

# **UNDERSTANDING THE PROBLEMS OF ENTERPRISE SYSTEM IMPLEMENTATIONS**

## ***Beyond Critical Success Factors***

Sue Newell, Gary David, Traci Logan , Linda Edelman and Jay Cooprider

*BENTLEY COLLEGE, 175 FOREST STREET, WALTHAM, MA 02452-4705, US.*

**Keywords:** Enterprise System implementation, critical success factor, case study

**Abstract:** Many companies continue to implement Enterprise Systems (ES) in order to take advantage of the integrating potential of having a single common system across the organization that can replace a multitude of independent legacy systems. While increasingly popular, research continues to show that such systems are difficult to implement successfully. A number of studies have identified the critical success factors for such implementations. However, in practice, it is often difficult to ensure that these critical factors are in place and are maintained in place across the lifespan of the implementation project. In this paper we identify the socio-political and cultural issues that explain why this is difficult and suggest some meta-level processes (induction, informality and improvisation) that can help to offset the problems with maintaining the critical success factors.<sup>1</sup>

## **1 INTRODUCTION**

Enterprise Systems (ES) are being widely adopted by organizations in all types of industry and geographical locations and there is now considerable research around ES adoption and impact (Holland and Light, 1999, Robey et al., 2002).

In particular, many multinational enterprises have adopted ES with the intention of leveraging productivity and efficiency gains in order to improve organizational competitiveness (Davenport, 1998, Wagle, 1998). The promoted advantage of an ES is that it can integrate business functions into a single system with a shared database (Lee and Lee, 2000), allowing organizations to develop a homogenous enterprise-wide information systems infrastructure. At the same time as improving integration, this will also allow the organization to get rid of legacy systems, which will have typically been developed in an ad hoc fashion over a long period. Large organizations will often have several hundred, often duplicated legacy systems which are very costly to maintain. Replacing many of these with a single ES is therefore seen to be advantageous.

While these potential benefits are very attractive, explaining why so many organizations have opted to adopt an ES, in reality implementing an ES can be problematic to the extent that many such projects

involve significant delays and budget over-spends, as well as sometimes ending in outright failure (Robey et al., 2002). A great deal of research has been done to identify the critical success factors for ES success (Summer, 2000, Holland and Light, 1999, Parr and Shanks, 2000, Markus et al., 2000). This is very helpful and provides the background for the results of the research reported in this paper. More specifically, in this paper we explore why many of the normative and prescriptive factors that research has identified as critical to success are problematic in practice. We argue that prescriptive accounts can be enhanced with research which considers why these so-called critical factors are difficult to establish and maintain in practice

## **2 ERP CRITICAL SUCCESS FACTORS**

As indicated above, a number of studies have identified the critical success factors associated with successful ES implementations. In this paper we draw upon the list produced by Nah et al., (2003). This list is based on an extensive literature review of previous research that had sought to identify the critical factors for ES implementation success.

Based on this literature review they identified 11 critical ES implementation success factors that they suggest become more or less critical at different times in a project's life-cycle. In this paper we group these elements rather differently, since they relate to different aspects of project management and structure that we found were associated with the problems experienced in our case organization. Specifically, we consider the 11 factors that Nah et al., (2003) identified under three headings: Staffing Issues: here we consider three of the critical success factors - top management support, project champion and ES teamwork and composition; Formal Project Management Methodology: here we consider five of the critical success factors - project management, business plan and vision, effective communication, software development, testing and troubleshooting and monitoring and evaluation of performance; and finally Organizational Structure and Culture: here we consider three of the critical success factors - change management program and culture, appropriate business and legacy systems and business process reengineering and minimum customization.

Given the need for brevity we will not discuss these factors in any more detail here. Instead, we next present the case study and then consider the case findings in the analysis section in terms of these critical success factors. In doing this we provide a more detailed discussion of these different critical factors, in particular identifying why, in practice, each factor can prove problematic from the perspective of the implementing company.

### 3 METHODOLOGY

In this paper we use an exploratory case study of a large consultancy firm, hereafter called XYZ that was in the process of implementing a major ES across its global business. The data collected in the study is subjected to an interpretive analysis since we had no predetermined hypotheses or propositions to test. The strengths of the interpretive methodology have been reported in a number of studies, notably Klein and Myers (1999) and Walsham (1993). The appropriateness of adopting such a paradigm is reflected in the need for not only investigating the influence of the technology implemented, in this case ES, but also the need to take into account the broader context, including the organization and its environment. For example, in the words of Walsham (1993 p. 4-5), interpretive research methods are 'aimed at producing an understanding of the context of the information

system, and the process whereby the information system influences and is influenced by the context'.

