

Respondent Summary

The Promise and Performance of Enterprise Systems in Higher Education

Paula King

Enterprise system implementations are among the single largest investments in dollars and resources ever made by higher education institutions. This research study examines the state of those implementations that occurred over the past seven years for student, human resource (HR), and financial information systems in higher education. The study addresses five major areas:

1. What is enterprise resource planning, and why did universities invest in it (or not)? What was promised to institutions that chose to install ERP systems?
2. What is the current status of ERP implementation nationally? How did institutions implement their ERP systems?
3. How did institutions work with software vendors and consultants?
4. What were the actual benefits and costs, and, concomitantly, what lessons were learned? Do institutions feel their ERP efforts were successful?
5. What comes next? What directions is ERP taking, from the perspective of both higher education and the vendor community?

Scope and Methodology

A multifaceted research methodology was designed to gather both quantitative and qualitative data from nearly 500 higher education institutions, which we believe is the single most comprehensive gathering of information on ERP in higher education ever. The following data collection and analytical initiatives were undertaken:

- An extensive literature review
- A detailed survey completed by 481 respondents from EDUCAUSE member institutions, members of the American Association of Community Colleges, and the Council of Independent Colleges

- In-depth case studies and telephone interviews of enterprise system users, managers, and owners
- Expert industry panel discussions
- Higher education ERP vendor and consulting firm interviews

Note that many of the findings presented in this study represent both the average and range of experience of the industry viewed as a whole. As a consequence, some readers will find the information contrary to their own experiences.

What Is ERP?

Christopher Koch defines ERP as “attempts to integrate all departments and functions across a company onto a single computer system that can serve all those different departments' particular needs.” The term has its origins in the area of manufacturing. The Gartner Group transferred the concept into service sectors of the economy, including higher education, in the 1990s and described ERP systems as having the following attributes:

- Multiple in scope, tracking a range of activities including HR, student, and financial systems
- Integrated, meaning that when data is added in one area, information also changes in all areas and related functions
- Modular in structure
- Industry-specific solutions that enhance standard systems by providing best practices for key business processes (we would interpret this to include business process redesign)

For this study, the Gartner attributes were used. Institutions were identified as ERP institutions if they implemented at least one of a purchased financial, human resources, or student system since July 1, 1995.

The Promise of ERP Systems

The most commonly stated objectives for implementing an ERP system in the literature on ERP include providing better information for planning and management of higher education institutions; better service to faculty, students, and staff; lowering business risk; and, potentially, increasing revenues and reducing costs through greater efficiency. ERP systems also resolved Y2K problems that made legacy administrative systems difficult, if not impossible, to modify. Additionally, ERP systems hold the promise of removing the silo approach to information—with every department owning and maintaining its own databases—and moving to a cross-departmental system.

Why ERP?

Survey respondents rated the perceived need to replace aging legacy systems as the most important driver of change. Surprisingly, the least important motivation was resolution of the Y2K problem, although it is clear that these factors are related. Notably, doctoral institutions that were completing

implementations during 1998–2000 were most likely to emphasize the Y2K problem. Improving services and the manner in which the institution operates also motivated many respondents.

Across most areas of motivation investigated, there was uniformity of opinion across all Carnegie groupings, including size of institution and public and private institutions. Respondents were given an opportunity to note other factors of importance.

Why Not ERP?

Not all institutions jumped on the ERP bandwagon. Existing systems are used by nearly half of the institutions in this sample, and two-thirds of those implementing new ERP systems continue to use legacy systems as well as newly purchased software.

For the most part the factors given for not implementing ERP systems are pragmatic. They also reflect the absence of a compelling IT business case, especially in light of available resources and other institutional priorities. For 32 percent of the non-implementers, “The existing system works.” For many others (18 percent), “Other priorities have taken precedence.” Sixteen percent of responding institutions report being “not ready” for this activity or investment.

Soon, But Not Yet

A number of the institutions that have not implemented an ERP module in the past seven years are either implementing or considering implementing a system in the near future. The data are similar for all ERP modules. Approximately 10 percent are either currently implementing or will implement an ERP module within the year. Twenty-five percent expect to implement a system in the next one to three years. Sixty percent are at least three to five years out.

