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Erica Wagner
Cornell University

Sue Newell
Bentley College

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MAKING SOFTWARE WORK: PRODUCING SOCIAL ORDER VIA PROBLEM SOLVING IN A TROUBLED ERP IMPLEMENTATION

Erica L. Wagner
School of Hotel Administration
Cornell University
Ithaca, NY U.S.A.
elw32@cornell.edu

Sue Newell
Department of Management
Bentley College
Waltham, MA U.S.A.
snewell@bentley.edu

Abstract

In this paper, we focus on making software work in practice, an important issue given the high failure rate that many companies experience with software products, especially ERP, the focus of this paper. We explore the ways that social order is produced to create a workable information system—accepted and used within the organization. We argue that there are many different ways people solve problems in projects and the practices may be characterized according to stable patterns of coordinated action where compromise is sought or common goals are worked toward. We focus on theories of social ordering in order to illuminate what was occurring at the case organization. More specifically, we examine how despite common aims within an organization there will be different stakeholder groups with unique goals and beliefs about how to achieve their objectives. To overcome these differences, the norm of reciprocity is often adopted in order to produce an orderly state. We look at contentious episodes experienced during an ERP implementation to illustrate the difficulty of trying to always achieve common aims and illustrate the way in which reciprocity helped to move the project forward at these points of conflict. This highlights the importance of establishing reciprocity during controversies where creating a "good enough" solution for all parties takes precedence over the agenda of one particular functional group.

Keywords: ERP, system implementation, failure, problem solving, power, case study research

Introduction

The concept of social ordering is central to understanding the adjudication of disputes from a legal perspective because it provides the foundation for understanding how individuals "come together to secure advantages for all participants" (Fuller 1978). The idea of working out a solution for all parties involved is one that has applicability within the information technology domain where implementation failure is common. In this paper, we are interested in how social order is produced by coordinated action and problem solving. Specifically, we explore the ways in which people solve problems during software projects and characterize the practices involved according to stable patterns of seeking compromise or working out/toward common goals. To this end, we look at two basic forms of social ordering, organization by common aims and organization by reciprocity, as a lens for exploring action and problem solving during a complex and at times troubled enterprise resource planning (ERP) project.

ERP software is designed to allow firms to integrate and streamline their business practices and information across the enterprise (Davenport 1998). This whole-house approach to computing is challenging for organizations to achieve because it requires the coordination of processes and data collection across stakeholder groups with different preferences and legacy systems (Wagner and Newell 2004). The trend for enterprise-wide systems such as ERP has extended to include all aspects of the value chain (i.e. Customer relationship management and supply chain management), together creating a market that is expected to grow to $31.4 billion by 2006 (Surmacz 2002). However, there is evidence to suggest that realizing the benefits of ERP is difficult (Shanks and

Seddon 2000). In fact, two-thirds of ERP projects are considered failures by the implementing organization,[1] which is why there has been considerable Information Systems research focused on ERP implementation (see, for example, Howcroft et al. 2004; Wegner et al. 2005). This research has provided analysis of the problems and critical success factors around ERP implementation, but has not considered this specifically from the perspective of social ordering. Given the importance of creating a new social order around the ERP, research focused on how IT projects "work out" would appear to be timely.

We focus on contentious episodes encountered during an ERP project and analyze how social order was produced, thereby allowing the initiative to move forward. Distinguishing forms of social ordering lies in considering the goals of those who seek a mutually advantageous position. Fuller (1978) argues that organization by common aims or reciprocity represent opposing ways in which problems are solved and goals achieved with the former being based on participants having the same goal and the latter on their wanting different things. In this paper, we explore problem solving through a longitudinal case study. The findings highlight several interesting ways in which progress is achieved. We characterize the practices that we observe as representing either patterns of common aims or reciprocity. In preparation for this analysis, we consider coordinated action during IT-enabled change initiatives as well as the nature of social ordering. This is followed by a description of the research methodology informing this study.

Coordinated Action

Embarking on an integrated computer-mediated organizational change initiative can introduce dramatic shifts to organizational culture both in terms of business practices, membership, reporting structures, and professional identity (Davenport 1998). Such organizational change creates a condition of interdependence, since the change will only be effective if parties in all affected departments embrace the initiative. Pfeffer and Salancik (1978, p. 40) define interdependence as existing "whenever one actor does not entirely control all of the conditions necessary for the achievement of an action or for obtaining the outcome desired from the action." During such times, it is important that those involved coordinate their thoughts, actions, practices, and goals (Boland et al. 1994). This is because individuals do not create change; rather it is through coordinated *action* that change takes place (Boland and Tenkasi 1995). Brunsson (1985) similarly emphasizes the importance of action. Action, for Brunsson, designates "activities other than the purely cognitive, and it cannot be expected to derive automatically from decisions, or choices, or problem-solving activities. Organizational action is accomplished by several organization members in collaboration" (p. 7). This need for coordination poses special problems in a university setting given their fiefdom-like structure where information systems have tended to develop organically to support the values of academic freedom and scientific separateness (Allen and Kern 2001; Cornford 2000; Pollock 1999) rather than coordination and control which is the central value behind ERP systems.

