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Higher Education ERP: Lessons Learned

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ABSTRACT

Universities are now spending in excess of $20 million each to implement modern Enterprise Resource Planning (ERP) projects that can take two, three or more years to implement. The early report cards are coming in from across the country in regard to ERP projects in Higher Education and the results are mixed. The two authors of this report, both CIO’s of large universities, share their experiences and lessons learned on ERP and provide a framework to approach an ERP that could save your university millions of dollars.
Introduction

Universities are now spending in excess of $20 million each to implement modern Enterprise Resource Planning (ERP) projects that can take two, three or more years to implement. The early report cards are coming in from across the country in regard to ERP projects in Higher Education and the results are mixed. The two authors of this report, both CIO’s of large universities, share their experiences and lessons learned on ERP and provide a framework to approach an ERP that could save your university millions of dollars. The issues covered include the development of a solid foundation for ERP such as a clear definition of requirements, a comprehensive project plan, a strong project team, back-filling the organization, and the commitment of leadership. Also discussed is the importance of the contract with vendors, including options of fixed cost versus time and materials approaches. The expected costs and benefits of ERP are discussed. Key challenges are identified for the success of the functional and technical project teams. Finally, the future of ERP is explored.

What is ERP?

The term “Enterprise Resource Planning” was coined in the early 1990s. ERP is a software solution that integrates information and business processes to enable information entered once into the system to be shared throughout an organization. While ERP had its origins in manufacturing and production planning systems, the scope of ERP offerings expanded in the mid-1990s to include other "back-office" functions such as order management, financial management, asset management and human resources management. The range of functionality of ERP systems has further expanded in recent years to include more applications, such as grants management, marketing automation, electronic commerce, student systems and supply chain systems. Common examples of ERP systems available include Oracle, SCT Banner, PeopleSoft, and SAP.

What are the Benefits of ERP?

There are many reasons to start down the ERP path. One of the main advantages to ERP is to improve access to information. With some legacy systems it is challenging to develop reports or to tap into transaction data stored on the computer. Modern ERP systems often improve upon this process and provide a strong foundation for moving to a data warehouse that can provide even more capability to extract data from administrative information systems.

Another reason to consider ERP is to improve workflow and efficiency. As an example, online requisitions can be completed and workflow processes can forward the form along the approval path more rapidly than with traditional paper processes. Another reason to consider ERP is the ability to improve controls and to program alerts. Alerts, for example, can be programmed to warn budget managers about budgets that are in danger of running out of funds and to implement controls that prevent individuals from overspending budgets.
One of the exciting developments in modern ERP systems is the availability of easy-to-use Web interfaces. These interfaces incorporate integrated portals that provide one-stop shopping for a wide range of administrative functionality and information. The ERP project often results in significant process reengineering and can breathe new life into ineffective and inefficient departments. The ERP also creates the foundation for new business processes such as e-procurement that can provide significant returns on investment. Finally, one additional benefit we have observed from the ERP process is that the individuals that have been involved with the project often bring away from it a new work ethic that helps to spread to the surrounding work place.

**First Steps to ERP: Well Begun is Half Done!**

The planning and preparation process of an ERP project often consumes a significant portion of time. A woodcutter will often spend one-third of his time sharpening the axe before he starts chopping wood. Likewise, the time spent in preparation for the ERP makes the job go more smoothly and quickly. One of the first steps is to evaluate the needs and requirements that will drive the implementation of an ERP. A detailed needs assessment and a definition of requirements are essential not only to guide the start of the project, but also to gauge the success of the project after completion. You should ask yourself, “What do you want your business to become?”

The next step is to review the different solutions available and see which system can best fit your requirements. As part of the fit analysis, detailed accounting of gaps may be developed. An evaluation will need to be conducted that compares the trade-off of the various solutions. Some solutions are more flexible and can accommodate a wider range of different best-practice models. Other systems have less flexibility and will require custom modifications to make changes. The added costs of modifications should be factored into the decision process.

