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ERP Implementation in Higher Education:
An Account of Pre-Implementation and Implementation Phases

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EXECUTIVE SUMMARY

Enterprise Resource Planning (ERP) systems long have been known as systems that bring integration to numerous business activities within complex organizations. However, in today's contemporary organizations, ERP systems are becoming a standard information system, irrespective of size and nature of the business. This case focuses on the implementation of an ERP system in higher education. The case covers the key stages of implementation. Particular emphasis is placed on the selection of the ERP system and the organizational dynamics involved. The implementation of the first two modules and the views of users are discussed. The depth of the case can enable managers to understand the complexity of an ERP system selection and the organizational issues involved. The analysis of the case sheds light on the activities involved in ERP projects and what to expect during the implementation stage.

Keywords: academic administration IS; business process re-engineering; enterprise resource planning; higher education; process improvement; IS project selection; IS/IT planning; system selection

ORGANIZATIONAL BACKGROUND

Agora University

This case is about an ERP implementation effort at Agora University, a private co-educational university in the midwest USA (see Table 1). While the following school statistics might seem impressive, they only reflect the challenges facing the university in order to maintain high standards and to remain competitive. There must be continuous efforts to ensure that the univer-

Table 1. Organizational background, Agora University

Basic Facts	Enrollment	Operating Budget (2004/2005)	Colleges	Administration
-Private, coeducational university located in the midwest USA -Provides a liberal arts education in the Catholic, Jesuit tradition -The third-largest independent institution in the midwest USA	-6,668 total students -3,943 undergraduates -2,725 graduate students -48 states represented -56% female -44% male -Student/faculty ratio: 13:1	-Annual budget of $108 million -Endowment of $94 million	-College of Arts and Sciences -College of Social Sciences -College of Business	-*U.S. News & World Report's America's Best Colleges* issue ranks Agora in the top 10 among 142 master's-level colleges and universities in the midwest. -Agora has ranked in the report's top 10 for 10 straight years. -Agora was named one of the "Best 357 Colleges in America" by *The Princeton Review* in 2004. -The College of Business is listed as one of the "Best 143 Business Schools" in the nation, according to *The Princeton Review* 2005 guidebook of business schools.

sity remains in the league of best universities without putting undue financial burden on the students. As with any organization, the most viable solution is to improve efficiency and to lower cost through an improvement of internal operations.
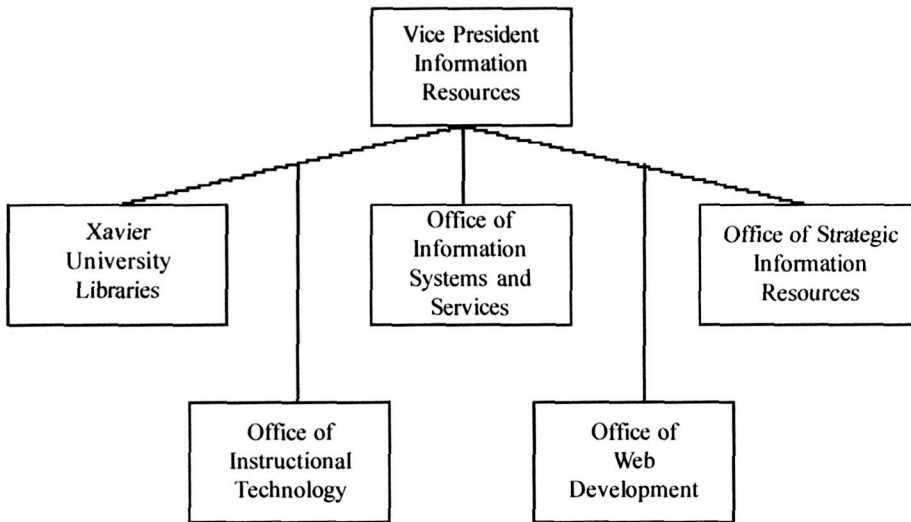
The University is headed by a president and supported by seven vice presidents:

- The Academic Vice President and Provost heads up all academic and faculty affairs.
- The Senior Vice President for Financial Administration heads up the human resources and financial affairs areas.
- The Vice President for Mission and Ministry is responsible for mission and ministry and promotion of the Jesuit tradition of the university.
- The Administrative Vice President is responsible for government and community relations.
- The Vice President for University Relations is responsible for the office of marketing and public relations, all phases of Agora's development efforts, alumni relations, and special events.
- The Vice President for Student Development supervises campus dining, discipline, security, student development assessment, and student activities.
- The Vice President for Information Resources heads up the division of information resources (see Figure 1) and provides leadership to enable the university to progress in the use of technology and information resources in order to enhance the teaching and learning environment, supports scholarly activity, and improves service and productivity.

