Using a case study to test the role of three key social enablers in ERP implementation

Suprateek Sarker[a,*], Allen S. Lee[b]

[a]*School of Accounting, Information Systems, and Business Law, College of Business and Economics, Washington State University, Pullman, WA 99164, USA*
[b]*Department of Information Systems, School of Business, Virginia Commonwealth University, Richmond, VA 23284-4000, USA*

Abstract

The literature indicates that three key social enablers—strong and committed leadership, open and honest communication, and a balanced and empowered implementation team are necessary conditions/precursors for successful enterprise resource planning (ERP) implementation. In a longitudinal positivist case study, we find that, while all three enablers may contribute to ERP implementation success, only strong and committed leadership can be empirically established as a necessary condition. This presents a challenge to future ERP researchers for resolving apparent contradictions between the existing literature and the results of our analysis. One possible direction for future research would be to undertake an interpretive re-examination of the rationalisitic assumptions that underlie much of the existing literature on ERP systems implementation.
© 2002 Elsevier Science B.V. All rights reserved.

1. Introduction

Today, enterprise resource planning (ERP) systems are considered to be "the price of entry for running a business" [19], and large growth rates in ERP implementation, especially among mid-sized and small-sized companies, are expected worldwide [2,9,14,30,44]. Unfortunately, a significant proportion of ERP implementation projects do not succeed [5,7,10], and a number of potential explanations for ERP implementation failures have been offered in the literature [7,18,29,38] that may broadly be classified as human/organizational (e.g. lack of strong and committed leadership), technical (e.g. problems in software customization and testing, and lack of technically knowledgeable staff), and economic (e.g. lack of economic planning and justification). While each set of factors is important, there appears to be a growing consensus among researchers that human factors, more than technical or economic, are critical to the success of ERP projects [3,19,26,29,32]. Surprisingly, few studies have attempted to examine the role of these human factors through detailed analysis in an empirical setting.

In this study, we seek to fill this void by focusing on three human/organizational issues or social enablers (*strong and committed leadership*, *open and honest communication*, and a *balanced and empowered ERP*

---

* Corresponding author. Tel.: +1-509-335-5724.
E-mail address: sarkers@wsu.edu (S. Sarker).

Table 1
Results of the deductive case study

Social enablers	*Phase I*: changing organization structure and culture to prepare for ERP software introduction	*Phase II*: implementing "core modules" of BASYS—the chosen ERP software	*Phase III*: implementing the configurator, an "add-on module" of BASYS
	Outcome: success	*Outcome*: success	*Outcome*: failure
Strong and committed leadership	Present at all relevant levels	Present at the top level, process level, project-level, and for the MIS function	Absent
Open and honest communication	Almost not present between top management and rest of the organization; later, communication channels among functional units started opening up	Great deal of communication present, though sometimes selective and deceptive. Not much communication among implementation-team and shop-floor workers	Communication between implementers and other stakeholders almost absent
Balanced and empowered team	Absent in the first part of Phase I; no "team" in the second part; thus no possibility of "empowered team." Some of the individuals involved in this phase were partially empowered though	Present; team carefully chosen; members were clearly empowered	Not balanced, somewhat empowered

implementation team) that have been suggested to be necessary conditions for ERP implementation success in the literature.[1] While we do not claim that these are the only social enablers that deserve careful investigation, we have chosen to study them because of the importance attributed to them in the ERP literature. We examine the role of these key enablers using an intensive longitudinal case study of a company that implemented an ERP system in three phases. Table 1 summarizes results of our case study, in which we evaluated the outcome of each phase and the presence or absence of the hypothesized necessary conditions. Our analysis reveals that strong and committed leadership is essential to the success of an ERP implementation initiative; however, the presence of open and honest communication and an empowered and balanced implementation team cannot be empirically established as "necessary conditions" for ERP implementation success (as implied in the literature). This finding provides future ERP researchers with a puzzle regarding the three enablers that is worthy of further investigation.

Our paper is organized as follows. In Section 2, we develop the propositions regarding the three social enablers. In Section 3, we discuss our methodology. In Section 4, we describe our case study and test the propositions developed. In Section 5, we discuss some implications for future research.

2. Social enablers of ERP implementation success

In this section, we review the literature to discern testable propositions regarding the role of the three key social enablers identified. At the outset, we would like to mention that the ERP literature does not provide precise definition of the "constructs" (i.e. the enablers) used in our propositions. For example, none of the sources on ERP that we came across specifically delineates what leadership means (or involves) in the context of ERP implementation. While this may seem disconcerting at first, a review of authoritative texts on leadership [4] reveals that "[t]here are almost as many definitions of leadership as there are persons who have attempted to define the concept," and that leadership may be conceptualized based on "nucleus of tendency, personality in action, induction of compliance, influence relation, power differential, persuasion, influence act, influence on goal achievement, . . . status position, . . . reinforcement, and initiation of structure," all of which may be applicable in an ERP implementation setting. Similarly,

---

[1] We also consider the BPR literature, because ERP implementation usually involves BPR [17,27,34,37].

communication has been viewed as "transmission," "filtering ... reception, and perception," "connections," "social interaction," "expression, suppression, and distortion," and "conversation" in the literature [39], making it impossible to precisely define the concept. Likewise, the literature on teams, and discussions of diversity in team-composition as well as on empowerment and participation provides evidence on the existence of a large number of perspectives [36]. Consequently, for the purpose of this study, we did not feel it appropriate to define the "constructs" a priori in a "precise" but potentially narrow manner; instead, we deliberately chose to adopt an inclusive view of the constructs as we analyzed the case data.

2.1. Structure of the propositions

Several scholars have argued for the need to develop process theories on ERP implementation [18,24]. A review of the literature reveals that information systems (IS) scholars [25,31,41] offer a great diversity of views on the appropriate form for stating process theories. The form that we adopt in this paper is fundamentally consistent with that proposed by Markus and Robey [25], who see *necessary conditions* as being the foundation of process theories.[2] Further, since any functionalist theory/proposition (including process theory propositions) needs to be stated in a falsifiable manner [20], we develop propositions that are stated as follows:

⟨outcome⟩ can occur only if ⟨condition⟩ occurs

A statement represented in this form is falsified if ⟨outcome⟩ occurs without the occurrence of the ⟨condition⟩; however, it would not be falsified if the ⟨condition⟩ occurs but not the ⟨outcome⟩, since the ⟨condition⟩ is not posited as necessary and sufficient (as in variance theories) but merely as necessary (in accordance with process theory specification requirements discussed earlier).