Another issue to consider is best-of-breed versus integrated solutions. ERP solutions today often have their spearhead application. Some ERPs are better at finance, others are better at human resource, and still others may be better at student applications. One option is to integrate best-of-breed from different vendors and another is to pursue an integrated solution. While an integrated solution may not provide the best available solution in all cases, the advantages of an integrated solution may outweigh the benefits of best of breed. Integrated solutions often leverage the advantages of having an integrated store of data. The challenge in this rapidly changing environment for ERP, where new releases are often, is to ensure that the different systems work well together.

Over time, the differences between systems are becoming less pronounced, so that integrated solutions are becoming available from multiple vendors. Also, don’t underestimate the timesaving involved in dealing with only one vendor and the burden of maintaining relations and communications with multiple companies.

Lastly, your ERP implementation plan must consider whether to follow a phased implementation rather than attempt the big bang approach. A phased implementation is
usually the wisest and most cautious course but takes longer and can incur higher consulting costs. At WVU the big bang approach was utilized primarily because of Y2K deadlines and the additional cost that would result from incorporating temporary stubs and drivers to bring modules up individually.

**Do Not Underestimate the Costs of ERP**

It is important to get an accurate and complete picture of the projected costs of an ERP. Many of the direct costs of ERP are obvious and are often budgeted and accounted for directly by project planners. However, these costs do not represent the total picture of what an ERP will cost your institution. It is important to not underestimate the total cost lest you nickel and dime your leadership over the course of the project. The direct costs include the costs of the software applications and tools. These applications are often licensed by the number of users, so be sure to project anticipated growth based upon new Web-based applications, not the installed base of legacy systems that may have restricted access to users.

The next area to consider is the underlying database management system. There is little competition at present in this product space, though some ERP vendors are making significant efforts to integrate with more than one database vendor.

Our experience with the hardware environment is that you will probably need much more hardware than you had anticipated. On one of our ERP projects we doubled the amount of disk an “expert” consultant told us we would need, and we still ended up using every bit of this extra disk and then some. The hardware components budgeted should include the central servers (CPU, disk, network equipment) and don’t forget the need to upgrade PCs to a designated minimal configuration.

Probably the largest area of costs will accrue from personnel – project staff, back-filled staff, consultants, recruiters, project managers, and raises. Don’t forget the need and costs for training and mentoring. Contracts with consultants often leave out the important area of knowledge transfer – be sure to put this in your contract with consultants. While you may remember to budget for the main consultants to assist you with the project don’t forget consultants that you will bring in to conduct a risk assessment and audit of the project at mid-stream and prior to cutover.

Another cost consideration to be considered before the project is initiated is the cost of ongoing maintenance and future upgrades. ERP upgrades are not cheap and can involve considerable expense and effort. Make sure your executive leadership knows what they are committing to long term, not just the cost of the initial implementation.

**Contract for an ERP**

Many institutions will embark onto an ERP with the assistance of one main vendor. This prime contractor will often sub-contract out other work and services when needed. There is a real advantage to having just one butt to kick. Anyone that has attempted to build his
own house and act as their own contractor can attest to the risks of doing it alone, since it is difficult to obtain expert assistance if you do not have depth of resources to draw from. Millions of dollars are on the line so it is best to leave this area to the experts.

If you decide to retain a prime contractor for ERP then the contract is critically important to your success. Take it very seriously. We inherited one contract developed without the needed expertise and review. We suffered for it, so heed our warning. Develop a precise contract with both legal and ERP expert review. Should you attempt to negotiate a fixed-cost or a time-and-materials contract? We have done both forms of contracts and the fixed cost approach has some advantages, but the language of the contract will need very careful wording since vendors will look for loopholes to reduce their costs. On the other hand, a time-and-materials contract should have clear milestones and performance benchmarks to insure best use of your resources.

