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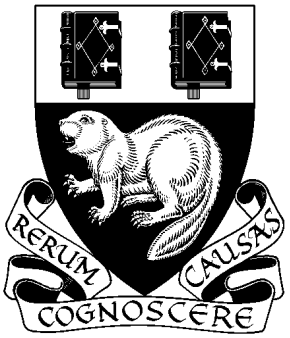

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"Unfolding New Times: The Implementation of Enterprise Resource Planning into an Academic Administration"

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Unfolding New Times: The Implementation of Enterprise Resource Planning into an Academic Administration

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ABSTRACT
This paper analyzes one of the first ERP implementation projects within a prestigious US university, an initiative that opened organizational 'doors' to multiple narratives of the unknown whose presence challenged system localization efforts. We use an interpretive, case-study-based narrative methodology adopting a time sensitive, actor-network perspective, to highlight the University's choice to implement a standard ERP package and the negotiations that allowed the technology to be compromised. Much of the research in this area has tended toward snapshot actor-network analyses that foreground the agency and role of technology in negatively subverting ERP projects. This study provides a more balanced conceptualization of computer-mediated change efforts, where the 'locally accepted' ERP system results from a highly progressive and non-linear process of translation involving negotiations with many alien influences. Small, punctuated moments are interwoven to affect change and result in the future becoming colonized through the unfolding of day-to-day events.

KEYWORDS: interpretivist perspective, IS implementation, enterprise resource planning, organizational change, actor-network theory, narrative, academic administration

1. Introduction

The last half of the 21st century heralded 'The Enterprise Resource Planning Revolution' (Ross, 1998) with enterprise systems implemented within most Fortune 500 companies (Kumar & van Hillegersberg, 2000). Business leaders, persuaded by the concept of an emerging 'global marketplace' (e.g., Castells, 1996; Held, 1999), were enamored by the technology's promise to streamline organizational activities, eliminate duplication of effort and data, and co-ordinate business operations across geographically dispersed locations (Davenport, 2000; Markus & Tanis, 2000). International management consultancies were a "driving force" (Walsham, 2001) behind the proliferation of the trend, as they worked with software vendors to sell Enterprise Resources Planning (ERP) as an appropriate 'solution' for multiple markets (Soh, Kien & Tay-Yap, 2000; Walsham, 2001). Fuelled by media coverage of the feared year two-thousand (Y2K) millennium bug, the trend increased as a mass of organizations from a variety of industries, jumped on the "ERP bandwagon" (Kremers & Dissel, 2000; Kumar & van Hillegersberg, 2000).

By early 2000, ERP-related sales generated $40 billion in revenue split between software vendors and consulting firms (Willcocks & Sykes, 2000) and practitioner literature claimed enterprise systems were a prerequisite for business success in the twenty-first century (Langerwalter, 1999; Davenport, 2000; Norris, Hurley, Hartley, Dunleavy & Balls, 2000).

Traditional university administration provides an interesting context in which to study ERP implementations. Although US higher education institutions took to purchasing packaged software rather later than profit-driven, business corporations, it seems they too have joined the bandwagon (Mahrer, 1999; Pollock, 1999; Volkoff, 1999; Allen & Kern, 2001). We argue that the trend for ERP 'business solutions' reflects the "marketisation" (De Boer, 1999) of universities where institutional governance is now the domain of professional managers who must compete within a global higher education marketplace that has grown increasingly complex and competitive over the past ten years (Barnett, 2000; Brennan, Fedrowitz, Huber & Shah, 1999; Gumport, 2000). As universities throughout the world struggle to revamp their identity within an era focused on "commercializing higher education" (Noble, 1998a), software vendors are increasingly viewing the education market as a lucrative "industry" (Winner, 1997), potentially worth several hundred billion dollars in revenue (Lehman Brothers study quoted within Noble, 1998a). The growing popularity of ERP technology within today's uncertain educational environment has the potential to redefine intra-organizational operations and transform administrative functioning within many North American universities. In addition, if vendors are able to successfully market their US-model as a viable "industry solution" for multiple cultural contexts, higher education operations may become standardized worldwide (e.g., Educom and Oracle Corporation websites as well as the Newcastle Higher Education Symposium, 2000 on The Future of Universities).

Recent research found that the implementation of ERP technology creates a "concrete" central operating platform, which is at odds with the university's historically decentralized and autonomous structure (Cornford, 2000; Pollock, 1999). The current generation of ERP systems evolved from technology designed for the manufacturing industry (Klaus, Rosemann & Gable, 2000) and still embeds a template of "best business practices" based on a "traditional, hierarchical [and] functional view of organizations" (Soh et al., 2000), limiting the extent to which the technology can be customized to meet local organizational needs. The integrated, 'whole-house' view underpinning ERP technology forces previously independent university "fiefdoms" (Allen, Kern, Newman & O'Keefe, 2000) to adjust their working practices to a standardized template (Pollock, 1999; Allen & Kern, accepted for publication 2001).

Our case study follows one of the first ERP project initiatives within a traditional academic administration, a high-profile effort between an Ivy League university and Oracle Corporation who together contracted to develop and implement flagship technology. System modernization and business process redesign efforts were conducted within the key functional areas of financial management, human resources and payroll, and grants and contracts administration. The project scope was unprecedented for a historically self-directed university administration and the timing of the project meant external IT experts were entering a unique organizational domain. The research questions addressed in this study are: why are contentious, global ERP business systems being implemented within this distinctive setting? How do people cope with the introduction of

previously unknown political forces and how do these alien influences shape the outcome of the project?

The contentious nature of ERP project initiatives is well documented (Davenport, 2000; Kremers & Dissel, 2000; Markus, Tanis & Fenema, 2000) and it is rarely disputed that enterprise systems redraw organizational boundaries (Brehm, Heinzl & Markus, 2001; Davenport, 1998; Foremski, 1998; Willcocks & Sykes, 2000) and reorder organizational memory (Stein & Zwass, 1995). Through a distinctive use of theory we also hope to redraw boundaries by extending our understanding of the computer-mediated change processes that are so often the focus of IS research. We focus on the way in which an ERP project initiative changes not just the space/place dimension of where work is done and stored, but also the way in which choices made during the project impact the temporal features of work (Adam, 1995). The study foregrounds the social times experienced by the University, as its members traversed an unfamiliar project landscape and managed to negotiate some of their temporal working rhythms (Adam, 1995) into a major software vendors' 'global' technological standard. Our analysis provides an in-depth understanding of the political artistry involved in maneuvering through complex change by juxtaposing local priorities with powerful "other times" (Adam, 1995) to illustrate the complex negotiations involved in constructing a shared temporality necessary to localize an information system.