Information Systems and Services Division

The Information Systems and Services (ISS) division is responsible for the management and administration of information technology at Agora University. The division is headed by an

Figure 1. Organizational structure, division of information resources, Agora University (Agora University, 2002)

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                        ┌─────────────────┐
                        │ Vice President  │
                        │  Information    │
                        │   Resources     │
                        └─────────────────┘
         ┌───────────────────┬──────────────────┐
┌─────────────┐     ┌─────────────────┐   ┌─────────────────┐
│   Xavier    │     │   Office of     │   │ Office of       │
│ University  │     │  Information    │   │ Strategic       │
│  Libraries  │     │  Systems and    │   │ Information      │
└─────────────┘     │   Services      │   │ Resources       │
                    └─────────────────┘   └─────────────────┘
          ┌─────────────────┐     ┌─────────────────┐
          │   Office of     │     │   Office of     │
          │  Instructional  │     │     Web         │
          │   Technology    │     │  Development    │
          └─────────────────┘     └─────────────────┘
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Associate Vice President. The mission of ISS is to provide the students, faculty, and staff of Agora University with computing, information technology, and telecommunications support and services necessary to achieve the institution's instructional and administrative goals and objectives. This area provides support for the computer hardware and software used in instruction and administration. In addition, ISS manages the ongoing development of administrative systems to facilitate the business processes. ISS also supports the campus data and voice networks and provides business information to aid administrators in decision making. There are a total of 32 staff members in ISS with varying skills that cut across the functionalities of all departments. Over the past five years or more, they have been able to attract and retain professionals for all the managerial and technical positions. ISS is divided into three main departments: application services, client services and technology services (see Table 2).

The Environment — Higher Education

The similarity and differences between educational institutions and business organizations have been an issue of discussion in the literature (Balderston, 1995; Heiskanen et al., 2000; Lockwood, 1985; Pollock & Conford, 2004). According to Pollock and Cornford (2004), it is tempting to see the educational institutions as unique organizations that are different from other organizations. This uniqueness can be based on a combination of certain characteristics, which, according to Lockwood (1985), could include complexity of purpose, limited measurability of outputs, both autonomy and dependency from wider society, diffuse structure of authority, and internal fragmentation. A university specifically can be "thought of as a band of scholars coming together in pursuit and dissemination of knowledge, governed by a more or less collegiate model of organization, based around a complex structure of committees and with a high degree of individual and departmental autonomy" (Pollock & Cornford, 2004, p. 36). Thus, the decision-making process in the university could be fundamentally different from business organizations, and the information systems developed for business may not be directly appropriate in universi-

Table 2. Three main departments of information systems services (ISS) division

Units	Responsibilities
Application services	1. Programming support for the university's central administrative computing systems: FRS (financial information), HRS (human resources), SIS (Student services), and ADS (alumni/development). 2. Supporting academic systems and local departmental applications.
Client services	1. Provides computing support to Agora faculty and staff for their desktop machines as well as operational support to other ISS units.
Technology services	1. Provides support for the university's servers, data network, campus wire & fiber plants and the telephone system. 2. Technology Services is responsible for the administration, maintenance, operation and security of the university's central computing infrastructure, such as the servers and mainframes.

ties (Heiskanen et al., 2000). This also can be extended to the process of implementing such a system and its usage.

While higher educational institutions have interacted with each other in a collegial fashion, they all are striving to achieve administrative excellence and to provide the best experience for the students. They understand that they all seek the best and the brightest students and that they need to provide a strong reason why their particular institutions should be chosen over others. The universities also need to be able to support the activities of the faculty in teaching, research, and service. Federal and local research funds continue to be more competitive, and faculty members require a more conducive environment to be able to function effectively in order to attract research money. Administratively, educational institutions are under pressure to perform at the same Internet speed as business organizations do. Despite the inherent differences in the orientation and functionalities of educational institutions and business organizations, they all share the need for efficiency and productivity.