It is suggested that in your contract you allow for changing technology during the course of your project. ERP projects can often last for an extended period of time and new functionality or ERP modules may become available that were not included in the contract. Keep the door open to new functionality. Finally, be skeptical of vendor promises. Get it in writing!

**Limit Customizations and Scope**

One of the biggest problems in ERP implementations is when the institution attempts to customize the new system to fit every existing business practice. Most state-of-the-art ERPs are based on best and current business practices. Many institutional business practices have evolved over many years and are outdated and arcane. When faced with a choice many institutions choose to adapt the new system to the old business practices because “we’ve always done it that way”. The resulting modifications add a huge cost to the project and perpetuate an outdated way of doing business. The opportunity should be taken to reevaluate business practices and workflow processes, possibly incorporating those suggested by the new ERP. This isn’t an easy or quick task and is fraught with political peril, but what other better opportunity will the institution have to accomplish this important review?

In addition to the danger of a multitude of customizations, be careful to clearly delineate and effectively limit the scope of your project. “Scope creep” can be a major problem in any poorly managed project but can be especially rampant in an ERP project. Your contract will help you manage this problem if it is precise and detailed, but especially in a time-and-materials contract the vendor will be more than happy to add additional functionality for a price. As the project progresses members of the campus community will see “critical” functionality that needs to be added and will lobby hard for additions to the original scope. While new functionality should not be rejected out of hand, hard decisions must be made to keep the project from careening out of proportion. Even worse is the scenario where customizations quietly happen behind the scenes and without the knowledge of the project manager. Care must be taken at all stages of the project to contain scope creep.
Use of Consultants

Most large-scale ERP projects will employ consultants. Consultants can play many different roles on your ERP project. Consultants can help staff the project team, help to back-fill positions, be charged with responsibility for project management, audit the project, serve as the prime contractor, and be the one source for everything from software to hardware and personnel for the ERP. You need to select the proper balance between university and outside people on the ERP project. Too many outside people and not enough university people may make it difficult to transfer the knowledge of the new ERP and also provide much needed information on legacy operations and procedures. It may be a good idea to open up channels to more then one group of consultants, since it will reduce the leverage they may have and also provide a greater range of resources to use if needed. At one of our institutions it was found that a cost effective method was to employ “Big Five” equivalent consulting (at much higher hourly rates) for tasks that required intimate product knowledge while using cheaper “local” talent for more run-of-the-mill programming and other tasks. Check with other universities prior to hiring consultants to make sure they performed well on similar ERP projects at other universities. Also, plan the exit strategy for consultants, since they are expensive and the monthly run rate makes it critical that projects do not run over.

Lastly, make sure your contract includes a clause that gives you “right of refusal” over any individual that does not perform to your expectations. Generally speaking, you should have at least a week - preferably two - to send back any consultant that isn’t right for the task that has been assigned. Also, watch carefully for consultants who have been oversold by their company and in reality are relatively inexperienced. It’s an expensive proposition if they learn at your expense. While consultants need to gain experience somewhere, you shouldn’t have to pay full price when you are effectively training them.

Project Management

Without question, one of the most important decisions to be made on an ERP project concerns the selection of a project manager. The project manager is the general that will lead the troops into battle. This person needs to be a leader and have the respect of the troops and university administration. It is better if they are an insider and have loyalty to the university. But, it is also necessary that an experienced project manager be selected – a professional. If your logical choice for project manager is a person who has superior knowledge of the functional area, but no formal project training or experience, be very careful. We found the ability to efficiently and effectively run a large project to be the single most important attribute of this key individual, far outweighing any other factor. If experience is not available, at a minimum make sure you send your designee to formal project management training. The next suggestion is that a standard project methodology be adopted that provides some guidance and structure to the project. Next, it is necessary to select a manager for the functional side and also one for the technical side of the project. Individual teams, such as the grants management team, needs to have a lead identified. The project manager needs to report on a weekly basis to a group of executive
sponsors, generally composed of the Functional VPs (e.g., CFO) and CIO. A larger group, that comprises an Executive Steering Committee, will provide periodic strategic guidance and support to the project. Some schools have additional advisory committees, such as process owners, who provide focused input from users. However, be careful, that broad based consensus decision making does not generally work well on ERP projects. The project team should be located in a shared location that enables groups to interact and work together away from the day to day concerns of the functional units.