The paper is organized as follows: after the introduction we present a substantial section detailing the theoretical grounding of the study. We take particular care to explicate this aspect of the paper as we are using a distinctive conceptual context, which is relatively unfamiliar within information systems. This is then followed by our research methodology describing our data gathering and method of analysis. The next section of the paper provides the case description. We then present our analysis, which we have organized into three *narratives of the unknown* belonging to powerful networks involved in the project. The paper concludes with a discussion of the most significant implications of our findings for research and practice.

2. Theoretical grounding

In this section we outline the theoretical grounding of the paper, introducing the themes of time and translation through the work of Barbara Adam (1990, 1995, 1998), and authors from the social studies of science community (Callon, 1986; Latour, 1987). We chose conceptual tools from actor-network theory because we were inspired by work conducted around them on information infrastructures, like ERP, by an IS community of scholars (Hanseth & Braa, 1998, 1999; Hanseth, Ciborra & Braa, accepted for publication 2001; Montiero, 2000). We begin by reflecting upon their analysis and suggesting another perspective on ERP infrastructures to broaden the debate with information systems research.

Our critique of this literature is that, whilst they have generated important debate around the inscription of IT standards, their concentrated focus and particular use of language could give the impression that technology is the most significant locus from which to study infrastructure. They have tended to truncate human stories and the socio-political processes intertwined in the actor-networks. An explicit shift to the *process view* of work practices inscribed within enterprise resource planning implies a re-ordering of our social times that can have far reaching consequences including loss of expertise, pressurized workplaces or imposition of problematic,

static standards, but this has remained a background implication of computer-mediated change processes. Ironically, since the literature on ERP is usually centred around programmes of widespread organizational change, there is little discussion of temporality and the dynamics involved in achieving order within the work practices of those who lives are entangled with the ERP event. We would suggest that this blinds these authors to the profound ways in which interpretive flexibility can be implicated in the translation of strategic intentions into everyday practice, everyday work times.

The importance of time in enhancing our understanding of organizational processes has been recognized (Butler, 1995; Das, 1987, 1992; Lee & Liebenau, 1999, 2000), though it still remains one of the least researched dimensions of business strategy implementation (Ramaprasad & Stone, 1992). We join with Mosakowski and Earley (2000) in calling for broader consideration of multifaceted, subjective views of time and conclude that researchers and managers alike need to confront their implicit temporal assumptions and view their expanding world through different temporal lenses. Whilst we acknowledge the interesting work that has been conducted within the information systems' Heideggarian community, which regards temporality as fundamental to existence, outside of clock-time (Ciborra, 1999), this paper adopts a different stance. We position our work alongside authors, such as Barbara Adam (1990, 1995, 1998) suggesting time as an important, and much ignored, category or theme in the organization of social life. Our aim is to reflect upon how we can use the concept of multiple times as an 'analytical lens' to re-draw the boundaries of organisational IS issues, revealing potentially interesting insights for theory and practice.

Time is a deeply taken-for-granted aspect of social life, it is not an 'out there' phenomenon like a fence, but permeates our social worlds. Schops and Bergman suggest that it is the positivist search for invariant repetition and pattern that has pushed time into neutrality and means that we don't have the eyes to deal with human time. One of the challenges associated with writing about time is that brief descriptions do not communicate the complexity and pervasiveness of the concept in our daily lives. As Adam (1995) notes, the dominance of clock time in contemporary Western culture makes it difficult to conceptualize other features of time which are less concrete, but none-the-less prevalent, in our daily lives.

Adam (1990, 1995) acknowledges that clock time is an important aspect of contemporary society, but maintains that it always needs to be held in relation to other times; the academic context illuminates this concept of multiple times nicely. The academic calendar textures the year, drawing our attention to each new fall, providing familiar traditions and rituals. Graduation ceremonies roll by; yet in their repetition we find difference, as every person, clique, and year group imbue the events with their own meaning. The slow rhythms of research and cycles of publication are set apart from the 'hurly burly' of business times but, especially in information systems, move in awareness of each other. Career expectancy has tended to follow distinctive work times with formal job-for-life, tenured positions among academics and informal, long-term networks among administrators. These form, what Barbara Adam (1998) might call the 'timescape' of academic lifeworlds.

The experience of 'other' or 'multiple' times in the information systems literature is rare (notable exceptions are Orlikowski & Yates, 1999; Sahay, 1999) as is work that makes explicit the

temporal assumptions of actors and how they influence corporate strategy (examples would be Clark, 1985; Das, 1987; Mosakowski & Earley, 2000). The imposition of clock time as a means of implementing and measuring the success of plans, and strategies like ERP, is also not a neutral process. Clock-time is 'fundamentally embedded in an understanding of the structural relations of power, normative structures, and the negotiated interactions of social life' (Clark, 1985; Harvey, 1989; Adam, 1990). An awareness of 'whose' times we are living by is an evocative method of 'bringing to view' the multiple times that we experience and their relative weight on our sense-making.

As we have summarized in table one, our case study of ERP transports the reader to a particular period in the history of academic institutions in the United States, and temporal features that underpin the prestige associated with an Ivy League university. The steady long careers of university administrators came into conflict with intellectual trends toward Y2K global business solutions like ERP; elite higher education institutions were no longer able to ignore the compelling urgency underpinning powerful corporate approaches to accounting and regulation. Entrenched time-honored routines and procedures came head-to-head with process-view projects, as the University in our case study leapt at the opportunity to lead IT innovation in academia. As Barbara Adam (1995) suggests, we are called upon to find a way of thinking theoretically about 'resonances and multiple readjustments where the old figures in the new and the new modifies the old'.

Foregrounding the process by which 'foreign' times become negotiated into local times, is an effective vehicle for describing the way in which standard technology becomes part of the furniture; a local resident. Adam's (1995) discussion of the "global electronic embrace" highlights the power of technology to dominate local, temporal contexts. The global world becomes a local one through the instantaneity of electronic communication coupled with the simultaneity of networked information and communication technologies (Adam, 1995). Local temporalities are unduly influenced by decisions being made across the globe and the effect is that local futures are recursively defined through the observation of 'our time' in relation to others. The organizational zeitgeist of late 1990s is captured by stories of ERP and the Y2K millennium bug. Their electronic embrace sent ripples around the world communicating the political rhetoric of these trends across time and space (Adam, 1995). The result was a global trend for Y2K compliant, ERP technology that is used to try and supercede local computing strategies and grassroots temporalities.

Porter (2001) recognizes the organizational trend away from local temporalities in favor of standardizing technologies like ERP and the internet and he primes us for a backlash against global operating strategies when he calls for business leaders to jump off their current bandwagon and revive localization efforts and in so doing, regain competitive advantage. We explore Porter's (2001) line of argument, proposing that the electronic embrace of ERP technology was strongly felt within the University we studied and yet, the strength of its grip loosened over time as the vendor's 'global' standard became interwoven with strong, local temporalities. In preparation for our presentation of this analysis, the rest of this section outlines our time sensitive, actor network approach.

