trajectory so far. Applying the idea of biography this tracing would involve the collection of evidence aimed at explicating not what the ERP has become within individual installations, but how some changes rather than others came to be incorporated within the fabric of the ERP itself. There is a clear difference in what we describe here to Dechow and Mouritsen's (2005) path dependence which seeks to explicate how the ERP came to be as it is during its configuration within a user organization.

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? Which problems 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 organizational problems how has the ERP changed in order to bring in its users, as allies? One of the researchers' concerns in trying to trace the ERP's biography 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?

¹ Latour (1994), uses the term 'black box' to refer to what makes(-up), society's macro actors. Latour suggests that the contribution of science and technology is to provide these 'black boxes' which mix into the fabric of society and provide 'allies' which enable things to happen; organizations to grow; individuals to accumulate power and so on (see also Chua, 1995).

In this paper we seek to illustrate the nature of a single change to a constantly changing ERP package. We do this in the following section in the context of a case study through which we are able to provide some idea of the extension of the ERP package to incorporate a customer relationship management (CRM) module and the contestation of future changes at a user group meeting. The story we present is a slice in the life of the ERP we have studied.

3. 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 (Alvesson, 2003; Alvesson and Deetz, 2000; Humphrey and Lee, 2004). In the first section we recount a series of exchanges from our Australasian case company, which we will call Barramundi Ltd², where the ERP software is about to 'go-live'. This is followed by some material from a meeting held in the UK organized by the software vendor and attended by representatives of about ten adopting companies. We seek to illustrate the transformation of a client-specific modification (customisation)³ to the ERP package into an important 'enhancement' to a module within the software package.

² We wish to thank the participants in this research who gave generously of their time. The commitment to support research is a significant one for a small business. All participants, including the software vendor, wished to remain anonymous so we have masked some identifying information and used pseudonyms. Our method involved observing and collecting data about the implementation of the ERP at Barramundi from the time just after the software selection process had been completed until 'go live'. Over the seven months 12 interviews were conducted and eight meetings were attended along with a number of training sessions and pilot runs of the software. The interviews took around 50 minutes each. We also had useful informal conversations with participants throughout the implementation. After the system had been running for a few months we held a further six interviews with key users of the system. We attended as many meetings and training sessions as possible in order to observe the interactions as events unfolded. Some documentation and emails were also provided by the organisation. The user meeting in the UK was attended in its entirety and one of the participants companies allowed the researchers to spend a day at their company to interview key users of the system and observe the company's businesses processes using their new ERP system.

³ 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.

This section of the paper aims to set the scene for a biographical account of the fabrication of the ERP object over time and through its contact with individuals and organizations that sometimes have competing interests in its features. The case material concerns the developments in a CRM module in an ERP system and efforts to manage users' responses to the ERP's perceived dysfunctional characteristics. First we track 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 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 the object, the ERP – CRM module, and its representation in another setting is quite striking. Second, we note the push for other changes to the system and something of how the human actors interact in the process of negotiating the future shape of the ERP.

Our research evidence is partial as all case evidence is (Ahrens, 2004; Alvesson, 2003). A 'complete' biography of a knowledge object, which may exist in varying forms over extended periods of time, is not practical, nor is it necessary. We can learn something about how it has come to be as it is and how it interacts with others by taking a slice out of the biography of our target ERP software. ANT researchers must make such choices about the granularity of their study and the extent of the network they follow (Bruni, 2005; Monteiro, 2001). Quattrone and Hopper (2005) note the limitations of case work. They also recognize the difficulty of conducting research which requires the researcher to follow the actors. These limitations include the budget constraints when trying to conduct research involving multinational corporations, limitations of access and the difficulty for the researchers to be present enough of the time. Quattrone and Hopper (2005) talk of using email and documentary evidence to support their data collection activities. This could 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).

A feature of our research was its surprise nature. We did not anticipate an opportunity to follow the social life of our target ERP. It presented itself by chance. As a result we did our best to observe all we could and piece together the story (see also Collins, 2004). Our network is partial in that we have much better data on some aspects of the network than

others. 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, from our implementing organization in Australasia to an ERP user group in the UK. We lack data of the technical nature of the software development itself, although we do have an understanding of the ERP software from our attendance of training and pilot ‘Go Live’ sessions. These vendor presented training sessions were useful in showing us what the software looked like⁴ to the client users and demonstrating how difficult it was for the vendor to illustrate even the most basic elements of the ERP effectively.

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. Unfortunately our access did not allow us to follow these socio-technical arrangements. We are able, however, to glimpse the pressures and difficulties the programmers faced through reports of software vendor representatives at meetings at the case company. We have reported excerpts of these discussions to allow the reader to make their own assessments about the relationships with the client company, the difficulty of the programming task and the time pressure under which the revised module was produced.

So while we wish to propose the usefulness of a biographical perspective in ANT studies, we recognise the demands on researchers it introduces – to have access to multiple organizations, sites and possibly over long periods of time. We would argue, however, that it is worth pursuing for the additional insights offered into knowledge objects which may in this way be revealed as having a continuing existence and not simply ‘materializing’ in isolated implementations.

3.1 A Brief Look at the Biography of the ERP

Our case study is set in a medium sized Australasian manufacturing company during the implementation⁵ phase of a new ERP up to ‘go-live’. We track and describe some of the

⁴ The ERP package involved in this implementation was from an international vendor selling to medium sized clients. The package was built on Microsoft technology and it was interesting to see the user screens looking just like any other windows based software.

⁵ The period of ‘implementation’ is used in the terminology of the vendor and literature on ERP implementations (Lodh and Gaffikin, 2003; Parr and Shanks, 2000) as the time from the decision to adopt through to ‘go live’ –

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 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 they believed ought to work and would 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 that has also been observed in other studies (Briers and Chua, 2001; Chapman, 2005; Dechow and Mouritsen, 2005; Lodh and Gaffikin, 2003; Pollock and Cornford, 2004; Quattrone and Hopper, 2005). 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 were 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 were 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

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.

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 and Kaindl, 2000; see also Cornford, 2000; Cornford and Pollock, 2003).

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 and Gaffikin, 2003; Pollock and Cornford, 2004).

3.2 The Complaints System: the Beginnings of the CRM Module in Australasia

This section provides some background on the origins and development of the CRM enhancement. The beginning of the adaptation of the ERP takes place at Barramundi. The complaints system (as it was known⁶) 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 phone complaints, returns, quality issues, and feeding into product development.