---

[2] One important implication of using necessary conditions (rather than necessary and sufficient conditions which are at the heart of the more commonly used "variance theories") is that process theory statements recognize that an outcome does not necessarily occur if the precursors are present, which is a more realistic approach in explaining complex processes where outcomes are dependent on other probabilistic events.

2.2. Leadership

Parr and her colleagues, in their study of factors "necessary for successful implementation" of ERP systems, report that all interviewees "stated categorically that management support was indispensable to the achievement of ... success" in ERP implementation [32]. Similarly, Willcocks and Sykes report that "senior level sponsorship, championship, support and participation" is one of the "critical enabling factors if ERP-supported business innovations are to stand a chance of succeeding" [42]. Koh et al. also recognize "management commitment" as a necessary condition for success in all phases of an ERP implementation [18]. Bingi et al. state that implementation "completely hinges on the strong, sustained commitment of the top management" [5]. Leadership has also been granted a critical role by noted reengineering experts, who propose the following "moral" [12]:

> If you proceed to reengineer without proper leadership, you are making a fatal mistake. If your leadership is nominal rather than serious, and is not prepared to make the commitment, your efforts are doomed to failure.

The person in the leader's role must have sufficient strength and authority over all stakeholders in the processes, so that he or she can solve political problems among stakeholders that lead to unproductive delays [11]:

> Most reengineering failures stem from the breakdowns in leadership. Without strong, committed, and knowledgeable leadership, there will be no one to persuade the barons running functional silos within the company to subordinate the interests of their functional areas to those of the processes that cross their boundaries.

Chen elaborates on what committed leadership means in the context of ERP implementation [7]:

> Top management commitment is much more than a CEO giving his or her blessings to the ERP system. This commitment must not be limited to the conception of the project but should continue through its conception .... Commitment also implies that they are willing to spend significant amounts of time serving on

steering or executive committees overseeing the implementation team …. As in many major change efforts, objections and disagreements aris[ing] in the process of reengineering and ERP implementation can only be solved through personal intervention by top management.

In addition to the role of the top management, the importance of the project manager (PM) in ERP implementation, is highlighted in the literature [27]:

… the project manager stands out as the most critical resource …. Credibility is the most important quality a PM must strive to acquire. More than just possessing technical knowledge of the software being implemented, the PM must have good business knowledge so that clients feel their needs and requirements are understood … the PM must lead an efficient and effective team. He must act as a coach, keeping his staff motivated and in harmony.

Finally, Willcocks and Sykes state that the IT leadership needs to be "wide awake" and have the "credibility" to build strong/strategic partnerships with functional areas [42]. Based on the above, we have the following proposition:

P1. *ERP implementation can be successful only if there is a strong and committed leadership guiding the initiative.*

2.3. Communication

Communication issues are seen as central to success of an ERP implementation project by a number of researchers in the area [3,13,38]. In their review of critical factors influencing ERP initiatives, Nah et al. [29] state, "expectations at every level need to be communicated. Employees should be told in advance the scope, objectives, activities, and updates, and *admit* change will occur …" (emphasis added) suggesting the importance of honesty in communication. Consistent with the findings of academic researchers, Mendel cites "communication breakdown" as a major "ERP project hurdle" and offers the following advice [26]:

Another strategy for avoiding company-wide rebellion is constant communication about the project throughout its various stages. Getting

employees to understand what is changing, why it's changing, and how it will help the organization is crucial to acceptance …

Parr et al. also report, that in their study, 50% of the interviewees saw communication as a "necessary condition" for ERP success[3] [32]. In the related BPR literature, Hammer and Stanton portray communication "over and above all their other challenges," recommending principles including "be clear" and "honesty is the only policy" [12]. Davenport provides similar guidance [8]:

Communicate throughout the change program …. Sensitive issues, such as level and type of personnel reductions to result from the initiative, must be addressed honestly and openly.

Thus, we have the following proposition:

P2. *ERP implementation can be successful only if there is open and honest communication among the stakeholders.*

2.4. Balanced and empowered implementation team

In Parr et al.'s study, 80% of the interviewees indicated that a balanced implementation team was a "necessary condition" for ERP implementation success [32]. In Willcocks and Sykes' view, successful ERP implementation requires a balanced multifunctional team that is composed of members with a variety of skills from different areas [42]. These team-members must be active until the conclusion of the project [10]. Similarly, Chen argues that it is important to identify the right people, "free them from present responsibilities, organize them into an interdisciplinary team, and empower them with the responsibility of the project" [7]. It is important to empower the team-members for self-management [28] because this increases "user involvement," a condition identified as necessary for ERP success [18]. Thus, we have the following proposition:

---

[3] The fact that half of Parr's subjects indicated that communication is a necessary condition indicates that there is not an absolute consensus on the role of communication among practitioners, and this further points to a need to empirically test the validity of the proposition implied in much of the BPR/ERP literature.

P3. *ERP implementation can be successful only if the implementation team is balanced and empowered.*

3. Methodology

We used a critical embedded single-case design within the positivist case research tradition [43]. The view of positivism adopted in this paper represents a synthesis of three traditions: (i) the *empiricist* tradition, which views "the indubitable experience of the external world" as being the "the foundation of human knowledge," and thus relies on "publicly verifiable, observable sensory data, systematically collected and collated, as the route to knowledge" [1]; (ii) the *rationalist* tradition, which argues that "the route to indubitable knowledge is . . . through logical, that is rational principles which are beyond doubt" [1]; and (iii) the *critical rationalist tradition*, which holds that it is not "positive evidence " or "confirmation" but rather "negative evidence" or "falsification" through deduction that is at the "core" of science [35]. The three traditions together form the basis of *hypothetico-deductive* logic that we use in our case methodology. The empiricist influence is reflected in the procedures for ensuring systematic documentation and the rigor of the research process [21,43]. Our underlying premise is that by following the recommended procedures, the study will satisfy the following positivist criteria for rigor: construct validity, internal validity, external validity, and reliability. In addition to the four criteria mentioned earlier, and consistent with the empiricist ideal of eliminating "speculative assumptions not founded on observation" [35], we adopt a "realist" ontology rather than a social constructivist or an impressionist perspective [40], focusing on what organizational participants *said* or *did*, rather than on what (we thought) they *meant* through our interpretation of symbols [33].

