Pre-Mortem Factors for ERP Projects: Preliminary Findings

John J. Sullivan, Charleston Southern University, USA; E-mail: jsullivan@csuniv.edu
Mela Wyeth, Charleston Southern University, USA; E-mail: mwyeth@csuniv.edu
Wade M. Chumney, Charleston Southern University, USA; E-mail: wchumney@csuniv.edu

ABSTRACT

While ERP systems have the potential to provide significant benefits, they are often mismanaged, with unrealistic expectations, or fail outright. This research focuses on applying organizational reliability to ERP systems. Findings from preliminary analysis of exploratory interview data from a group of ERP implementation managers/consultants are examined within the context of Sullivan and Beach's (2004) model for how High Reliability Organizations (HROs) manage complex systems. The model is comprised of five broad categories: risk factors, expectations, resources, organizational competence, and consequences. ERP implementations and HRO systems share considerable commonality, and thus, it is anticipated that ERP implementations could adopt HRO techniques to improve outcomes. By understanding organizational readiness issues for ERP projects, areas of weakness can be identified, and project performance metrics can be forecasted. This would enable ERP project managers to understand project vulnerability better and strengthen areas of weakness before the project begins.

INTRODUCTION

This research addresses recurrent problems with ERP systems. Four ERP managers/consultants have been interviewed (so far) to obtain perspective of factors that are critical for success with their absence contributing to failure. Sullivan and Beach's (2004) model for High Reliability Organizations (HROs) provides a basis for understanding success in managing complex systems. HROs have one difference; failure is the exception rather than the rule. By understanding the successes of HROs and overlaying that against ERP failure factors, it may provide a basis for a pre-mortem framework for improving ERP system management. If successful, this research will provide practitioners the ability to:

1. assess organizational readiness for undertaking an ERP project,
2. identify areas of weakness, and
3. predict with a degree of confidence the outcome of the project in terms of common project metrics such as budget, schedule, and system capability.

EXPLORATORY RESEARCH: PRELIMINARY FINDINGS

ERP implementation managers/consultants rarely have authoritative roles however their close proximity to the authoritative core of these projects provides a insightful perspective into ERP project management. It is recognized that four interviews with this set of participants is not a representative sample of the entire ERP universe. However, these participants were chosen because of their experience in a variety of industries and organizations. A list of factors is provided (Table 1) along with the number of participants who identified those factors. These were considered necessary for success, yet were frequently absent and contributed to failure.

Missing, or misplaced, *accountability* is where project managers are not held accountable for managing projects effectively. Failure does not lead to consequences. Misplaced accountability occurred when the only people held accountable were, "outside the client's organization" (i.e., the consultant or vendor), "anyone but the in-house people." Overwhelmingly, the participants believed that if internal project managers were held accountable for the success or failure of a project, they would succeed far more often.

The consultants reported a lack of *organizational learning*, where organizations failed to learn from past mistakes or the mistakes of others. While there are critics of the effectiveness of organizational learning strategies (Anheier, 1999; Husted and Michailova, 2002; Mellahi, 2005), there are cases where it is commonly used effectively (Garvin, 1993; Laise, 2004), particularly in cases of organizational benchmarking or Total Quality Management (TQM) (Camp, 1993; Yasin and Zimmerer, 1995; Daniels, 1996). While transferring learning strategies may not be universally effective, there is evidence that some organizations can learn from others.

Table 1. Factors emphasized by ERP managers/consultants

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

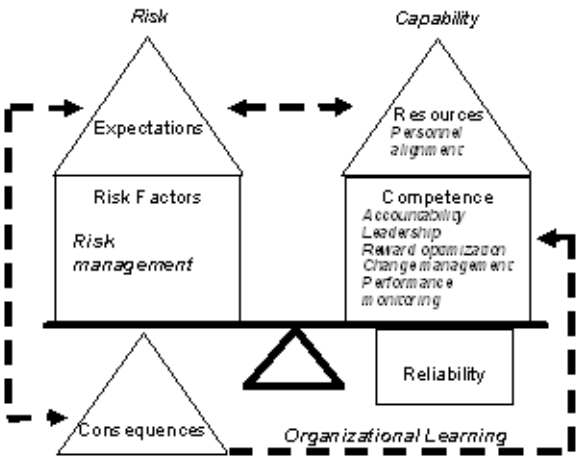
Reward optimization was another theme that emerged from the interviews. Three of the participants believed that organizations often reward behavior that improves the performance of a small component of the organization, at the expense of the greater organizational goals. "…this type of sub-optimization of an organization's overall goals occurs quite frequently. …subverts the overall goals for the maximization of their own personal goals." Thus, rewarding the highest *good* for an organization requires an understanding by its members of what that *good* is.