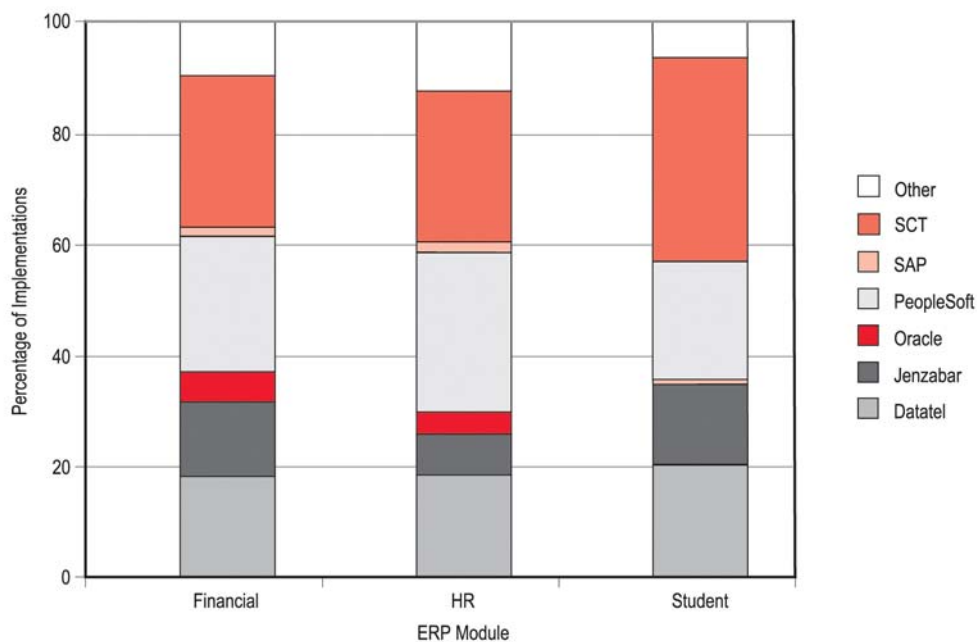
When asked what would have to change for an ERP purchase to take place, the respondents’ factors basically are cost as well as the continued viability of the legacy system.

The Current Status of ERP Implementations Nationally

Public and private institutions were equally likely to purchase ERP systems. The larger the institution, the more likely it was to implement an ERP system. Small institutions were evenly divided in their implementation of an ERP system. Of the institutions that implemented ERP systems between July 1995 and June 2002, 33 percent of the institutions installed all three modules, 37 percent installed two of three, and 31 percent installed only one. The primary reasons cited for not implementing all three modules are a deliberate and phased implementation plan and, to a lesser degree, waiting for the product to mature in a later release.

While no single ERP vendor dominates the higher education market for enterprise systems, competition occurs among four to five major vendors, depending on the application (see Figure 1).

Figure 1. Enterprise Systems Installed, by Vendor (*n* = 663 Implementations)



The primary reason given for selecting a particular vendor was that the vendor’s software had the best fit and functionality for the school. Next in importance were the architecture, the vendor’s reputation and ability to provide a complete solution, and price. Perhaps surprising is the low weight given to outside advice.

Institutions were generally satisfied with their vendor relationships. Eighty-seven percent agreed or strongly agreed that the vendor was responsive to their needs during the sales process, and 65 percent agreed or strongly agreed that the vendor provided strong support after the purchase of the software. Nearly 10 percent of the institutions changed vendors during the course of an implementation process. Reasons given included a vendor’s going out of business, a vendor’s not delivering promised software on time, and the system office’s mandating a new vendor.

Performance

Several factors covered by the survey address issues of system performance.

Project Budget and Timeline

More than two-thirds of the institutions reported finishing on or under budget. Five percent or less went over budget by 50 percent. Qualitative interviews following the survey raise the important question of “which budget” when judging higher education’s overall performance in this area.

Seventy-five percent of the institutions indicated completion of their Financial System on time or early; 70 percent, HR; and 66 percent, Student. Not surprisingly, the larger the institution, the less likely it was to finish on time regardless of vendor or Carnegie classification. While 60 percent of responding institutions are “live” within one to two years of purchasing the software, nearly 20 percent of

implementers report taking four or more years. For those institutions that went over the planned time, top reasons given were organizational issues and data issues. Some of this longer implementation time may also reflect some vendors' practice of bundling multiple systems in cases where the purchasing institution may only be looking for one system.

Respondents were asked to evaluate potential obstacles to completion for the three ERP systems. A similar pattern emerged (see Table 1) for all three ERP modules.

Table 1. Rankings of Potential Obstacles, by Type of System

Obstacles Ranked by ERP System	Financial Information System Rank	HR Rank	Student Information System Rank
Resistance to change	1	2	1
Data issues	5	4	2
Customization	7	6	3
Lack of understanding of software capabilities	4	3	4
Lack of internal expertise	2	1	5
Alignment between software and business practices	3	5	6
Conflicts with other priorities	8	7	7
Quality of software	6	10	8

Clearly the perceived obstacles to success are internal to the institution. Resistance to change and internal expertise—whether reflected in a lack of understanding of the software's capabilities, or alignment of software to business practices—are rated among the top barriers.

