

EVALUATING ERP SOFTWARE IN THE ACQUISITION PROCESS: A THREE PHASE ACTIVITY

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ABSTRACT

Based on an extensive study that involved the cases of four different organizations, this paper presents a discussion of the evaluation process for ERP software.

Keywords: evaluation, ERP, vendor, functionality, technical, and implementation

INTRODUCTION

Enterprise Resource Planning (ERP) is a suite of application modules that can link back-office operations to front-office operations as well as internal and external supply chains, ERP software conjoins functional areas and business processes in an integrated environment that provides a broad scope of applicability for organizations. While considered a viable alternative to in-house development (Verville & Halington, 2001; Verville, 2000; Eckhouse, 1999; McNurlin & Sprague, 1998), the acquisition of ERP software is not without its challenges. At a cost of several hundreds of thousands or even millions of dollars, the acquisition of ERP software is a high-expenditure activity that consumes a significant portion of their capital budgets. It is also an activity that is fraught with a high level of risk and uncertainty. Why? Because, first of all, if a wrong purchase is made, it can adversely affect the organization as a whole, in several different areas and on several different levels, even to the point of jeopardizing the very existence of the organization (Verville & Halington, 2001; Verville, 2000). This highlights the obvious need for making the right choice of software. It also brings to light the need for finding the best means for acquiring this type of software so that the right choice can be made. Second, because of the implementation and the risk of it going awry. ERP implementations are said to be the single business initiative most likely to go wrong (Verville & Halington, 2001; Verville, 2000; Hill, 1999).

In light of these concerns, a research project was undertaken to determine the best way to acquire ERP software. However, with little research found on the topic of ERP acquisitions, it became necessary, in the first order, to find out what indeed the process is that organizations go through to buy ERP software (Esteves & Pastor, 2001; Verville 2000). As such, the research questions for the study were: “How do organizations acquire ERP software? What are the processes that are involved for ERP software acquisitions? How do organizations evaluate ERP packaged solutions?”

The focus of this paper, then, is on the evaluation process. It will begin with a brief description of the cases. Subsequent to that, a presentation of the three types of evaluation activities (vendor, functionality and technical) that the organizations went through to purchase ERP software.

DESCRIPTION OF THE CASES

The four organizations (pseudonymously named, with the exception of Keller) that participated in the study were:

- OMEGA, a large international carrier, provides air transportation services for passengers and cargo both to domestic and international arenas. OMEGA purchased PeopleSoft's ERP solution (finance, human resources, and payroll applications) for the sum of US\$86 million. The ERP acquisition process that OMEGA went through took approximately 9 months and was completed by the summer of 1996. Its subsequent implementation was completed in the scheduled timeframe and was regarded a success.
- GAMMA is a holding company for a gas and electric utility and non-utility energy business. GAMMA completed the purchase of Oracle's ERP solution (finance and related applications) at a cost of US\$6.5 million in March of 1997. Its ERP acquisition process took approximately 6 months from start to finish. This case is especially significant because it highlights the need to verify sources of information.
- LIMA – LIMA Inc. is a North American based overseas carrier which maintains commercial relations and operates facilities that allow domestic network operators and other service providers to exchange telecommunication traffic with 240 countries and territories. LIMA started but did not complete the purchase of a proposed US\$10 million packaged ERP solution (international billing system). Owing to the strategic nature of the intended purchase, an impasse on the issues of code ownership and cost brought the business negotiations to a halt.
- Keller Manufacturing Company is a manufacturer of household furniture. Today, this organization has over 700 employees in three manufacturing plants in the Keller Manufacturing purchased an ERP solution (manufacturing execution system) from Effective Management Systems (EMS) Inc. for approximately US\$1 million. Keller's ERP acquisition process took approximately 11 months and was completed in August of 1996. Regarded as a great success, the implementation of EMS' software was completed within the scheduled timeframe with only a few minor problems.

ERP SOFTWARE EVALUATION PROCESS: VENDOR, FUNCTIONAL AND TECHNICAL

Within this study we have identified three types of evaluation that were carried out in acquisition process for ERP software: (1) vendor evaluation (conducted primarily by the purchasing department), (2) functional evaluation of the software (functionalities determined primarily by the users), and (3) technical evaluation (conducted primarily by the systems department).

The rigor with which the definition of evaluation criteria (vendor, functional and technical) and, subsequent to that, the Evaluation process were carried out appeared, in all of the cases, to have been proportionate to the size or type of purchase and its potential effect on the organization in

terms of strategic benefits. In each case, the evaluations took on slightly different twists depending on the internal customers, the culture of the organization, sometimes even the approval process that needed to be followed to get funding.

Each of the acquisition teams developed tools (questionnaires and matrices/grids) that they used to assist them with the three different areas of the Evaluation process. These evaluation tools had both quantitative and qualitative attributes.

As we see in the following sections of this paper, the Evaluation process was also an iterative process. The Vendor Evaluation occurred in part with the Marketplace Analysis. As more information was obtained from client referrals and other sources, the Vendor Evaluation process was re-visited. Similarly, the processes for evaluating the functional and technical aspects of the technology were reiterated. Preliminary evaluations for both areas were carried out during the Selection process with the review of the RFP (RFI for Keller) responses; then, during the formal evaluation, more in-depth investigations were conducted.