There is also a need for strong *leadership*. Managers "don't take ownership of the project" and that lack of leadership will allow problems to develop unmitigated. Ineffective or indifferent leadership sends a message to subordinates that the project is not viewed as important by senior management. Managers often delegate too much responsibility to consultants and vendors, and that lack of involvement results in a lack of understanding by internal personnel of the day-to-day management of the system.

Risk management was also reported as a problem for ERP projects. One participant said that many are aware of risk, but its affects are underestimate. Types of risk unaccounted for include, "amount of user acceptances, number and quality of resources assigned, data quality, willingness to change, and user skills, or lack thereof." Difficulties in large scale IT projects should be expected and contingencies should be available in such cases.

Organizational alignment means having the properly skilled personnel assigned to the proper job to avoid "people related problems." Further, "many of the reliability challenges you face with ERP do not deal with the system, but the business process and people instead." Having people assigned to jobs for which they are

Figure 1. Conceptual model for how HROs manage complex systems



not fully qualified develops weaknesses in the implementation process that persist over the duration (often years) of the project.

Another critical area of need is that of effective *change management*. ERP systems often require fundamental changes in the way an organization operates. One trap that some organizations fall into is excessive customization, "to make the ERP system look like our old system." As a result, they failed to recognize that ERP systems often require fundamental changes in the way the business operates.

Many of the participants mentioned that structured *business processes* were necessary. This process-orientation of ERP systems is a completely different perspective from the traditional functional orientation. Properly implemented business processes enhance the way departments interact. However, there appears to be considerable difficulty in getting managers to commit to the change in thinking from departmentalization to process orientation.

Finally, the organization must continuously monitor its performance. *Performance monitoring* provides feedback on the progress of the project. Participants recommended that a set of specific and measurable goals must be established, documented, and communicated among members of the organization. Key Performance Indicators (KPIs) that remove subjectivity are used as a standard set of metrics for measuring the performance of an ERP project. The Y2K problem is an example. When January 1, 2000 was reached, Y2K compliance was either achieved or not achieved, with the non-achievers being the more obvious cases.

DISCUSSION

While far from conclusive, there is considerable agreement in these areas. By aligning these areas with HROs, similar in terms of system complexity, budget size, project duration, and strategic importance of systems, much can be learned. Notably, accountability, leadership, and organizational learning are among the weakest. Understanding how HROs address these areas may provide insight into managing ERP systems.

Managing HRO Systems

HROs have been very successful in managing complex systems such as those controlling nuclear power stations, military operations, and chemical processes (Bierly and Spender, 1995; LaPorte, 1996; Britkov and Sergeev, 1998; Roberts and Bea, 2001; Weick, 2004). Yardsticks for HROs include, "How often could this organization have failed with dramatic consequences?" If failure could have occurred thousands of times, but did not, the organization is highly reliable (Roberts, 1990).

The ability to balance capability and risk in the presence of high consequence separates HROs from traditionally less critical organizations (Sullivan and Beach, 2004). The Sullivan-Beach Model (Figure 1) provides an illustration of the dynamics of managing complex systems in HROs using a scale to represent the weight of risk and the required weight of capability to counteract that risk. Failure occurs when risk, comprised of expectations and risk factors, outweighs an organization's capability, comprised of resources and organizational competence. In such cases the scale tips out of balance, and consequences follow. Bilateral relationships in this model exist between expectations and consequences, as well as expectations and resources. Additionally, a one-way relationship between consequences and organizational competence exists.

Expectations and consequences are related in that the consequences for failure are consistent with the degree of missed expectations. For example, a delay in launching the space shuttle by one day violates an expectation that the shuttle program stay on schedule. However, the consequences of failing to meet this expectation are minimal. Higher order expectations include returning the shuttle and its crew safely to earth. Failing to meet those expectations involves severe consequences (ibid). The relationship between expectations and resources is demonstrated when stakeholders provide resources to a project. Certain expectations, or a return on investment, accompany those resource commitments. Conversely, if resources are withdrawn, project managers will insist that stakeholders lower their expectations, or failure will result. Similarly, if expectations increase, managers will demand additional resources (ibid).

Finally, the one-way relationship between consequences and organizational competence is best described as organizational learning. When HROs fail, an investigation follows, and what is learned contributes to changes in policies and procedures that increase organizational competence so that the potential for failure is significantly reduced (ibid). ERP projects exhibit many of the same characteristics as HRO projects. The key to success for ERP systems might be found in the differences.