The CRM system represents the first of our knowledge objects (Knorr Cetina, 1999; Lash, 2001) or network nodes. Other actors and actants are channelled through the complaints

⁶ The actual name of the system has been altered to protect the case companies.

system in its capacity as a centre or calculation ... an obligatory passage point (Callon, 1986; Latour, 1987). The complaints system as we describe in the following paragraphs impacts on people inside and outside the organization. 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 organization 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 organizational members clearly felt the pressure of the system and its surveillance aspect (Foucault, 1977; Miller and O'Leary, 1987).

The progress of any entries into the complaint 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 complaints system ...
yeah, so no use worrying about something we don't know, may not happen
(Supervisor Customer Services).

During the first steering committee meeting in the middle of March, the complaint 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 complaints

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 and Cornford, 2004) of the ERP changes as a part of the internal network within the client firm comes to influence and then alter the features 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 complaints system is 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, 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 how the complaints system customisation to the ERP's existing CRM was progressing. 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 customisation] 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 do not become available in time. This proved somewhat inconclusive. After several minutes the accountant asks 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.

... 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.

The conflicting pressures brought into existence by the software company's decision to take up the opportunity to modify their CRM are illustrated here. They are under pressure because the new release of the ERP package is due out by the end of the year and so this modification must be substantially right on the first attempt since it would not be wise to incorporate features in the release that cause difficulties for current clients. The presence of the ERP is felt. There is a clash between the processes that Barramundi prefers and the ERP's existing techno-logic. Compromises have to be made, and Barramundi after having given up its intellectual capital, is left still having to pay for a customisation or 'working around' the new CRM.

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 by Harry:

... 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): **Complaint 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 exchange 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. Barramundi management were placed under some pressure to make a decision quickly, if not within this meeting then within a day or two.

We can draw a number of conclusions from the case material presented. Discussion of issues related to the 'complaints system' and its place among the company's other information systems indicates 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. It is clear that the decision to go with the modified 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 complaints 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 sketched the network of relations that underlay the move from the event system at Barramundi through 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 glimpses of some of the actors and through their eyes we have some perspective on the re-orientations made to the technology itself (see Law, 1986). The knowledge objects which make up the ERP are also important actants in the network that we seek to describe – but they were carefully protected from scrutiny. While access to the

vendor's programmers would have been interesting, we do not consider this missing part of the network to be critical to our story.

3.3 Changing Spaces: from One Australasian Client to the UK Client Base

At this point serendipity intervened in the research process (see Collins, 2004). One of the researchers travelled to attend an interest group meeting for users of the ERP package in Britain in early November of the same year. The interest group 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 to get access to the software vendor and gain the benefits of other users' experiences. The meetings are proffered by the vendor as 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'. The agenda also scheduled sessions to 'encourage' the adoption of the new release of the ERP and complementary packages.

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. The stresses and strains of the development of the new feature were invisible to its prospective new users and the transformed CRM was presented as one reason for adopting the new release.

What we had observed as the somewhat helter-skelter development of a system modification to meet a critical element of the system 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. 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.

But the new release was not the only transformation in the ERP of interest to participants at the meeting. The meetings also provide a forum for users to discuss their problems and experiences with the ERP system. The identification of users' problems and concerns, occurred in two ways. First, in response to a particular topic being mentioned (for example dispatch) user representatives raised issues about the difficulties they had experienced. This was either confirmed or 'work arounds' offered by other users. The difficulty with this style of discussion is that it quickly becomes very detailed and not everyone's concerns can 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), and between the users and the vendor, 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 organized around the dissemination of a list of possible 'issues and enhancements' distilled from queries and problems arising during a prior user meeting [similar to that just described] and additionally compiled from submissions made by individual user organizations. 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; MRP⁷ 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, or align their interests, 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 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 and 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.

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. The meeting and the voting system all play a role in mediating the forces that will come to bear on the ERP and influence how it will adapt, or not, in the face of the demands of current and imagined future users.

In the next section we will take up the issue of the development of the ERP package. The biography of the ERP accumulates over time as the software comes into contact with other objects: programmers, client organizations and new management techniques.

⁷ Materials Requirements Planning

4 DISCUSSION

Our aim through this paper has been to illustrate the way in which ERPs may usefully be seen as fluid, or non-stable (Dechow and Mouritsen, 2005; Quattrone and Hopper, 2005) objects which have a distinct temporal character, but nevertheless also contain some relatively stable elements. These stable elements are a necessary part of an ERP package that develops and is added to over time as a result of its biography. We have sought to theorise our research by combining the evidence from our research sites with ideas derived from ANT and 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: 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, in conjunction with ANT, can be used to explain how software systems like ERPs develop and have stable features which give them a particular character in their social interactions.

We noted earlier in the paper that there is a good deal of interest in the accounting and organization literature about how to: research; understand; represent and characterise ERP systems. Recently these systems have attracted particular attention in accounting, where researchers (Briers and Chua, 2001; Lodh and Gaffikin, 2003; Dechow and Mouritsen, 2005; Quattrone and Hopper, 2005) using variants of ANT have taken up the challenge of trying to explain these perhaps unfathomable socio-technical beings. In the research we report here we have sought to frame our interpretations through a mixing of ideas from ANT and the biography of the object. Dechow and Mouritsen (2005) note the reliance of their study on two theoretic props. They deploy ideas from:

... (French) Actor-Network Theory that emphasises the symmetry of humans and non-human actors in producing reality (Latour, 1987, 1999a, 1999b), and on the stream within the related field of (American) Symbolic Interactionism (Star, 1995) that advocates attention to how standards and classifications develop and become mediated in practice through ‘boundary objects’ (Bowker and Star, 1999; Star and Griesemer, 1989) (Ibid: 695).

The use of ‘boundary objects’ has a significant history in the sociology and social study of science literature. The incorporation of ‘boundary objects’ enables Star and Griesemer (1989)

to provide a more structured framework within which they are able to describe the broader translation process. These authors use the ‘boundary object’ concept to provide receptacles into which they are able to categorise different objects and practices ‘that... ‘discipline’ the information obtained by collectors ... and other non-scientists; and ... maximise both *the autonomy and the communication between ... [the different groups or] worlds*” (p. 404, emphasis added).

