At the end of the twentieth century and into the twenty-first, higher education has invested, by a conservative estimate, $5 billion in administrative and enterprise resource planning (ERP) systems. ERP—three letters that represent the tremendous time, energy, and money consumed by hundreds of institutions over the past decade. What is ERP, why has a large percentage of the higher education industry embraced it, and what are the facts surrounding actual implementations? ECAR and its subscribers, wanting to understand the real story of ERP in higher education, launched this study to provide a comprehensive analysis of several key questions:

- What is ERP and why did/should universities invest in it?
- How did institutions implement their ERP systems?
- Do institutions feel their ERP efforts were successful and worthwhile? What lessons were learned?
- After implementation, what’s next? What does the future hold for ERP, higher education, and vendors?

To address these questions fully, ECAR employed a multifaceted research methodology to collect both quantitative and qualitative data from nearly 500 higher education institutions—members of EDUCAUSE, the Council of Independent Colleges, and the American Association of Community Colleges. The approach consisted of an exhaustive literature review, a Web-based survey, a series of qualitative interviews (some developed into case studies), a discussion “summit,” consultation with administrative systems leaders, and vendor and consulting firm interviews. To facilitate data collection and analysis, ECAR had to define what it meant by ERP and on what time frame the study would focus. For the purposes of this study, ECAR adopted Gartner Inc.’s description of an ERP system as having the following attributes:

- The system is multiple in scope, tracking a range of activities including human resources (HR) systems, student information systems, and financial systems.
- It is integrated; when data is added in one area, information in all related areas and functions also changes.
- An ERP system is modular in structure.
- The system provides industry-specific solutions that enhance standard systems by providing best practices for key business processes. We interpret this to include business process redesign.

In addition to having these attributes, institutions were also identified as ERP institutions for the study if they had installed at
least one purchased ERP system—financial, HR, and/or student system—since July 1, 1995. Of the 480 institutions that responded to the Web-based survey, 54 percent met ECAR's criteria. Eighty-four percent of the respondents were CIOs, directors of administrative computing, or other IT professionals, and 78 percent of these respondents indicated that they had played a significant role on the project, functioning as an executive sponsor, a project leader, a management team member, or a functional/technical specialist.

**The Business Case and Respondent Overview**

The single most important reason for embarking on systems replacement was largely a tactical one: “to replace aging legacy systems” (selected by 42 percent). Other respondents selected factors of a more strategic nature: “to improve service to customers” (17 percent) and “to transform the way the institution operates” (13 percent). Interestingly, the reasons for undertaking an ERP initiative were consistent across large and small, public and private institutions.

Between July 1995 and June 2002, 54 percent of the survey respondents implemented one or more ERP systems; 46 percent continued with existing systems or strategically modified them. In total, the sample installed 663 ERP modules: 238 financial, 202 HR, and 223 student. SCT installed the most modules in the study’s sample group (30 percent), followed by PeopleSoft (25 percent) and Datatel (19 percent). SCT installed the most modules in the study’s sample group (30 percent), followed by PeopleSoft (25 percent) and Datatel (19 percent). SCT installed the most modules in the study’s sample group (30 percent), followed by PeopleSoft (25 percent) and Datatel (19 percent). SCT installed the most modules in the study’s sample group (30 percent), followed by PeopleSoft (25 percent) and Datatel (19 percent). SCT installed the most modules in the study’s sample group (30 percent), followed by PeopleSoft (25 percent) and Datatel (19 percent).

Public and private institutions were equally likely to purchase ERP systems; however, larger schools were more likely to purchase an ERP system. In terms of Carnegie class (see pp. 22–23), baccalaureate colleges (BA) and doctoral/research universities were more likely to have implemented ERP systems than associate’s colleges (AA) and master’s colleges and universities (MA). Thirty-three percent of the institutions that implemented an ERP module since July 1, 1995, installed all three modules, 37 percent installed two of three, and 31 percent installed only one. Sixty-two percent purchased all of their modules from a single vendor, and 37 percent purchased from two vendors. If a second vendor was chosen, most often it was for student systems.

It’s important to recognize that nearly half of the institutions in the survey are using non-ERP, or administrative, systems solutions that were implemented before July 1995. In addition, two-thirds of the ERP institutions in the study continue to use existing systems for one or two business areas. It’s also important to note that among the institutions that haven’t implemented an ERP module since July 1995, many are planning to implement an ERP solution, as shown in Table 1-1.