Coordinated action is accessible by studying various controversial moments over time with an emphasis on how such coordinated outcomes are (or are not) achieved (Boland and O'Leary 1991; Bruner 1990). It is argued that woven into individual stories of change are connections and politics that highlight the basis for coordination (Boland and Schultze 1996; Bruner 1990). We consider the basis of such coordination from the perspective of producing social ordering.

Forms of Social Ordering

As already discussed, organization by common aims or reciprocity are opposing ways in which people come together to seek a mutually advantageous position (Fuller 1978). In an organizational context it might be assumed that the best way to achieve change is through establishing common aims by articulating and getting buy-in to a common vision. However, while organizations are built on common aims, it is dangerous to assume, first, that all parties will want the same thing over time and, second, that if different goals emerge that it is just a matter of educating the dissenters so that they can "see the truth" (Fuller 1978, p. 361). Thus, the extent to which aims and goals are shared throughout an organization is variable. Especially in contexts of organizational change, where the status quo is threatened, there will be differences in goals *and* beliefs about how best to approach and solve a particular problem (Pfeffer 1992). This is the inevitable result of specialization since this means there are groups with different backgrounds and training and so different "thought worlds" (Dougherty 1992) who will, therefore, take different views of a situation.

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[1]The Standish Group's annual CHAOS report for 2001 (**http://www.standishgroup.com/**).

Given these differences, Fuller argues that it is important that one is skeptical of organizing through common aims. Instead, he argues one should consider what the other party wants and how to best negotiate with them:

> It is true...we may persuade the other fellow he wants something that he really does not...we at least try to make the fellow over so that he will want what we have to give him. We do not merely thrust something on him and say "Here it is." (p. 362).

This suggests that in such situations of interdependence and divergence of goals and beliefs, it will be necessary to use power and influence to get things done. Pfeffer (1992, p. 30) defines power as "the potential ability to influence behavior, to change the course of events, to overcome resistance, and to get people to do things that they would not otherwise do" and influence as "the processes, the actions, the behaviors through which this potential power is utilized and realized." If power and influence are not used, there will be a paralysis, reflecting "an inability to mobilize sufficient political support and resources to take action" (Pfeffer 1992, p. 4). While it may be possible to move forward through using hierarchical power to impose a particular decision, this will not in itself lead to successful problem-solving, since, as Pfeffer notes, "a decision by itself changes nothing" (p. 19). For example, while senior managers can dictate that a particular information system be implemented, this does not necessarily translate into information system use, since there are many ways in which users can resist using the IS, at least as it was intended (Bordreau and Robey 2005).

Other means must, therefore, be found to mobilize action in these situations of interdependence where groups have different goals and beliefs, and capitalizing on the norm of reciprocity is very important. "There is no free lunch," the oft-quoted saying, defines the norm of reciprocity which implies that we are obligated to future repayments of favors, gifts, invitations, etc. received from others (Gouldner 1960). This is different from a straightforward exchange, based on a market transaction, since the returned favor is not explicitly specified. Rather, the favor implies a diffuse, generalized obligation for repayment sometime in the future. This norm facilitates transactions between individuals and groups over time and is extremely important in facilitating organizational change (Pfeffer 1992). In a decision-making situation, it suggests that while each party must stand up for their goals and needs, they must at the same time be aware of the needs and goals of others because at some time in the future, each might want what the other party can give. Central to this form of working, then, is that each party involved has an understanding of what makes the other tick—their motivations and goals.

We recognize that both forms of social ordering are produced in any social environment and, therefore, during the ERP project under study here the presence of reciprocity does not negate the notion of common aims occurring within different pockets of the project. However, we have found that our analysis is facilitated by focusing on the form that dominated a particular controversy. We explore these forms of social ordering as a means for understanding how the goal of creating a working ERP is achieved. Our research question can thus be stated as follows: How is social order produced to create a workable ERP system?

Methodology

This study was designed from an interpretive perspective which emphasizes theory development resulting from the study of social actors and their attribution of meaning (Walsham 1993). In particular, we focus on the articulation of collective problem-solving activities during a problematic ERP implementation. An in-depth longitudinal case study was conducted between 1999 and 2000 in Ivy university. The conceptual ideas of Fuller (1978) were applied to the field data *post hoc*. This is in keeping with the interpretive approach to using theory as a "lens through which to view the world" sensitizing us to particular issues (Walsham 1993).

Evidence was collected from 129 narrative interviews conducted with 53 individuals. These interviews totaled nearly 200 hours of empirical data. Additional data sources included technical and official documentation, observation of weekly project meetings, informal conversations, and field researcher notes.