The main method used is the exploratory interview. We decided to supplement our data on the specific ES implementation case with data from consultants in the same organization who had been involved in many external ES implementations. We decided to consider this broader experience of consultants because consultants have wide-ranging involvement in a variety of companies which are likely to approach their ES adoptions very differently. At the same time, this was an exploratory study so we wanted to gain access to rich, qualitative data rather than quantitative data that could have been collected by a survey instrument. Thus, we collected data from two distinct groups of consultants: firstly, senior consultants who have had considerable experience of implementing ES in a range of different companies (N=7); secondly, senior consultants within this firm who are themselves involved in the implementation of an ES (Siebel) across the global firm (N=7). In addition to these interviews we also collected documents related to this consultancy firm's implementation methodology generally and the Siebel project specifically. The purpose of collecting data from multiple sources was to enrich the depth of the study, and to triangulate the data to ensure the validity and reliability of the findings (Denzin, 1989).

## 4 CASE DESCRIPTION

Given the focus of this paper we present data relating to the key problems that emerged in relation to XYZ's own ES implementation project. We draw upon the more general experiences recounted by the consultants only as they pertain to this specific experience and to the previously identified critical success factors. XYZ is a very large global organization manufacturing and retailing both PC and high-end computer systems. It also has large global consultancy businesses that focus on both general business services and IT-related implementation and support services

### 4.1 The Siebel Project

Siebel is an enterprise-wide customer-relationship management (CRM) system that the company decided to implement in 1999. XYZ had already developed its own CRM systems but the CEO decided they needed to "web-enable" this application. Since it was determined the in-house development efforts required to migrate to the web

were too significant, the decision was made to buy an external package to support the XYZ organization. The decision was made to go with Siebel, predominately because of its scalability and ability to support the breadth of the XYZ corporation. The project was kicked off in 2000 and was still ongoing in 2004.

Interviewees admitted that the success of the project was difficult to judge given that it had spanned such a long period of time, overlapping many other projects and organizational change initiatives. XYZ was described as becoming 'a very different and much more nimble organization' over this period and Siebel was seen to be at least a factor in contributing to this change. However, in more tangible terms, the Siebel project had not been a complete success. One of the major business rationales for the project was that by replacing many customized and independent legacy systems with a single "vanilla" application, maintenance costs would be significantly reduced. With this in mind the project plan had a built-in schedule for 'sunsetting' existing applications. Unfortunately, four years on, only one of the scheduled legacy systems had actually been phased out and as one of the project leaders admitted: "We are a little off-track!" (PM). More generally, there had been significant delays in implementing the various modules. For example, the sales module had been delayed by one year and the marketing module by two years. Moreover, the human cost of the project was very high, especially among the core team, who were described as 'burnt-out' by one of the core team members:

"When we are talking about four years, it's an awful long time to put people onto a project like that. And one of the aspects of that is that some of the executive team has been on the project now for four years and are burned, burned to crisps... In my own case... I can no longer sustain an 80-hour work week".

## 4.2 Project Methodology

The project has followed a well-established IT implementation methodology; one that XYZ uses with its clients when implementing IT systems. The overall project has a project leader who is a Vice-President. Under this leader there is a core team of about 12 individuals, each responsible for a different aspect of the design and implementation of the system, including communications, data coding, operations and deployment. In turn, each of these core team members is responsible for a number of project teams that are working on different modules

within the overall CRM system. Each module has been rolled out in relatively independent phases, including the call centre module, the services and support module, the field sales and distribution module, and the marketing module. For each of the module implementations, a unique global project team is brought together which includes content experts as well as CRM experts. This team is called the project definition team (PDT). It has a leader and under the leader there is a project manager, a process leader, an architecture leader, an education leader, and a deployment leader. That worldwide PDT team is responsible for the deployment of the particular module worldwide. This team is responsible for the initial gap exercise (see below), understanding the requirements of the business, feeding the requirements to the development arm, testing the applications and the changes as they come through, developing educational material for users, and actually deploying the system across the different geographies and BUSes.