The first author of this study collected the bulk of our data by conducting interviews with several stakeholders (Table 2) between 1996 and 2000 using an evolving protocol. In addition to direct observations (made by the first author), we also used company documents, e-mails, and informal interviews to triangulate our findings. The data analysis technique used was that of "pattern matching," which involved no formal coding, but, consistent with hypothetico-deductive logic, required us to search for patterns in the empirical material that

Table 2
Interview statistics

Interviewee	Number of formal interviews	Number of informal interactions (including telephone interviews/ conversations, e-mail exchanges)
(1) CEO	1	0
(2) Senior VP	1	2
(3) Plant manager	3	Few
(4) MIS manager	5	Several
(5) Systems analyst (1)	3	Few
(6) Quality assurance manager	2	0
(7) Production-planning manager	5	Several
(8) HR manager	1	0
(9) Purchasing agent	3	2
(10) Engineering manager	2	Few
(11) Accountant	1	0
(12) Manufacturing engineer	Requested, did not materialize	1
(13) Productivity facilitator	4	Several
(14) Consultant (vendor)	1	2
(15) Consultant (academic)	0	Several
(16) Exports coordinator	1	1
(17) Sales administrator	2	1
(18) Systems analyst (2)	0	2
(19) Shop-floor worker (1)	1	0
(20) Shop-floor worker (2)	0	1

Table 3
Rigor of the study as per positivist case research criteria

Criterion	Guidelines from the literature [21,43]	Whether/how the guidelines were followed in the study
Internal validity	Pattern matching	Predictions derived from falsifiable propositions were matched with empirical patterns. Also, "natural controls" used wherever feasible
	Explanation-building	Not relevant since, in this paper, we are testing propositions
Construct validity	Using multiple sources of evidence	Multiple interviews with multiple stakeholders at different points of the project; other modes of interaction—over dinner, e-mail, telephone, etc.; documentary evidence
	Having key informants review the case study report	The production-planning manager, a Systems analyst, and the MIS manager reviewed drafts of the case study; also other forms of "member checking"
	Establishing a chain of evidence	Detailed processual narrative developed; some cross-referencing with transcripts
Reliability	Creating/maintaining a case study database	Case study notes (annotated transcripts) Case study documents (questionnaires, brochures, summary tables) Case narrative
	Developing a case study protocol	An evolving set of questionnaires; literature review; proposal; etc.
External validity	Increasing degrees of freedom	Multiple observations for each prediction Multiple (three) embedded cases However, no competing theories tested
	Applying replication logic (not sampling logic)	Same propositions tested in each of the three phases; each phase can be seen as a separate study where we tested different instances of the same proposition

were consistent (or inconsistent) with the patterns suggested by the theoretical propositions that were stated in a falsifiable and logically consistent manner. Table 3 summarizes how the study satisfied the positivist criteria of rigor (construct validity, reliability, internal validity, and external validity) mentioned earlier.

4. Testing the propositions in the case study

In this section, we first describe the company background, and then test the three propositions developed above.

4.1. The company background

MANCO (a pseudonym) is a well-established company that, over its three decades of existence, had earned a worldwide reputation in the air-pollution and dust-collection markets.

Unfortunately, MANCO had become increasingly dysfunctional in recent years, primarily due to the "territorial" culture created and encouraged by the Vice Presidents (VPs) of engineering, sales, and operations. There was little sharing of information among the functional areas because of territorial attitudes and poor technological infrastructure. The resulting coordination problems led to unreasonable lead-times and deteriorating quality of products. Fig. 1 shows the process flows involved in custom-order-processing, MANCO's core business process (partially described below).[4]

Sales agents would bring orders to the sales department. At this point, sales would: (1) make the commission payable to the agent for the order; (2) make photo-copies of the order and forward one copy (the "production copy") to production-planning and

---
[4] A more detailed description of the business process is available elsewhere [33].

ACCOUNTING

(Under VP Finance)

Shipper (Credit Approved)

PURCHASING

(Under VP Operations)

1a: Shipper

2. Memo containing Estimated Ship-date

Negotiation and coordination Memos

SALES
(Under VP – Sales)

1 b: Production Copy of the Order

ORDER

3. Order + Custom Items Marked

Memos

4. Material Releases

ENGINEERING

(Under VP Engineering)

PRODUCTION-PLANNING
(Under VP Operations)

5. Purchase Requisition

6. Purchasing Delivery Information

7. Planning-guide+ Schedule + Purchase Delivery Dates + Shipper

MANUFAC-TURING
(Under VP Operations)

SHIPPED GOODS

Some informal communication ("chats," telephone calls, etc.) only between units reporting to the same VP (e.g., Operations)

Formal communication channels (e.g., memos)

Functional units reporting to the same VP (i.e., VP of Operations)
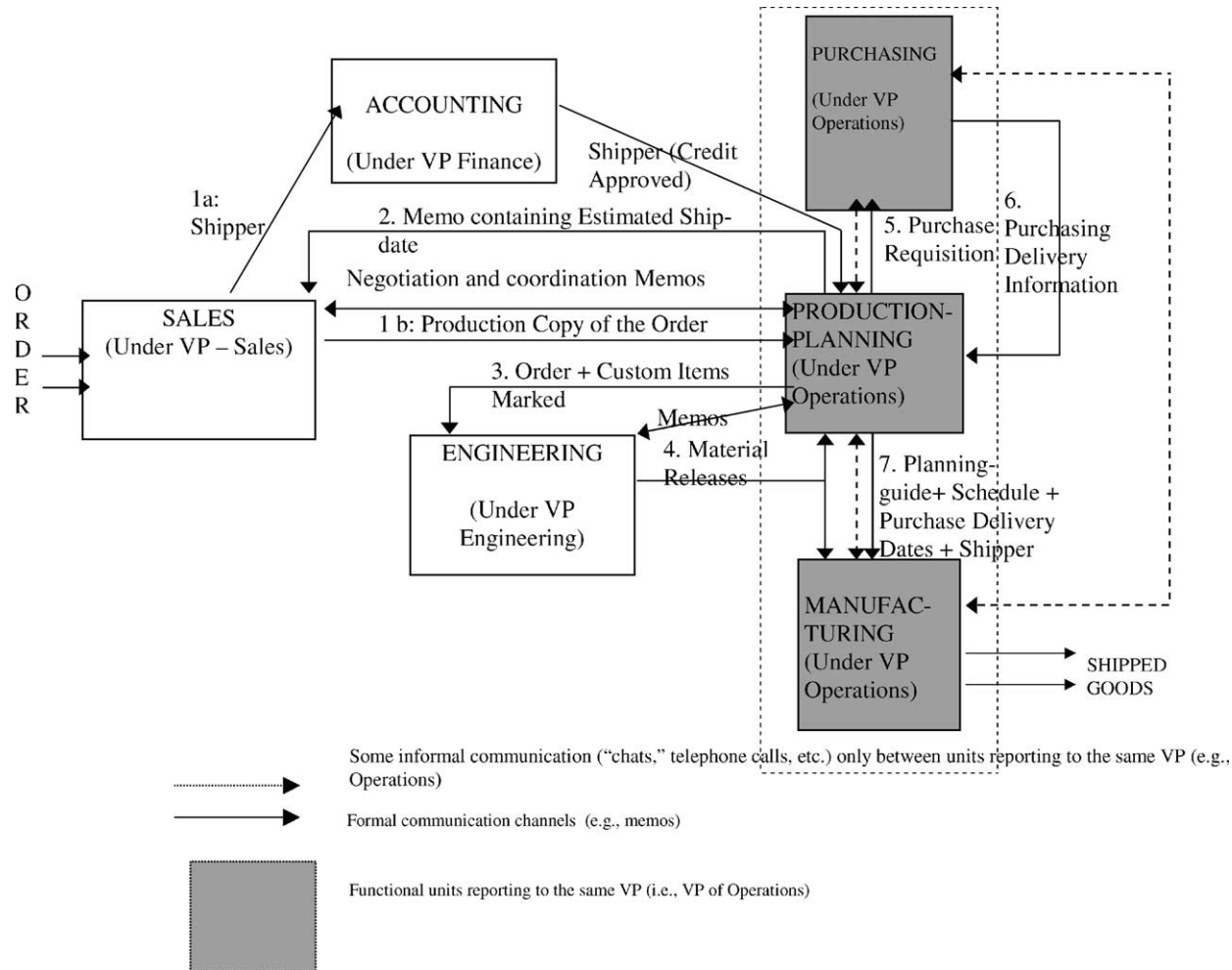
Fig. 1. Custom-order-processing at MANCO before the ERP initiative was undertaken [33].