Not only did we seek to collect multiple types of data over time, we deliberately set out to gather evidence from a variety of stakeholders throughout the organization in order to gain diverse perspectives. The fieldwork protocol began with preliminary interviewing of project team members; transcripts were immediately produced and analyzed in terms of actors and issues that were raised during the interview. Appointments would be scheduled with the aforementioned individuals as a strategy for gathering multiple perspectives of the same event. In addition this method helped us develop a preliminary set of themes that were prevalent across transcripts. Importantly, both allies and antagonists were interviewed as a result of this protocol. Rather than being guided by the recommendations of interviewees on who to interview next, we let the stories themselves drive our interview schedule.

Once all transcripts were preliminarily coded, data analysis followed a two-pronged approach. First, content-based themes that were significant across manuscripts were determined. Second, we conceptualized multiple agencies of change and order that constituted the project over time. It is the latter that is of particular interest to this study because we were able to analyze the ways in which these interests were interconnected to provide insight into how coordinated outcomes were/were not achieved during the complex IT-enabled change initiative.

Case Description

Ivy is a large, prestigious research university in the United States governed by a provost and a president along with a board of directors. The administration is centrally controlled but relatively decentralized in terms of the degree of autonomy experienced by academic departments. As such, Ivy has historically struggled with duplication and inconsistency of administrative activities done locally and then reported on centrally. A decision was made in 1996 to modernize all administrative information systems through ERP software. Ivy chose to partner with Vision Corporation because of the strong financial management module which was felt to be the heart of all administrative activities. In addition, the vendor's desire to work with Ivy to convert its government/ public sector package into a higher education "solution" was attractive to Ivy, who wanted to be seen as an administrative leader of higher education institutions. Here we focus on the grants management portion of the ERP software, which was being developed as a new module that would integrate with the existing government package and in turn allow Vision to tap into the vertical higher education market.

The project structure was formed around functional teams, each with business and technical members who were mostly Ivy middle managers from central administration and whose permanent positions had been back-filled for the duration of the project. Although a project manager had been hired based on his ERP project experience in the manufacturing industry, his lack of higher education experience meant that he acted as a figurehead and the real authority lay within the teams and that each leader would communicate directly to the vice president in overall charge of the project when necessary. The project domain became an environment where significant changes were made to the ways in which work was to be done at the University. While highly opinionated in terms of the institution's future, the project teams had limited technical expertise. This lack of familiarity created an environment where the majority of time and effort was spent theorizing. Hands-on configuration was the domain of Ivy technical staff expected to liaise with vendor staff. However, Vision's technical experts were not on-site as often as the project teams expected, leaving team members working with an incomplete software suite and having to imagine how the grants and contracts module would be integrated.

Worried about the project's progress after a year of high-level theorizing, Ivy hired consultants to audit the readiness of the software for its scheduled "big bang" implementation in October 1998. Their findings caused Ivy to modify expectations and switch to a phased implementation strategy, adopting a revised deadline of July 1999 for the fully integrated suite. This date marked the beginning of Ivy's year 2000 fiscal calendar and as such it represented the deadline for retiring legacy systems at risk from the millennium bug. Ivy met its "drop dead date" in that the skeleton ERP was operational on the first day of the new fiscal year but the user interface and reporting environment still required significant development. The suboptimal roll-out of the ERP was complicated by user resistance to the grants and contracts design. The academic constituencies who had expectations of an improved working environment were unable to complete crucial administrative tasks. Faculty demanded changes in the ERP's design as well as interim support for their administrators whose workload increased dramatically in the ERP-enabled environment. For more than three years, the project team was involved in post-implementation design changes before receiving buy-in from the academic community. The chronology of events is graphically illustrated in the timeline presented in Figure 1.