ERP Software Evaluation: Vendor Evaluation

In the early stage of the selection process, each of the teams conducted a cursory evaluation of potential vendors during which an initial screening was carried out, using pre-established high-level or general criteria, to arrive at a long-list of vendors. Some of the basic screening criteria that were used in three of the cases (OMEGA, LIMA and GAMMA) to evaluate potential vendors were the size of the vendor, and the vendor's reputation, market share and global presence. An exception to this was done by LIMA. As with OMEGA and GAMMA, the size of the vendor was a criterion that LIMA's team had used to weed out vendors. It was only when the team presented their short-list of three vendors to the Steering Committee at the end of the Selection process that the exception came about, however, more precisely, the Steering Committee asked the team to add two more vendors to their list for consideration, one of which was a small vendor. The reason for this was that they did not want the team to discount any new technology that might come from a smaller vendor simply because of their size.

As the teams received more information, their long-lists were further reduced to an acceptable number of vendors. As previously noted, one of OMEGA's strategies to evaluate the vendors on their long-list was to bring all of their potential vendor candidates together, which they did, in a vendor awareness session. Though uncertain of the results of this unorthodox strategy (normally, the vendors are kept 'in the dark' about whom they are competing against), it proved to be useful in that (1) it served as a natural weeding mechanism to reduce the number of potential candidates—one of the vendors bowed out once they saw who they were competing against and realized that they would not be able to meet OMEGA's criteria for an integrated solution; (2) it allowed OMEGA to get a feel for who could do the work for them; and (3) it gave vendors the opportunity to team or partner together in order to provide the full scope of applications that OMEGA ultimately wanted.

Another criterion that was evaluated was whether the solution was single-sourced, that is, was the proposed technology developed in-house by the vendor candidate or would they (the vendor candidate) have to outsource part of the application to another vendor? This was an important

factor for all of the cases. A single vendor solution would reduce or eliminate the risk of a potential fallout between partners, or of one of the vendors no longer being in business which could result in problems regarding the long-term responsibility for the overall solution. A single vendor solution would also avoid any shifting of responsibility for the technology.

Vendors were also evaluated according to their ability to assist the organizations with the implementation of their ERP software solutions, their association with or the availability of third-party vendors/partners to assist with local support, as well as other criteria such as their vision (future plans and trends regarding the direction of the components of the proposed solution [both technical and functional]) and strategic position.

ERP Software Evaluation: Functional Evaluation

The Functional Evaluation of the ERP software was also an important facet of the acquisition process. In the case of GAMMA, the functional requirements accounted for 42% of the overall weighting, and in the case of LIMA, functionality accounted for 60% of the overall weighting. For OMEGA as well as the functionality of the ERP software was the prime consideration and received the most weighting.

Two different methods were used to evaluate the functionality of the software: (1) scripted demonstrations, and (2) canned demonstrations. Two of the cases, OMEGA and GAMMA, used the strategy of a scripted demonstration. At the completion of their Selection process, OMEGA and GAMMA developed demonstration scripts that would be used to verify the contents of the RFP responses (“Can the software do what they claimed it can do?”), to simulate tasks (from simple to very complex), and to clarify issues and areas that were unclear or were not addressed in the RFP responses. These scripts were then sent to each of the vendors on their short-lists a couple of weeks prior to the demonstrations and were the basis for the functional demonstrations of the vendors’ proposed solutions. Keller, on the other hand, opted for canned demonstrations from the vendors they had invited in-house. Subsequently, they then asked their top vendor candidate to return for an intensive 2-day in-house ‘scripted’ demonstration where they (Keller) had them perform a multitude of simulations (tasks) with the software. For all three of these cases (OMEGA, GAMMA and Keller), user participation at these demonstrations was considered very important. On the other hand, LIMA’s strategy was quite different from the others on this point. They decided to visit the vendors on their short-list.

In each of the four cases, feedback was obtained from all demonstration participants to determine their impressions about the proposed software solutions. Both the users and the acquisition team members completed matrices/grids and/or questionnaires to report their impressions and score the appropriate categories for the demonstrations.

ERP Software Evaluation: Technical Evaluation

In conjunction with the Functional Evaluation, all of the cases, with the exception of Keller, conducted a Technical Evaluation of their proposed ERP solutions. The technical evaluation itself consists of a series of tests to assess the rigor, capacity, and performance of the ERP software and all aspects of the technology supporting the applications, including the platforms,

the operating systems, the database management systems, and all of the systems management aspects (availability, security, etc.). While these issues were addressed in the RFP (with the defined technical pre- and co-requisites) and reviewed during the “paper” Technical Evaluation, the “live” Technical Evaluation provided physical evidence of the ERP software’s ability to actually do what the vendor claimed. Hence, the Technical Evaluation provided answers to such questions/issues as (a few examples): Is the platform that the proposed solution should ideally operate on ideal for optimum performance?; Is the organization’s compatible DBMS (Database Management Systems) with the proposed solution?; Can the proposed solution integrate into the organization’s existing environment? In addition, the Technical Evaluation included tests to assess the rigor, capacity and performance of the software and all aspects of the technology supporting the applications, including the platforms, the operating systems, the database management systems, and all of the systems management aspects.