another copy (the "shipper") to accounting. On receiving the "shipper," accounting would initiate a credit check on the customer. Only after a successful credit check, which could potentially take up to 21 days, would the "shipper" be passed to production-planning from accounting. Meanwhile, the "production copy" would have reached production-planning, which would examine the order and send a memo back to sales with the estimated shipping date. Several memos had to be exchanged between sales and production-planning before a mutually acceptable date could be finalized.

When the "shipper" (credit approved) finally arrived at production-planning, the "production copy" of the order would be forwarded to engineering, which was required to provide "releases" (i.e. revised bill-of-materials and drawings) as soon as possible so that manufacturing could meet the shipping deadline. Next, production-planning would generate the "planning-guide"—a step-by-step guide for manufacturing the custom product based on the "releases" and on purchasing delivery information received from purchasing. Thereafter, production-planning would issue a "schedule" allocating machines and labor, and provide necessary deadlines. The "planning-guide," "schedule," "shipper," and purchase delivery information would then be forwarded to manufacturing. In case of incomplete product specifications, production-planning would send memos to sales, and sales personnel would, jointly with the customer, provide necessary information, based on which the "planning-guide" or "schedule" could be revised. If manufacturing required any clarifications regarding the "releases," it would notify the production-planning function, which would then send official memos to engineering. Likewise, clarifications from engineering, in the form of official memos and documents, would be routed through production-planning (unnecessarily) on their way back to manufacturing.

The dysfunctional structure and culture of MANCO significantly contributed to the ineffectiveness of the process. For example, the sales agents as well as the sales managers were evaluated on bookings rather than on shippings. Consequently, sales had little incentive to provide complete specifications to manufacturing in the "production copy" or to respond to clarification requests promptly. Other difficulties arose because of the animosity between production-planning and engineering. Production-planning would unilaterally set "release" deadlines for engineering, that were often not compatible with the engineers' schedules. In addition to being annoyed with the deadlines, the engineers perceived the creation of releases as not contributing to their mission of developing new products, and consequently, provided late and sometimes inaccurate releases.

Another problem was that no department knew the status of an order until it was its turn to process it. For example, while accounting was performing the credit check, engineering and manufacturing would not know that such an order had actually been placed, and thus could not schedule their personnel in advance, incurring tremendous overtime expenses for meeting deadlines that suddenly appeared without warning.

Finally, MANCO's processes were swamped with a "sea" of paperwork generated by organizational members to cover for the lack of trust as well as the absence of appropriate technological infrastructure.

4.2. The initiative

The *Phase I* of the initiative at MANCO, in preparation for the implementation of the ERP system, involved the recognition of territorial walls in the organization and dismantling them through the implementation of radical changes in the organizational structure, the reward systems, and the organizational culture.

The *Phase II*, involved information and business process requirements analysis, ERP package selection, IT infrastructure preparation, and the implementation of "core modules" of the chosen ERP package (BASYS) by an implementation team.

The *Phase III* involved the implementation of a "configurator," an add-on module of BASYS with the capability to transform order-processing by facilitating the configuration of products on-line and the generation of bills-of-material and routings pertaining to the configured order.

To summarize, Phase I focused on social and cultural issues, Phase II focused on the introduction of the core technology, and Phase III on technology enhancement. It is important to note that these phases reflect how stakeholders at MANCO themselves viewed the stages of ERP implementation, not how the IS literature would view implementation.

Table 4
Evidence regarding the outcome of each phase

Phase I (outcome: success)	*Phase II* (outcome: success)	*Phase III* (outcome: failure)
The plant manager: even though the process is the same . . . the culture and value systems changed remarkably. We started focusing on global goals, that being serving the customer	The production-planning manager: "When we started the project, we needed to change our system and our organization's processes ASAP . . .. We are online with basic features within the time-period . . . in future, as we make improvements, I do not expect any conflict among departments . . . I am confident that this project, overall, is a success . . ."	The plant manager: we . . . underestimated the complexity of the configurator plus two key people who were involved in BASYS are no longer here. So it hurt the (configurator) implementation
The senior VP: in the fiscal year that just ended . . . we said, let us ship the sales forecast and let us try to under-spend the operating budget, which we did, and we were able to have a record year . . .	The productivity-facilitator: "Our number one priority was that outside people (customers) should not be affected, we wanted to run the business as usual . . .. So we have definitely succeeded in that and we did not have a bad month in shipment or anything . . . I would say that the resistance level was pretty much low in all the departments,"	A purchasing agent: "I do not know anything about the configurator. I hear it is coming, but have not seen it"
The engineering manager walking down to the production-planning area for a "chat" with the *planners*	The purchasing agent: ". . . the entire project of integrating BASYS, the new environment, the new technology has been a success . . .. We definitely are more integrated together from a systematic standpoint . . . we have more capability on-line to access information, gather data . . .. My personal job has become easier . . .. It allows me to spend more time doing other purchasing related functions, negotiating, vendor relations . . ."	The former MIS manager (regarding the purchasing manager, who was charged with clearing some roadblocks to configurator implementation): "[His] personality being the way it is, people do not have a lot of confidence. . . so I think what should have had a good success. . . did not make any change. . . who-ever is trying to guide this has to have people's respect"
The production-planning manager visiting the purchasing agent to informally negotiate the purchase delivery date	A shop-floor worker: "As far as BASYS versus what we have before, it was a step for the better . . .. A lot of these people (other workers) never sat down in front of a terminal before . . . it was hard for them to understand, but . . . what we have is a step towards good,"	A Systems analyst: ". . . last I heard the configurator was still not on-line"
HR manager estimated that over 50% of the shop-floor workers were positively affected by the changes	A sales administrator: "Sales can pull up sales information and use for forecasting . . ."	
	A systems analyst: "Even though you have a spectrum of reactions, it (BASYS) has been accepted. The bottom line is that it was a successful implementation . . . people are using it . . ."	Configurator implementation viewed as an "Engineering" project; other stakeholders have lost interest
	The MIS manager: "All the modules that we had intended to put in place are being used"	The BOMs being used to implement the configurator cannot be used by any department other than engineering
		The configurator not implemented 3 years after the original deadline