The gap exercise is seen to be an extremely important part of the project. Led by the PDT team, a representative group of people from across the world are brought together for a one week intensive workshop. The people involved will eventually be users of the system and will be involved in various project teams during the implementation. By taking this group through the Siebel process and comparing this to existing practices, the core team is able to work-flow how these people do their job. The aim of the exercise is to see if there are any limitations to the Siebel software so that customization is needed. However, the overriding rationale is to get users to accept the 'vanilla' system, "out of the box", since customization is so expensive.

Any customization and interface requirements that are identified are then passed over to the development centre, which is now a separate profit centre within XYZ, mostly located in India, which develops the required code, working on a 24 hour a day cycle. There is then extensive testing done on the system before it is piloted and then gradually rolled-out across the different geographies and BUSes. In terms of this roll-out, the education of users is accomplished primarily through the use of online materials, with in a few cases, additional classroom sessions to supplement. At the time of the interviews most of the different modules had been deployed across Asia, Europe and North America, with the exception of the marketing module which was still in progress. The interviews were undertaken with project members involved in this marketing module since we wanted to track the project in real-time. However, we also interviewed members of the core team who had been involved in the project for four years. In total, about 50,000

users were already using the CRM system and this would rise by about another 10,000 once the marketing module was in place globally.

## 5 PROBLEMS ENCOUNTERED IN THE PROJECT

Interviewees discussed a number of problems that had been experienced over the four years of the project. We have categorized the main problems under five main headings and discuss each in turn next.

### 5.1 Sustaining Resources for Social rather than Technical Work

At the very outset of the project, the change management and relationship issues were seen to be central and resources were allocated to ensure that initiatives were introduced which focused on extensive user education and general user adoption issues. Yet in reality, very early on, as soon as the project hit some technical problems, funds got diverted from the human to the technical and these resources were never subsequently restored. As one core project team member commented:

"I have this chart that we developed in the first two months of this, which said one of the biggest issues to deal with is people change. We have to focus on that... And then we promptly forgot about it and we didn't do nearly as much from the people change aspects as we originally had planned to do... The IT side wasn't bedded in, so we gave up funding for people management in the early part, believing that we could put it in later in the season".

### 5.2 Getting Things Done at Critical Points

While following the formal methodology worked when everything went to plan, working around the formal system was described as necessary at 'crunch' times, when problems were encountered, especially when these problems had the potential to negatively impact the project's critical path. At these times, informal networks were used – 'to get things done in the end, as opposed to simply transferring information'. An example of the informal system at work was described:

"Right now I have an out-plan item, which is the deployment of marketing in

Asia-Pacific. We have no money to do this. But we figured out with the AT guys that we can actually do it as a skunk work if we can get everybody onboard and just get shit done. So what I did was I called one of the guys who used to work for me in my old job, who is now the relief manager, and I said I want to hide this. I want this to happen, but I don't want it be in front of everybody's face until we know more about it, to know how deep this bread box is we are looking in.".

### 5.3 Leadership and Team Involvement

Given the extended time-span of the project, there were numerous changes to both the leadership of the project, the core team and the middle managers involved at different points throughout the implementation. The leadership of the project had changed three times over the four year period. The first leader, who had initiated the project, was described as: "hard driving, pain in the ass, all of those sorts of things, and not a good people person". He understood that people issues were important but simply did not have good people management skills. However, he was very good at building senior management support. The second leader was described as:

"Very experienced with consulting background, but not someone who had a lot of experience with dealing with the politics of (XYZ); and above everything else, this was a political project".

In relation to the core team of about 12, this group was described as working very closely and effectively together:

"Most of us have worked together for four years now. There is a great deal of trust and liking amongst the executive team".

This cohesion was built up through intense interaction at the start of the project:

"(we were in) each other's pockets for about six or eight weeks to begin with, and we got to know each other extremely well, which was great because it carried us through the hiatus when we didn't get to see each other very much".