Difficulty of the ERP Implementation

Respondents were asked to rate the difficulty of implementing ERP systems in comparison with other large technology projects. These projects were judged to be difficult. Implementing student systems is considered to be significantly more difficult than implementing either financial or human resources systems. The larger the institution, the more difficult the implementation, independent of the institution's Carnegie classification.

Customization

Thirty percent of the survey's respondents indicated that no modifications had been made to their systems; 50 percent had modified up to 10 percent of the code and 20 percent had modified more than 10 percent but less than 25 percent of code. Only nine institutions, or four percent, had modified more than 25 percent of code. The data show that typically when customizations were made, it was in conformity with a formal process, often involving senior management.

Use of Consultants

Two-thirds of respondents used consultants, while the other third did not. For those institutions that did not use consultants, the primary reasons given were the strength of internal human resources or the intent to develop in-house expertise, followed by absence of funds for consulting services.

Ninety percent of respondents agreed or agreed strongly that the consultants helped the institution achieve implementation objectives. Two-thirds were of the opinion that their money was well spent, although half expressed concern that the cost was higher than estimated or that the price was not tied to achieving milestones.

Assessment

ERP projects at this writing appear to be moderately successful. Half of the respondents achieved what their institutions intended, while 46 percent reported partially achieving their objectives. It is clear that many institutions lose functionality and momentum in the earliest stages of live implementation, only to recover old functions and gain new ones as they gain mastery of new technologies and business processes. Specifically, there is a steep learning curve in using the new systems and screens, which did not always align with past practice. Other reasons for short-term losses in productivity include lack of experience, failure to change business practices and accept the new system, and more data entry and monitoring at the source. In particular, there is a common perception that workload and costs across the institution have increased, reflecting a significant change in the nature of the work performed. While the cost of inputs rose, 87 percent of respondents reported major benefits for management, while 85 percent reported such benefits for staff, and 78 percent reported major benefits for students.

Project Leadership and Governance

Eighty-two percent of the implementations had an oversight committee. The CFO played a significant executive sponsorship role in both the financial and HR system efforts. In the case of student systems, executive leadership support was shared among chief academic officers, business officers, CIOs, and student affairs officers. The executive sponsors of these projects changed in 13–18 percent of the reported cases. Not surprisingly, the CIO was cited most frequently as the major advocate of these projects, followed closely by the institution's business officer. Chief academic officers almost never assumed this advocacy role.

Project Management

Fifty-five percent of the institutions allocated a full-time manager to the ERP project. The managers were internal candidates 75 percent of the time, external 10 percent of the time, and joint (both internal and external) 15 percent of the time. Fifty-four percent of the managers had no previous experience implementing an ERP project, and only 25 percent had any experience with the vendor chosen. Thirty percent of the project managers changed over the course of the implementation.

Do It Again or Differently?

The respondents were asked whether they would build or buy if they were to do it again. Overwhelmingly, 88 percent of respondents would buy enterprise solutions, 7 percent would build, and 5 percent expressed no opinion. Two-thirds of the respondents would use a similar approach if

they were to do an ERP project again. A remarkable 85 percent of respondents indicated that replacing enterprise systems was worth the effort expended.

What Comes Next?

Respondents report significant efforts to build on or add to their ERP systems. In the near term (within 12 months), 70 percent will have implemented new modules of their core applications. Respondents also report significant efforts devoted to the following projects: e-commerce/e-procurement (55 percent), portal (54 percent), and data warehousing (49 percent). Looking further out over the next one to three years, the same trends continue.

Staying the Course

Much of the literature, particularly since 1999, has focused on what organizations can and should do after their ERP system has gone live. Many had not planned thoroughly for a complete transition to an enterprise-wide change in the way business is conducted. Changing from departments, silos, and bunkers to an information-sharing culture is not an overnight activity and can challenge employees to begin thinking of the ultimate goals of the enterprise rather than the specific performance of their individual units. That is the bottom line for most organizations implementing ERP—a fundamental shift occurs in their underlying principles of business practice.

Paula King (pking@educause.edu) is an ECAR Research Fellow.

A copy of the full study referenced above will be available via subscription or purchase through the EDUCAUSE Center for Applied Research (www.educause.edu/ecar/) in December 2002.