4.3. An evaluation of MANCO's ERP implementation

Evaluation of reengineering (whether or not using ERP systems) is a complex activity, and no universally accepted criteria exist for such evaluations [6,15]. Further, success/failure of an ERP system is multi-dimensional, and the evaluation criteria tend to vary with the phase of implementation [24].

The notion of "expectation failure" [22] suggests that an assessment of ERP implementation success requires the recognition of the existence of multiple stakeholders having different values, levels of power and interests, and hence, different expectations at different points of time. Consistent with the notion of expectation failure, and with our positivist approach, we consider implementation to be successful if different stakeholders *state* or *indicate through actions* that such was the case during the different phases. In light of the recent finding "that (ERP implementation) success at one point in time may only be loosely related to success at another point in time" [23], for the purpose of our analysis, we treat each phase of the ERP initiative as an embedded case, and evaluate the outcomes of each of the phases independently (i.e. without considering the outcomes of the other phases). Our evaluation may be summarized as follows:

Phase I (organizational structure and culture change): *successful*.

Phase II (implementation of core modules of the selected ERP package): *successful*.

Phase III (configurator implementation): *not successful*.

We provide evidence in support of our evaluation in Table 4.

4.4. Deductive testing

P1. *ERP implementation can be successful only if there is a strong and committed leadership guiding the initiative*.

MANCO's CEO "Tom"[5] came to realize that the company's "mediocrity" was due to the inefficient

processes that needed to be improved using ERP. Yet, before a system could benefit the company, he realized that the territorial wars between the different functional areas, created and fueled by three of the Vice Presidents (VPs), would have to be rooted out. In Phase I, Tom directed his attention to solving the "territorialism" problem by dismissing the VPs who were harboring this attitude. Next, Tom modified the structure of the organization, creating a new position of a senior VP (operations) and appointing a suitable person, "John," who would be the "owner" for order-processing, MANCO's core business process. All functional areas involved in order-processing were made accountable to John. The above moves were carried out with decisiveness and firmness, indicating that leadership was "strong." Tom also appeared "committed" to his vision of creating a cooperative work environment as a foundation for ERP implementation. In the following months, with the assistance of some hand-picked managers, Tom instituted programs (quality, profit-sharing, etc.) to help foster a cooperative culture in MANCO, and personally monitored the progress. John (the senior VP) also proved to be a strong and committed leader and pursued Tom's vision with enthusiasm.

Similar strong and committed leadership was in evidence in different functional areas. For example, the *production-planning manager* explained his stern approach to managing his planners, emphasizing his commitment to cross-functional cooperation:

> I made it very clear to the planners that we have to be very honest, that is the key . . . no games, we cannot play games . . .

Phase II, which involved the acquisition and implementation of the ERP system, was led by the MIS manager ("Judith"), whom the CEO and (especially) the senior VP unconditionally supported throughout this phase:

> Judith has my full support . . . . I go around and whenever somebody gets in her way, I try to smooth that around . . . . I've been kind of cavalier about it. I have said in meetings . . . get in her way, and I'll kill you.

A systems analyst's comments also showed the firm commitment of the leadership towards BASYS implementation:

---

[5] The names of the project participants have also been changed in the case study.

The general message was that we are going to use this and this is the way it is going to be, get on board or you will get behind. Most people after their initial fear ... got adapted to it.

The plant manager was convinced that the project would be successful, citing leadership as the primary reason:

This project will succeed because we have the senior VP of operations who is in-charge of all the disciplines involved ... he has stated that it will succeed ... if you have the guy at the top saying that it will succeed, then us soldiers will make sure that it will succeed ... because that has been the edict from the top.

The MIS manager, who also served as the project manager (PM), enjoyed organization-wide credibility and was seen as capable of balancing technical and organizational concerns, and was described by the quality assurance manager as a "real authority" whose judgments and insights were well-respected by all. The plant manager also credited the MIS manager's participative but firm leadership style for the success of the implementation in this phase.

Unfortunately, during Phase III, the leadership for the organization as well as for the configurator implementation fell into complete disarray. MANCO had been acquired by another company (referred to as "the Corporation"), Tom (the CEO) had left the company and had been replaced by John (the senior VP). The plant manager, a major supporter of John earlier, expressed his dissatisfaction with John's leadership:

He thought that we can run the business without a VP of operations. The gridlock ... started to come back and reoccur, and John started to become very autocratic .... Our president does not know what needs to be done.

With John's agenda dominated by other concerns, he appointed a former purchasing manager to sort out problems in the inventory, BOM, and labor reporting, that needed to be addressed before the configurator could be implemented. In Judith's view, the former purchasing manager could not provide effective leadership to the initiative:

[His] personality being the way it is, people don't have a lot of confidence. Upper manage-

ment does, but the people he works with do not ... whoever is trying to guide this has to have people's respect.

To add to the leadership problems plaguing the configurator implementation, Judith, in recognition for her excellent leadership in Phase II of the initiative, was promoted to the position of Corporate MIS manager, and placed in-charge of implementing ERP throughout the Corporation. With her departure from MANCO, the ERP team-members stopped meeting, and the MIS function was reduced to the role of maintaining the computing infrastructure. The responsibility of the configurator implementation was thrust on two engineers who had not been part of the initiative until this time.