However, while the core team of 12 remained more-or-less consistent over the 4 year time period, there was a great deal of turnover among the more periphery members of the project. Initially, the whole team, core and non-core, had got together for a 2 week meeting where they had discussed the

project – its objectives, how it was going to transform the organization, the problems and opportunities of the project etc. This had provided a lot of energy for all team members at the outset. However, over time, those who had been involved in this initial meeting left and were replaced with other people who had not been at this kick-off meeting. This created problems in terms of both commitment to and understanding of the project. As one of the core team members commented:

“If I were to run a project like this, the lessons I have learned about people on the project is we need to be re-educating them on how you want the project to work; otherwise, they will reinvent it”.

## 5.4 Divergent ‘Common’ Practices

While the original legacy CRM systems were not integrated, working off multiple independent databases, they had been based on a reengineering analysis that had been undertaken at the time that XYZ was significantly downsizing during the early 1990s. During this reengineering effort the aim had been to define common processes and procedures so that the way of interacting with customers was common across all geographies and business units of XYZ. The prior establishment of these common processes meant that the introduction of Siebel should have been relatively easy since they anticipated that only minimal adjustments to reflect country differences would be necessary. However, this did not prove to be the case. So, in the initial fit-gap exercise the PDT team found that:

“There is an interesting difference between the process documents – how they say the job is done and the people at the keyboard actually doing the job – they don’t match. You get very clever people who learn their own short-cuts and unless you are a practitioner you don’t learn these things”.

In other words, even though at the start they had believed that the implementation would be easier because common processes were assumed to have been universally adopted, they found during this fit-gap analysis stage that in reality people followed very different processes in actually carrying out their everyday practices. People had developed work-arounds and adaptations to ‘common processes’, hence the concept of common processes had gone through a natural erosion over time. This introduced enormous problems for creating the unitary database and interfaces for Siebel. For example, to create the common marketing database they had to clean-up data from many different legacy systems,

supposedly all based on common processes but in reality with a lot of diversity:

“So you end up with a huge amount of different data formats and different legacy databases... the people are doing the best they can and also people using the fields for something in which it was never intended, either because it was never really closely defined or because tactically they had to do something so they did that”.

Each of these legacy systems had grown and developed overtime so that there were many examples of the idiosyncratic use of particular fields. An example was provided of the use of the customer number:

“A rather amusing example that is probably (XYZ) specific; but we had something call the customer number. It’s supposed to be a unique identifier for a customer. Which is actually legacy thinking if you think about it because if you’ve got a customer database that’s got separate address lines, customer lines, you don’t actually use the proxy which is the customer number”.

This interviewee went on to say that although the customer number is obsolete in the new system, and the simple fix would be to delete all the customer numbers, this had not been done because there was resistance from users who had always relied on customer numbers and could not understand how they would not be needed in the future. So, for the sake of getting user-acceptance the customer number (or rather numbers) had been left in. But cleaning up the data so that the databases could be integrated into a single database was a major undertaking, especially because of the frequency of duplication records:

“If you’ve got a duplication of contact or duplication of an account with marketing you can get a major problem with some of the work flows that you’ve got”.

The problem was enormous given the numbers of accounts that needed to be integrated into the common database. So, in the UK for example, where they were starting the roll-out, they had to sort through about three hundred thousand accounts and over a million contacts; and this was ‘small deal’ compared to some of the other countries. For example in Germany there were about four million contacts and in Italy over one million accounts.

## 5.5 Resistance and Stalemates

In relation to the first call-centre module, mutual discussion among the participants during the fit-gap

week lead to the identification of the differences between the way people wanted to do their job and how the Siebel tool enabled them to do it. Because of this, the first group identified over 600 requirements for customization. However, as was noted, the implementation plan was to keep customizations to the absolute minimum, and consequently in the first release of the software only 8 of the suggested customizations had been developed and put into production. These were mostly related to nomenclature and terminology so that the tool mirrored existing XYZ usage. The rest of the suggested customizations were disregarded as non-essential:

"The rationale was to keep as close to out-of-the-box as possible – we were really striving to minimize the number of customizations that had to be made to the application".

However, while the project team was able to get users to accept the 'vanilla' system in this instance, they were less successful for the other modules. For example, users in sales were reluctant to accept changes to their existing practices, not only holding out against them, but also imposing additional modifications to the system:

"The sales team basically stuck their tongue out and said screw you; we ain't going to do this unless you do it our way, which has led to a number of compromises in how we actually implemented the package, some of which are good, some of which aren't good".

