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32F. Developing the ERP Pre-Mortem Framework: Addressing the Debate Over Organizational Learning

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Abstract

Organizational learning (OL) is a major weakness for ERP project implementation. Exploratory research interviews of ERP managers/consultants support this finding. Many organizations do not implement proper procedures that effectuate valid learning experiences from failures endured. The literature suggests that effective OL involves complex ongoing processes requiring pervasive knowledge management and organizational memory systems (Jennex and Olfman, 2002). One example of an OL failure is FEMA's experience with the pre-Katrina "Hurricane Pam" exercise. Alternatively, an example of OL success is found in the U.S. Navy's methods and procedures. There is considerable similarity between managing ERP systems and managing high reliability system environments like those of FEMA and the US Navy. Given both the failures and successes in the area of OL, it is evident that further research is required if the phenomena is to be more fully understood.

Keywords

ERP Systems, Organizational Learning, Pre-Mortem Framework, High Reliability

1. Introduction

This research is part of an on-going effort to develop a "Pre-Mortem" (as opposed to traditional post-mortem assessments) framework to identify organizational weaknesses before ERP implementations begin. This would have the profound effect of providing managers with the opportunity to correct shortcomings in advance with the potential to make significant improvements in the project's bottom line. Previously reported findings from ERP implementation consultants revealed nine areas of ongoing weakness for ERP projects. Among them is OL, which all participants believed was lacking. While not a representative set of participants, the unanimity and conviction of response invites further inquiry. If OL strategies become a component of the developing Pre-Mortem framework, they need to be understood clearly in order to be addressed effectively. Obviously, if an organization can learn from its mistakes, identify root causes, and develop corrective action, it can minimize the potential for repeat failures.

But there is no universal agreement among researchers as to the effectiveness of OL programs. Significant divisions and conflicting opinions exist with regard to OL. Further, effective OL cannot be oversimplified in its approach or implementation. Clearly, OL and its component processes must be understood within the Pre-Mortem context and the limitations recognized for the Pre-Mortem framework to have credibility in its final form. The

remainder of this paper summarizes the findings of the preliminary empirical data and addresses the issue of OL and its role in the development of the Pre-Mortem framework. To this end, a review of the concepts relating to OL along with opposing views are presented and evaluated, and the feasibility of an OL component in the developing framework is provided.

2. Preliminary Findings from Exploratory Research

Four ERP managers/consultants were interviewed to obtain perspective of factors that are critical for success, with their absence contributing to failure (Table 1).

| ERP Factors | Participants |
|--------------------------------|--------------|
| Accountability | 4 |
| Business Processes | 3 |
| Change Management | 4 |
| Leadership | 3 |
| Organizational Learning | 4 |
| Performance Monitoring | 3 |
| Personnel Alignment | 4 |
| Reward Optimization | 3 |
| Risk Management | 4 |

Table 1: Factors Emphasized by ERP Consultants.

The lack of any type of OL was strongly and unanimously emphasized as a significant deficiency of organizations pursuing ERP systems. It was observed that when failure occurs no real effort is made to understand the root causes of the failure. Consequently no remedial action is taken and failure repeats itself.

3. OL and ERP

OL includes what Arrow (1962) calls “learning by doing,” or an accumulation of knowledge over time (Adler, 1990). Corsini (1987) refers to this as declarative knowledge, an organized body of knowledge that allows learning to occur in a collective environment. In addition, Argyris and Schoen (1978) used the term *deutero learning* to describe OL through external sources, such as observations of other organizations, the experience of consultants who are familiar with other environments, and customers who interact with multiple types of organizations. Guha et al., (1997) summarize the goal of OL as providing positive outcomes by effectively adapting to environmental changes and improving efficiency.