The theorizations we use are drawn, as we indicate earlier, from ANT [though we would not distinguish it as peculiarly French] and from biography (Appadurai, 1986; Kopytoff, 1986; Pollock and Cornford, 2004; Cornford, 2000). Dechow and Mouritsen structure their theorisations very closely around the idea of ‘boundary objects’. They classify their empirics in terms of six boundary objects: visionary [objects (sic)] (Briers and Chua, 2001); coincidental boundaries; standard forms; repositories, ideal types (Star and Griesemer, 1989); and path dependency. Dechow and Mouritsen argue that they need to add the sixth, path dependency, because they determine Star and Griesemer’s description of ‘coincident boundaries’ too ‘a-historic’. They indicate that for them ‘*path dependence*’ [relates to] ... *the way that system configuration ... matters through its implications in the present and for the future* (Dechow and Mouritsen, 2005: 697, emphasis added). We feel that although the addition of path dependency may be useful as an explanatory category it may also lead to confusion. This confusion relates to two different issues. A simple area of potential confusion relates to the apparent increasing number of types of ‘boundary objects’ that are being defined in the accounting literature. The second issue is a more fundamental concern over whether the definition of ‘boundary object’ is being applied in a reasonable manner. A full discussion of this latter point is beyond the scope of this paper.

Boundary objects are intended to assist the researcher to make sense of the context and processes which obtain when the object of study involves distinct social groups working across social, cultural and knowledge boundaries (see also Guston, 1999; Star and Griesemer, 1989). Star and Griesemer state that the boundary objects they identify operate to preserve the autonomy of the groups while acting to enable good communication across otherwise obdurate social boundaries. Though the idea of boundary objects have been used in the accounting literature (Briers and Chua, 2001; Dechow and Mouritsen, 2005) we believe the concept of biography offers more to our understanding of how ERP systems become what they are and appreciate more fully their impact on the social. Biography provides the

emphasis on time and space [the impact on the ERP of installations across multiple organizations] that we believe is important to our research while being less restricted in scope than the boundary object concept.

Dechow and Mouritsen deploy these conceptions of boundary objects in order to construct an explanation of ERP in two large multinational organizations that had implemented SAP (ERP) systems. We believe that given the focus of our research the use of biography has much to commend it. The semantic and metaphoric linkage to the concept of the passage of time and the acquiring of experience is we believe most appropriate to our conception of the importance of the social life of the technological object. We suggest the need to theorise the life of the object as extending over its development beyond any single implementation.

Given the discussion presented above we have chosen not to adopt Dechow and Mouritsen's idea of 'path dependence' since we do not feel that it could add anything to the concept of biography which we have deployed to help explain how the life and times of the object comes to affect its place in the social world. Biography we believe provides an excellent label for the concept that we use to define aspects of the '*conceptual and technical work space*' and, in particular how in the case of ERP this work space has developed over time. Nevertheless it is interesting to contrast the intent of Dechow and Mouritsen's 'path dependence' with our interest in biography. Both are intended to offer a frame through which to locate historical effects which may be relevant to studying translations and the social impact of technology on social collectives.

In a passage discussing how management work uses ERP to "problematize the process through which actors ... transport ... information across localities in order to establish ... representations" (Dechow and Mouritsen, 2005: 725), the authors argue that "history matters because the configuration later becomes a significant part of the techno-logic that the ERP system in place exercises on the organization." This is true but what Dechow and Mouritsen neglect is that this complex 'bricolage of technologies' that the ERP represents has been built up over a very long time [in the case of SAP – several decades]. It is not just the present implementation history, software modifications and interaction with the organization's elements that is in play here, but a much bigger history, indeed the biography of the ERP technology itself. Dechow and Mouritsen seem to focus exclusively on the ERP as it is configured within the organization on the basis that it is these decisions that serve to constrain

the system in operation. We believe that this type of analysis is of value but neglects the restrictions that the ERP system has inherited from the much longer history that has been involved in its fabrication as an ICT object. It is these factors that we have sought to highlight in our case study. We would argue that much of the essential techno-logic of an ERP package is determined well before any specific implementation takes place.

In focussing on implementation and configuration we believe that Dechow and Mouritsen (2005) overplay the flexibility offered by ERP software in practice. They illustrate the way managers close down options and create constraints as they configure the system with the following observations.

What seemed an ‘easy’ solution (namely to convert the old system directly into the new one) turned out to be ‘difficult’, because (in both Time-Corp and SpaceCorp) *the debate on consequences of such techno-logic were pushed away by concerns to make the financial database work* (Ibid: 727, emphasis added).

ERP systems are configured with certain problems in mind and even in these complex database technologies there is no place for all details of all management control problems (Ibid: 729).

This is an interesting interpretation. Another way to look at the implications of this mismatch between what we seem to be told are ‘reasonable’ expectations of the ERP and its less effective outcomes, would be to focus not on what was done deliberately by ‘management’ but on the unintended consequences of decisions necessarily taken with imperfect information. Rather we would emphasise the complex character of an ERP system such as SAP. It is this complexity which makes it impossible for client company managers ever to take ‘full advantage’ of the claimed ‘flexibility’ of the software. They cannot do so because they can never hope to know all there is to know about what inflexibility their choices, as they make them, will produce. Not only do they perhaps consciously ‘push away [some] concerns’ to focus on others, they close off avenues that they never appreciate they had as they struggle to cope with such complexity of choices. These are communication problems worthy of research but problems which may not be amenable to solution even by the most effective ‘boundary objects’. In practice the ERP vendor’s people cannot hope to know the firm and the firm’s people cannot expect to know the ERP software in sufficient detail to achieve some perfect configuration during what are necessarily high pressure implementations. As a consequence we would argue that it is the techno-logic of the default settings of the ERP that are of great significance to the outcome of most implementations (see also Pollock and

Cornford, 2004). It is these default settings among other things that the biography of the ERP has contributed 'reality' to. Through processes such as the one we describe in the case section of this paper 'best practices' are added over time to fabricate the ERP we 'see' 'today', which in turn influence default settings.

Configuration of the ERP in negotiations prior to implementation and during implementation does make significant impacts on client organizations. As we indicate earlier these decisions are often taken under conditions of time pressure and ignorance of their longer term impact. These are very significant elements in any ERP implementation which Dechow and Mouritsen (2005, pages 700-707) give particular emphasis to in their discussion of what they term 'path dependence'. Our theorisation deliberately focuses on issues that relate to the broader explanation of how ERP software develops over time among client companies and the software vendors rather than within client firms as they struggle to fabricate an ERP system within their organization. In this context Chapman suggests that the way ERP "shape[s] the actions and intentions of organizational managers through the systematic implications [ERP] brings to the management of organizational data" (2005: 686) presents valuable opportunities for ANT. We would go on to argue that much of this 'shaping of actions and intentions' is powerfully influenced by what the ERP brings with it, in addition to what happens during implementation. It is in order to give this sufficient emphasis that we want to extol the value of investigating the social life of the ERP package being aware of its biography, of where it has come from and, to a lesser extent perhaps, where it may be going.