2.1 Actor-Network Theory

Actor-network theory (ANT) was originally conceived by Bruno Latour (1987) and Michel Callon (1986) as part of the field of science and technology studies (STS), which focuses on how the work of society is *accomplished* (Latour, 1999a). The proponents of this approach argue that human and non-human actors work together to create social environments and therefore, AN theoreticians advocate a broad sense of agency, and assign a symmetrical relationship to actors for purposes of analysis (Latour, 1999a). Adopting an actor-network perspective can help highlight transformations involved in forming, transforming and maintaining heterogeneous networks (Law, 1999a) before these activities become black boxed – hidden from observation (Vidgen & McMaster, 1996). Focusing on these processes foregrounds the emergent and progressive manner in which order is achieved and relationships are established (Monteiro, 2000).

2.2 Time and ANT

Our analysis draws primarily from the work of Latour (1999a) and Kavanagh and Araujo (1995) whose paper entitled *Chronigami*, is one of the only publications explicitly connecting temporal issues with actor-network theory. The authors employ origami, the craft of paper folding, as a metaphor to argue that the future becomes colonized through successive "trials of strength" (Kavanagh & Araujo, 1995). An origami artist creates a three-dimensional object from a series of folds made in one-dimensional paper. Similarly, in the temporal equivalent of chronigami, flat paper represents our 'taken-for-granted', social time (Adam, 1995), which becomes punctuated during change processes. This local time only regains its invisibility (Bowker & Star, 1999) – its flatness - by moving through complex negotiations with other times. Folds in the paper build on one another to create a complex, interconnected structure that is simultaneously similar and different to that with which the artist began. During periods of dramatic change, the constitutive nature of our taken-for-granted time is forever replaced, at first by a multi-dimensional and obviously foreign temporality and later, by a conflated, newly localized, taken-for-granted time. The seemingly one-dimensional nature of our local temporality is an achieved state that operates silently until thrown into high relief during negotiations with others.

During normal interactions, actors flip between different "temporal zones" (Kavanagh & Araujo, 1995) that are present within their lives while simultaneously trying to maintain their own, preferred temporality. For example, an accountant whose computerized tax calculation is presented to an external auditor, will flip between the foreign zones inscribed within her information system and held by the external auditor, while still directing the discussion based on her local, temporal working rhythms. However, during "trials of strength" (Kavanagh & Araujo, 1995) actors become enrolled in a power struggle where each vies for the dominance of their local temporality within the larger network by prescribing a vision for the future within a proposed "program of action" (Akrich & Latour, 1992). These programs act as 'scripts' (Akrich, 1992; Akrich & Latour, 1992; Law, 1997) that call upon allies from the past, present or future in an effort to persuade actors to subscribe to their version of the future and in so doing, adopt its embedded temporality (Kavanagh & Araujo, 1995; Latour, 1999a). In our example, the auditor's suspicion of an incorrect tax calculation results in a trial of strength between our main actors. The auditor, whose program of action is to increase the tax liability, employs a script that calls upon official regulations, previous tax records and his vast experience with similar organizations, to act out a narrative of the 'auditor as expert'. A successful translation of interests by the auditor results his temporality dominating both the computerized calculation method and the

accountant's working rhythms. Kavanagh and Araujo (1995) mark this shift in the power base as a "fold in time" where the future and the past are implicated by the outcome of the present moment.

This fold in time represents a stage in the creation of a phenomenon (whether it be an origami object, an information system or a redesigned work practice) and as such is positioned within a trajectory of change where it 'forms the basis for subsequent folds and provides the structure for what precedes it' (Latour, 1999a). The point being, that the construction of the future occurs not in isolation but rather as a result of movement in time. A dominant actor-network involved in a trial of strength during a particular moment in time will later be marked only by a fold in the wider network construction. For example, the fold in time marked by the change in the accountant's tax calculation makes reference to the negotiations preceding it and also impacts the future negotiations of their network. In addition this fold may impact the individual actors as they flip between their various work responsibilities and maneuver between various network temporalities. Inevitably, as the accountant moves through her different working roles, she may be influenced by outcome of the contentious tax network. However, only "specimens" or "representatives" (Latour, 1999a) are brought forward in time as delegate actors (Walsham, 1997) or inscriptions (Akrich, 1992; Akrich & Latour, 1992) that refer to the physically absent whole. Whilst the auditor is left behind, his interests are inscribed within the accountant's technological tools. This process of abstraction creates room for the development of new and different understandings (Latour, 1999a). It is precisely the connections between what is abandoned, transported over time, and created during each stage of transformation that provides insight about the trajectory of change processes.

The interconnectedness of networks illuminates the potential for network paths to become standardized, limiting the range of choices that can be made, and in turn, creating a diffuse time zone with strong qualities of durability (Kavanagh & Araujo, 1995). However, network stability is tenuous because alternative temporal working rhythms are offered by opposing collectives and actors can become recalcitrant (Latour, 1999b), choosing to align themselves with another (Callon, 1991). The goal, therefore, is to constrain this recalcitrance by limiting actors' choices through the creation of a relatively irreversible (Callon, 1991) network that progressively inscribes (Akrich & Latour, 1992) its preferred temporality within technological artifacts, software, routines, norms and practices. The origami artist embeds her temporality within the object by making successive paper folds based upon her program of action (Akrich & Latour, 1992). She moves forward and backward in time, conscripting (Akrich & Latour, 1992) past events and envisioning future scenarios in order to help her decision making in the present moment and propel her toward the desired outcome. Similarly actors involved in change efforts reflect upon previous choices, consider current options, and attempt to create folds in time that will secure their preferred future.

This highly progressive and non-linear process of translation illustrates the way in which small, punctuated moments are interwoven to affect change and result in the future becoming colonized through a series of seemingly innocuous, past events (Kavanagh & Araujo, 1995). This study focused on gathering narratives from diverse actors, over time, as they articulated version of events during important trials of strength. This approach highlighted how disparate actor-networks imbued with multiple temporal features, became interconnected as each vied for a

dominant position during the ERP project initiative. Law (1997) calls for actor-network researchers to move away from what he sees as analyses that construct an ordered representation of an actor-network that implies linearity and rationality as the dominate mode of change. Much IS research employs ANT as a theoretical foundation, but their doesn't yet exist in-depth, narrative research of an ERP project initiative that analyzes actor-networks through a temporally sensitive lens. In the next section we outline our narrative research methodology, which together with our novel theoretical lens attempts to answer Law's (1997) call for research that embraces the margins of collectives rather than attempting to artificially, "draw things together" (Latour, 1990).