Case Analysis

The case illustrates the challenges associated with maintaining forward momentum during the challenging times inherent to systems implementation and use. In the analysis that follows, we consider two contentious episodes that nearly caused the derailment of Ivy's ERP project and analyze what happened in each situation in terms of how social order was produced by coordinated action and problem solving. These episodes have been selected because they illustrate the kinds of factions that one might typically come in contact with during large software projects where multiple stakeholder groups are involved in the implementation. The first episode adopts an internal-external perspective, which is important to consider in light of the growing trend for contractual relationships between client organizations and external experts such as software vendors, management consultants, and application service providers. The second episode concentrates on the goals of different organizational groups
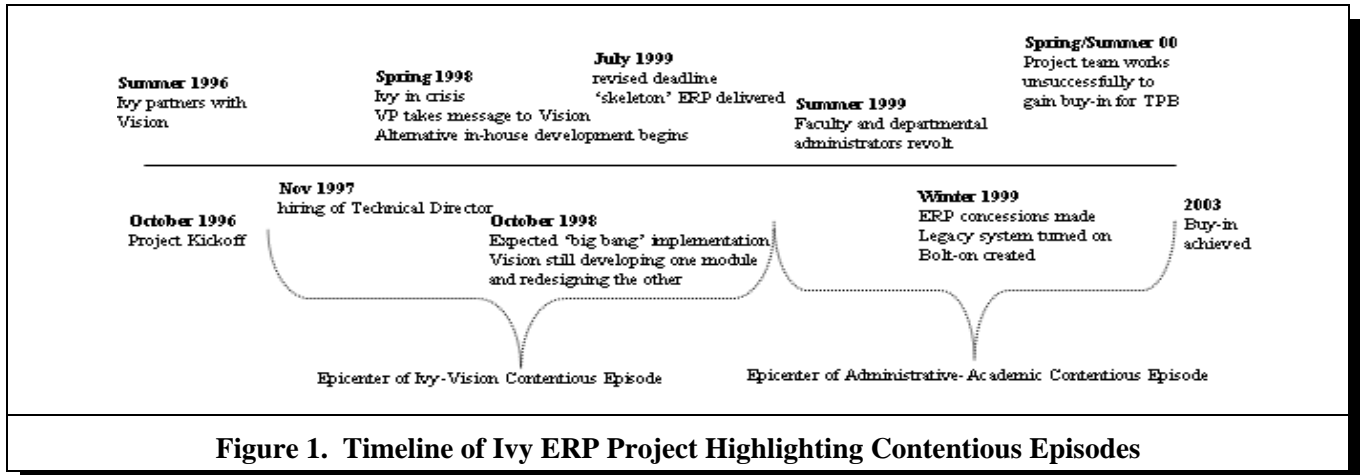
Figure 1. Timeline of Ivy ERP Project Highlighting Contentious Episodes

who share in the university mission but also have unique aims. Of course, in reality, in a project of this length and complexity, there were many episodes of contention. However, given our intent to explore episodes in-depth, using the rich qualitative material that has been collected, we have selected two episodes that are archetypal of the ways stakeholders solve problems in projects and so produce social order.

Ivy–Vision Goals

The Ivy–Vision strategic partnership was created to benefit both parties through the development of an ERP suite for higher education institutions. This suite would form the basis of Ivy's administrative infrastructure and would help Vision enter an untapped vertical market. Vision sought the industry expertise of Ivy in order to help the software vendor modify their government/public sector ERP product to meet university needs. Vision would then create two additional modules specific to the grants management process and the distribution of labor across different research projects that would be tested at Ivy. The result would be the creation of a new product in which both Ivy and Vision would continue to invest resources for developing and fine-tuning over time through migrations to new releases of the ERP product. Through coordinated action, Ivy and Vision were expecting to achieve this common aim because alone neither had all of the necessary skills to create a higher education enterprise solution.

However, during the first two years of the project, Vision didn't spend as much time at Ivy as the Ivy project teams expected:

> I had a sense that [Vision] didn't even staff this thing for a year...when I asked questions at a cocktail party like...how big is your staff now? [I'd learn]...it's up to two people. They would catch themselves and say, "No, no, no...we've got seven now." Then they'd reveal things like, "We assigned our first person in April '98."

Ivy felt the level of resources provided by Vision were inadequate and a misrepresentation of their agreement to work together. The partnership had created a condition of interdependence (Pfeffer and Salancik 1978) between the two parties and Ivy did not entirely control all of the conditions necessary to create the ERP product. In Vision's absence, Ivy floundered.

> Without the [Vision] guys here with us we were still talking philosophies and strategies...and had not even set up the system and figured out the decisions that needed to be made.

In the absence of Vision representatives, Ivy failed to produce action in Brunsson's sense because, despite their cognitive activities and attempts at problem solving, they were unable to effectively collaborate with Vision—a necessary player in the process. So the Ivy team did what it did best: coordinated thoughts, practices, and goals about how the university should be administratively organized. This time of theorizing was significant for team members because it illustrated that despite original buy-in to a common vision, the extent to which common aims (Fuller 1978) were produced was variable over time as illustrated by the differing methods each party took in order to meet the goal.

From Vision's perspective, Ivy represented one client within a small vertical market that had limited growth opportunities and they staffed the project to reflect this. Their approach to development was to modify the government package in the most efficient manner possible so that they could see the highest return on investment given the market potential.

> The thing about [Vision] is, they have made a commitment to higher ed but it's much harder than...they thought it was going to be because they thought we were much more like government than we really are....And when you look at [Vision], higher ed is such a small piece of it. They have made an investment and they continue to invest in this market but you have to wonder how long they're going to do that. There's only about 50 institutions that comprises the [U.S.] market.