We have sought to present in the case section of the paper a slice of ERP life. In this we hope to be able to reveal how it is that the biography of the ERP affects its clients. The implication of our research is that organizations that come later are impacted by the way the ERP's life has transpired. In fact ERP changes usually have an impact on existing users' firms as they grapple with revisions to the ERP software they are using. Some would say that such life long developments are beneficial to the value and versatility of the ERP. Our conclusion is more equivocal. Whether ERP changes are positive or negative is much less significant than understanding how such changes are affected and why a biographical account of an ERP is a valid way of examining the impact of ERP on user organizations, or indeed vice versa.

The findings of our research 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 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. Though this development was unanticipated by both parties, the Australasian client and the ERP software vendor, it was sufficiently robust to impact the ERP software offered to users on the other side of the world.

The manner in which the CRM module developed also raises issues of what is 'best practice' and raises questions about what it means for an ERP vendor to argue that its product offers 'best practice' solutions to clients. We describe in the case section the way in which material sourced from one company (that had no particular expertise in CRM and within which concerns about the system had been expressed) is then presented 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 (de Laet and Mol, 2000; Law, 2002) 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.

5 CONCLUDING COMMENTS

Our research has taken a combination of concepts from ANT and ideas based on the biography of the object (Appadurai, 1986; Cornford, 2000; Kopytoff; 1986; Pollock and Cornford, 2004; Winner, 1986). These ideas have provided us with a basis from which to examine the temporal aspects of ERP development. Our findings indicate that the development of ERP software can usefully be theorised along biographical lines (Cornford, 2000; Pollock and Cornford, 2004). This distinguishes our approach from other recent accounting literature which has tended to focus on implementations within individual organizations rather than the development of ERP software across implementations. We use a biographical approach to suggest that the impact of ERP in organizations is significantly affected by the experience and techno-logic that comes embodied within the software package. We are not suggesting that configuration decisions within individual ERP implementations are not also an important area for research to seek to investigate (Dechow and Mouritsen, 2005; Quattrone and Hopper, 2005), but that there is more to our understanding of ERP than can be gained from this type of research.

To appreciate the biography of an ERP it is necessary to look for ways to follow the development of the software package over time by examining the ways in which the software develops from experiences or interactions with implementations and other events over longer periods of time, involving client firms potentially from differing commercial sectors, locations and of different sizes. We would argue that it is possible in this manner to get an appreciation of how the specific features of an ERP package have developed in the way they have and at the times they have. This should allow us to better appreciate how ERP operates within any individual implementation to constrain aspects of the organization while perhaps liberating other parts. This should offer new ways to examine what Chapman (2005: 687) describes as the “techno-logic [of the ERP] that conditions management control practice ... [and] their potential to inhibit traditional and comfortable modes of management control.”

Our research has described the development of a CRM module within an ERP package. Our focus is limited to the observation of an ERP implementation that morphed serendipitously into the development of a CRM module. Our case traces the CRM module of the ERP over a

limited period through time and space from its origins in an Australasian manufacturing firm, then becoming a part of the ERP software and later being used as a selling point of the new release of the ERP software package to a user group in the UK. We are able to appreciate something of the nature of the biographical development of modern ERP software.

A further way in which researchers might add to our understanding of ERP would be to focus on the fluid nature of the ERP as a technological object (De Laet and 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.

Finally we can see the nature of the ERP as 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' (see also Dechow and Mouritsen, 2005). 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. Biography based approaches to researching and understanding ERP software offer us ways to open up the black boxes of which the ERP package is comprised.

In the case we describe how the ERP vendor presents the software technology as 'best practice' to the UK user group. We would maintain that the new CRM module reflects the 'practice' of a single Australasian firm, but this need not necessarily or ordinarily be the case. What is important is to realise that the ERP is not 'just' the creation of SAP or Oracle, but a complex 'bricolage of technologies' and ideas brought together from a range of organizations and individuals located in different times and spaces.

References

- Abolafia, Mitchel Y. (1996) *Making Markets: Opportunism and Restraint on Wall Street*. Cambridge, MA: Harvard University Press.
- Ahrens, Thomas (2004) 'Refining Research Questions in the Course of Negotiating Access for Fieldwork', in Christopher Humphrey and Bill Lee (eds) *The Real Life Guide to Accounting Research: A Behind the Scenes View of Using Qualitative Research Methods*, pp. 295-307. Oxford: Elsevier.
- Allnoch, Allen (1997) 'ERP Market Expanding Globally', *IIE Solutions*: 8-9.
- Alvesson, Mats (2003) 'Beyond Neo-Positivists, Romantics and Localists: A Reflexive Approach to Organizational Research', *The Academy of Management Review* 28(1): 13-33.
- Alvesson, Mats, and Deetz, Stanley (2000) *Doing Critical Management Research*. London: Sage.
- Amsterdamska, Olga (1990) 'Surely, You Must Be Joking, Monsieur Latour!' *Science, Technology and Human Values* 15(4): 495-504.
- Appadurai, Arjun (1986) 'Introduction: Commodities and the Politics of Value', in A. Appadurai (ed) *The Social Life of Things: Commodities in Cultural Perspective*, pp. 3-63. Cambridge: Cambridge University Press.
- Baudrillard, Jean (1996) *The System of Objects*. London: Verso.
- Bloomfield, Brian P., and Best, A. (1992) 'Management Consultants: Systems Development, Power and the Translation of Problems', *Sociological Review* 40(3): 533-560.
- Bloomfield, Brian P., Coombs, Rod, Cooper, David J. and Rea, David (1992) 'Machines and Manoeuvres: Responsibility Accounting and the Construction of Hospital Information Systems', *Accounting, Management and Information Technologies* 2(4): 197-219.
- Bloomfield, Brian P., and Vurdubakis, Theo (1997) 'Paper Traces: Inscribing Organisations and Information Technology', in B. P. Bloomfield (ed) *Information Technology and Organisations: Strategies, Networks and Integration*. Oxford: Oxford University Press.
- Boubekri, Nourredine (2001) 'Technology Enablers for Supply Chain Management', *Integrated Manufacturing Systems* 12(6/7): 394.
- Briers, Michael and Chua, Wai Fong (2001) 'The Role of Actor-Networks and Boundary Objects in Management Accounting Change: A Field Study of an Implementation of Activity-Based Costing', *Accounting, Organizations and Society* 26(3): 237-269.
- Bruni, Attila (2005) 'Shadowing Software and Clinical Records: On the Ethnography of Non-Humans and Heterogeneous Contexts', *Organization* 12(3): 357-378.
- Calas, Marta B. and Smircich, Linda (1999) 'Past Postmodernism? Reflections and Tentative Directions', *Academy of Management Review* 24(4): 649-671.