3. Research Methodology

This research study adopts an interpretive methodology (Walsham, 1993; Orlikowski & Baroudi, 1991) supported by a qualitative research approach and focusing on a longitudinal case study. Interpretive researchers take the ontological position that reality is socially constructed and can be articulated as a result of human sense making activities on the part of participants and researchers (Walsham, 1993). Access to these interpretations is gained through the collection and analysis of language, symbols and artifacts (Klein & Myers, 1999). Our approach privileges language as the medium through which to understand the research context, and is supported by actor-network theoreticians who agree that narrative accounts help researchers gain access to the situated explanations of actors involved in network transformations (Callon, 1991; Latour, 1999a). When gathering and analyzing interview data, the aim is not to find the interviewee/s who gave the answer closest to the truth, but rather to understand the processes and patterns revealed in multiple interpretations. Narratives tend to be constructed as a convincing explanation of 'why things are the way they are' (Bruner, 1986, 1990; Czarniawska, 1998).

This research was conducted at an Ivy League university, which will be referred to by the anonym 'Ivy' in order to evoke an archetype through which readers can relate their experiences. One hundred and twenty interviews were conducted with forty-two project members and the wider university community. The majority of the interviews followed the narrative interviewing (NI) convention, which provides a temporal frame of reference (for example, "Describe the last project phase to me.") and then allows the interviewees to narrate, without interruption, their interpretations of important moments of negotiation in front of them at that time (Bauer, 1996). All the interviews were tape-recorded and verbatim transcripts were produced which facilitated the process of analysis (Riessman, 1993). In addition, we took detailed notes during and after all interviews to supplement the transcripts with information about pre/post interview banter, non-verbal cues, and the interviewers interpretation of events. Throughout the fieldwork we observed critical meetings and collected internal and external documents related to the project, which were analyzed as other organizational narratives.

Regular intervals of intensive fieldwork included consistent repeat interviews with actors. Important issues and actors referred to in narrative accounts set the agenda guiding us to the next round of interviews. This allowed us to gain multiple perspectives by interviewing not only organizational allies but also controversial actors who may have otherwise remained 'silent voices' (Star, 1991). When a reference was made to a group, or to non-human actors, the researchers would arrange to interview a delegate actor (see Adam, 1995; Pouloudi & Whitley, 2000 for further discussion of technology speaking through human delegates. See Callon, 1991

regarding language as a window into delegate roles). This incremental and participant-led process meant that the researchers took up opportunities to reach interviewees and collect narratives that reflect their *in situ* sense-making and rhetorical perspectives.

Any collection of narratives is likely to be partial; on a practical level one cannot collect data all the time, from everyone. However, when abstracting from the empirical material the researchers found that the majority of narratives clustered around important political processes occurring at the time. For example, impending deadlines, user group requirements or controversial work practices. The analysis of these narratives highlighted the variety of perspectives that existed within Ivy at a given moment in time and we organized them into trials of strength to illuminate the socio-technical processes at work. These storylines focused on resolving an unknown future and took us 'backstage' to provide insights into the complex processes of socio-political negotiation whereby conflicting interests worked to colonize organizational reality.

We often found that interviewees would not want to discuss the issues that they had made the agenda of the last interview, since in their minds 'the world had moved on'. What had dominated their focus at one point in time was now, in the words of one interviewee "a done deal"; what had been an open controversy during a certain period had become black boxed (Vidgen & McMaster, 1996) and a matter of fact (Latour, 1999a) for the interviewee. This is directly linked to the principle of emergence (Adam, 1995), where the present is the only locus of reality, and as the present emerges we make sense of it, adjusting our interpretation of the past and future accordingly. For example, as we began the last phase of interviews, one project team leader said that she would be "fascinated" to read her own transcripts from interviews over the last two years, because her understanding of the project, and what it meant to Ivy University, had changed so much over time that she actually couldn't remember how she had made sense of it previously. A key reason for this is that, understandably, the temporal frame of interest to the interviewee tends to be radically different from the researcher.

The juxtaposition between our academic time zone and that of the frenetic project management world highlighted the importance of moving beyond a snapshot actor-network analysis or a retrospective account of change based on interviews from a discrete period in time. We developed a more subtle understanding of network dynamics and project work through our analysis of the interconnectedness of each situated trial of strength. In the next section the empirical material is presented in the form of a case study. Constructing a case study description from narrative data can be challenging; whose narrative does one privilege? How does one ensure that the personal voice of the interviewees speaks through the text? The researchers take responsibility for 'authoring' the version of narrative that is read. It inevitably reflects their sense-making process to a certain extent, albeit one that has representativeness as its goal. The account that follows is, therefore, a necessarily selective, crafted version of the case which serves as background and ‘base camp’ for the presentation of the analysis.

4. Description of empirical material: Ivy University’s project initiative

The Vice President (VP) for Finance and Administration was newly arrived at the University when he began communicating to a core group of middle managers his vision to “partner with industry in order to create an administrative center of excellence, putting the school on the map and creating a state of the art system" (interview with VP). ERP software companies were

seeking to quickly penetrate untapped markets in order to widen their customer base by selling Y2K compliant technology. Several vendors approached Ivy about developing an "industry specific solution" (interview with project manager) that could be sold to universities worldwide. The VP was eager to have Ivy chosen as the model organization over its rival institutions and when offered the opportunity, University officers unanimously approved the initiative.

Ivy created an alliance with Oracle Corporation to become their "showcase customer" (contractual documentation, May, 1996) in order to develop and implement flagship technology. The choice to work with a single ERP vendor was predicated on Oracle's interest in developing a grants management capability that did not exist in their product line. Ivy, like most higher educational research institutions, needed the ability to track multiple funding sources for a particular project as well as multiple project destinations for single funding sources. This "project accounting" (multiple interviews with project members) functionality was quite complex to integrate within an ERP suite and the vendor required Ivy's expertise if they were to be successful. In late 1996, the University Provost and VP officially announced the project initiative to the Ivy community.

During this time the project structure formed and a leader with experience implementing ERP software in large business organizations was hired to guide the initiative. However, his inexperience with university operations meant that day-to-day leadership of the initiative was driven by the VP's core group of middle managers, the majority of whom were considered functional business experts with only a cursory understanding of ERP technology. The development priorities of Oracle were to modify existing ERP technology quickly and inexpensively while the core group spent time considering possible business process changes that would support the project accounting model. They were later criticized for being focused "30,000 feet above sea-level" and "not opening the box and installing the software to see what it did" (interview with technical director).

Two years into the project, the rapid approach of Y2K led the VP to secure local ERP expertise by hiring a technical Director of Administrative Systems. The VP told the Director that his number one priority was to "meet the Y2K fiscal year deadline - no matter what" (interview with Director). The VP was so concerned about Oracle's development delays that he traveled three-thousand miles by plane to their corporate headquarters to inform top management that the partnership would cease if the custom ERP modules were not delivered in a timely manner and with high functionality. Ivy received 'bare bones' technology in time for going live but this meant that only "essential" (multiple interviews with team leaders) ERP functionality was operational on the first day of the new fiscal year. What was previously supposed to be a single, big-bang implementation was re-defined by the project team as having multiple phases with the remaining work to be completed during 'phase-two' implementation.