In contrast, the project represented a major commitment for Ivy in terms of time and resources and was a substantial capital investment that was expected to have long term implications for the operation and governance of the university. A project leader reflects on this situation,

> The strategic development partnership was fun and rewarding but at the same time very stressful...the consumption of human capital is very high. It takes your best and brightest...they're not doing other things....Also it's a very risky implementation because you don't know what you're going to get —it's dependent on a future release—you're not quite sure at the last minute whether your partner's going to say, "sorry, I can only do five of these features"....It's almost like trying to fly a plane and you're not quite sure whether you're going to land in LA or Chicago. So you're constantly recharting your flight path.

It is not surprising that Ivy and Vision had different views of the situation, given that the former is a nonprofit organization seeking what is best for its constituencies and the latter, an international, publicly-traded software company operating from a market-based perspective. As Dougherty (1992) noted, backgrounds and training create different thought worlds that will result in variable interpretations and as such one should be skeptical of relying on common aims in order to achieve organizational stability.

When the original October 1998 deadline arrived, Vision was still developing one of the modules and decided to completely redesign the other. Their absence from the Ivy site coupled with the failure to produce tangible products lead Ivy team members to organize themselves more closely to one another and simultaneously reinterpret their relationship with Vision. Ivy began considering alternative ways to achieve its goal given its reliance on Vision: what did Vision want and how best should Ivy negotiate with them? It was clear that Vision needed from Ivy discipline expertise with regard to university grants management and Ivy team members began to realize that their modernization initiative was more complex because of the partnership with Vision due to the vendor's need to create a marketable product.

> We're going to have to find good ways to work together because [Vision] is committed to doing a pre-award [grant] system...because they want to market this product to higher education institutions and pre-award is an important part of the business. This is where we find we have the most duplication because we don't need a pre-award system. [Functional team member]

Ivy had a well-respected grants management office that managed the external funding process for faculty. This office sought to ensure that Ivy had as many successful grant applications as possible by assisting in the submission process and then managing the approval and receipt of funds on behalf of the principal investigators. For this service, the office charged faculty a fee off the top of their grant award. Ivy was happy with the current operations of this office and their accompanying information system; however, they lacked the ability to centrally manage the way in which faculty budgeted and spent their award dollars. So while Ivy would have preferred to leave pre-awards out of the scope of the ERP project, they realized that they were in a reciprocal relationship with Vision who saw pre- and post-award activities as parts of the same process, both of which were necessary to develop as part of a higher education solution that would be sold to research institutions. Ivy saw the potential to leverage their grants management expertise in the future in order to obligate (Gouldner 1960) Vision for repayment to Ivy sometime in the future.

As Ivy began to reinterpret their partnership with Vision seeking compromise, the vice president decided to mediate divergent goals and beliefs by using his power and influence to get things done. He began by exerting his power over the project and hired an enterprise computing expert as Technical Director of Administrative Systems whose charge was to stop waiting for Vision and "ramp up" the technical development in time for the Y2K deadline. In addition to refocusing the project team through strong leadership, the vice president and newly hired director felt that it was necessary to give Vision an ultimatum related to the higher education modules with which Ivy had yet to be presented. The Technical Director explains,

> We were in crisis in late Spring of '98. The grants management piece was simply not working and [the other module] had not even been delivered. And so it was very clear to me [and others] that there was no way we were going to meet the July '99 date [given] the state we were [at in] May of '98. That's the very first time...that we were going to tell [Vision] that we were going to chuck 'em on grants—that we were going to come up with an alternative strategy. That would have been very bad news for them because that's how they want[ed] to sell this market....So we went through the discipline of [asking] what would we do instead? And it was very ugly, very messy, not ideal—but we were prepared to do it. We really meant business—if they couldn't execute, we were not going to install.

Power relations are key to leveraging a reciprocal relationship between involved parties. Since a win-win situation is necessary to produce this form of social ordering, one must understand the goals of those involved and must have enough power to "change the course of events, to overcome resistance, and to get people to do things that they would not otherwise do" (Pfeffer 1992, p. 30). To this end the Ivy vice president had spent several years cultivating a relationship with Vision and was able to capitalize on this in order to better position Ivy at a vulnerable time.

> [The vice president] spent a significant amount of his time trying to make sure the project was successful by forging partnerships with [Vision]. So when we found ourselves in a situation where [Vision] was not proceeding in the direction that we wanted to, you know, [the vice president] had these senior relationships that really move[d] the project along.

The vice president was influential in achieving concessions from Vision because of his ability to mobilize Ivy resources toward alternative development activities during a crucial time when the project was experiencing paralysis. In-house technical expertise was mobilized.

> I had the geniuses working for me....I asked them to do the detailed homework and gave them full empowerment...so that we could create the development that had to be done...and that required taking the geniuses from other groups like the Warehouse [team] and making it happen. [Technical Director of Administrative Systems]

The vice president's personal visit to Vision headquarters indicated that there was indeed no free lunch available for the vendor but rather they had an obligation to repay Ivy for its commitment to developing the higher education product. While the project team "geniuses" continued to develop an alternative solution for grant and labor functionality, Vision produced what they called essential functionality in time for Ivy's fiscal year 2000. The suite they provided excluded one of the higher education modules.

