

December 2002

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Recommended Citation

Volkoff, Olga; Strong, Diane; and Elmes, Michael, "BETWEEN A ROCK AND A HARD PLACE: BOUNDARY SPANNERS IN AN ERP IMPLEMENTATION" (2002). *AMCIS 2002 Proceedings*. 135.
<http://aisel.aisnet.org/amcis2002/135>

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BETWEEN A ROCK AND A HARD PLACE: BOUNDARY SPANNERS IN AN ERP IMPLEMENTATION

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Abstract

Resolving the differences between the way organizational units want to conduct their processes and the way ERP software functions is one of the central challenges in ERP implementations. Individuals with comprehensive knowledge of organizational processes and those with expertise in how the software operates represent different communities of practice, each with its own view of the problem and how to solve it. In this research-in-progress we are examining the different boundary spanning mechanisms that are used in bridging the gaps between the different groups.

Introduction and Conceptual Foundations

One of the central challenges in ERP implementations is bringing organizational processes and software functionality into alignment (Jones, 2001; Lee and Lee, 2000; Newell et al, 2001). Misfits arise along various dimensions, including data structures, processing procedures, and output requirements (Soh et al, 2000). Configuring the software during implementation requires that these misfits be resolved. Additional problems arise because ERP systems are intended to integrate different organizational processes, and incompatibilities can arise across the requirements of participating organizational units (Pan et al, 2001). These differences must also be resolved. This paper explores some of the organizational mechanisms by which companies attempt to bridge these gaps.

Companies usually set up one or more project teams to work on both configuring the software in ways that support organizational processes, and redesigning business processes to fit with the software and each other. These teams generally consist of individuals from three domains: users from the organization who have been seconded to the team for the duration of the project on either a full or part-time basis, IT support personnel from the company, and implementation consultants who are familiar with the software (Bancroft et al, 1998.)

The role of users on the team is multi-faceted. First, they are expected to provide knowledge of organizational processes and business requirements to the team. They use their knowledge to help direct the configuration activities, to help in the development of testing plans and training material, and to help with data migration from legacy systems. In addition they usually become actively involved in configuration itself. At the same time they are often expected to become the primary source of knowledge about the ERP system during training and once the system goes live. In general, then, they must help bridge the gaps between the software and organizational processes and between different functional areas.

Viewed in theoretical terms, the composition of an ERP implementation team is a collection of representatives from various communities of practice. Any community of practice is marked by several characteristics – its members are mutually engaged in a joint enterprise and have developed a shared repertoire of concepts, stories and tools (Wenger, 1998). Members of such communities are expected to participate in mutually negotiated activities and to share accountability for them. Through such activities they develop a sense of identity with the group as evidenced by common language and an ongoing discourse that creates shared meaning, interpretations and experiences. While these shared norms, values and language may increase local efficiency, they can create obstacles to transfer of information between communities, generating a need for boundary spanners who can “recode” the information at the boundaries (Tushman and Scanlan, 1981).

The users on the ERP team come from the business, and are expected to represent a number of specific communities of practice, depending on the jobs they held (or perhaps are still holding) prior to their appointment to the team. As individuals who have shared in the core activities of their specific areas they are expected to understand (or know who knows) organizational needs at a fairly detailed level. In bringing this understanding to the ERP team, the expectation is that they will help span the boundaries between the different communities. Specifically they are expected to be “brokers,” providing connections across boundaries by introducing and explaining elements of one community of practice to another (Wenger, 1998).

Despite expectations regarding the roles of members of the project team, there is some evidence that they may be either unwilling or unable to play an appropriate boundary spanning role. Newell et al (2001) discovered that, while they expected project team members would make use of their social capital across the firm, first to help in appropriating business knowledge and then gaining the commitment of users, this did not happen. Instead this social capital was employed to further personal goals rather than the ERP project goals. Volkoff (1999) discovered that the team became its own community of practice, where the users were mutually engaged in a new joint enterprise (implementing an ERP system) and had changed their identities enough to no longer be full members of their original communities. As such they were less able to play a boundary spanning role.

In order to explore how the necessary boundary spanning actually occurs during an ERP implementation, the data from three longitudinal case studies was collected and is being analyzed. A variety of different boundary spanning mechanisms was observed, but each was problematic. In the sections that follow, the three case studies and the findings to date from each will be described. The paper concludes with some general comments on the role of boundary spanners in an ERP implementation.

Methodology and Case Overviews

The three cases were all conducted as longitudinal studies employing a mixture of interviews and observation during the period that the organizations implemented an ERP system. For each case observations were conducted almost weekly over the course of approximately fourteen months (and in one case the observations are on-going.) The three companies are in different industries and vary in size. The ERP implementations also vary in style and size. Observations in Co.A and Co.B occurred from October 1998 to March 2000. During this grounded study of ERP implementations, the need for boundary spanners and the problems they experienced surfaced as a by-product of other questions. The ongoing study of Co.C, which started in August 2000, provided us with an opportunity to focus on this phenomenon more directly, using insights from the earlier work as a basis for our questions and observations.