- Callon, Michel (1986) 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay.' in J. Law (ed) *Power, Action and Belief: A New Sociology of Knowledge?*, pp. 196-233. London: Routledge and Kegan Paul.
- Chapman, Christopher S. (2005) 'Not Because They Are New: Developing the Contribution of Enterprise Resource Planning Systems to Management Control Research', *Accounting, Organizations and Society* 30(7-8): 685-689.
- Chen, Injazz J. (2001) 'Planning for ERP Systems: Analysis and Future Trend', *Business Process Management Journal* 7(5): 374.
- Chua, Wai Fong (1995) 'Experts, Networks and Inscriptions in the Fabrication of Accounting Images: A Story of the Representation of Three Public Hospitals', *Accounting, Organizations and Society* 20(2/3): 111-145.
- Ciborra, Claudio U. (2001) 'Critical Review of the Literature on the Management of Corporate Information Infrastructure', in C. U. Ciborra, K. Braa, A. Cordella, B. Dahlbom, A. Failla, O. Hanseth, V. Hepsø, J. Ljungberg, E. Monteiro and K. A. Simon (eds) *From Control to Drift: The Dynamics of Corporate Information Infrastructures*. Oxford: Oxford University Press.
- Collins, Harry (2004) 'Qualitative Methodology in Practice: My Experience', in Christopher Humphrey and Bill Lee (eds) *The Real Life Guide to Accounting Research: A Behind-the-Scenes View of Using Qualitative Research Methods*, pp. 481-490. San Diego, CA: Elsevier.
- Collins, Harry, and Yearley, Steven (1992) 'Epistemological Chicken', in A. Pickering (ed) *Science as Practice and Culture*, pp. 301-326. Chicago: The University of Chicago Press.
- Cornford, James (2000) 'The Virtual University Is . . . The University Made Concrete', *Information, Communication and Society* 3(4): 508-525.
- Cornford, James and Pollock, Neil (2003) *Putting the University Online: Information, Technology, and Organisational Change*. Milton Keynes: Open University Press.
- Davenport, Thomas H. (1998) 'Putting the Enterprise into the Enterprise System', *Harvard Business Review* 76(4): 121-131.
- de Laet, Marianne and Mol, Annemarie (2000) 'The Zimbabwe Bush Pump', *Social Studies of Science* 30(2): 225-263.
- Dechow, Niels, and Jan, Mouritsen (2005) 'Enterprise Resource Planning Systems, Management Control and the Quest for Integration', *Accounting, Organizations and Society* 30(7-8): 691-733.
- Doolin, Bill (1999) 'Sociotechnical Networks and Information Management in Health Care', *Accounting, Management and Information Technologies* 9(2): 95-114.

- Engeström, Yrjö and Blackler, Frank (2005) 'On the Life of the Object', *Organization* 12(3): 307-330.
- Everdingen, Yvonne van, Hillegersberg, Jos van and Waarts, Eric (2000) 'ERP Adoption by European Mid Size Companies: Searching for ERP Systems Offering a Perfect Fit', *Communications of the ACM* 43(4): 27-31.
- Ezzamel, Mahmoud (1994) 'Organizational Change and Accounting: Understanding the Budgeting System in Its Organizational Context', *Organization Studies* 15(2): 213-240.
- Fujimura, Joan (1992) 'Crafting Science: Standardized Packages, Boundary Objects, and "Translation"', in A. Pickering (ed) *Science as Culture and Practice*, pp. 168-211. Chicago: University of Chicago Press.
- Foucault, Michel (1977) *Discipline and Punish*. Harmondsworth: Penguin.
- Gaboury, Jane (1998) 'Research Predicts ERP Market Will Grow', *IIE Solutions* 30(10): 8-10.
- Guston, David H. (1999) 'Stabilizing the Boundary between USA Politics and Science: The Role of the Office of Technology Transfer as a Boundary Organization', *Social Studies of Science* 29(1): 87-111.
- Hanseth, Ole, Aanestad, Margunn, and Berg, Marc (2004) 'Guest Editors' Introduction: Actor-Network Theory and Information Systems. What's So Special?' *Information Technology and People* 17(2): 116-123.
- Hansen, Allan and Mouritsen, Jan (1999) 'Managerial Technology and Netted Networks. 'Competitiveness' in Action: The Work of Translating Performance in a High-Tech Firm', *Organization* 6(3): 451-471.
- Hassard, John S., Law, John and Lee, Nick (1999) 'Preface', *Organization* 6(3): 387-390.
- Humphrey, Christopher, and Lee, Bill (eds). (2004). *The Real Life Guide to Accounting Research: A Behind-the-Scenes View of Using Qualitative Research Methods*. San Diego, CA: Elsevier.
- Klaus, Helmut, Rosemann, Michael, and Gable, Guy G. (2000) 'What is ERP?' *Information Systems Frontiers* 2(2): 141 - 162.
- Knorr Cetina, Karin D. (1981) *The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science*. Oxford: Pergamon.
- Knorr Cetina, Karin D. (1997) 'Sociality with Objects: Social Relations in Postsocial Knowledge Societies', *Theory, Culture and Society* 14(4): 1-30.
- Knorr Cetina, Karin D. (1999) *Epistemic Cultures*. Cambridge, MA: Harvard University Press.
- Knorr Cetina, Karin D. (2001) 'Postsocial Relations: Theorizing Sociality in a Postsocial Environment', in G. Ritzer and B. Smart (eds) *Handbook of Social Theory*, pp. 520-537. London: Sage.