Jennex and Olfman (2002) concluded that to make a positive impact in organizational effectiveness, OL has to be considered in relation to Knowledge Management (KM) and Organizational Memory (OM). For the organization to be effective it uses OL to learn how to improve critical activities to remain competitive. Knowledge workers use KM systems to identify meaningful information to be retained and implement mechanisms for capturing it. OM is the physical IT infrastructure that facilitates the storing, searching, and retrieving factual information (Jennex, 2008). Thus, organizational effectiveness is affected when management monitors organizational performance and establishes knowledge requirements (OL). Knowledge engineers identify and capture knowledge for future use (KM). Finally, IT personnel maintain the physical infrastructure that that makes knowledge available to knowledge users and managers where it is used to affect organizational effectiveness (Jennex and Olfman, 2002; Jennex, 2005).

Freeman and Perez (1988) conclude that in areas of technology, effective adaptation includes not only making appropriate responses to technological advancements, but learning from other organizations that have been successful in doing so in accordance with industry best practices. Senior managers have regular access to trade publications that are littered with cases of failed ERP systems. Performance would likely improve immediately if organizations benchmarked their ERP efforts against competitors as attentively as they do their strategic product lines. Clearly, the recommendations of Jennex and Olfman are rarely taken into consideration with regard to ERP implementations. Al-Mashari et al., (2003) suggest that effective measurement techniques provide useful information that enables decision-making processes to achieve organizational goals. Further, in the context of ERP systems, performance management techniques must recognize the holistic perspective of the system. Metrics applied to ERP systems must measure organizational performance (timeliness of information, efficiency, flexibility), not just technical performance (ibid). SAP (2004) strongly promotes the monitoring of Key Performance Indicators (KPIs) as a method of measuring project performance and adjusting behavior. Regular benchmarking and auditing of results are recommended in order to optimize business processes (Al-Mashari, 2002). These recommendations could be facilitated within the context of the Jennex and Olfman Model.

3.1. Criticism of OL

While the benefits of OL might appear realistic and obtainable, critics argue that unrealistic expectations for improved performance lead to costly and ineffective programs. Understanding failure is not enough. There is evidence that organizations fail to make proper adjustments even when warning signs are obvious (Mellahi, 2005). Those that experience painful outcomes tend to cease existing behaviors, but are not likely to initiate different behaviors (Milliken et al., 1992). In addition, managers are reluctant to discuss failures for fear of blame from colleagues or retribution from superiors (Husted and Michailova, 2002). Further, political aspirations often sub-optimize organizational welfare as some try to take credit for successes and take advantage of others' failures (Anheier, 1999). Competition among senior managers for promotions, resources, and political advantage creates scenarios where individuals can realize personal gain even if the organization fails and vice versa (Starbuck, 1993). Additionally, it has been suggested (Busby, 1999) that while learning opportunities from certain types of projects can provide value to an organization, the results are often poorly disseminated or fall into disuse. Reasons for this include the time it takes to conduct learning exercises, a desire by project participants to look ahead to new projects rather than relive old ones, anxiety that findings of project activities will be perceived as criticizing colleagues, and the perception that the experience of the project was a sufficient learning experience on its own. Effective OL appears to be more difficult in large organizations, as the typically less nimble, more formal, more intensely political environment makes the objective analysis of success and failures more problematic (Starbuck, 1993; Baumard and Starbuck, 2005). Smaller, more responsive organizations have an advantage in that they can adapt more quickly, with less political influence, and where success is more closely linked to individual gain.

3.2. A Case of OL Failure: Federal Emergency Management Agency (FEMA)

FEMA is a government agency whose main purpose is to respond to disasters, usually falling under the category of either a natural event (i.e., hurricane, tornado, or earthquake) or a

terrorist attack. On March 1, 2003, the agency became part of the U.S. Department of Homeland Security (DHS). FEMA's mission is to "lead the effort to prepare the nation for all hazards and effectively manage federal response and recovery efforts following any national incident. FEMA also initiates proactive mitigation activities, trains first responders, and manages the National Flood Insurance Program" (FEMA, 2006). Essentially, FEMA is part of an integrated system of agencies (i.e., Department of Health and Human Services (DHS), Department of Defense (DoD), National Guard, Coast Guard) that provides a coordinated response to man-made disasters and acts of God.