At the turn of the century, higher education was being redefined through advances in information technology (i.e., many courses were made available online and many manual processes in higher education were becoming automated). The rise of many virtual universities challenged the traditional university model. Many universities responded through the development of many Web-based courses and through an increased use of information technology in the classroom. Administratively, there were challenges to reach prospective students without the limitation of location and time. With the reduction in government support and increasing costs, universities began exploring ways to strengthen their fundraising activities, to increase their efficiency and productivity, and to become more accountable to their stakeholders.

The immediate response of universities has been to look at how the corporate world has been able to deal with the issue of efficiency, productivity, and competition, along with how some of the leading educational institutions are running efficient administrations. Considering the influence of Information Technology in the 21st century, it was not surprising that Agora Univer-

sity looked to pursue new ways to remain competitive and to deliver the best services to their stakeholders. They investigated and adopted a system for the purposes of improving their administrative processes using information technology.

SETTING THE STAGE

It was this situation — a need to respond to growth in the education sector and the increasing environmental challenges — that made the leadership of Agora University request the assessment of their dated administrative information system. The system had been in use for more than a decade and was seen as no longer meeting the requirements of the university and the demands of the growing global competition in higher education. The assessment revealed that many users were no longer happy with the dated system, and more importantly, the underlying technology was viewed as obsolete. This denied the user from benefiting maximally from recent advances in information technology. There was a long list of problems, and university users called for more integrated, user-friendly, Web-enabled information systems.

On December 4, 2001, Patti Boulay, Associate VP for Information Systems and Services, was coordinating a meeting. She had an agenda as well as an opportunity to prove her expertise and professional proficiency. She was concerned about the big responsibility that was about to rest on her shoulders; she needed to call upon her leadership ability and all the knowledge she had acquired over the last 25 years in the areas of information technology design, implementation, and management. More importantly in her mind was the risk associated with the mission and the charges of the committee that she was chairing that day. If the committee succeeded, it would go down in the history of the university as a team that led the university to a new era. It had specific charges from the President, Reverend Fr. Clement Gordon, S. J. The task was challenging, and it had to be done. Fr. Gordon had been a faculty member since the mid-1980s and also the Vice President for University Relations before he assumed the presidency in January 2001. Fr. Gordon, a great visionary for the university, had recorded a number of successes since he became president. He believed that in order for Agora to reach the height he envisioned, it was paramount that the operation of the university run smoothly, consistent with the demands of the environment and the reality of the digital age. The university could not afford to be complacent and to not take advantage of the revolution occurring in information technology. He personally formed a committee and charged it with some specific responsibilities:

- Undertake a detailed review of the current status of Agora University's administrative systems with special attention devoted to the long-term viability of software and hardware platforms used.
- Solicit extensive input from both system owners and end users concerning functionality of current systems to meet business operations and reporting needs.
- Develop a list of features and functionality considered essential in current systems.
- Develop a gap analysis highlighting additional features and functionality desired.
- Identify business process changes/improvements necessary to effect the desired changes.
- Prioritize identified features and functionality.
- Evaluate available systems and ERP options in light of the results of the needs assessment.
- Forward a recommendation with project timeline and budget estimate to the President by April 2002 (Project Document, 2001).

In 2001, Agora had been using the Vendor B 2000 suite of systems from Vendor B Corporation for primarily administrative functions of the University. This suite of systems was supplemented by a number of satellite server-based systems for functions such as financial aid, classroom management, online instruction, housing management, and various Web applications developed in-house. Agora's server network was primarily a Novell infrastructure using NDS as the primary means of authentication. A number of customized modifications had been made to the Vendor B 2000 administrative systems over the past several years. A separate central identification system and an in-house written admissions system also interfaced to the Vendor B 2000 administrative system The most current suite of administrative systems ran on a VAX 7000 Model 74 with 4 CPUs, 1 GB Memory, 4 HSJ40 Controllers, 60 RZ29 4.3 GB disks, and 2 TZ87 DLT tape drives. A mixture of servers was currently in use for some of the satellite systems.