Eventually, John hired a VP (operations) and also put him in-charge of MIS. Unfortunately, the new VPs management style was not well received by the MIS department. For example, a systems analyst said that the VP "did not know much about IS but thought he did." Another systems analyst expressed his dissatisfaction:

Judith's management style was to treat you as an adult .... As long as things are on schedule ... working OK, she was very open rank, and you decide ... how you go about doing it. There is a change now .... The new Vice President of operations ... who IS was now reporting to, has no experience with running an IS department .... He preferred to bark orders rather than listen to what the problems were.

Also, the new VP showed little interest in the configurator implementation, which was by now being viewed as an "engineering" project and not really concerning operations or MIS. The productivity facilitator summarized the situation:

We lost our leadership and our key figures, and so people tend to go separate ways.

It is clear that strong and committed leadership was present in Phases I and II, but not in Phase III. Given that Phases I and II were successful, and Phase III was unsuccessful, we conclude that the empirical patterns match those suggested by the proposition P1. Thus, P1 survives empirical testing.

P2. *ERP implementation can be successful only if there is open and honest communication among the stakeholders.*

The dismissal/replacement of three VPs was done swiftly and without much discussion with other members of the organization. According to our informants, the official "story" introduced into the organization grapevine by the HR department was that the VPs were moving on to "better opportunities." Based on this, the communication in MANCO during this earlier part of Phase I of the initiative cannot be characterized as "open and honest."

In the latter part of Phase I as well as during Phase II, issues about restructuring and the ERP implementation and their implications were being addressed in the company-wide profit-sharing meetings. We found that the plant manager, who was aware of the potential negative impacts of the new ERP system on the shopfloor workers, was planning to address these workers during the profit-sharing meetings in a way that would amplify the potential benefits (e.g. "their take-home pay can go up with them working fewer hours") while completely omitting any of the expected negative effects (e.g. "anxiety" because "big brother is watching them too much").

However, there was some evidence indicating that communication among functional areas was becoming open and honest. For example, the production-planning manager, reflecting on the vastly improved cross-functional communication, said:

> It all goes back to trust and honesty and truthful communication . . . if you don't have this foundation, whatever system you have will not work.

In Phase II of the initiative, most of the information regarding the progress of the project was being communicated, rather passively, to the employees through announcements and project-status reviews displayed on a notice-board. The MIS manager explained the implementation team's communication strategy:

> We have a bulletin board down by the cafeteria . . . to communicate what's going on with the rest of the company. We decided to do that with a very simple graphical chart . . . we elected not to put any dates . . . if something slipped . . . we

didn't want people thinking, well, there is something wrong . . . it is failing or whatever . . .

Our own observations of the infrequent updates to the "bulletin board" (e.g. it had not been updated for over a month in one instance, even though it was to be updated weekly) also indicated to us that this mode of communication was not designed to communicate openly and honestly. Instead, it served to create a facade that the ERP implementation team was diligently communicating its progress to the rest of the organization.

The instances presented earlier demonstrate that communication at MANCO during the initiative was not open and honest, but selective and deceptive. However, we did find that the communication among the implementation team-members and between top management and the implementation team, during the latter part of Phase I and throughout Phase II, was fairly open and honest. There was also evidence indicating open and honest communication among representatives of functional areas. For example, according to the productivity-facilitator:

> Good people in different departments communicated and coordinated, and are very understanding of what others' problems are.

In Phase III, communication between John (the former senior VP who had become the CEO) and middle management suffered greatly. Even the plant manager described the CEO as "autocratic." The plant manager also observed that the gridlock due to lack of trust and communication among functional areas (which was addressed during Phase I) was again becoming apparent. The new VP (operations) was described as being "from the old school" who "preferred to bark orders rather than listen to what the problems were." The person coordinating the streamlining of the BOM, inventory, and labor as foundation for the configurator database, was also described as uncommunicative. Further, with the implementation team no longer meeting after the promotion of Judith (MANCOs former MIS manager), there was very little communication regarding the configurator in the organization, or between the two engineers charged with configurator implementation and the BASYS implementation team-members. This point was obvious from the remark of a purchasing agent (an active

team-member in Phase II) who said "I do not know anything about the configurator," and also from the comments of a systems analyst who discussed how sales had completely incorrect expectations regarding the configurator's capabilities.

To summarize, while communication regarding the initiative was present in the organization during Phases I (latter half) and II, it was not predominantly honest or even open. In Phase III, there was almost no communication regarding the configurator, and it was apparent that the honesty and trust in the cross-functional communication that had been so carefully nurtured during the first two phases was declining.

Based on evidence from Phases I and II, we conclude that open and honest communication is not a necessary condition for successful implementation (i.e. the proposition is falsified). The evidence in Phase III was insufficient to test the proposition involving a necessary condition for success, since the outcome was "unsuccessful." However, one could speculate, viewing the data pertaining to Phase III inductively, that lack of communication may have negatively influenced the configurator implementation.

P3. *ERP implementation can be successful only if the implementation team is balanced and empowered.*

The first part of Phase I (which involved replacing the three VPs) was executed *solely* by the CEO (Tom). This reorganization was done without much discussion with other organizational members. The only other person who had peripheral involvement was the HR Manager, who facilitated the transition by providing job-search assistance to one of the VPs, and working out adequate compensation to ensure that the VPs parted MANCO without much ill-will. Tom also personally envisaged and executed well thought-out changes in the organization structure to prevent the resurgence of territorialism in the organization.

Soon after reengineering the organization at the top, Tom offered the Production manager ("Stan") the position of plant manager, and gave him a "clean sheet" assignment of reorganizing the shop-floor. Stan accepted the position, initiated some reorganization in the shop-floor, and also appointed a new production-planning manager, who would help him manage the critical production-planning function.

While the organization was adjusting to the structural changes, a serious attempt to change MANCOs culture was initiated. For example, the Quality manager, was asked to start a program to instill a sense of quality in MANCO. Around this time, Tom defined the vision for MANCO as "Enterprise Agility," and also formulated the mission statement.

To summarize, the first part of Phase I did not involve any team since the CEO *himself* implemented the change. Thereafter, the CEO did involve the senior VP, the Quality manager, and the new plant manager who, in turn, brought onboard the production-planning manager, to help in reorganizing the structure and transforming the culture of MANCO. In the second part of Phase I, while the CEO did involve a few individuals to help him, they were not really part of a "team" since they were not working collaboratively, but rather implementing changes in specific organizational areas under the direct supervision of the CEO. Also, the representation in the group was not "balanced" in the sense that many important functional-units/levels were not represented.