This had similarly happened in relation to the marketing module, resulting in a two year delay to the implementation. Eventually a new manager was brought in to try and resolve this setback. His view was that if you lead the implementation from a purely organizational perspective, it would be too expensive and too time-consuming. Instead he advocated getting the system up and running, believing that users would be able to adapt their practices to the system:

"The piloting and working forward I think are the absolute key ingredients because otherwise you can get a committee working and discussing it for years and they'll come up with something they think is absolutely perfect and it will fall apart within two weeks of going live because there's so much stuff they didn't know...".

## 6 ANALYSIS AND DISCUSSION

In this section we will consider the data from the case in relation to the critical success factors identified by Nah et al., (2003), grouping them into three areas – staffing issues, project management methodology issues, and organizational structure and culture issues. Our analysis identifies how the socio-political and cultural realities of an organization make it very difficult to sustain the so-called critical success factors.

### 6.1 Staffing Issues – Leadership and Team Composition

First, in terms of leadership issues, it is clear that top management support in general (Summer, 2000, Bingi et al., 1999) and a project champion in specific (Summer, 2000, Rosario, 2000) are critical to the success of any large organizational project, such as the implementation of an ES. The general interviews with the XYZ consultants confirmed this:

"The key thing (for ES project success) is higher executive championship. Somebody from the top who has bought in, who is really doing that, having the key mentality of having everybody bought in."

Moreover, the project itself should include people who have been selected based on their skills and expertise, so that there is an appropriate mix of team members, each of whom will presumably add value to the implementation. Again, the general consultant interviews emphasized this factor in discussing what made a successful ES implementation. These interviewees stressed the importance of building a strong internal project team because of the impact this could have on knowledge sharing and creativity, both seen as essential for a successful ES project:

"Where the team comes together and starts to appreciate each others personalities and each others values, then you start to build the relationships that will see you through... there's just a natural outpouring if you put a bunch of smart people in a room with a problem. They're going to come up with some alternatives that any one person wouldn't have seen before".

However, in reality the Siebel project demonstrates how difficult it is to achieve sustained project team commitment, and consistent on-going project leadership in the context of complex ES projects spanning multiple years like the one described here. Four years is a long time, during which any organization is likely to see numerous

personnel changes at all levels, including senior management. This was the case with XYZ who, over the four year span, experienced three different project leaders and multiple changes to the project teams assigned to the various CRM modules. In terms of the different leaders, each had a different style and was more or less able to play the necessary internal and external leadership roles. In relation to the team participants, for those who joined the project later, and so had not been involved in the initial 2 week induction meeting, there was less understanding of the project benefits and less commitment to the goals of the project, especially to the goal of minimizing customization.

In other words, what happened in this case was that the initial induction was successful in providing the relevant stakeholders (leaders, project members and users) with a good understanding of the project and its importance, thus they were very much behind it. However, over time, as the mix of personnel changed, most of whom did not receive any formal induction, project commitment could not be sustained. What seems therefore to be important is a continuous and unified induction of all new stakeholders, including project leaders, project team members, and end users, the aim of which is to ensure project understanding, commitment and prioritization over time. Research does demonstrate the importance of prioritizing projects (Case and Shane, 1998), but this emphasis is typically communicated at the outset of a project. However, for projects like Siebel, which are of significant duration, this priority needs to be continuously reemphasized in order that all key stakeholders continue to buy-in to the project (Huang, 2000). Maintaining the priority of a project over a four year duration would be difficult in any situation, and certainly these inevitable personnel changes serve to exacerbate this problem. Bringing people periodically together for workshops may be a good way of encouraging this continuous induction, since it will also encourage the development of informal networks which were also identified as crucial (see below).

## 6.2 Formal Project Management Methodology

Structured IS project management methods offer a set of techniques and tools to carry out systems development work within a defined framework. Formalized project management methodologies are seen to be a key to successful ES projects (Holland and Light, 1999, Summer, 2000). The formal project management structure should be based on a clear business plan (Wee, 2000), which is effectively

communicated to all stakeholders ((Falkowski et al., 1998), and constantly evaluated and monitored (Holland and Light, 1999). The project plan should also crucially ensure that there is adequate testing and troubleshooting of the software (Wee, 2000). All of these were identified as critical success factors by Nah et al., (2003). The general interviews with XYZ consultants confirmed the importance of these project management factors and the Siebel project was very firmly based on a formal methodology. However, both the general consultant interviewees and the Siebel interviewees stressed that the formal methodology alone is insufficient. For example, one general interviewee commented:

“The actual relationship building is probably more important than any of the other formal methods. The formal methods will get information through, but they don’t build the empathy and understanding that will encourage people to work till 10:00 at night together because they don’t want to let the team down or they don’t want to let each other down”.