This broad overview of the survey respondents and the distribution of the various ERP modules leads to the essential, overarching question: Did the schools achieve what they intended with their ERP implementations? The answer from 51 percent was yes; 46 percent reported partial achievement, and only 3 percent said no. However, the cost was greater than the institutions originally planned, and the promised efficiencies have not translated into cost savings. Furthermore, 54 percent of the respondents believed their institution’s productivity experienced a short-term (within the first six months) decline immediately after the implementation, although 70 percent now perceive productivity to have improved, following the initial break-in period.

When asked whether the institution would take the same approach again, 66
percent of respondents said they would use a similar approach if they were to do another ERP project. Fewer than half (46 percent) of the non-ERP institutions would take the same approach.

**How Did Institutions Implement?**

Perhaps the most frequently asked question regarding ERP implementations is, "Was the project completed on time and on budget?" For the majority of our survey respondents, the answer was yes. More than two-thirds of the institutions surveyed reported finishing their implementations on or under their original budget. Most reported that they met their original schedule or were early: 75 percent for financials, 70 percent for HR, and 66 percent for student modules. These results are an enormously positive reflection on ERPs in higher education.

Nevertheless, there are a few notable exceptions to these trends. Size is an important indicator of whether an implementation remains on time and on budget: The larger the school in the study, the less likely it was to finish on time, regardless of vendor, public or private status, or Carnegie class.

The year an institution embarked on its ERP initiative also made a difference. As part of the analysis, the dates of the respondents’ implementations were divided into four time-of-implementation periods. The 1998–2000 period was found to be the most difficult time to implement an ERP (especially for doctoral institutions) because the implementations were more likely to take longer, to be over budget, and to involve more customization of the base code. Customization had a greater impact on respondents’ ability to complete their implementations on time and on budget than any other variable in the study.

The natural follow-up question to whether an implementation was on time and on budget is, “What was the budget?” Approximately 54 percent of the 258 ERP institutions in the study provided cost information and reported ERP expenditures that totaled $1.6 billion. On average, a finance module cost $2.9 million, a human resources module $2.3 million, and a student module $3.1 million. The most common funding mechanism among the survey respondents was central allocations (25 percent), and the near-unanimous choice for most underestimated budget item was training. Institutions also reported that their ERP systems are more expensive to support, with the most significant cost increases occurring in packaged software, databases, and training.

Value is perhaps a more important metric. However, higher education, like the private sector, has not systematically measured the value derived from ERP implementations, nor has it benchmarked its ERP systems against any kind of performance metric.

A complete and successful ERP implementation requires many decisions during

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Planning to Implement ERP Module</th>
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<tr>
<td>Within the next year</td>
<td>10% are implementing or will implement</td>
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<tr>
<td>One to three years</td>
<td>25% expect to implement</td>
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<tr>
<td>Three to five years</td>
<td>10% may implement</td>
</tr>
<tr>
<td>Not under consideration</td>
<td>55%</td>
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the life of the project, and these ultimately determine the project’s success or failure. Several major decisions revolve around leadership, reengineering, customization, and use of consultants.

**Leadership**

Who typically leads these ERP efforts? According to the survey respondents, the primary advocates are the CIO (31 percent), the CFO (29 percent), and the president or chancellor (17 percent). The CFO typically sponsors both the finance and the HR system efforts, but sponsorship of the student system is more varied: chief academic officer (21 percent), chief student affairs officer (17 percent), CIO (17 percent), CFO (17 percent), president (9 percent), and other (19 percent).

Full-time project managers were allocated to the project at 55 percent of the institutions. Overwhelmingly, doctoral/research universities used full-time project managers, whereas the majority of project managers at BA institutions were part-time. Full-time versus part-time managers were more evenly divided at AA and MA institutions. Project managers were internal employees 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 in ERP project implementation, and only 25 percent had any experience with the vendor chosen. Thirty percent of the institutions changed project managers over the course of the implementation.

Along with the efforts of primary advocates, individual system sponsors, and project managers, 82 percent of the survey respondents used an oversight committee. Interestingly enough, the same percentage of respondents (82 percent) reported little or no involvement by the Board of Trustees in any aspect of their ERP implementations.

**Reengineering**

Sixty percent of the survey respondents performed some reengineering as part of their ERP implementation, 13 percent reengineered in advance of the implementation, and 22 percent did no reengineering at all. One hundred and two institutions indicated they would change how they performed business process redesign if they had the opportunity to do it again.