Comparing and Contrasting HRO and ERP Systems Management

Based on the Sullivan-Beach Model, HROs share considerable commonality with ERP implementations:

- complex, highly integrated, systems,
- significant resource investment,
- high expectations for success,
- risk factors that threaten success,
- significant consequences for failure (punitive, financial, etc.),

Managing ERP and HRO systems involve similar factors that influence their success. System complexity, resource commitments, high expectations, and risk all interrelate in their respective environments. However, there are differences. Preliminary findings from this research suggest one significant difference: the accountability and organizational learning connection between failure and enhanced competence. For example, losses of the space shuttles Challenger and Columbia involved significant consequences where NASA was held accountable. Consequently, they learned from their mistakes and became more competent. Even though the findings are not yet conclusive, it appears that accountability is frequently misplaced or absent in ERP implementations. Thus, an avoidance of certain types of consequences negates the benefits of organizational learning, and failures repeat.

CONCLUSION

Preliminary findings from ERP managers/consultants provided some insight into causes for failure. Using the Sullivan-Beach Model for how HROs manage complex systems, it provides understanding into how some organizations manage complex systems effectively and apply those techniques to those that do not. Additional data in the next phases of this research will build upon these preliminary findings.

Ultimately, this research seeks to develop a framework for practitioners to assess organizational readiness for undertaking an ERP project, identify areas of weakness, and provide the opportunity to correct weaknesses before the project begins. This pre-mortem organizational assessment model can be derived from prioritizing factors that contribute to success to provide insight into organizational shortcomings while there is time to correct them. Considering the immense resource commitments of ERP projects, opportunities to correct weaknesses in advance could be worth millions of dollars in wasted resources.

REFERENCES

Anheier, H. K. (1999). *When Things Go Wrong. Organizational Failures and breakdowns*, Sage Publications.

Bierly, Paul E. III and Spender, J.C. (1995). "Culture and High Reliability Organizations: The Case of the Nuclear Submarine," *Journal of Management*, Volume 21, Issue 4.

Britkov, V. and Sergeev, G. (1998). "Risk Management: Role of Social Factors in Major Industrial Accidents, *Safety Science*, Volume 30: pp.173-181.

Camp, Robert C. (1993). "A Bible for Benchmarking, by Xerox," *Financial Executive*, Volume 9, Issue 4: pp. 23-27.

Daniels, Shirley (1996). "Benchmarking," *Work Study*, Volume 45, Issue 3: pp. 18-20.

Garvin, D. (1993). "Building a Learning Organization," *Harvard Business Review*, July/August: pp. 78-91.

Husted, K. and Michailova, S. (2002). "Diagnosing and Fighting Knowledge Sharing Hostility," *Organizational Dynam*ics, Volume 31, Issues 2: pp. 60-73.

Laise, Domenico (2004). "Benchmarking and Learning Organizations: Ranking Methods to Identify 'Best in Class,'" *Benchmarking: An Internatioal Journal*, Volume 11, Issue 6: pp. 621-630.

LaPorte, Todd R., (1996). "High Reliability Organizations: Unlikely Demanding and at Risk". *Journal of Contingencies and Crisis Management*, Volume 4, Issue 2: pp. 60-71.

Mellahi, Kamel (2005). "The Dynamics of Boards of Directors in Failing Organizations," *Long Range Planning*, Volume 38: pp. 261-279.

Roberts, Karlene H. (1990). "Managing High Reliability Organizations," *Organization*, Summer, 1990 issue.

Roberts, Karlene H. and Bea, Robert (2001). "Must Accidents Happen? Lessons from High Reliability Organizations," Academy of Management Executive, Volume 15, Issue 3.

Sullivan, John J. and Beach, Roger, (2004). "A Conceptual Model for System Development and Operation in High Reliability Organizations," In Hunter, M. Gordon and Kathy Dhanda (eds.). *Information Systems: Exploring Applications in Business and Government*, The Information Institute, Las Vegas, Nevada. USA.

Weick, Karl E. (2004). "Normal Accident Theory as Frame, Link, and Provocation," Organization & Environment, Volume 17, Issue 1: pp. 27-31.

Yasin, Mahmoud M. and Zimmerer, Thomas W. (1995). "The Role of Benchmarking in Achieving Continuous Service Quality," *International Journal of Contemporary Hospitality Management*, Volume 7, Issue 4: pp. 27-32.