Thus, the qualitative interview data demonstrated that although formal project management methodologies provide a necessary framework for directing each implementation phase, they fail to adequately address the inherent “work arounds” introduced by participants in an effort to keep a project moving. Such a view is supported by Crabtree (2003, p. 36), who observes, “rules and other formal procedures do *not* determine the performance of work activities and do not, therefore, determine how coordination gets done on each occasion of work”. This is especially true when critical project assumptions prove to be inaccurate. Suchman (1987), in comparing *plans* (or formal processes and methodological conceptualizations of work) to *situated actions* (or how work actually gets done as an everyday practical achievement), describes how incongruencies between the two can result in significant design flaws in technological systems that actually impede productivity rather than enhance it. This indicates that there needs to be more attention given to understanding how work is accomplished; rather than depending upon formalized institutional accounts of work processes in the building of systems.

In working around the formal process, informal networks were stressed as being important both for moving the project along, especially when difficulties were faced, and also for developing the internal project team cohesiveness. This is because in a large project like Siebel, many different players need to be involved, each approaching the project from different cultural backgrounds and understandings. Consequently, the existence of

personal relationships, those that are collaborative and mutually supportive, become essential to ensuring support and common understanding of the project.

The concept of social capital is helpful here since social capital relates to using personal networks to get things done. For example, Nahapiet and Ghoshal (1998, p.243) define social capital as ‘the sum of actual and potential resources within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through the network’. Adler and Kwon (2002) distinguish between the bridging and bonding aspects of social capital; that is the external networks between a given social unit and the broader community of which it is a part and the internal networks developed within a social unit. Likewise, Brown and Duguid (2002) note the importance of seeing information as a social rather than technologically driven resource. In this way, the *social relationships around* and the *social use of* the information (and technology) are the driver for organizational change. Similarly, Heath and Luff (2000) stress the importance of the social uses of information and technology, and highlight the growing body of research that investigates this theme.

The interviews with the Siebel participants stressed the importance of these social relationships, both internally within the project teams and externally between the project team and the wider stakeholder communities. So, networks across XYZ were used to mobilize support, get favours done, and identify solutions to problems that were outside the scope of the formal project procedure. Moreover, the internal networks within the project teams were developed and cohesiveness strengthened by the informal activities outside the project itself, as individuals socialized at lunchtimes and in the evenings. It is this informal networking, in combination with formal project management methodologies that keeps projects moving forward.

### **6.3 Organizational Structure and Culture**

Finally, projects exist within particular organizational contexts and Nah et al., (2003) identified features of this context that influence project success. Again, while the results from our case do not refute any of these as critical factors, they do suggest that in practice these factors are not straight-forward because of the socio-political realities of organizational existence. The first identified critical success factor in this group

suggests that it is important to manage the change process, including the people, organizational and cultural elements (Rosario, 2000). In the case presented here, the importance of managing the change process was clearly recognized. However, sustaining resources for this aspect of the project proved to be impossible in the face of more immediate and urgent technical problems.

The second critical success factor here is that an ES is more likely to be successful if it is being implemented in a context which is stable and successful. This suggests a context where reengineering has already taken place. In the case reported here this reengineering had, as prescribed, been previously undertaken. However, between the reengineering project and the ES project, there had been considerable divergence from the agreed processes, as individuals developed these into practices that suited their own unique situation. Harold Garfinkel (1967) described such “ad hoc” behaviours as the essential elements to understanding everyday social activity. Considerable evidence now exists that demonstrates how employees use ad hoc practices and decision-making, rather than formalized rules and processes, in the course of getting work done [see Crabtree, 2003, Garfinkel, 1967, Luff and Heath, 2000]. As these ad hoc behaviours form the basis of *communities of practice* (Lave and Wenger, 1993), separate workplace cultures (based on shared practices) emerge. Formalized systems based upon an assumed shared methodology and process can, and often does, clash with the localized “informal” actions.