At this first meeting, Dr. Katrina Maakinen, VP for Information Resources, read the charges:

[T]he committee would evaluate our current administrative systems. If warranted, investigate replacement systems, and make recommendations to the President by April 2002 (before the board's meeting in May 2002). We need to look at the business processes and reporting and become more knowledgeable about how the systems interrelate across the institution. The committee will look at the long-term viability of software products. This needs to be a university decision and include input from the system owners as well as the end users. Find out what would people like to see in our current systems and review our business processes. Vice presidents need to prioritize their needs. We will evaluate systems that are available to Higher Ed. We will provide additional resources, if necessary, and have a workshop to help us with team dynamics to keep us moving forward with this project.

Despite the charges, the committee was very open in their approach from the beginning; they were not looking for one system, but they wanted to explore all options for improvement in efficiency and productivity. The chair of the committee suggested:

[W]e evaluate our systems and then evaluate what's next, we might decide to keep what we have and do nothing or we might decide to modify our current system or even replace our system.

The committee was named Administrative Systems/ERP Assessment and Recommendation Steering Committee, a.k.a. the ERP Steering Committee, with the following membership:

- The Associate Vice President for Information Systems and Services (Chair)
- Director for Internal Operations for Development
- University Registrar
- Associate Academic Vice President for Enrollment Services
- Assistant Vice President for Student Development
- Budget Director
- Director of Application Development
- Director of Institutional Research
- VP for Information Resources
- Assistant Vice President of Human Resources
- Director for Web Communications

- Director of Finance
- Representatives of Faculty

This was the beginning of the process that extended through the period of this case. The selection of the ERP system took a period of one year, and the implementation is still ongoing; it is still difficult to predict the true completion date. Before continuing with the details of the case, the theoretical background of ERP implementation will be presented. Although most of the findings are based on business organizations, the knowledge still guides the data collection process and the approach to the case preparation. Details of the selection process and the problems that relate to the actual implementations will be presented next. The success factors and the challenges during the implementation stages complete the case discussion.

THEORETICAL BACKGROUND

The name of this class of information system (IS) — enterprise resource planning systems — clearly explains the bias in the literature and practice toward business organizations. Enterprise resource planning (ERP) evolved from materials requirement planning (MRP) and manufacturing resource planning systems (MRPII) (Al-Mashari et al., 2003; Kumar at al., 2003). As the names indicated, these systems were used predominantly to support manufacturing operations in the 1960s and 1970s. Due to shortcomings of MRPII (Chung & Snyder, 1999) to cover all major organizational functions and also due to the increasing demand for additional features, ERP systems were developed during the 1980s and 1990s. This was made possible by the advancement in computing technology and the falling price of computer hardware. According to Yusuf and Little (1998), the key difference between MRPII and ERP systems is that ERP includes functionalities, such as financial accounting, sales and distribution, human resources planning, decision support applications, regulatory control, quality, elements of supply chain management, and maintenance support, which are beyond the traditional focus of MRPII (see Figure 2).

From Figure 2, it can be seen that ERP systems still focus primarily on business; in fact, the modules in many ERP systems are fashioned after the traditional business functions of sales and

Figure 2. Evolution of ERP systems (Watson & Schneider, 1999)
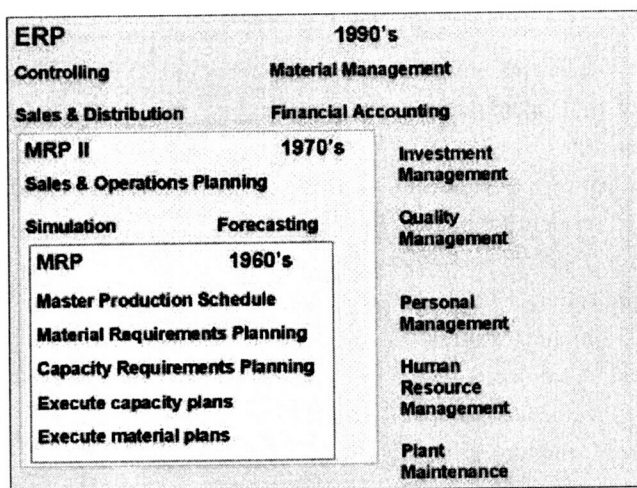
marketing, manufacturing, finance and accounting, human resources operations, and logistics (Umble et al., 2003). There is a general assumption that all organizations operate in similar ways and most likely have these functions. Although ERP systems are highly parameterized to cater to varying organizationally specific requirements, provisions originally were not made for the use of ERP in other types of organizations. However, at the turn of century, the need for efficiency and performance drove many higher education institutions to acquire ERP systems.