It was noted within this study that the Technical Evaluation was carried out in a two-tier process (much the same as the Functional Evaluation was carried out), the first of which happened subsequent to the return of the RFP responses from the vendors (i.e., evaluation of the paper responses), and the second of which took place either before or following the in-house vendor demonstrations and/or at the vendors sites and/or at referral sites. This also was an iterative process. As the acquisition teams learned more about the vendors solutions from the RFP responses, they were able to adjust, add, or remove criteria, benchmarks, etc., in their Technical Evaluation processes.

OMEGA, LIMA, and GAMMA used the information they had gathered earlier about their organizations’ current functional and data/information needs, their existing systems architecture and their existing (or future) technological infrastructure, as the basis by which to evaluate the vendors’ proposed ERP solutions. From an evaluation of the information they gathered on their current functional and data/information needs, they gained a high-level understanding of their organizations’ business processes and needs, the key functions that were supplied by their existing application(s) (and that would necessarily be required of the new application[s]); the data (the minimum data) that they needed to keep track of; and the types of interfaces that were used (and would be required of the new software solution). From both a business perspective and a technical perspective, this was important because of the existing relationships and interdependence of the applications that were to be replaced by the proposed ERP software solution and those that would remain in place. Integration of the new applications might necessitate modifications to their organizations’ existing processes (business and technical) and data models in order to conform with the new software. Modifications to the business processes were an issue of BPR (which was a factor) and were of concern to the organizations? OMEGA, GAMMA, and Keller viewed the replacement of their current systems as an opportunity to reengineer the way they do business in those areas. However, from a technical perspective, each of the organizations voiced that a conscious decision was made on their parts to be as flexible as possible with regard to changes that might have to be made in order to accommodate the ERP solution of their choice into their technological environment. So, although it was important for them (OMEGA, LIMA and GAMMA) to understand the internal workings of their current applications as well as the proposed ERP solutions, they found it more important that the new software meet their base requirements regarding business processes, key functionalities, minimum data, and visual (front-end) interfaces.

From a support and implementation standpoint, OMEGA, LIMA, and GAMMA each did a high-level analysis of the proposed ERP software architecture during their initial technical evaluation. Here, once again, they began by referring back to information that they had gathered during the initial stages of the process when they were defining their system requirements and gathering information on their infrastructure for inclusion in the RFP, information such as who the users were, what processes and data the systems would be handling, what the availabilities were, the service-level requirements, the platforms they were on, the type and number of hardware systems, network, DBMS, and so on. They compared their requirements with the information that was supplied by the vendors on the major components of their solution, its architecture, process and data models, integratability with the organization's systems, infrastructural requirements, and their implementation services and strategies. During this initial evaluation, they were able to assess the appropriateness of each vendor's solution for their organization, that is, how it would fit with their organization's current technological environment, the ability of the organization to support it (what the processing requirements were—on-line, batch, synchronized, central, distributed; in-house technical expertise, etc.) and, its scalability and openness. It also gave the teams an indication of what type of performance they could expect, what the loads would be on their networks based on their volume of data, the volume of processing that would be required, whether the traffic would be significant, what the impact would be, and what the response times would be on a LAN (local area network) versus a WAN (wide area network). Further, they looked at what systems management tools would have to be procured (if any); and what systems management processes would have to be executed if they needed to have software data distribution across the network, etc. They also looked at the ability of their whole infrastructure, end-to-end, to support the availability feature of the software.

For the second phase of the Technical Evaluation, which consisted of evaluating working versions of the software solutions, OMEGA and GAMMA used benchmarks that they had established. They had benchmarks to evaluate the server capacity, the capacity of the network components, and the size of the workstations that would be needed. The Technical Evaluation teams also validated benchmarks that were supplied to them by the vendors as well as those coming from external sources to assist them in evaluating the capacity of the software.

CONCLUSION

The evaluation process for ERP software comprised of three distinct areas of evaluation: Vendor, Functionality, and Technical. All three types of evaluation were conducted by the three of the four cases and of the three, the Functional Evaluation carried the most weight, primarily due to the participation of the end-users in the process and three of the four the organizations (OMEGA, GAMMA and Keller) which weight heavily because of user-buying (acceptance of the system) which was a factor in the decision process.

In addition, the area of technical evaluation, during this study, was found to differ somewhat from what has been described in the systems development. While the technical evaluation and testing of each step or module of software as it is developed, the technical evaluation that was done of the ERP software took a significantly different approach. In fact, the technical evaluation that was described in three of the four cases appeared to have been an 'outside-in'

approach (not be confused with ‘reverse engineering’), where they began with the finished product and examined its architecture, design characteristics, and how the proposed solution integrated with existing systems; tested load capacity and speed on their networks, response time, availability, security and so forth.

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