Phase II was spearheaded by the ERP implementation team. There was careful attention given to the selection of the team, reflecting the fact that the leaders of the initiative recognized the importance of creating a well-balanced team with competent members. The selection of team-members was carried out in two phases: first, the MIS manager obtained nominations for potential team-members from each functional area; and second, the nominees were evaluated based on their understanding of their areas' functions, the inter-relationships among different functional areas, their ability to work constructively as a group, and their ability to represent their areas' special interests. As observers in the team-meetings, we (the researchers) could sense the importance of bringing together a group of people from different functional areas. We also felt, on several occasions, that the absence of a team-member from any functional area would have resulted in the implementation of a business process that potentially violated some fundamental assumptions of the area not represented in the ERP team.

The fact that the implementation team's recommendations regarding process, procedures, and technology, developed through a collaborative effort among team-members, was respected and acted upon by

MANCO's top management, indicates that the team was empowered. The only constraint set by the CEO was that the ERP system selected should not require significant customization. Emphasizing the importance of empowering a group to rethink the business and select/implement the relevant information system, the plant manager of MANCO had said in an interview:

I guess what that boils down to is participation in the project . . . Judith [the MIS manager] was in-charge of the project . . . but she formed teams . . . that is the second biggest reason that it [the project] will succeed . . . because the people who are gof thatit34378.1(sucer)-1411(ed)5014.4(weed)55.4()20 9(vol1(v)1911(ed)5014.7(in)]TJT*[(the)-336.decind 0((in)61.4(fi(an)ic711.4((i(pas)-8.7ed.)5)28.[(thn)]TJT*pthw)6.(pr8(e,he27299.1(t(whe)-7.(but26635.1(gularut266.1(perge)-8[(sation

The third direction, likely to be the most fruitful, would involve examining taken-for-granted assumptions that the ''experience far'' positivist literature on ERP implementation makes about the ''subjective understanding'' of the participants of the initiative [20]. The subjective understanding, in the instance of our study of MANCO, refers to how the observed human subjects (i.e. MANCO's employees) phenomenologically experienced the ERP implementation (in contrast to how the existing literature models their experiences, based on characteristics imputed by researchers). In our study, we sought to test propositions from the literature on BPR/ERP implementation, much of which may be characterized as ''positivist'' due to the embedded objectivist assumptions and deterministic reasoning, and nomothetic methodological orientation. Evidence from the MANCO case validates the proposition that strong and committed leadership is a necessary condition for successful implementation, but refutes the propositions that open and honest communication is a necessary condition for success in implementation and that a balanced and empowered team is a necessary condition for success in implementation. Reading between the lines of the positivist BPR/ERP implementation literature, one can discern its presumption of rationalism as the basis on which people act. However, did the actors at MANCO actually see themselves as subscribing to and behaving according to a rationalistic, decision-making model?

To address this question, a researcher would need to observe and interpretively ''read'' how the actors actually saw and understood themselves. In other words, the researcher would need to develop a new interpretive understanding, as called for by Lee in his framework for integrating positivist and interpretive approaches [20]. A clue is offered by the proposition that was validated and by the two that were refuted. The validated proposition is about leadership and the refuted propositions are about open and honest communication, and about a balanced and empowered team. As mentioned earlier, a hermeneutic reading of the BPR/ERP literature may reveal a presumption of rationalism: leadership is needed to straighten out any dysfunctional aspects of the organizational structure and business processes so that the ERP may be properly installed and configured; communication is needed so that this straightening out may occur

seamlessly with all parties developing a shared understanding of the initiative and moving towards the mandated goals in a synchronized fashion; and a balanced and empowered team is needed to carry out this rational mandate by creating plans that would be agreeable/meaningful to all the different functional groups in the organization. However, *a presumption of rationalism is but one possible presumption*. Also possible is an alternative presumption of political, power-based, and other non-rational motivations: regardless of what rationalistic decision-making would dictate, leadership achieves the changes it desires (such as the implementation of ERP technology) either through charisma or through coercive power; communication is not necessarily needed; and a balanced and empowered team is not necessarily needed either.[6] Indeed, the evidence in the MANCO case appears consistent with the non-rational/political model outlined in the preceding sentence. To formulate theoretical explanations based on non-rational/political assumptions, a researcher would need to revisit the MANCO case study database and/or re-interview the principals in the case, in order to examine whether the actors saw themselves and their setting in primarily a rationalistic way or primarily in a non-rational/political way, and to unearth what subjective meanings strong and committed leadership, open and honest communication, and balanced and empowered leadership had for the ERP project participants. This subjective understanding would then form the basis for the new theoretical propositions, which would be subject to empirical testing in other organizational contexts [20].

In conclusion, we would like to reiterate that ERP implementation is a complex IT-related social phenomenon, for which a large body of knowledge, consisting of substantial ''folklore,'' based on unexamined assumptions or without empirical basis, exists. This study takes a first step in separating myth from reality in the extensive literature available on ERP implementation and on information systems development in general.

---

[6] In fact, a recent study by Kawalek and Wood-Harper does suggest that communication and empowerment may be used as a ''tool of appeasement'' or even a ''façade'' that helps create an illusion of involvement, thereby allowing leadership greater control to coercively push ERP project-team-members and other employees in a predetermined direction under certain circumstances [16].

References

[1] S. Ackroyd, J.A. Hughes, Data Collection in Context, Longman, New York, 1992.

[2] F. Adams, P. O'Doherty, Lessons from enterprise resource planning implementations in Ireland—towards smaller and shorter ERP projects, Journal of Information Technology 15, 2000, pp. 305–316.

[3] R. Alvarez, J. Urla, Tell me a good story: using narrative analysis to examine information requirements interviews during an ERP implementation, Database 33 (1), 2002, pp. 38–52.

[4] B.M. Bass, Stogdill's Handbook of Leadership, Revised and Expanded Edition, Free Press, New York, 1981.

[5] P. Bingi, M.K. Sharma, J.K. Godla, Critical issues affecting an ERP implementation, Information Systems Management 16 (3), 1999, pp. 7–14.

[6] M. Boudreau, D. Robey, Coping with contradictions in business process re-engineering, Information Technology and People 9, 1996, pp. 40–57.

[7] I.J. Chen, Planning for ERP systems: analysis and future trend, Business Process Management Journal 7 (5), 2001, pp. 374–386.

[8] T.H. Davenport, Process Innovation: Reengineering Work Through Information Technology, HBS Press, Boston, MA, 1993.

[9] Y.V. Everdingen, J. Van Hillegersberg, E. Waarts, ERP adoption by European midsize companies, Communications of the ACM 43 (4), 2000, pp. 27–31.

[10] M. Ferranti, Debunking ERP misconceptions, InfoWorld 20, 1998, pp. 33.

[11] M. Hammer, J. Champy, Reengineering the Corporation, HarperCollins, New York, 1993.