> We're still fighting tooth and nail with [Vision] on [one module]. We had to customize it. But they understood and [the vice president] understood that all bets were off on these products if they could not execute on time. [Project team leader]

As is typical of organization by reciprocity, Vision understood both its own goals and that of Ivy and as such gave Ivy just enough of what it needed to continue the partnership. Vision delivered the skeleton ERP and Ivy chose not to drop the vendor as a development partner. As one project member notes, Ivy's implementation of ERP modernized administrative systems, but the strategic alliance also required new ways of organizing in an attempt to achieve order.

> The difference between now and before is we're not our own masters. Our code is provided by vendors who have their own agendas and timeframes....Unlike the days before, [Ivy] cannot dictate how it wants to do its business by itself.

To date, Ivy continues its partnership with Vision for strategic reasons.

> We've put a lot of time and resources into our relationship with [Vision] because we like the position that we're in, being able to drive the changes [in the higher education market]. We sent a team of people out to California for two weeks in June to do Beta testing on the [new] versions of those applications....It costs a lot of money to do that and it costs a lot of resource time but we think that it's worth it in the long run. [Team leader]

This quote illustrates Ivy's attempt to have power over Vision so that they can influence the design of the ERP software. Their continued involvement with the vendor is directly related to their own interests for a robust product which they understand will only be achieved if they are able to influence Vision's behavior and development trajectory by visiting the vendor and being involved in product functionality decisions.

This example of conflict between Ivy and Vision despite their strategic alliance illustrates very clearly that it is a mistake to assume that common aims will consistently produce social order within a software project and that problems can be resolved by appealing to individuals' sense of shared goals. Rather, we see here that what looked like common aims between Ivy and Vision at the beginning of the project tended to break down further along the road. This is because conflicting interests were also present at the same time as the common aim and these other interests overshadowed the shared goal. We further analyze these forms of social ordering in the next subsection, focusing on the aims of internal stakeholders.

Administration and Academic Goals

The common aim of creating an integrated information system that would position Ivy for 21st century administration held beneath it different interpretations of what that meant: institutional governance, seamless delivery of Ivy's research and teaching missions, streamlined and elegant business processes. These different interpretations of an overarching aim should not be surprising given that the organizational form of a university is designed to meet multiple agendas simultaneously with power being shared between central administration (president's line of responsibility) and academic programs (provost) (see Wagner and Newell 2004). One may not be able to force compliance of university groups with different backgrounds and training in the manner sometimes appropriate for a more hierarchically profit-driven enterprise. Instead, negotiation across interdependent parties is an important skill for university leaders because, while imposing power over another may work for a limited amount of time, any long-term solution will only result from finding a mutually agreed upon result (Pfeffer 1992). Ivy learned this lesson during their ERP project when at first the project team attempted to mandate the way grants management would be done by the academic enterprise only to later have to seek compromise through reciprocity in order to move the project out of paralysis.

During implementation, team members focused on developing an ERP that would ensure institutional governance and mediate financial and regulatory risk. The objective of the project was to professionalize the university's administrative practices. This effort was spearheaded by the Financial Management (FM) team leader.

> We have a 1.3 billion dollar operating budget and [we] can't afford to do things in an *ad hoc* way anymore...it's not comfortable to me that a bunch of tweedy academics get together and [manage grants] in a very soft way....I think certainly the motivation for having this more high-powered enterprise software is that [Ivy] has become more complex and we need better data. We need to make better decisions based on data...we're running a huge financial behemoth...higher ed has become an incredibly complicated business, even though we're not for profit.

Project members shared this team leader's aim and through coordinated action they purposely excluded legacy grants management practices from the enterprise system design in preference for a corporate accounting approach based on time-phased budgeting interpreted as more rigorous. The connections and politics that highlight the basis for coordination (Boland and Schultze 1996; Bruner 1990) are represented in the FM team leader's story.

> I would say that the mentality that we've had…for managing is primitive...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 toward a management model where we're going to ask [them] to put together a time-phased budget and management plan.

The FM team leader went on to liken the legacy commitment accounting approach to Quicken, a simplistic software program for the management of personal finances.

> If they don't like it, we ought to fire 'em—and get new users!...It's a…retreat…I taught Karate for many years—*you know what*? If you're afraid to fight, you'll never fight! Got to decide to get up there *and get hit*…[we're] spending *millions and millions of dollars* to go forward, not to *duplicate what we had*....[Ivy] needs more than a copy of Quicken for each grant - we have 4,000 grants...*we don't do that here any more*. I mean—*we just don't!*

The rhetoric of this story excludes the possibility of reciprocity in favor of squashing the old ways of working. In the interviewee's mind, everyone should be on the same page—sharing common aims—or they have no place at the university. The content and tone of his message illustrates little respect for the different university thought worlds, instead suppressing interdependence in favor of forcing change. The team leader makes a mistake when he equates his *decision* about the best way to manage grants through time-phasing with the ability to create coordinated action (Brunnson 1985).