ERP systems also are referred to as Enterprise systems (Davenport, 1998, 2000) or Enterprise information systems, which are defined as the computer-based technologies that integrate data across an organization and impose standardized procedures on the input, use, and dissemination of that data. According to Nah and Lau (2001), ERP systems have the ability to automate and to integrate an organization's business processes, to share common data and practices across the entire enterprise, and to produce and access information in a real-time environment. Examples of companies' supplying ERP systems are SAP AG, Baan, ORACLE, SCT Banner, and PeopleSoft. An ERP system can be highly beneficial to organizations, if they are able to overcome the implementation hurdles. According to Holsapple and Sena (1999, 2003), ERP systems can speed decision making, reduce costs, and give managers control of organizational processes and operations.

The drivers for ERP implementation, irrespective of the type of organization, have been categorized into technological and operational factors (Al-Mashari et al., 2003). Technological factors include replacement of disparate systems, simplification of integration of processes and systems, simplification of integration of technology infrastructure, replacement of older, obsolete systems, and acquisition of support systems for organizational growth. Operational factors include process improvement, simplification of ineffective and complex processes, provision for new processes, and standardization of processes.

During the preliminary interview with the project manager, the drivers for Agora University's ERP implementation project included the need to replace an existing system as well as the integration into other existing applications. The ERP project manager was also of the opinion that the ERP system would enable the re-engineering of some processes and possibly provide the opportunity to see what improvements could be made in the existing processes.

The high rate of failure in implementing ERP systems and the general difficulties associated with ERP implementation has been well documented. This has led to the isolation of the most important factors that could enhance ERP implementation success. These factors are commonly called critical success factors (CSF) (Al-Mashari at al., 2003; Hong & Kim, 2002; Nah & Lau 2001; Umble et al., 2003). Various authors have presented lists of critical success factors (see Nah & Lau, 2001 for detailed review) but with not many differences. Among the main CSF in literature are ERP teamwork and composition, change management program and culture, top management support, business plan and vision, business process re-engineering (BPR), minimum customization, effective communication, project management, software development, testing and troubleshooting, monitoring and evaluation performance, project champion, appropriate business, and legacy systems (Nah & Lau 2001).

While CSF could enable success of a project, it does not guarantee success or provide a means for evaluation. Al-Mashari et al. (2003) proposed a means of assessing ERP project success. They argued that an ERP project can be considered successful (1) where there is a match between the ERP system and the stated objectives of implementation (correspondence success), (2) when the project is completed within time and budget (process success), (3) when users' attitudes toward ERP are positive (interaction success), and (4) where the ERP system matches users' expectations (expectation success).

On the other hand, an understanding of the reasons why many ERP implementation projects have failed could be a recipe for success in a new project. Umble et al. (2003) summarized reasons for project failure into 10 categories. They contend that ERP could fail when:

1.   Strategic goals are not clearly defined.
2.   Top management is not committed to the system.
3.   Implementation project management is poor.
4.   The organization is not committed to change.
5.   A great implementation team is not selected.
6.   Inadequate education and training results in users that are unable to satisfactorily run the system.
7.   Data accuracy is not ensured.
8.   Performance measures are not adapted to ensure that the organization changes.
9.   Multi-site issues are not properly resolved.
10. There are technical difficulties.

The reasons for ERP implementation failure and the CSFs point to similar issues, which, if organizations consider carefully, could increase the chance of project success. These factors were drawn carefully from a detailed and rigorous analysis of cases of ERP implementation in many organizations. The only drawback of the list was the lack of evidence in the literature that shows that organizations that follow these suggested factors actually did well. Also, there is an intrinsic assumption about the nature of organizations and their primary interest in making profit. On this basis, the question is whether these critical success factors will hold for organizations that do not conform completely to these particular assumptions.

ERP Implementation Phases, Key Players, and Activities
ERP implementation phases have been categorized in a number of different ways in literature. In each phase, there are a number of players that are directly involved and whose activities are required for the success of the phase and the implementation in general (see Table 3).