While a small group of departmental end-users were consulted throughout the initiative, the phase-one system very much reflected the interests of Oracle and the VP's core group of managers. In an effort to illustrate this shaping process we focus on the transition from phase-one into phase-two of the project implementation and use the example of the Principle Investigator (PI) Report, to highlight relevant issues. The PI Report illustrates the extent to which the ERP project initiative was driven by the core group's agenda, AND despite the

promise of "higher quality administrative services to faculty, students, staff, alumni, donors, and sponsors" (official Ivy announcement of initiative, October, 1996), neglected the wider University community.

4.1 The Principle Investigator Report

Faculty administrators provide the vital link between academic agendas and University reporting requirements. As direct consumers of the phase-one system, they found themselves unable to provide faculty, who were principle investigators (PIs) on grants, with a report detailing their financial commitments and could not answer the fundamental question 'How much money do I have left to spend?'. Suddenly, a group who had been told to expect a "reduction in hassle factor" (interview with faculty member) as a result of the new system, felt unable to accomplish key aspects of their job.

Faculty and their administrators joined together and met with the VP. They demanded that the legacy system which generated the 'old world' PI Report remain live until new tools were developed as part of phase-two implementation. This compromise was particularly hard for the project team to accept since from their perspective the PI Report represented an outdated mindset in conflict with the 'new world' project accounting model. The VP's core group had purposely created a system that did not allow for tracking financial commitments to the penny. Rather, they felt that faculty should be taught to prefer reports that presented their funds based on time-phased spending scenarios. A senior financial manager bluntly articulates this:

> 'I would say that the mentality that we've had…for managing is **primitive** to say the best and it's *very* old-fashioned…the corporate world left it many years ago…Many faculty…think of things **fundamentally wrong**…we want to move people towards a management model where we're going to ask [them] to put together a [time-phased] business plan'

However, the project team quickly realized an important omission in their development priorities for the phase-one system. The core group had deemed the time-phased reporting tools non-essential and re-scheduled them as a phase-two deliverable. Once the team realized their error in judgment, the legacy system concession had to be allowed.

The project team remained at the mercy of Oracle to deliver ERP functionality that supported a viable time-phased reporting environment. Until that time, their immediate goal was to create a temporary ERP solution as quickly as possible. The project team shifted phase-two development priorities and took a crude intermediary step in which the old style PI Report was temporarily bolted onto the ERP system. They then shut down the legacy system and forced a user migration to the new technology. However, faculty administrative staff found the ERP process cumbersome and inefficient and as a result, a new wave of shadow systems emerged.

The core group entered into an unexpected back-and-forth process of report development with faculty but remained unable to completely break the hold of the 'old world' shadow systems. A year and a half after going live with the phase-one system, the majority of faculty administrators still import data from the ERP system into customized spreadsheets that re-create the faculty PI Report.

Despite the faculty's success in achieving compromise on this issue, over time the PI Report has appeared more and more like a 'border skirmish', rather than a revolution. The investment in the project initiative has grown so large that the ERP system as a whole is indisputable. Issues such as the PI Report are being 'talked away' in the dominant success stories that are taking place:

> 'The VP, who was the father of this project…was willing to compromise on the strategic goals that he wanted to achieve to get to the end game - which was - **to get it done**…more than anything else, failure is **not** an option! Regardless of whether its *pretty* and whether various people are *happy* with it - **its got to get done**! The project couldn't be a failure.' (Technical Director of Administrative Systems)

So, we argue that this is not just a story about the powerful 'winning'; that would be far too straightforward. Although the ERP will become 'part of the furniture' at Ivy, it does not resemble its original definition; instead its design, use and detail will reflect to varying degrees the constitution of interests being articulated within the context of its development. In the next section we discuss how three *narratives of the unknown* influenced the way in which the technology was modified, in order to create a local information system.

5. Analysis

This study constructs three *narratives of the unknown* each belonging to a powerful network that came to dominate at different moments in time during the project initiative. The researchers argue that these actors became involved in trials of strength (Kavanagh and Araujo, 1995) which in turn influenced both the university's choice to implement a standard ERP package and allowed it to be compromised. Together, these folds in time (Kavanagh and Araujo, 1995) illustrate the way in which collectives influenced the temporality and texture of the ERP system. Our analysis begins with the presentation of the VP's network, whose narrative of a *global unknown* impacted the commissioning of the ERP project, setting in motion a powerful temporality that would influence Ivy's future. This is followed by the project team's narrative of a *collective unknown*, which, together with the VP's collective, further colonized Ivy's future through the creation of a durable, boundary-crossing network that imposed upon the working rhythms of its administrative staff. The final subsection highlights the faculty network whose narrative delayed the localization of the ERP technology by negotiating a voice for the *local unknown* which had been relegated to the periphery during the project initiative.

5.1 The VP's Network: A Global Unknown

The horizon of the 1990's was overshadowed by fears of computer viruses associated with Y2K, the hubris of the 'internet economy' and enterprise-wide organizational transformation (see Financial Times, 1999). Wide currents of change toward the automation and "commercialization of higher education" (Noble, 1998a, b) existed as quite influential narratives within the educational context of the US (e.g., Noble, 1998a, b; Winner, 1997). Software vendors, consultants and university administrators, "hoping to get a piece of the commercial action…giving their institutions a fashionable forward-looking image" (Noble, 1998a), are flipping between time zones and connecting previously divergent networks, order to develop powerful, strategic alliances. Together the network will attempt to colonize an unknown future in light of advances in computer-mediated learning and integrated technological infrastructures (Agre, 2000; Cornford, 2000; Noble, 1998a, b; Silver & Silver, 1997).

In 1996, a newly arrived VP was confronted by these powerful narratives and was charged with creating an infrastructure that would position Ivy against the litigious hazards and potential reputation risk posed by an uncertain environment. Historically within the University, IT decisions fell within the domain of the Chief Information Officer and his staff. However, this changed with the VPs program of action (Akrich & Latour, 1992) to position the university as an administrative leader by embracing recent technological trends that were dominating the corporate, business world. Rather than aligning himself with Ivy's diffuse network of grass roots development expertise, his agenda was to "partner with industry". The VP's break from tradition marked the beginning of a trial of strength (Kavanagh & Araujo, 1995) where he worked to enroll the University community into his prescribed temporality. The VP cultivated a powerful narrative that conscripted (Akrich & Latour, 1992) non-human actors, from the global networks in which he was enrolled, to provide sources of legitimacy for his perspective. No longer was it a story of 'just another IT system' rather, University leaders became enrolled into the VP's network through the belief that seeking outside expertise secured a prosperous future for them all.