Finally, there is the recommendation that the organization should change to suit the software rather than visa versa (Holland and Light, 1999) so that customization is minimized. This was indeed the stated objective in the project reported here. However, while this proved possible in most instances, in other instances user resistance to the vanilla application was simply too powerful to ignore, as was the case with sales and marketing. This isn’t surprising, given the strong link between these two departments, the strategic mission of the organization and their external focus on the customer. The general consultant interviewees identified problems related to changing the organization and minimizing customization:

“I mentioned earlier a lot of time re-engineering and best practices are not always the focal point. They really are not. As much as we would like them to be and we try to drive that, a lot of the time they’re not. So they’ll look at what standard [name of ES software] provides. They’ll look at what they have today. And try to go

through as least change as possible and that's the way I can describe it".

In relation to all these factors connected to the organizational change process, our case data suggests that what is most important is to recognize the flexibility and the improvisational skills of the users (Orlikowski, 2000). Indeed, the fact that the agreed common processes had already begun to diverge after only a short time period in the Siebel case attests to these improvisational abilities. The key seems to be to provide users with the functionality that they use in their day-to-day practice, albeit in a slightly different format with the new ES. Then allow users to 'play' with the system. The outcome is very likely to be that they will soon begin to exploit the added functionality of the ES, as long as this will indeed make their jobs more efficient and effective. From this perspective, the concern about providing resources for a major organizational change effort will be less important since the emphasis will evolve to providing a system that users can learn to exploit through their day-to-day improvisational practices. Given the difficulties of sustaining resources for the organizational change effort when faced with unplanned technical road blocks, this is also likely to be the most realistic way to exploit the system.

## 7 CONCLUSION

A list of critical success factors for successful ES implementation is helpful (Nah et al., 2003) and our intent is not to refute these critical success factors. However, our qualitative case research has provided sufficient evidence to suggest that in practice, most organizations encounter difficulty in sustaining these factors, especially in projects spanning multiple years. Our analysis demonstrates that even if a critical factor is in place at one point in time, the socio-political and cultural realities of organizations, together with unplanned technical challenges and project team turn-over make it nearly impossible to sustain the critical factor over time. This has led us to stress some meta-level processes that might help organizations in the face of these difficulties related to sustaining the critical factors. To make these meta-level processes more memorable we have termed them the three Is – induction, informality and improvisation. Emphasis placed on these three processes is likely to help keep the project on-track, even in situations where the critical success factors have been neglected or have deteriorated.

Induction – we have identified the need for induction not only at project kick-off, but continuously throughout the project as the portfolio

of key stakeholders (leaders, team members and users) changes. This helps to ensure a culture of engagement by participants while reinforcing priorities and project benefits across the organization. Periodic workshops involving key stakeholders can be a useful way to achieve this, helping to develop informal networks as well as bolstering commitment to the project (Huang, 2000). Such induction sessions will help to ensure sustained buy-in, both intellectual and emotional, to the goals and priorities of the project.

Informality – we have identified the need to recognize that the formal methodology is only likely to be successful to the extent that informal networks and influence structures are used to supplement the formal methodology. Using social capital (Adler and Kwon, 2002) to 'get things done' and to build the internal team cohesiveness is as important as following the formal methodology.

Improvisation – we have identified how the difficulties of managing organizational change may be offset as long as stakeholders, especially end users, are encouraged to improvise with the technology that they are provided with (Orlikowski, 2000). While adoption of technologies like ES is often driven by defined business goals and ROIs, its true business value will typically emerge as the technology is exploited by the end user, rather than in response to the benefits hyped by the vendor. In this sense, while an emphasis on change management is important, it may be helpful to intentionally rely upon and build into the project plan an opportunity for improvisation by employees. Given the natural tendency to shift resources away from organizational development to resolve unexpected technical issues as the ES project progresses, this reduces the burden on active management of the change process, which will often be neglected in any case. In this way, improvisation becomes documented and where appropriate, communicated across the organization. This in turn aids in reducing the likelihood of making incorrect assumptions about practice in future upgrades and system replacement projects.

Putting in place the so-called critical success factors (Nah et al., 2003) for an ERP implementation may indeed be more likely to lead to project success than ignoring these factors. However, we argue that realistically these factors are difficult to maintain in practice, especially in a project of long duration. Attention to the three identified meta-processes may not guarantee project success, but they can help to overcome the inevitable socio-political realities that any large-scale IT project is likely to face. Thus, we argue that these socio-political realities need to be taken into consideration through the continuous induction of all key stakeholders, the proactive use

of informal networks to garner support and get things done, and the active utilization of the improvisational abilities of end-users.