On August 29, 2005, Hurricane Katrina made landfall as a category four storm, diminishing to a strong category three causing wide-spread damage to the Gulf Coast states of Louisiana, Mississippi, and Alabama. FEMA's response to the aftermath of Hurricane Katrina was widely criticized for its ineffectiveness resulting in persistent "finger-pointing" between local, state, and federal authorities (Congressional Report, 2006). Consequently, the federal government appointed a congressional committee to investigate the response efforts. The extent of the damage caused by Hurricane Katrina should not have been a surprise to governmental officials at any level. There had been concern for many years that the city of New Orleans, which is largely below sea-level, would not be adequately protected from flooding by its system of levies that were not designed to withstand even a category three storm. A catastrophic storm "had been predicted in theory for many years and forecast with startling accuracy for five days." (ibid: p. 1). The inevitability of such a storm was so obvious that FEMA sponsored the "Hurricane Pam" exercise to simulate the effects of a strong category three hurricane making landfall in New Orleans.

In 2004 Innovative Emergency Management, Inc. (IEM) of Baton Rouge, Louisiana conducted a five day simulation with emergency officials from fifty local, state, and federal agencies (FEMA, 2004). The purpose of the exercise, called "Hurricane Pam," was to develop operational plans to enable joint agencies to respond to a strong category three storm in the New Orleans area (Congressional Report, 2006). Some agencies found that they were better able to respond to Katrina as a result of the exercise although many of the lessons learned were not implemented in time. Additionally, a full complement of response plans was not able to be developed when funding for the exercise was cancelled before it was complete. The Committee concluded that there was "a perplexing inability to learn from Hurricane Pam and other exercises." (p. 359). The Committee's report is critical of leadership at many levels for not taking action even though they may have had imperfect information. By not completing the Hurricane Pam exercise, officials at the federal level held unrealistic and uncommunicated expectations of officials at the state and local levels, and vice versa. Hurricane Pam was an attempt to plan for and address problems associated with such a hurricane. However, funding for the exercise was discontinued long before any meaningful response plans could be developed.

Perhaps, in the absence of an actual hurricane, the "someday" element may have diminished any sense of urgency that would have existed if it were known that a hurricane strike was imminent. Further, the Pam exercise was not a response to consequences resulting from failure (traditional chronology of OL cycles). Thus, it lacked the intrinsic motivation for improvement that an organization would naturally have after experiencing the consequences of a disaster. While there is evidence that some learning did take place during the Pam exercise, it is clear that for many organizations only undesirable consequences provide motivation to learn and improve. Accountability and the consequences that follow provide an effective method of communicating the need for change and a sense of urgency. It should be

noted that accountability was also reported by the ERP consultants as a necessary element for success, albeit an absent one. While it is premature to speculate how much was learned from the Katrina experience, FEMA and its associated agencies probably learned more from that experience than they did from the Pam exercise.

3.3. Support for OL

Some researchers have found that developing OL capability is worthwhile (Garvin, 1993; Laise, 2004). Busby (1999), while identifying weaknesses on many levels, is strongly in favor of OL efforts. He maintains that OL efforts, in spite of their limitations, are still valuable. While these efforts will not correct all organizational shortcomings, the organization has reason to be hopeful that improvements can be made. One recurring theme among researchers is that leadership commitment is essential to success. In addition, critics of OL strategies consistently cite shortcomings in top management as contributing to failure (Starbuck, 1993; Husted and Michailova, 2002; Baumard and Starbuck, 2005; Mellahi, 2005). Thus, it appears that top management plays a key role in facilitating the development of an environment where weaknesses and failures can be examined objectively so the organization can learn from them. Interestingly, the ERP consultants reported that effective leadership was necessary, but often absent, for the success of ERP endeavors.