- Knorr Cetina, Karin D. and Bruegger, Urs (2002a) 'Traders' Engagement with Markets: A Postsocial Relationship', *Relationship, Theory, Culture and Society* 19(5/6): 161-185.
- Knorr Cetina, Karin D. and Bruegger, Urs (2002b) 'Global Microstructures: The Virtual Societies of Financial Markets', *American Journal of Sociology* 107(4): 905-950.
- Kopytoff, Igor (1986) 'The Cultural Biography of Things: Commoditization as Process', in A. Appadurai (ed) *The Social Life of Things: Commodities in Cultural Perspective*, pp. 64-94. Cambridge: Cambridge University Press.
- Lash, Scott (2001) 'Technological Forms of Life', *Theory, Culture and Society* 18(1): 105-120.
- Latour, Bruno (1987) *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.
- Latour, Bruno (1988) *The Pasteurization of France*. Cambridge, MA: Harvard University Press.
- Latour, Bruno (1993) *We Have Never Been Modern*. Hemel Hempstead: Harvester Wheatsheaf.
- Latour, Bruno (1994) 'On Technical Mediation - Philosophy, Sociology, Genealogy', *Common Knowledge* 3(2): 29-64.
- Latour, Bruno (1999) *Pandora's Hope. Essays in the Reality of Science Studies*. Cambridge, MA: Harvard University Press.
- Latour, Bruno (2003) 'Is Re-Modernization Occurring - and If So, How to Prove It? A Commentary on Ulrich Beck', *Theory, Culture & Society* 20(2): 35-48.
- Law, John (1986) 'On the Methods of Long Distance Control: Vessels, Navigation and the Portuguese Route to India', in J. Law (ed) *Power, Action and Belief: A New Sociology of Knowledge?*, pp. 234-263. London: Routledge and Kegan Paul.
- Law, John (1999) 'After ANT : Complexity, Naming and Topology', in J. Law and J. S. Hassard (eds) *Actor Network Theory: And After*, pp. 1-14. Oxford: Blackwell.
- Law, John (2002) 'Objects and Spaces', *Theory, Culture and Society* 19(5/6): 91-105.
- Lee, Nick and Hassard, John S. (1999) 'Organization Unbound: Actor-Network Theory, Research Strategy and Institutional Flexibility', *Organization* 6(3): 391-404.
- Lee, Zoonky and Lee, Jinyoul (2000) 'An ERP Implementation Case Study from a Knowledge Transfer Perspective', *Journal of Information Technology* 15(4): 281-288.
- Light, Ben, Holland, Christopher P. and Wills, Karl (2001) 'ERP and Best of Breed: A Comparative Analysis', *Business Process Management Journal* 7(3): 216-224.
- Lodh, Sudhir and Gaffikin, Michael J. R. (2003) 'Implementation of an Integrated Accounting and Cost Management System Using the SAP System: A Field Study', *European Accounting Review* 12(1): 85-121.

- Lowe, Alan D. (2001a) 'Casemix Accounting Systems and Medical Coding: Organisational Actors Balanced on "Leaky Black Boxes"', *Journal of Organizational Change Management* 14(1): 79-100.
- Lowe, Alan D. (2001b) 'Accounting Information Systems as Knowledge Objects: Some Effects of Objectualization', *Management Accounting Research* 11(1): 75-100.
- Lowe, Alan D. (2001c) 'After ANT : An Illustrative Discussion of the Implications for Qualitative Accounting Case Research', *Accounting, Auditing and Accountability Journal* 14(3): 327-351.
- Lowe, Alan D. (2004a) 'Objects and the Production of Technological Forms of Life: Understanding Organisational Arrangements from a Postsocial Perspective', *Journal of Organisational Change Management* 17(4): 337-351.
- Lowe, Alan D. (2004b) 'Postsocial Relations: Toward a Performative View of Accounting Knowledge', *Accounting, Auditing and Accountability Journal* 17(4): 604-628.
- Lowe, A., and Doolin, W. (1999) 'Casemix Accounting Systems: New Spaces for Action?' *Management Accounting Research* 10(3): 181-201.
- Miller, Peter and O'Leary, Ted (1987) 'Accounting and the Construction of the Governable Person', *Accounting, Organizations and Society* 12(3): 235-265.
- Monteiro, Eric (2001) 'Actor Network Theory and Information Infrastructure', in C. U. Ciborra, K. Braa, A. Cordella , B. Dahlbom, A. Failla, O. Hanseth, V. Hepsø, J. Ljungberg, E. Monteiro and K. A. Simon (eds) *From Control to Drift: The Dynamics of Corporate Information Infrastructures*, pp. 71-83. Oxford: Oxford University Press.
- Moscove, Stephen, Simkin, Mark and Bagranoff, Nancy (2003) 'Chapter 6: Accounting and Enterprise Software' *Core Concepts of Accounting Information Systems*, 8th ed. Hoboken, NJ: John Wiley and Sons.
- Mouritsen, Jan (1999) 'The Flexible Firm: Strategies for a Sub-Contractors Management Control, Analysis and Open Book Accounting', *Accounting, Organizations and Society* 24(1): 31-55.
- Munro, Rolland (1999) 'Power and Discretion: Membership Work in the Time of Technology', *Organization* 6(3): 429-450.
- Mueller, Frank, and Carter, Chris (2005) 'The Scripting of Total Quality Management within Its Organizational Biography', *Organization Studies* 26(2): 221-247.
- Palaniswamy, Rajagopal and Frank, Tyler (2000) 'Enhancing Manufacturing Performance with ERP Systems', *Information Systems Management* 17(3): 43-55.
- Parr, Anne and Shanks, Graeme (2000) 'A Model of ERP Project Implementation', *Journal of Information Technology* 15(4): 289-303.
- Pels, Dick, Hetherington, Kevin and Vandenberghe, Frédéric (2002) 'The Status of the Object: Performances, Mediations, and Techniques', *Theory, Culture and Society* 19(5/6): 1-21.