Oracle's powerful sales narrative also conscripted Y2K, ERP media-hype and the future higher education 'industry' to cast doubt upon the reliability of Ivy's legacy system. Boardroom negotiations ushered in an 'additional temporal zone' (Kavanagh & Araujo, 1995); Ivy's local times were introduced to ERP's standard working rhythms (Adam, 1995). The VP's strategic vision drew together multiple time zones to combine leading-edge business logic and prestigious intellectual ethos with the aim of colonizing the *unknown global future*. It was presented to Ivy as an opportunity to set the global standard for academia.

The approval of a "strategic partnership" (interview with VP) by University officers marked a fold in time (Kavanagh & Araujo, 1995) where Ivy's future was being colonized based on the newly formed alliance with industry. Ivy's leaders acted as delegates for the larger University community, subscribing to the VP's narrative and lending a degree of stability (Callon, 1991) to his network by inscribing (Akrich, 1992; Akrich & Latour, 1992) the future within artifacts such as the contractual agreement, software license and initial seed funding. No longer were Ivy's administrators "masters of their own destiny" (interview with Director of Administrative Systems). Rather, the Ivy temporal frame would from then on be regarded in relation to other times. Ivy was "in bed with" (interview with team member) Oracle, for whom the higher education market represented a miniscule network alliance when compared to their total business agenda; and they were committed to implementing a technology that was not yet fully developed and which embedded a different temporal working rhythm.

The approval of the project initiative marked the beginning of what was commonly referred to as the "VP's vision" or his "number one baby" (multiple interviews with Ivy community). His strategic narrative was so powerful that it had the affect of black boxing (Vidgen & McMaster, 1996) the negotiations preceding the purchase of Oracle's ERP technology. The appropriateness of a standard software package for university operations was unquestioned, and took on "matter of fact" (Latour, 1999a) status within the organization. The irreversibility (Callon, 1991) of this network proved quite phenomenal over time as it maintained the enrollment of almost the entire University community who became unable to recall a time when alternatives to this vision existed.

The VP's program of action (Akrich & Latour, 1992) to create a center of administrative leadership had become scripted into the University's narrative of an unknown future. Ivy's enrollment into his network required that they leave behind an historically self-directed managerial and computing style in order to make room for an unknown future. The next subsection analyzes how the VP's network further colonized Ivy's future through the creation of a durable project network that successfully translated the disparate interests of different project narratives.

5.2 The Project Network: A Collective Unknown

Ivy opened its doors to actor-networks representing the alien ERP assumptions and timeframes of project, process and milestones. The external experts lacked contextual understanding of Ivy's ethos and workflow, making it difficult to develop a common basis for a collective, project team narrative. Ivy worked to inscribe a project mentality through the allocation of space, state-of-the-art technology and a generous financial budget. However, the creation of a project network required its constituent actors to learn how to flip between time zones in order to communicate with one another (Kavanagh & Araujo, 1995). A core group of Ivy's middle managers adapted their knowledge of embedded and embodied university work-times to a broader project temporality; in an attempt to translate both their own and other times into a shared "project time" (Kavanagh & Araujo, 1995). These efforts succeeded in opening a dialogue focused on developing "divergent knowledge" (Baskerville, Pawlowski & McLean, 2000) about one another's expert domains.

For the VP and his Ivy managers, the project became their top priority, subsuming previous commitments. The VP 'back filled' the permanent jobs of the core group, replacing the managers allowing them to leave behind a many of their pre-project, network alliances. While the managers conscripted past experiences to act as delegates (Walsham, 1997) in their discussions of the new context, the abstraction of practices allowed for a translated version of them to be brought to the ERP context. These "circulating references" (Latour, 1999a) helped Ivy's project team members make associations between past, present and future temporalities. However, for the ERP delegates, this was one small project network among many, whose temporal markers and commitments had to give way to more powerful networks concerned with macro-corporate goals of return on investment (ROI). These actors were less willing to 'make room' for the Ivy project collective and this led to trials of strength (Kavanagh & Araujo, 1995) between the various actors in a struggle to maintain preferred temporal priorities. The core group was constantly attempting further enrollment of ERP programs, whose temporal resources would often be pulled away elsewhere.

The transformation of Ivy was not all shaped by the work of external vendor 'conquistadors'. Rather, the fold in time (Kavanagh & Araujo, 1995) made by the project initiative was the result of a chain of transformations (Latour, 1999a) made during a series of trials of strength. Fueled by the VP's narrative of the University as an intellectual hotbed for both academic and managerial ideas, the core group thrived upon conceptualizing the future based on different scenarios. Through envisioning alternative folds in time, Ivy's "futures [were] continually being created and destroyed" (Kavanagh & Araujo, 1995). Employing circulating references (Latour, 1999a) helped the project team to move forward in time and hypothesize about the impact current decisions would have on the future collective. It was in the present moment, that the team was

deciding what would get transported over time and what would be created during each stage of transformation. Unfortunately, the team was less adept at systematically determining what would be abandoned in order to make room for the new Ivy temporality. A frequent phrase during the first two years of the initiative was "now is the time" (multiple interviews with team members), which was underpinned by a powerful narrative of organizational transformation that implied a fleeting 'window of opportunity'. The innovations brought to the table by Ivy team members were added to the development agenda, creating 'scope creep' and putting additional pressure on the already recalcitrant ERP project management timeframe.

With the approach of an immovable Y2K deadline, the VP became concerned with the project's progress. He decided to enhance the power of his local network by acquiring an Ivy technical director to subvert Oracle's hold over the University's future. This culminated in the VP's flight across multiple time zones (clock based and socially constructed) in an attempt to conscript (Akrich & Latour, 1992) Oracle and the ERP technology back onto his own political timeline. This trip triggered a compromise, whereby Oracle delivered generic modules by moving, what they defined as, non-essential, to a phase-two time zone that became added to the project plan.

The creation of the phase-one system resulted in another fold in time (Kavanagh & Araujo, 1995) that impacted the way in which Ivy's future would be colonized. While the project initiative had defined the 'right time' to inscribe (Akrich, 1992) the core group's priorities into the ERP, its members neglected important 'other times' (Adam, 1995) held by the wider university community. The VP and his core group had managed to create a durable, boundary-crossing network but had not yet been successful in embedding the technology as a local solution. The next subsection highlights the faculty network whose narrative delayed the localization of the ERP technology into the wider Ivy community by negotiating a voice for the *local unknown* which had been relegated to the periphery during the project initiative.

5.3 The Faculty Network: A Local Unknown

The temporal working rhythms (Adam, 1995) inscribed in the phase-one system were initially at odds with those of faculty and their administrative staff who refused to become enrolled within Ivy's new collective. Previously silent actors exhibited their recalcitrance through narratives of resistance during the first six months of the system's use. This prominent controversy is highlighted by the 'border skirmish' involving the PI Report. Users were not well positioned to opt out of the ERP system completely because by this time it was inscribed with the network interests of Oracle, the VP and the project team. The ERP system now represented a significant 'sunk cost' for the University whose narrative of the future was 'folded into' its success.