Supporters of OL point to studies on benchmarking (Camp, 1993; Yasin and Zimmerer, 1995; Daniels, 1996; Yavas and Yasin, 2001) and *best in class* methods (Laise, 2004) where organizations actively seek information relating to the operations of other companies as a method of improving their own performance, gaining a competitive advantage, or simply keeping pace. Research has revealed five major underlying criteria for learning to take place in an organization (Mills and Friesen, 1992; Senge, 1992; Garvin, 1993; Di Bella, 1995; Goh and Richards, 1997; Sharif, 2002):

- clarity of purpose and mission,
- leadership commitment and empowerment,
- experimentation and rewards,
- knowledge transfer, and
- team and group problem solving

These criteria are consistent with the recommendations of ERP researchers (Meyers et al., 1999; Shang and Seddon, 2000; Motwani et al., 2002; Al-Mashari et al., 2003; Umble et al., 2003), particularly in areas of strategy, leadership, and teamwork. Even though there are differing opinions as to the effectiveness of OL practices, there is considerable evidence that supports the notion that OL can, under certain conditions, be fostered. These conditions are clearly present in some environments, and should be *de rigueur* for the ERP environments. Recognizing the aforementioned concerns, it is possible to benefit from OL efforts if the correct environment is in place.

3.4. A Case of OL Success: United States Navy

OL is a fundamental component of organizations such as the U.S. Navy. In spite of their large size, they defy conventional wisdom that large organizations have difficulty learning from past failures. More remarkably, the Navy not only learns from past mistakes, they anticipate future difficulties and develop mitigating strategies based on imagined risk scenarios. Stated more succinctly, they learn without the failure. The Navy is an organization that has grown slowly and accumulated experience and knowledge over time, thus enhancing the chances that they will perform reliably (LaPorte, 1993, 1996; Perrow

1994). The Navy has been very successful in managing systems similar in complexity to ERP systems. These include systems for controlling nuclear powered vessels, weapon control systems, launch and recovery systems for aircraft carriers, and sophisticated threat detection and communication systems (LaPorte, 1996; Roberts and Bea, 2001; Weick, 2004). Roberts and Bea (2001) consider the U.S. Navy to be a High Reliability Organization (HRO) characterized by several key attributes that enhance reliability within the organization:

- "HROs aggressively seek to know what they don't know.
- HROs design their reward and incentive systems to recognize the costs of failures as well as benefits of reliability.
- HROs consistently communicate the big picture of what the organization seeks to do, and try to get everyone to communicate with each other about how they fit in the big picture."(Roberts and Bea, 2001)

The Navy places a high priority on effective performance and avoiding disasters through highly developed and specialized processes, including collective learning (ibid). Weick (1987) reported that they are different from other types of organizations in that they place reliability as a higher priority than any other objective. Obviously, reliable performance of each member of the vessel, and the performance of the vessel as a whole can be a matter of life and death in combat situations (Dworetzky, 1987). Not surprisingly, military culture has a predictable process of reward and punishment. Aboard ship, the Commanding Officer (CO) is the absolute authority of the vessel, and is responsible for everything that either occurs or fails to occur as expected (Bierly and Spender, 1995). Further, sanctions implemented by the CO carry with them a high degree of visibility, and notices of disciplinary actions are displayed publicly. Visibility and accountability for inadequate performance are methods used to effectively communicate that one crew member's poor performance is an indication that the entire crew is not performing up to standard. Each member of the organization understands the importance of his or her contribution to the greater organizational objective. This is yet another instance where strong leadership, accountability, and an effective OL environment contribute to a culture that expects success.

4. Conclusion

This paper presents an unsettled issue with regard to the goal of developing a Pre-Mortem framework to improve ERP implementation outcomes. Preliminary findings from exploratory research have identified a set of factors proposed by ERP consultants that are necessary, but often absent, for ERP success. One of those factors, OL, has been the subject of debate by researchers. It is evident that both the alleged benefits and failures of OL warrant further study before a more definitive list of OL parameters can be proposed. It is not suggested that the cases presented here are a representative sample of all cases that support or criticize the effectiveness of OL principles. However, the evidence does suggest that additional research is necessary to draw conclusions more confidently. Once a more complete understanding of OL has been established, one of three potential scenarios will emerge: OL will be effective in all environments, it will be ineffective in all environments, or it will be beneficial under a set of specified conditions. It is anticipated that the latter is the case. There are indications in the literature and the cases provided above that suggest the need for certain conditions to be present to obtain the greatest benefit from OL programs.

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