**Customization**

Customization was a primary reason for projects to go over time and over budget. Eighty-seven percent of the survey respondents agreed or strongly agreed that their institution’s ERP strategy was to implement with as little customization as possible. In practice, the results were more varied: 48 percent modified up to 10 percent of the code, 30 percent had no modifications, 18 percent modified more than 11 percent of the code, and 4 percent modified more than 25 percent. The results do not suggest that “plain vanilla” is necessarily best. In fact, the analysis demonstrates that customization has a major impact on business owners’ and customers’ satisfaction. Although this may seem intuitive, customization’s prominence as the most statistically significant variable in the analysis is worth noting.

**Consultants**

Two-thirds of the survey respondents used consultants during their ERP implementations. Surprisingly, 90 percent agreed or strongly agreed that consultants helped them achieve their implementation objectives. Public and MA institutions were more inclined to use consultants than other institution types responding, but these trends are
modest statistically. Generally, the level of consulting assistance was higher for student systems than for finance or HR.

Institutions hired consultants primarily to support training, provide ongoing project support, and help with system selection. They derived benefits from consultants on the basis of their particular skills, which were used to fill gaps in existing staff skill sets. The benefits reportedly gained from consultants included product expertise (21 percent), technical expertise (20 percent), experience (methodologies/insights) from prior projects (16 percent), and the ability to help meet the project timeline (13 percent). An interesting correlation emerged when comparing data on institutions’ perceptions of how they managed their consultants and whether their money on consultants was well spent: The better they felt about the way they managed their consultants, the more likely they were to feel that the money was well spent.

Lessons Learned

A key advantage to surveying hundreds of institutions after their ERP implementation is hindsight. No longer consumed by the day-to-day implementation effort, people have the time, distance, and perspective to reflect on what went well and what could have been done better, and this can provide valuable insights for the rest of the higher education community. Many of these insights, or lessons learned, will sound all too familiar, but repeating them here merely emphasizes the importance of incorporating them into our collective thinking about ERP implementation.

- **Leadership.** Strong executive leadership—not merely sponsorship by active executive involvement—is imperative to implementation success. Getting buy-in from all layers of management is also advised.
- **Communication.** A communication plan ties the many parts of the ERP vision and plan together, making the goals and implementation requirements clearly understood and securing support for them throughout the institution. It’s been said that it is almost impossible to over-communicate.
- **Central ownership of data.** Shared data-center operations and central ownership of data is critical to success and also reduces costs.
- **Training.** The study finds that, generally, training costs are underestimated, delivery timing is bad, and training needs to focus on using the system to both support transactions and leverage the ERP system to change existing business practices. This is one area where institutions thought they could have done better.
- **External assistance.** Consultants were often cited as key to successful implementations, but the costs were a surprise. The advice from study participants is to select consultants carefully, be clear about their scope of responsibility, and actively manage the relationship to get the maximum benefit for the implementation.
- **Customizations and modifications to the vendor software.** One of the most significant findings of this study is the impact customizations had on the sample’s ability to finish on time and on budget. The greater the volume of customizations, the more likely the ERP implementation was to be over budget and off schedule.
- **Reporting.** The ERP products often cannot generate the reports the institutions need. Many institutions have created data warehouses to solve their reporting and data query needs.
- **Obtaining value from the ERP implementation.** The four basic ways to obtain value from ERP implementations are
through efficiency, effectiveness, customer satisfaction, and reduced business risk. For example, providing online self-service and linking and automating related transactions have resulted in more efficient relationships between the universities and their students. These services have been provided on a scale that simply would not have been possible using personal service in expensive physical facilities.

Learning and knowledge. Learn from other projects. Participants in the study emphasize that knowledge gained from previous projects helps institutions move forward more effectively with their implementations.

Even though many of the surveyed institutions adopted a number of these effective practices, some still had challenging implementations. External forces such as quality of software or consulting were found to be less influential than internal forces. When asked, these institutions revealed that the major obstacles to completion were mostly internal to the institution. They include data issues, cultural resistance to change, and lack of understanding of software capabilities. The realization that the greatest implementation challenges are the result of internal institutional issues—not external forces—contradicts a popular message prevalent in the industry for the past few years. It’s interesting to discover that the institutions themselves—their cultures, their people, and their historical decisions—are the primary hurdle to clear for a successful implementation, not the technology, the consultants, or the vendors.

**Endnote**

1. There was no significant variation by Carnegie class, school size, vendor used, or ERP system purchased.