Co.A is a packager and distributor of high volume specialty consumer products. The company has approximately 250 employees and 1999 annual sales were approximately US\$200 million. In 1998 it started implementation of a broad set of modules from J.D. Edwards World software. The implementation team consisted of only nine people, all from the company. These individuals had, with two exceptions, worked together for many years and were, with the same two exceptions, fairly senior in their departments. While team members were seconded to work on the ERP implementation, they did not relinquish their other responsibilities. A contract was signed with a consulting company for implementation support, but the consultants played a minimal role, providing training and advice on request rather than actually performing configuration. The team was not co-located, but tended to spend time together on the approximately one day a week when a consultant came to answer questions and solve problems. Observations were timed to coincide with this visit, and involved attending the weekly team meeting, sitting in on problem-solving and training sessions, participating in informal discussions, and conducting a series of interviews with each team member.

Co.B, a North American subsidiary of a European manufacturer of specialty industrial machinery, has two plants, one in Canada and one in the U.S. In 1999 it employed about 700 people, and received orders for about 700 machines. It chose to implement a fairly complete set of modules from SAP's R/3 software. At the start approximately fifteen individuals from operations, a number of the IS support staff, and fifteen consultants became members of the full-time project team and worked out of a dedicated project room. Over time at least fifty people became actively involved on the team. Observations were made both in the project room and during other meetings, for an average of one day a week for fourteen months. Key informants were identified, and were regularly asked for their comments over the course of the implementation.

Co.C, a global organization that designs, assembles and services a certain type of high-precision industrial equipment, started a multi-phase global implementation of SAP R/3 approximately three years ago. With tens of thousands of employees in many locations within the U.S. and around the world, the project is expected to continue for several more years. The ERP team has

approximately two hundred members, housed in a facility that is separate from any of the plants. A major consulting firm was actively involved in earlier phases, but as internal knowledge grew, consultant participation declined. A three-person research team began observations and interviews part-way through the third of six implementation phases. Over the last twenty months the researchers have followed the end of phase three, all of phase four, and are now observing phase five. A series of interviews has been conducted with each of a group of team members and users, both before and after each go-live, and researchers observe walkthroughs, meetings, testing and training sessions.

Observations of Boundary Spanning at the Three Sites

Co.A, with its small size and an experienced team that remained active in their old jobs, seems an ideal situation for effective boundary spanning. Certainly the members of the team brought detailed knowledge of business processes with them. That said, there was a wide range in level of commitment to the team. Some members became adept at getting into the software, exploring its capabilities, and configuring it to suit their needs. While they ensured that any potential impacts on their departments were articulated to the team, they were willing to make process changes when required. Others, in contrast, started out as active representatives of their departments, but ended up having little to do with design decisions, much less configuration. As one team member explained, he felt caught in the middle: "I'm tired of being the go-between – defending and explaining the implementation team to [his boss] and [his boss] to the team. After all, he's the boss, so he should be able to say how things are done. I don't even know where I stand anymore." As he struggled with these conflicting loyalties, he progressively withdrew from active participation, and others on the team made design decisions for his department. This was possible because of the company's small size and the individuals' long tenure in the company and with each other.

The part of the boundary spanning role that was related to bringing organizational knowledge into the implementation team was being done, then, by those team members who had begun to identify with this new "community of practice" most closely. The others, for one reason or another, were uncomfortable in trying to be part of both the team and their home departments at the same time.

Another part of the boundary spanning role involves bringing information about the new software back to each team member's home department. For Co.A, because team members never left their other jobs, those who stayed active on the team were in a good position to perform this function, and some did it very well. That said there were some individuals who became so focused on the implementation that they did not spend the time to do so. Interestingly there were a few people not on the team, but who became active in data conversion and other tasks, who managed to "pull" the information into the departments.

Co.B had a more typical structure for its implementation team – individuals who were seconded to the team were relieved of their former responsibilities, and in many cases did not expect to return to their old job at the end of the project. Under such circumstances it was much more difficult to withdraw, and in fact most members of the team very quickly identified more strongly with the team than their original community of practice. Not only did they have a strong sense of shared purpose (getting the software implemented) but they also started using language that was bound up with the software, and this created something of a barrier between them and their former colleagues.

With respect to their roles as boundary spanners responsible for representing their old departments, while they could still talk about the organizational processes, they became fairly willing to make changes to accommodate the software. The one exception, a long-time employee of the company who struggled to get familiar with the software, took it upon himself to be a vocal representative for how he believed his former colleagues would react to some of the process changes that were being made. While he did not have the option of withdrawing, he clearly felt a great deal of conflict between his two identities, and unlike the other members of the team was unwilling to let his new affiliation overpower his old one. The outcome was that the other members of the implementation team marginalized him – he was perceived as not being "up to it," and his views were often discounted.