- Pickering, Andrew (1995) *The Mangel of Practice*. Chicago: University of Chicago Press.
- Pollock, Neil and Cornford, James (2004) 'ERP Systems and the University as a 'Unique' Organisation', *Information Technology and People* 17(1): 31-52.
- Preston, Alistair M., Cooper, David J., and Coombs, Rod W. (1992) 'Fabricating Budgets: A Study of the Production of Management Budgeting in the National Health Service', *Accounting, Organizations and Society* 17(6): 561-593.
- Quattrone, Paolo, and Hopper, Trevor. (2001). 'If I Don't See It I Cannot Manage It: The Quasi-Ontology of SAP. Accounting, Translations, and Visibility in Multinational Organisations.' Paper presented at the 24th Annual Congress of the European Accounting Association, Athens.
- Quattrone, Paolo, and Hopper, Trevor (2005) 'A 'Time-Space Odyssey': Management Control Systems in Two Multinational Organisations', *Accounting, Organizations and Society* 30(7-8): 735-764.
- Scott, Judy E. and Kaindl, Lisa (2000) 'Enhancing Functionality in an Enterprise Software Package', *Information and Management* 37(3): 111-122.
- Serres, Michel (1990) *Le Contrat Naturel*. Paris: Editions Francois.
- Smith, Charles W. (1999) *Success and Survival on Wall Street: Understanding the Mind of the Market*. New York: Rowman and Littlefield.
- Soh, Christina, and Kien, Sia Siew (2004) 'An Institutional Perspective on Sources of Erp Package-Organisation Misalignments', *Strategic Information Systems* 13(4): 375-398.
- Soh, Christina, Kien, Sia Siew, and Tay-Yap, Joanne (2000) 'Cultural Fits and Misfits: Is ERP a Universal Solution?' *Communications of the ACM* 43(4): 47-51.
- Star, Susan L. and Griesemer, James R (1989) 'Institutional Ecology, 'Translations and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology', *Social Studies of Science* 19(3): 387-420.
- Suchman, Lucy (2005) 'Affiliative Objects', *Organization* 12(3): 379-399.
- Turkle, Sherry (1995) *Life on the Screen*. New York: Simon and Schuster.
- Wagner, Erica L., and Newell, Sue (2004) "'Best' for Whom?: The Tension between 'Best Practice' Erp Packages and Diverse Epistemic Cultures in a University Context", *Strategic Information Systems* 13(4): 305-328.
- Winner, Langdon (1986) 'Do Artifacts Have Politics?' in L. Winner (ed) *The Whale and the Reactor*, pp. 26-38. Chicago, IL: University of Chicago Press.

OTHER PAPERS IN THIS SERIES

1. Lawrence, S.L. Rational and social aspects of management accounting practice: Report of a field study, June 1990.
2. Northcott, D.N. Capital budgeting in practice: Past research and future directions, August 1990.
3. Cheung, J., Vos., E. and Low, C.K. IPO underpricing in New Zealand, September 1990.
4. Van Peursem, K.A. Extant research in public sector accountability, March 1991.
5. Van Peursem, K.A. New Zealand auditor perceptions: Difficult and critical audit procedures, July 1991.
6. Alam, M. The budgetary process from information processing perspectives, September 1991.
7. McCracken, T. & Hooper, K. The New Zealand goods and services tax (GST): Identifying the problem areas, September 1991.
8. Lowe, A. Strategic management accounting, September 1991.
9. McCracken, T. Pricing: A review of contemporary approaches, February 1992.
10. Cheung, J. Estimating costs of capital for small ventures, March 1992.
11. Cheung, J., Vos, E., & Bishop, D. Pre-holiday returns in the New Zealand share market, May 1992.
12. Van Peursem, K.A. Accountability for social policy: A moral framework, June 1992.
13. Alam, M. & Poulin, B.J. Budget as a discipline: Lessons from a turnaround enterprise, December 1992.
14. Raj, M. Pricing options on short and long-term yields using stochastic arbitrage based models, May 1993.
15. Godfrey, A. & Hooper, K. Domesday Book: Its significance as an accounting document, June 1993.
16. Van Peursem, K.A., Lawrence, S.R. & Pratt, M.J. Health management performance: A classification and review of measures and indicators, July 1993.
17. Coy, D. & Goh, G.H. Overhead cost allocations by tertiary education institutions 1989-91, September 1993.
18. Coy, D., Dixon, K. & Tower, G. The 1992 annual reports of tertiary education institutions: quality, timeliness and distribution, November 1993.
19. Van Peursem, K.A. & Tuson, C. Financial reporting in Area Health Boards 1987-1992, January 1994.
20. Vos, E. & Davey, H. Time consistent accounting standards as a necessary condition for relating "point in time" accounting information to market returns, April 1994.
21. Coy, D., Buchanan, J. & Dixon, K. The users of New Zealand tertiary education institutions' annual reports: who are they and what information do they seek? December 1994.
22. Coombes, R. & Davey, H. The New Zealand accountant's role in environmental accountability, December 1994.
23. Wells, P.K. Marketing regulation and compliance programmes, November 1995.
24. Haslam, J. Analysis of accounting as at the end of the Napoleonic war: towards a critical theoretical history of the prescribing of accounting by the British State, November 1995.

25. Haslam, J. The British state and the prescribing of accounting, 1815-1830: a focus upon the regulating of friendly societies and savings banks in the post-Napoleonic war context, November 1995.
26. Haslam, J. Accounting publicity and the revolution in government, November 1995.
27. Haslam, J. Accounting history as critique of the present: a critical theorising of interfaces between accounting and the British state of the early 1840s, November 1995.
28. Dosa, L., Gallhofer, S. & Haslam, J. Accounting's location in a transition process: a focus upon Hungary, November 1995.
29. Gallhofer, S. & Haslam, J. Accounting on the road: turnpike administration in early nineteenth century Britain, November 1995.
30. Ciancanelli, P., Gallhofer, S., Haslam, J. & Watson, R. Pay systems and social ideology: the case of profit related pay, November 1995.
31. Jenkin, Erica and Van Peurseem, Karen A. Expert systems in auditing: New Zealand auditor perspectives, November 1995.
32. Wells, P.K. Marketing regulation and compliance programmes: Attitudes and reactions of New Zealand marketing managers in 1988, November 1995.
33. Davey, H.B., Bowker, T. & Porter, B. New Zealand's controlled foreign company regime, November 1995.
34. Davey, H.B., Barnes, H. and Porter, B. External environmental reporting: The need for a New Zealand standard, November 1995.
35. Lawrence, Stewart, Rethinking professional ethics: A religious metaphor for accountants, November 1995.
36. Ciancanelli, P., Watson, R., Gallhofer, S. & Haslam, J. Alternative perspectives on finance: A critical analysis, November 1995.
37. Gallhofer, Sonja & Haslam, J., Beyond accounting: The possibilities of accounting and "critical" accounting research, November 1995.
38. Gallhofer, Sonja, "It really challenged everybody": Accounting and critical and feminist pedagogy, January 1996.
39. Gallhofer, Sonja, and Haslam, Jim, The direction of green accounting policy: Critical reflections, January 1996.
40. Wells, P.K., Marketing regulation and compliance programmes: attitudes and reactions of New Zealand marketing managers in 1995, February 1996.
41. Pratt, Michael and Coy, David, Managing teaching allocations in a university department: the TAMM model, June 1996.
42. Coy, David and Pratt, Michael, The spider's web: politics and accountability in universities, June 1996.
43. Doolin, Bill, Organisational roles of decision support systems, June 1996.
44. Beale, Bob and Davey, Howard, The nature and origins of comprehensive income, August 1996.
45. Davey, Howard, and Holden, Mark, Emerging directions in the evaluation of foreign subsidiary performance, September 1996.
46. Kelly, Martin, A personal perspective on action-research, October 1996.
47. Doolin, Bill, Defining decision support systems, November 1996.