However, the focus of this controversy broke an implicit set of trust relationships between the project team and the wider University community. In addition it tested the irreversibility of the VP's original vision to shift Ivy toward a more corporate operating platform. Powerful faculty conscripted (Akrich & Latour, 1992) certain narratives from Ivy's past to use as delegate actors (Walsham, 1997) on their behalf in order to remind the VP of his official promise to improve University working rhythms for the entire community, through the new system. The faculty leveraged their own actor-network, to make their voices heard in the broader project narrative, and achieve tactical concessions in the flow of organizational strategy. The extent to which the

VP's vision and the project accounting model would become Ivy's dominant temporality was at stake.

The network of faculty interests enrolled enough powerful actors to conscript (Akrich & Latour, 1992) the VP and his project team, who without an alternative network solution in place, were forced to turn on the legacy system. The failure of the core group to envision this trial of strength (Kavanagh & Araujo, 1995) during the project initiative and negotiate faculty interests into the phase-one ERP system was an omission that had cost them powerful allies. Unable to conscript (Akrich & Latour, 1992) Oracle, whose post Y2K working tempo was itself an immutable mobile (Walsham, 2001), the team worked to increase the stability of their network through a series of quick, trials of strength (Kavanagh & Araujo, 1995). First the team inscribed (Akrich, 1992) the 'checkbook' temporality within the ERP system by creating a 'bolt-on' report generator. They then conscripted (Akrich & Latour, 1992) users into their network by closing down the legacy system and creating an obligatory passage point (Callon, 1986) through which they expected to enroll faculty interests. This trial of strength (Kavanagh & Araujo, 1995) succeeded in closing down the legacy system and the temporal working rhythms embedded within it, but failed to translate user interests.

The 'bolt on' remained unused by administrators who proposed an alternative program of action (Akrich & Latour, 1992) by moving through time to conscript (Akrich & Latour, 1992) actors from their past and pull them forward to the present. These circulating references (Latour, 1999a) helped administrators create shadow systems which translated basic accounting details from the ERP system into customized 'checkbook' reports. These systems were shared amongst actors within the faulty network and resulted in a grassroots network underpinned by Ivy's 'old world' temporality. This act of political recalcitrance (Latour, 1999b) delayed the acceptance of the ERP technology into the wider University community and it influenced the extent to which the system was localized. At the time of writing, the VP's core group of managers is still working to enroll faculty and administrative staff into the working rhythms of the time-phased business plan. The shadow systems inscribe the interests of a powerful alternative network and demand an important place within the Ivy University administration. However, the actors within this network still flip between their local time zones (Kavanagh & Araujo, 1995) and those inscribed (Akrich, 1992) within the ERP system in order to complete their job responsibilities making it twice as difficult for them to excel as valuable administrators. The working lives of long term Ivy employees are governed by the folds in time (Kavanagh & Araujo, 1995) that have been made and will change based on the chain of transformations (Latour, 1999a) that will occur in the future.

Although in some ERP implementation literature it is easy to get the impression that creating a locally accepted system is somehow a linear process and that ERP technology often controls the success or failure of a project, this research argues that it is rarely that neat and tidy. Rather, the implementation of standard ERP technology within Ivy foregrounds the political artistry involved in project initiatives. The localization process is conceptualized as an *achievement of order* (Monteiro, 2000) resulting from successive negotiations between actor-networks. As Latour (1999a) says, when their goals are frustrated actors take detours through the goals of others resulting in a general drift. The narrative of one becomes intermingled with the narrative of the other and the drift that emerges represents not solution two overtaking solution one, but a fusing

of multiple interests. Ivy's future is colonized to such an extent that the ERP is happening and the best that the faculty hoped to do was leverage a moment, create a fold in time (Kavanagh & Araujo, 1995), and get themselves written into Ivy's *narrative of an unknown future*.

6. Implications

Although ERP is entangled with programs of widespread organizational change, much literature is curiously quiet about how change occurs. Instead, information systems researchers tend to focus on the outcome of ERP implementation efforts either by conceptualizing the end result as a controllable variable that can be 'strategically aligned' (Bancroft 1996; Bancroft, Seip & Sprengel, 1998; Brown & Vessey, 1999; Parr, Shanks & Darke, 1999) or, by refuting this position and arguing that 'technology drifts' (Ciborra, 1996) thereby making futile, any attempts to control the outcome of IS projects (Ciborra, 1998, 2000; Farbey, Land and Target, 1995). While this study broadly aligns itself with the latter approach, we argue that acknowledging an information system as a product of 'drifting', socio-technical negotiations, provides only a partial understanding of change. This study moves beyond the terminology and 'critical success factors' associated with project outcomes in order to understand how communities manage to negotiate a platform for their local agenda in the midst of powerful, conflicting networks.

IS project initiatives are not discrete events, rather, history is being formed everyday and in this way, so too is the 'foreign IS' subtly becoming accepted as a 'local resident'. As Bowker and Star (1999) highlight, researchers should focus on understanding the process by which 'taken-for-granted' standards, such as those embedded within ERP systems, acquire their status. Researchers who take snapshots of organizations may well gather important data illuminating current issues, or reflections on the past, that convey the distillation of experience. This may be valuable and contribute to a 'cumulative wisdom' about IS change efforts. However, the nature of project work means that actors are frequently so thoroughly enrolled that they can no longer 'open the black box' or revive the controversies and complexity that transported them to the present.

Therefore, an important goal of this study was to illuminate situated and reflexive shaping processes as they unfolded over time, by considering Ivy's ERP project not as single event but as a collection of more detailed negotiations between both human and non-human actors. Gathering longitudinal narratives uncovered the political processes fundamental to project work before these dynamics became masked through the standardization of enterprise-wide work practices. Latour (1999a) notes that successive "chain[s] of transformations…link us to an aligned, transformed [and] constructed world" (Latour, 1999a). Foregrounding the interconnectivity of heterogeneous networks highlights stories of actors as they worked to localize standard ERP technology within a traditional university administration. By doing so, we sought to develop our understanding of actors traverse uncertain project landscapes, and how choices made during one moment in time, impact later opportunities.