When the ERP was rolled out to the Ivy community, it was met with resistance from academic administrators who were unable to inform their faculty members about the financial details of their grant and contract awards using the time-phased approach embedded in the ERP. At this time, the project entered paralysis because the project team was unable to gain political support for their ERP system. It is in this moment of controversy that all parties involved realize the lack of common aims and begin to consider how to achieve social ordering through reciprocity.

Faculty whose interest in administrative matters was normally limited to inquiries about how much money remained for them to spend became deeply unhappy about the ERP because they were unable to receive the answers they needed in order to do their jobs effectively. While central administrators were rightly concerned about mediating institutional risk through an integrated computing platform, faculty considered administration a service provider that would manage and report on the financial status of their academic enterprise in return for the nearly 30 percent of indirect costs that they paid on all external funding sources brought into the university. To this end, the legacy grants management system was designed by faculty and their administrators as a simple debit and credit calculator that allowed for the commitment of future expenses against current funds. This commitment accounting approach allowed departmental administrators to report to faculty how much money they had left to spend in their account, excluding from the discussion their actual remaining balance because parts of it were already committed for future expenditures.

In this legacy environment, a great deal of power remained within departmental units whose administrators used shadow systems to help them translate between academic/programmatic needs and institutional reporting requirements, whereas in the ERP-enabled environment, these administrators were required to work within a system designed to meet central administrative needs. What was previously a relatively straightforward accounting system was made complex, nonintuitive, and difficult from a departmental perspective. This lead to a prominent controversy at Ivy that nearly stalled the use of the ERP by the academic constituency because they felt their needs were not considered in its design. A dissenting central leadership voice shares his interpretation of this controversy.

> We took an environment that wasn't very complex and added a level of complexity that was 100 fold...and the reason we did it—we said it was to eliminate shadow systems. But the thing is that in the old world, people invented shadow systems around the accounting system in order to do their jobs with faculty—they understood the shadow systems and they could get the information that they needed when their faculty member came in and said, "How much money do I have left to spend on this grant?"....They understood how to take faculty information here, and central university information there, and make them both accurate....But with the ERP, central administrators win!

We see here that while the FM team leader was able to gain buy-in from the project team for the time-phased approach, this decision did not change the perspective of faculty. While it was possible for the project team to move forward during implementation by using hierarchical power to impose a particular decision, this did not lead to a successful ERP system in-use.

Frustrated by the environment described above and cognizant of the increased stress levels of their staff, powerful faculty members reminded the vice president of his official promise that the ERP would improve University administrative practices for the entire community. Faculty and their administrators joined forces and used their power to secure a meeting with the provost, the vice president, and project leadership where they gave an ultimatum threatening to build local systems and use the ERP only as a data repository unless the legacy functionality replaced the time-phased approach. Their influence is illustrated in the narrative of a faculty administrator.

> I took the message over to the [project team], and said..."we have looked at every creative way of using the ERP for [grants] and it has become clear to us that we need commitments....we're poised...to create our own system but I would like to present this as a University issue and I want to know whether or not you would like to join us in this effort." Boom, boom, boom. All of a sudden it...happened...*overnight*. They had a working group that very quickly went into designing a customized system.

As a result of these meetings, the project began to move out of paralysis and establish stable patterns of organizing through an agenda of reciprocity. The legacy commitment accounting system remained live until new tools could be developed within the ERP that would meet faculty needs. The expectation was that by appeasing faculty with regard to grants management, the ERP as a whole would be more likely to succeed.

Compromising on system functionality was not something that the project team had envisioned having to do. However, the project team came to realize that if they were going to successfully move users out of shadow systems and into the integrated ERP

environment, they were going to have to temper their hard-line approach. The team thus reprioritized their post-installation development activities and created a customized piece of software that was bolted onto the ERP software. The project team thus moved from attempts to establish common aims in favor of reciprocity where each involved party stands up for themselves and expresses their needs. Central to this form of organization working is an understanding of what makes the other group tick—their motivations and goals. Although the project team wanted to shift the way work was done at Ivy, the ultimate goal at the end of a long and expensive implementation was to have the ERP accepted and used by the University community. The project team realized that if the academic constituency remained outside the ERP environment, the system could not be said to successfully integrate university administration. As such, the project team worked diligently with faculty and their support staff to develop reports that would meet their informational needs, completely abandoning in this process the initial time-phased grant accounting approach.