48. Gallhofer, Sonja, Haslam, Jim and Pratt, Mike, Developing environmental accounting: insights from indigenous cultures, November 1996.
49. Ciancanelli, Penny, Gallhofer, Sonja, Haslam, Jim and Watson, Robert, In the name of an enabling accounting: critical reflections developed and enhanced through an analysis of accounting and profit-related pay, November 1996.
50. Lowe, Alan, The role of accounting in the processes of health reform: providing a "black box" in the cost of blood products, November 1996.
51. Coy, David and Buchanan, John, Information technology diffusion among business professionals: Preliminary findings of a longitudinal study of spreadsheet use by accountants 1986-96, February 1997.
52. Beale, Bob and Davey, Howard, Total recognised revenues and expenses: an empirical study in New Zealand, March 1997.
53. Coy, David, Nelson, Mort, Buchanan, John and Jim Fisher, Spreadsheet use by accountants in Australia, Canada and New Zealand: Preliminary findings, March 1998.
54. Wells, P.K., Manapouri: catalyst or consequence? October 1998.
55. Lowe, Alan, Tracing networks through case studies, October 1998.
56. Kim, S.N. and Mfodwo, K., Prospects for the establishment of Islamic banking in New Zealand: a contextual analysis, November 1998.
57. Van Peurse, K.A., Method for a methodology: a new approach for the middle range, November 1998.
58. Locke, Joanne and Perera, Hector, An analysis of international accounting as a catalyst for the re-integration of accounting research, August 1999.
59. Julian, Aileen and Van Peurse, Karen, Ethics education and the accounting curriculum: Can ethics be taught?, August 1999.
60. Van Peurse, K.A., Wells, P.K. and L'Huillier, B. Contracting services in SMEs: A New Zealand professional accounting firm case study, September 1999.
61. Lowe, Alan, Accounting in health care: Providing evidence of a real impact, September 1999.
62. Alam, Manzurul and Wells, Philippa, Control systems of government-owned business enterprises: a critical analysis of the New Zealand model, November 1999.
63. Kelly, Martin, In praise of holistic education in accounting, December 1999.
64. Smith, Susan Ann and Coy, David, The quality of city council annual reports, 1996-97 and 1997-98: Preliminary findings, March 2000.
65. Hooper, Keith and Low, Mary, Representations in accounting: the metaphor effect, June 2000.
66. Dixon, Keith, The impact of management control across a hospital system, August 2000.
67. Lowe, Alan, Accounting information systems as knowledge-objects: some effects of objectualization, August 2000.
68. Locke, Joanne and Lowe, Alan, A market test of the ranking of accounting journals: an Australasian perspective, October 2000.
69. Francis, Graham, Humphreys, Ian and Jackie Fry, Lessons for other countries from the privatisation, commercialisation and regulation of UK municipal airports, December 2000.

70. Hooks, Jill, Coy, David and Howard Davey, Information disclosure in the annual reports of New Zealand electricity retail and distribution companies: Preliminary findings, January 2001.
71. Lowe, Alan, Methodology, method and meaning in field research: Intensive versus extensive research styles in management accounting, March 2001
72. Van Peurse, Karen, Locke, Joanne and Harnisch, Neil, Audit Standard Analysis: An Illocutionary Perspective on the New Zealand Going Concern Standard April 2001
73. France, Necia, Francis, Graham, Lawrence, Stewart and Sacks, Sydney, Measuring Performance Improvement in a Pathology Laboratory: A Case Study, April 2001
74. Hooper, Keith and Davey, Howard, Preferences on learning options in accounting education: a new zealand/asian perspective, May 2002
75. Lowe, Alan and Locke, Joanne, A paradigm sensitive perspective on the ranking of accounting journals: A web-based survey approach, May 2002
76. France, Necia, Francis, Graham and Lawrence, Stewart Redesigning clinical laboratory services: Securing efficient diagnoses for New Zealanders, January 2003
77. Lowe, Alan and Jones, Angela, Emergent strategy and the measurement of performance: The formulation of performance indicators at the micro-level, May 2003
78. Francis, Graham, Humphreys, Ian, Ison, Stephen and Aldridge, Kelly, Airport surface access strategies and targets, September 2004
79. Bourke, Nikki and Van Peurse, Karen, Detecting fraudulent financial reporting: teaching the 'watchdog' new tricks, September 2004
80. Low, Mary and Francis, Graham, Improving the research skills of the first-year accounting class by incorporating corporate annual report analysis into the classroom, November 2004
81. Nath, Nirmala, Van Peurse, Karen and Lowe, Alan, Public sector performance auditing: Emergence, purpose and meaning, February 2005
82. Bather, Andrea and Kelly, Martin, Whistleblowing: The advantages of self-regulation, September 2005
83. Samkin, Grant and Lawrence, Stewart, Limits to corporate social responsibility: The challenge of HIV/AIDS to sustainable business in South Africa, November 2005
84. Alley, Clinton and James, Simon, The interface between financial accounting and tax accounting – a summary of current research, December 2005
85. Samkin, Grant, Trader, Sailor, Spy, December 2005
86. Van Peurse, Karen, The auditor's dilemma: an economic perspective on an old problem, December 2005.
87. Alley, Clinton and Maples, Andrew, The concept of income within the New Zealand taxation system, October 2006
88. Francis, Graham, Lawrence, Stewart, Humphreys, Ian and Ison, Stephen, Risk transfer and uncertainty in privatisation: Cases from air transport, October 2006
89. Van Peurse, Karen A., Public benefit vs private entities: A fresh look at accounting principles, October, 2006
90. Bather, Andrea, The Companies Act 1993 and Directors' Duties: Small and medium entities are not well catered for, December 2006

91. Ryan, Jim, Tax relief still available for small property owners?, December 2006
92. Samkin, Grant and Schneider, Annika, Reviewing the changing face of financial reporting: The case of a public benefit entity, May 2007