[12] M. Hammer, S. Stanton, The Reengineering Revolution, HarperCollins, New York, 1995.

[13] C. Holland, B. Light, A critical success factors model for ERP implementation, IEEE Software, May/June, 1999, 30–36.

[14] A. Howle, ERP is still alive and kicking, Computer Reseller News, 2000.

[15] M. Jones, Don't emancipate, exaggerate: rhetoric, reality and reengineering, in: R. Baskerville, S. Smithson, O. Ngwenyama, J.I. DeGross (Eds.), Transforming Organizations with Information Technology, Elsevier, Amsterdam, 1994, pp. 357–378.

[16] P. Kawalek, T. Wood-Harper, The finding of thorns: user participation in enterprise system implementation, Database 33 (1), 2002, pp. 13–22.

[17] C. Koch, BPR and ERP: Realizing a vision of process with IT, Business Process Management Journal 7 (3), 2001, pp. 258–265.

[18] C. Koh, C. Soh, M.L. Markus, A process theory approach to analyzing ERP implementation and impacts: the case of Revel Asia, Journal of Information Technology Cases and Applications 2 (1), 2000, pp. 4–23.

[19] K. Kumar, J. Van Hillegersberg, ERP Experiences and Evolution, Communications of the ACM 43 (4), 2000, pp. 23–26.

[20] A.S. Lee, Integrating positivist and interpretivist approaches to organizational research, Organization Science 2 (4), 1991, pp. 342–365.

[21] A.S. Lee, A scientific methodology for MIS case studies, MIS Quarterly 13 (1), 1989, pp. 33–50.

[22] K. Lyytinen, R. Hirschheim, Information systems failures: a survey and classification of the empirical literature, Oxford Surveys in IT 4, 1987, pp. 257–309.

[23] M.L. Markus, S. Axline, D. Petrie, C. Tanis, Learning from adopters experiences with ERP: problems encountered and successes achieved, Journal of Information Technology 15, 2000, pp. 245–265.

[24] M.L. Markus, C. Tanis, The enterprise systems experience—from adoption to success, in: R.W. Zmud (Ed.), Framing the Domains of IT Research: Glimpsing the Future Through the Past, Pinnaflex Educational Resources Inc., Cincinnati, 2000, pp. 173–207.

[25] M.L. Markus, D. Robey, Information technology and organizational change: causal structure in theory and research, Management Science 34 (5), 1988, pp. 583–598.

[26] B. Mendel, Overcoming ERP project hurdles, InfoWorld 21, 1991, p. 29.

[27] P. Mousseau, ERP Projects Call for Multi-Talented Managers, Computing Canada 24 (42) (1998).

[28] E. Mumford, Creative chaos or constructive change: business process reengineering versus socio-technical design, in: G. Burke, J. Peppard (Eds.), Examining Business Process Reengineering: Current Perspectives and Research Directions, Kogan Page, London 1995, pp. 192–216.

[29] F.F. Nah, J.L. Lau, J. Kuang, Critical factors for successful implementation of enterprise systems, Business Process Management Journal 7 (3), 2001, pp. 285–296.

[30] R.W. Oliver, ERP is dead! Long live ERP! Management Review 88 (10) 1999.

[31] W.J. Orlikowski, CASE tools as organizational change: investigating incremental and radical changes in systems development, MIS Quarterly 17, 1993, pp. 309–340.

[32] A.N. Parr, G. Shanks, P. Darke, Identification of necessary factors for successful implementation of ERP systems, in: O. Ngwenyama, L.D. Introna, M.D. Myers, J.I. DeGross (Eds.), New Information Technologies in Organizational Processes: Field Studies and Theoretical Reflections on the Future of Work, Kluwer Academic Publishers, Massachusetts, 1999, pp. 99–119.

[33] S. Sarker, A.S. Lee, Using positivist case research methodology to test three competing theories-in-use of business process redesign, Journal of AIS 2 (7), 2002, pp. 1–72.

[34] A. Scheer, F. Habermann, Making ERP a Success, Communications of the ACM (43:4), 2000, pp. 57–61.

[35] T. Schweizer, Epistemology: The Nature and Validation of Anthropological Knowledge, in: Handbook of Methods in Cultural Anthropology, H.R. Bernard (Ed.), Altamira Press, Walnut Creek, CA, 1998, pp. 39–87.

[36] D.R. Seibold, B.C. Shea, Participation and decision making, in: F.M. Jablin, L.L. Putnam (Eds.), The New Handbook of Organizational Communication: Advances in Theory, Research, and Methods, 2000, pp. 664–703.

[37] V. Sethi, W.R. King, Organizational Transformation Through Business Process Reengineering, Prentice-Hall, Upper Saddle River, NJ, 1998.

[38] M. Sumner, Risk factors in enterprise-wide/ERP projects, Journal of Information Technology 15, 2000, pp. 317–327.

[39] P.K. Tompkins, M. Wanca-Thibault, Organizational communication: prelude and prospects, in: F.M. Jablin, L.L. Putnam (Eds.), The New Handbook of Organizational Communication: Advances in Theory, Research, and Methods, 2000, pp. 17–31.

[40] J. Van Maanen, Tales of the Field: On Writing Ethnography, University of Chicago Press, Chicago, 1988.

[41] G. Walsham, Management science and organizational change: a framework for analysis, OMEGA 20, 1992, pp. 1–9.

[42] L. Willcocks, R. Sykes, The role of the CIO and IT function in ERP, Communications of the ACM 43 (4), 2000, pp. 32–38.

[43] R.K. Yin, Case Study Research: Design and Methods, Sage, Thousand Oaks, CA, 1994.

[44] A. Zeichick, ERP development trends, Software Development 7 (4) (1999).

Suprateek Sarker is currently an assistant professor of information systems at Washington State University, Pullman. He received his BE degree in computer science and engineering from Jadavpur University, India, MBA from Baylor University, MS from Arizona State University, and PhD from the University of Cincinnati. His research focuses on utilizing qualitative research approaches, both positivist and interpretivist, to study IT-enabled organization change, virtual teamwork, mobile collaboration, and on-line education. His teaching interests include database and knowledge management systems, systems analysis and design, case studies in IS, and qualitative research methodologies.

Allen S. Lee is professor of information systems and associate dean for Research and Graduate Studies in the School of Business at Virginia Commonwealth University. He is a past editor-in-chief and a current senior editor for *MIS Quarterly* and a founding senior editor of *MIS Quarterly Executive*. He publishes in the areas of information systems research methods and information systems case studies. He has also been a tenured professor at Northeastern University, the University of Cincinnati, and McGill University.