## REFERENCES

- Adler, P. and Kwon, S-W. (2002) Social capital: Prospects for a new concept. *Academy of Management Review*, 27, 1, 17-40.
- Bingi, P., Sharma, M. and Godla, J. (1999) Critical issues affecting an ERP implementation. *Information Systems Management*, 16, 3, 7-15.
- Brown, J.S. and Duguid, P. (2002) *The Social Life of Information*. Cambridge, MA: Harvard Business School Press.
- Case, R. and Shane, S. (1998) Fostering risk taking in research and development: The importance of a project's terminal value. *Decision Sciences*, 29, 4, 765-84.
- Crabtree, A. (2003) *Designing Collaborative Systems: A Practical Guide to Ethnography*. London, UK: Springer.
- Davenport, T. (1998). Putting the Enterprise into the Enterprise System, *Harvard Business Review*, 76, 4, 121-133.
- Denzin, N. (1989) *The Research Act*. Prentice Hall, New Jersey.
- Falkowski, G., Pedigo, P., Smith, B. and Swanson, D. (1998) A recipe for ERP success. *Beyond Computing*, 44-5.
- Garfinkel, H. (1967) *Studies in Ethnomethodology*. Englewood Cliffs, NJ: Prentice-Hall.
- Heath, C. and Luff, P. (2000) *Technology and Social Action*. Cambridge, UK: Cambridge University Press.
- Holland, C. and Light, B. (1999) A Critical Success Factors Model for ERP Implementation. *IEEE Software*, 16, 3, 30-36.
- Huang, J. (2000) *Knowledge Integration processes and dynamics: An empirical study of two cross-functional teams*. PhD, Warwick University, UK.
- Klein, H. and Myers, M. (1999) A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly*, 23(1), 67-94.
- Lave, J. and E. Wenger (1993) *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press, Cambridge.
- Lee, Z. and Lee, J. (2000) An ERP Implementation Case Study from a Knowledge Transfer Perspective", *Journal of Information Technology* (12: 2), pp. 281-288.
- Luff, P. and Heath, C. (2000) *Technology and Social Action*. Cambridge, UK: Cambridge University Press.
- Nah, F., Zuckweller, K. and Lau, J. (2003) ES implementation: Chief information officers' perceptions of critical success factors. *International Journal of Human-Computer Interactions*, 16, 1, 5-22.
- Markus, M.L., Axline, S., Petrie, D. and Tanis, C. (2000) Learning From Adopters' Experiences with ERP: Problems Encountered and Success Achieved. *Journal of Information Technology*, 15, 245-265.
- Nahapiet, J. and Ghoshal, S. (1998) Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23, 242-266.
- Orlikowski, W. (2000) Using technology and constituting structures: A practice lens for studying technology in organizations. *Organization Science*, 11, 4, 404-428.
- Parr, A. and Shanks, G. (2000) A model of ES project implementation. *Journal of Information Technology*, 15, 289-303.
- Robey, D., Ross, J. and Boudreau, M-C. (2002) Learning to implement enterprise systems: An exploratory study of the dialectics of change. *Journal of Management Information Systems*, 19, 1, 17-46.
- Rosario, J. (2000) On the leading edge: Critical success factors in ERP implementation projects. *Business World*, Philippines.
- Suchman, L. (1987) *Plans and Situated Actions: The Problem of Human/Machine Communication*. Cambridge, UK: Cambridge University Press.
- Sumner, M. (2000) Risk Factors in Enterprise-wide/ERP Projects. *Journal of Information Technology*, 15, 317-327.
- Wagle, D. (1998) The Case for ERP systems. *The McKinsey Quarterly* 9, 130-138
- Walsham, G. (1993) *Interpreting Information Systems in Organization*. Wiley, Chichester.
- Wee, S. (2000) Juggling toward ERP success: Keep key success factors high. *ERP News*, February, available: <http://www.erpnews.com/erpnews/erp904/02get.html>
- Yin, R.K. (1989) *Case study research: Design and methods*, Newbury Park, CA: Sage Publications