Creating the “Single Team” Atmosphere

A typical ERP project involves personnel from a number of departments within the institution as well as a sometimes major injection of consultants. A primary reason for less than successful ERP implementations is the inability of this disparate group to come together in a focused team-oriented manner. All too often the team membership polarizes into “us versus them” factions (functional vs. technical, everybody vs. the contractor, etc.) and the project degenerates into a mass of finger pointing. A successful ERP project will require that the functional and technical leadership and teams develop a strong partnership and a shared commitment to the success of the ERP. The partnership at the top provides the foundation that needs to be created. Without this joint commitment to work together don’t even attempt an ERP project. Furthermore, if there is a major consultant presence on the project, key partnerships at every level will be required to maintain the cohesiveness of the team. When possible, consultants should be incorporated directly into the team. This requires a major trust factor on the part of the institution but is important.

Key Functional Issues and Challenges

The ERP Functional Team will encounter some significant challenges not touched on previously that should be anticipated early on in your project. We cover them briefly below.

- **Process engineering** – Change in current business processes are often needed and recommended as a result of an ERP; you don’t just want to pave cowpaths!

- **Back-filling staff** – Do not assume that it is possible for someone to do everything they did before the ERP started and also serve as an important agent on the ERP project. Be realistic about needs both on the project and back in the functional unit during ERP.

- **Training** – Give some serious consideration to the type and timing of training. The traditional form of training where a person goes for days at a time and does not interact with the system for months does not work.

- **Recruiting and retaining staff** – Once you train people on an ERP they become much more marketable and you will need to consider the difficulty you will encounter in retaining and recruiting key personnel. Therefore, get started early.
• **CRP** – Give serious attention to the CRP (conference room pilot); it is more than just window shopping.

• **Reporting** – Will routine reports be printed to the Web? Will users give up their paper easily? The ERP will often enable easier development of ad hoc reports. You will need to set priorities, since it will be difficult to meet the broad demand for reports on the first day of production.

• **Addressing gaps** – There will be gaps between what you perceive is needed and what different ERP solutions can provide. You will need to make some compromises or get your wallet out to support modifications to the system.

• **Setting expectations** – Don’t make the mistake of raising expectations too high in order to obtain the funds needed for ERP. Be more modest in the expectations you set and then exceed them.

• **Obtaining user buy in** – It is nice to obtain user buy in, but don’t think you will obtain a universal consensus; this is a university we are talking about.

• **Validation of data and systems** – You will need to plan a mid-course risk assessment and a pre-production audit before you go live to verify your testing of the system and final production set ups.

• **Communications** – Get the word out often and in different forms.

**Key Technical Issues and Challenges**

The ERP Technical Team will encounter some significant challenges not touched on previously that should be anticipated early on in your project. We cover them briefly below.

• **Holding the line on modifications** – The Technical Team needs to work closely with the Functional Team to hold the line on modifications, since they will inherit the system and have to maintain the mods. When computing the cost-benefit do not forget the discounted cost of maintaining the mod into the future through a rapid stream of upgrades that can be anticipated in the years to come.

• **Recruiting the talent needed and holding onto them** – Personnel issues will hit the Technical Team as well, especially the difficulty in recruiting apps DBAs.

• **How much hardware is enough?** – Do not underconfigure your system. It can be a nightmare to spend many months designing and building a system, just to have it perform slowly out of the gate. Remember not only to do functional testing, but also performance and load testing of the system.
• **Conversion of data** – Do not underestimate the challenge of converting years of legacy data into a new format needed for the ERP. A better approach may be to ship the legacy data to an archive or data mart and then start the new system fresh or with little converted legacy data.