For example, Ivy faculty failed to become enrolled by project management during the initial phases of the change initiative. University leaders specifically designed a series of poorly attended, ERP information sessions for their academic community. The lack of faculty interest at that moment in time was interpreted by the project team as apathy for the entire process. In actuality, Ivy's academicians recognized their lack of knowledge about University governance

activities and ERP technology and chose to act "as if" they trusted administrative experts to guide the institution's future (Wynne, 1996). It was only when the faculty perceived their personal working rhythms to be at risk, that they expressed their dissatisfaction with the proposed IS and worked to strategically position themselves by moving from the margins of the initiative, forcing a shift in organizational boundaries. This repositioning led to profound post-implementation challenges that upset interpersonal relationships, increased the project budget and delayed the localization of the ERP system. Project leaders were resentful of faculty blaming them for an '11th hour' interest, rather than a dedicated commitment to the change effort. We argue that "as if" trust is a regular feature of project work and silence should not be mistaken for compliance or relinquishment of ownership by 'lay persons' to the perceived expert (Wynne, 1996). Rather, we suggest participatory systems development requires project leaders to acknowledge the dormant politics of those exhibiting as-if trust and intuit the appropriate timing for soliciting their perspectives and garnering support.

Similarly, IS researchers and practitioners will benefit from an increased awareness of ERP technology as only one of many alien influences whose presence during project initiatives, impacts the way in which local actors negotiate an organizational future. We have illustrated that the future is colonized through a series of events that together culminate in a reality that is both similar and different to the past. Actors involved in trails of strength, move through time evaluating what will be transported into the future and what will remain behind. Organizational leaders attempting to colonize a preferred future will benefit from recognizing the situated and progressive nature of network dynamics. In addition, employees would gain from recognizing that others are often responsible for colonizing their future. As Bowker and Star (1999) note:

> "Each standard and each category [embedded within the local ERP] valorizes some point of view and silences another. This is not inherently a bad thing – indeed it is inescapable. But it is an ethical choice, and as such it is dangerous – not bad, but dangerous." (pp. 5-6)

Stable organizational reality relies not only on securing a particular vision during the project initiative, but also maintaining the 'invisibility' of alternative perspectives. This is powerfully illustrated in the show of strength made by Ivy faculty who demanded an explanation for why their agenda was 'written out' of the ERP system. These recalcitrant actors 'broke the silence' upon which the stability of the phase-one system was resting and exposed the politics underpinning the choices made by the project team. In direct contrast the more common interpretation of ERP as uncontrollable - "everybody's enemy by resisting all organizational change" (Hanseth & Braa, 1998, p. 195), this example illustrates the strength of the local - the voice of the supposedly silenced - to overthrow the technological 'monster' (Monteiro, 1999).

Therefore, while it may be helpful to view the technology as an important foreign actor; an unknown, whose presence creates 'drift' and impacts localization efforts, the ERP's intervention cannot form the basis for understanding the complexity of a project initiative. Recent actor-network analyses (Ciborra, 2000; Hanseth & Braa, 1998, 1999; Hanseth et al., accepted for publication 2001) background other important processes of negotiation that occur during project initiatives and thereby act to skew our understanding of localization efforts. Researchers attempting to afford a symmetrical relationship to human and non-human actors have actually brought the technology into such high relief that their analyses whisper of technological

determinism (for further discussion see Webster, 1995). This perspective may unfairly skew readers interpretation of both IS project initiatives and enterprise-wide software solutions. We question ERP research that prioritizes the agency and role of technology and argue that such a focus may indicate researcher bias rather than actors' interpretation of reality. Our narrative methodology strives for a more balanced and longitudinal representation of IS change initiatives. The narratives gathered within Ivy University clearly directed us to multiple human and non-human actors whose importance within the project was foregrounded.

Managing enterprise-wide, IS change initiatives involves fluid and timely maneuvering between the perceived 'center' of activity and the margins where alternatives to the standard vision are being conceptualized. As Miller (1998) highlights, it is at the margins of a collective that boundaries are slowly redrawn and the seemingly invisible alternatives to normative practice gradually come to constitute the center. Project leaders should be aware of trials of strength amongst the most visible networks, while keeping an 'ear to the ground' in order to anticipate the emergence of narratives from previously silent collectives, vying for a voice within the larger project network. This study illustrates the importance of developing managerial skills across collectives; leaders who are able to mimic the scope and power felt by the 'electronic embrace' may have a chance to diffuse emergent and contingent political acts of recalcitrance by adopting a 'just-in-time' management approach.

Where organizational change is dramatic, as in the example of Ivy, project leaders should focus on the substantial representation of diverse actors within the project team. Project managers may benefit from adopting a temporally situated perspective which foregrounds the growing importance of alliance building skills, the development of cross boundary collectives within project initiatives and anticipates the emergent and interconnected nature of boundary shifting politics. Rather than a project horizon focused on the outcome of a complex change effort, we argue for a reframing of the 'lens'. Questions such as: 'what will we take with us from this stage of the project?', 'what will be left behind?' and 'what are the potential implications of these decisions?', may help highlight the multiple temporal viewpoints that exist within the organization and in turn, impact the relative success of its project initiative.

Creating a local information system from a 'global' software package presents unique challenges for universities as they struggle to make meaningful decisions in the face of an unknown. For many, implementing standard technology such as ERP requires multi-year project initiatives involving collaboration with disparate organizational networks and external experts. Not only are these alliances difficult to negotiate during the initial implementation project; they remain an important influence over local temporalities in the longer term because of system upgrades and maintenance contracts. The alliance between Ivy and Oracle helped create the vendor's "higher education industry solution" which is being marketed on their international web site as an appropriate package for universities across cultural and geographical contexts. This has implications not only for North American colleges and universities whose activities are quite diverse but also for institutions around the globe where the 'commercialization of education' (Noble, 1998a) is a far less familiar concept.

The Ivy ERP highlighted the way in which valuable cultural and operational practices were carried forward by dominant networks whilst others were left in the past. It will be interesting to

study the extension of this network chain by observing Oracle's attempt to spread their proposed 'solution' to higher education institutions worldwide. How will the balance between center and fiefdoms so common in university structures be redefined over time? What will be carried forward and what will be relinquished in order to make room for the future academic "industry"? The extent to which university administrative functions become standardized may lead us one step closer to realizing the ideology of education as a "business", where researchers, teachers, students and administrators are driven by market demands for specific and saleable knowledge (Winner, 1997). We propose a backlash against the anxious rush to the electronic embrace of technology and counsel a subtler and more creative approach to uncertainty and change. Our study challenges practitioners and IS researchers whose respective utopians and dystopian views of technological advancement, perpetuate a naiveté regarding the extent to which local agents are able to secure powerful resources are affect organizational change. As social scientists we call for additional research which focuses on the relationship between information systems and the trajectory of higher education in an effort to better understand and reflect upon 'how we wish to live' (Beck, 1992), before finding our preferred temporalities subsumed by those who have spoken for us and colonized their future within our academic lifeworld.

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The prestigious history that makes an Ivy League university
The local, embodied, embedded expert work times of university administration
A period of uncertain industry transformation
End of millennium Y2K panic
Individual biographies and careers
Intellectual trend toward global business solutions
Phase of technological maturity and diffusion of ERP
The time worlds of project and project teams
The ‘right time’ for change

Table one: Multiple and interpenetrating times present during the ERP project initiative