Boundary spanning did not, however, depend solely on team members trying to retain two identities. A number of additional people were brought to work with the team part time. In some cases this was because they could not be spared from their other positions full time. In other situations they were brought in to do specific tasks for which they had special knowledge. Most of these individuals did not enjoy this role. On the one hand they were less knowledgeable about the system than others on the team, which kept them from being fully accepted by the team. On the other hand they had a different appreciation of the system than their departmental colleagues, and found that this made them different from what they had been before. In general, the need to go back and forth between the two groups was seen as harder than being a full-time member of either community.

Towards the end of the implementation, as serious issues in data conversion threatened the project, a few additional people were brought in for a few weeks. These individuals never really left their original departments, but they did become more familiar with the software than individuals who had simply gone through training. A number of these people clearly relished their new role as “experts” and the unintended consequence of the “emergency” was that there were a few people in the departments who became conduits for information about the software.

Co.C, the multinational with a large, isolated team, clearly demonstrates how an implementation team can become a distinct – and sometimes disconnected – community of practice. While individuals on the team did at one time all work in operating divisions, many had joined the ERP team with the first phase, and had stayed there for three years. When new people joined the team they were teased as having “come over to the other side.” By phase four the team members did not presume to be able to speak for the plants, and held periodic design walkthroughs to ensure that functionality was appropriate for organizational needs.

A variety of boundary spanning mechanisms were set up to maintain a good connection between the team and the plants. First, an ERP site manager was appointed for each plant. In addition a team of power users was identified by each organization. These individuals were supposed to participate in software testing and in the preparation of training materials. Through the experience they gained in this role they would then become the chief trainers for their organizations, and finally the first line of support after go-live.

These roles were extremely challenging. One site manager expressed her frustration at being made a scapegoat by both sides. The ERP team felt that the problems experienced after go-live stemmed from the insufficient training that had been delivered, while people at the plant felt their needs had been inadequately communicated to the ERP team. The site manager felt herself caught in the cross-fire, held responsible for problems on both sides. Power users also complained about their experiences. First they felt that they had been pushed into testing without adequate training. Through immersion they learned what they needed to know. Unfortunately, as with most large projects, when they started to deliver training the system was still being tweaked, and they were never sure whether the cause of problems encountered in the classroom related to bugs, bad data, or their own inexperience. Once the system went live, the power users were deluged with questions and complaints about the system. Worse, some of them found that instead of being valued as experts they were being accused of doing a bad job, both in training and in knowing all the details of the system. As Co.C moves through Phase 5 it is trying to learn from this experience and is trying to set up better boundary spanning mechanisms. That said, there were some users who though they were not designated power users, embraced the new system and emerged as local champions and experts.

Discussion

Across these three cases, which demonstrate a wide variety of boundary spanning mechanisms, one theme is constant: the boundary spanning role is generally difficult and thankless. The main problem is that it is not enough to act as merely a conduit of information. Effective boundary spanning seems to require that individuals become members of two communities of practice, and at the very least this leads to inner conflict. In addition it harbors the external threat to the boundary spanner of potentially being marginalized rather than valued by both communities. At the very least there seem to be few rewards for this very important role.

Preliminary analysis does suggest a number of conditions that make boundary spanning easier. In Co.A, for example, where some of the most successful boundary spanning occurred, the individuals who succeeded were those who continued as active participants in both communities. In addition, however, they had to have enough seniority to make difficult process change decisions, and they had to have good systems ability. Needless to say, this is a rare combination, and in particular it is only in smaller companies that team members can consider retaining their old responsibilities. It does suggest, however, the need for system sponsors to provide special support for boundary spanners to help them maintain credibility in both communities. Instead we have observed that both communities place high expectations on the boundary spanners but rarely provide enough support to ensure they succeed.

Another interesting observation was the presence of individuals in the business communities who spontaneously emerged as self selected experts who could pull the necessary information about the new software into a department. Trying to learn more about this phenomenon will be part of our further analysis.

One useful lens for examining these results is research on labor negotiation that suggests brokering between communities of practice can take a number of forms, and that it may be helpful to have different individuals take on the different roles (Friedman

and Podolny, 1992). First, the activity can either be directed out from the community (broker acts as a representative – in this case a representative of a specific business unit to the ERP team) or in to the community from outside (broker acts as gatekeeper – in this case taking information back from the team to their business unit.) Second, the substance of the connection can either be task-oriented (measured by flows of advice) or socioemotional (measured by flows of trust.) For example the self selected experts mentioned earlier played a task-oriented gatekeeper role. In addition, roles are likely to alter both in nature and in importance over time (Pan et al, 2001). Since a boundary spanner's degree of identification with the different communities of practice to which he or she belongs is likely to shift over time, expecting the same person to continue in any role may well be inappropriate. We are exploring these issues as we continue our data collection and analysis.

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