• **Interfaces** – Who is going to maintain interfaces in the new ERP environment? Who is responsible for checking the data prior to it being shipped to the ERP? The new model of operations will most likely not conform to your previous approach.

• **Change management and problem tracking** – Adopt a formalized process and system for logging change requests and any problems encountered with the system during the development as well as production phases. At some point shortly after CRP you need to put a freeze on change. However, get ready for objections from the functional side.

• **The minimum desktop requirements** – Some ERP systems may require many of your existing legacy PCs to be upgraded. Some ERP clients do not support MACs. Be sure to factor in the desktop issue and make some early decisions and announcements on who is responsible for upgrading systems.

• **Distributed vs. Centralized production** – There are various modes of production from a distributed model to a highly centralized model. ERP systems can support a distributed model that places more control and responsibility into the hands of the functional units. But, they will need the same types of controls and procedures to guide their efforts, which are akin to the run books of centralized production environments.

**Personnel Recruitment and Retention Issues**

Probably one of the greatest challenges to be encountered these days on an ERP has to do with recruitment and retention of key personnel. Additional issues to consider are listed below.

• **Additional compensation for “Life of Project” efforts** – Announce a bonus program to help keep key personnel on throughout the project and help drive key objectives such as CRP. Then deliver on your promises.

• **Find and nurture people early** – Get started early in identifying and recruiting key personnel needs. You may have to grow your own specialists, so identify people you can count on sticking with you throughout the project and after you go live. Invest in these people, but realize you will lose some of them during and after the project. This is where a partnership with one of the large consulting groups is valuable since they can provide some depth of resources when needed. But, even these companies are having some difficulty these days, so you may want to line up a few sources.
• **Back-filling staff** – Make sure you have enough depth on the operational side, since it can really take the steam out of a project to lose key functional staff as they are pulled off the project to support day to day functional operations.

• **Staffing matrix** – Set goals for staffing and then track progress.

• **Knowledge transfer and mentoring** – Develop a plan to transfer knowledge from consultants to key university personnel.

• **Stress management** – The pressures of an ERP project can build up enormous levels of stress in everyone. It is good to give some attention to managing stress levels through various means and keep an eye out for the employee on the edge, since it can cause a ripple effect throughout the project.

• **Team building** – Early on in the project focus some energy at building teams that can work together even when the going gets difficult.

**Morale of the Team**

ERP implementations are hard on institutional personnel. The extreme perseverance and dedication required over a long period of time take its toll. Caution must be taken to provide periodic “downtimes” and events to boost and maintain moral. During our projects we periodically provided occasional dinners and lunches, held brief cake and punch parties to celebrate the achievement of important milestones, had barbecues in the parking lot, and other activities. These events also gave us the opportunity to recognize outstanding contributions to the project. After completion of the project more major events were undertaken to recognize team efforts and reward contributions.

**The Future of ERP**

The ERP space in higher education is moving rapidly. Vendors that have not spent much time understanding the needs of higher education are doing much better now than previously, though they can still do much better. As a result of the growing competition, vendors are working at rolling out integrated suites of software that support the thin client Web interface and object oriented systems. New versions are now rolling out much faster, making it challenging to keep up with the ERP project that never seems to end. As soon as you are done with the implementation, you are working on the next major upgrade.

User Groups are growing in their importance since they can help to drive vendors to become more sensitive of the needs of higher education. They can also provide important forums for schools to share information. ERP systems are rapidly beginning to embrace the demands forthcoming for e-commerce applications such as online billing and payment, e-procurement, etc. The data warehouse and data retrieval tools are maturing and will play a more important role in the future.
Sooner or later higher education will wake up to the fact that not every university is that much different. There are some best-practice models that should be provided by ERP vendors in order to reduce the cost of ERP implementation. Some of the ERP vendors are doing this for smaller schools, but what about the more complex R1 institutions? Finally, as universities can move toward some best-practice models, the possibility of ASP becomes more attractive and economical.