Discussion and Conclusions

Today more software is being purchased than written from scratch. In addition, the enterprise-wide nature of software such as ERP (or SCM or CRM) means that costs and commitments are considerable. The whole-house nature of such initiatives means that process and functional owners from across the value chain must be involved. In addition, user representatives from different parts of the organization (here the university) are involved as are external experts. All of this means that ERP projects develop momentum and it is difficult to pull the plug once the projects are ramped up. This has lead researchers to speak about ERP as a runaway engine, one which many are afraid to derail because of the sunk cost that will be incurred without potential for a return on investment (Hanseth 2001). Such an environment calls for research to focus on *making software work*. As Pfeffer (1992, p. 7) indicates, making a decision to do something (here invest in an ERP system) is the easy part; the difficult part is actually implementing this decision: "What we often don't recognize is that failures to capitalize on innovations are, in actuality, failures in implementation." The skill of "getting things done" depends on the use of power and influence, to initiate and *sustain* action translating intention into reality (Bennis and Nanus 1986, p. 15).

The overarching goal of an implementing organization is, then, to create a working information system from a standard software product. After all, if the system goes unused by organizational constituents; all other goals are moot. The Ivy case shows that multiple approaches to social ordering are present within software projects and are necessary for achieving a working information system. Even where it might be possible to impose design requirements through the use of hierarchical power, this approach is likely to work only during implementation where the circle of influence is limited and somewhat controllable. The likelihood of creating a stable post-implementation environment where users actually use the software as intended is small (Boudreau and Robey 2005), especially in a university setting where the use of absolute power is antithetical to the fiefdom-like structure, where values of academic freedom in teaching and research are dominant (Allen and Kern 2001; Cornford 2000; Pollock 1999). In such contexts, attempting to impose a software system on different users, without considering their interests and demands, is likely to at best create a system that will be only partially used and, at worst, lead to complete system failure. Instead, what is important is to give a little so that the demands of users are met, even though decision-makers may believe that these demands are based on old thinking. Our analysis supports this idea by showing how bringing forward some of the valued legacy practices was essential to ensure buy-in as a necessary part of change. This may not be rational from the perspective of the project team, in the sense that the underpinning legacy thinking may be unnecessary in the changed organizational context, but it is necessary to ensure the commitment and motivation of those who need to be enticed to use the system. Such irrationality, argues Brunnson (1985), is often the key to effective decision implementation in organizations. Over time, change involves a process of reordering the dominant organizational landscape and cycles of activity by making decisions about "what will be carried forward into the future, and what will be left behind to make room for the new" (Latour 1999, p. 71). In other words, we may have to carry the past forward in time if we want users to come along with us into the future.

A workable solution by definition is that which is "capable of producing the desired effect or result; practicable; feasible" (*Oxford English Dictionary*). Importantly, our research demonstrates that achieving this workable solution does not mean that consensus must be sought or achieved in all instances as is articulated in the principle of common aims. Rather, the important thing appears to be coordinating action that will allow goals to be achieved, even if this involves compromise along the way. Such compromise depends on reciprocity to produce social order and doesn't expect a shared aim as long as a solution can be negotiated. The implication of this principle is that in some organizations, as in Ivy, select customizations are necessary if the ERP is to be made to work because these valued legacy practices can't be met through configuration alone. This goes against all the advice about avoiding customization to ensure the benefits of upgrades (Alshawi et al. 2004). However, our findings indicate that customization to a system is sometimes necessary to achieving a working information system because customizations allow legacy thinking and practices to be embedded in the software design when mere configuration may not allow this. In fact, if done

strategically, customization can ease tensions and sustain employees' commitment and motivation through the complex transitional phases that are part of any organizational change initiative.

Focusing on negotiation and reciprocity to achieve order does not, of course, mean that all requests are accommodated. There will be options presented that are not plausible and have little potential to propel change. For example, those individuals who are focused solely in the past do nothing to help create a workable solution and therefore their requests cannot be considered equal to other requests. To ensure success, our case illustrates the importance of negotiation—of people maneuvering through change and order. It is in these negotiations that one can learn what the other wants in order to achieve their goals. Ivy provides us with a compelling story of ICT-enabled change where the devil is in the details, in spite of a seemingly overarching common aim, reciprocity was necessary in order to produce social order and propel the project forward.

So what does this mean for practice? Are we to compromise with everyone all the time? Surely not. Rather this paper highlights that there are likely to be divergent motivations of different interest groups in a project even where stakeholders seem to be operating from a place of common aims. This is particularly important in enterprise-wide initiatives where conflicting thought-worlds are expected to join together in an integrated manner through the design of the ERP. As Ivy one manager said,

> At the end of the day we had to decide: did we want it to be on time, perfect, or used by our community. In the end we picked the latter.

If the goal of implementing software within an organization is to have it used as part of a working information system (as opposed to designing for technical elegance), then beginning to understand the nature of problem solving during software projects is important.

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