For the success of ERP implementation, it has to involve many players with varying roles. The success of the ERP implementation project is hinged on communication and collaboration among the various players. The main players that have been identified in the literature include top management, the project champion, the steering committee, the implementation consultants, the project team, the vendor-customer partnership, the vendors' customization tools, and finally, vendor support (Somers & Nelson, 2003). Many activities also have been identified in ERP implementation. The key activities that are common include selection of the ERP product, the project manager, implementation partners, configuration of project team, development of detailed project plan, selection and assignment of project team members, ongoing project management, user training and education, infrastructure upgrade, software configuration, testing, rollout and startup, data analysis and conversion, business process re-engineering, change management, education on new processes, communication, and finally, problem resolution (Somers & Nelson, 2004; Kumar et al., 2003).

ERP IMPLEMENTATION AT AGORA UNIVERSITY
This case used the Markus and Tannis (2000) phases of implementation to present the case of ERP implementation at Agora University.

Table 3. ERP implementation phases, key players and activities

Phase	Description	Key Players	Key Activities
Chartering	Comprises decisions leading to funding of the ERP system project	Vendors, consultants Company executives IT specialists	Initiation of the idea to adopt ERP Development of the business case Decision on whether to proceed with ERP or not Initiation of the search for the project leader/champion Selection of software and implementation partner Project planning and scheduling
Project	Comprises system configuration and rollout	The project manager Project team members Internal IT specialists Vendors Consultants	Software configuration System integration Testing Data conversion Training Rollout
Shakedown	The period of time from going live until normal operation or routine use has been achieved	Operation managers Users IT support personnel External technical support personnel Project team	Bug fixing and rework System performance tuning Retraining and staffing up to handle inefficiency
Final Onward and Upward	Ongoing maintenance and enhancement of the ERP system and relevant business processes to fit the evolving business needs of the organization. It continues from normal operation until the system is replaced with an upgrade or a different system.	Managers End users IT support personnel (internal and external)	Continuous business improvement Additional user skill building Upgrading to new software releases Post-implementation benefit assessment

The Chartering Phase (December 2001-July 2003)

After the first ERP steering committee meeting, each representative of the functional areas was requested to analyze his or her current system and report suggestions. They were advised to consult with members of their unit and get the necessary inputs. They made the process as inclusive as possible; all interested parties within the university system were taken into consideration, and the process was set to be open and participatory. The committee needed input in order to develop a business case for the project and to provide justification to proceed with the project.

Patti suggested we evaluate our systems and then evaluate what's next, we need to decide to keep what we have and do nothing or modify our current systems or replace them. If we make a recommendation to replace the systems, the various departments will need to review available systems. The ultimate goal is to choose a system that is best for the university as a whole. Cost and implementation timeline must also be considered. The university will evaluate current

systems in December and January. The committee will come up with specific questions to find out what we want to know about every system. We also will seek input from the deans to obtain their visions.

From the early days of the project, there had been discussion of communication with the university community and even the external stakeholders. They disseminated information through Web pages and communicated with stakeholders through the university newsletter. They also posted information on educational resources like EDUCAUSE (www.educause.edu).

The goals of the first phase also were set clearly; as mentioned earlier, the committee was resolved to find the most appropriate solution to support the vision of the university.

There are at least three outcomes from the initial phase of the committee's work: the committee can recommend (1) keep the existing systems and do nothing; (2) keep some existing systems, change some, and fix some; or (3) evaluate other ERP systems with the intention of replacing our existing systems.

However, it appeared that some committee members already knew the direction of the outcome. They had started making provisions for how to evaluate some systems and how to proceed.

If we recommend the third option, we could evaluate the systems available first based on cost, next on technology, and last on functionality. Since some of the vendors are already contacting us, we can get them to submit ballpark prices of their system for our size of institution. Vendors include Vendor A, Vendor B, Vendor C, Vendor D and Vendor E. We need to visit other schools that have these products in use. This information will be gathered and presented to the group at a later date.

As soon as the steering committee started its work, each committee member was directed to form subcommittees in their respective areas to evaluate Agora's current systems. The decision about the composition of this project team was left to the leaders. The subcommittee was formed around primary functional areas of Student Information, Human Resources, Alumni Development/University Relations, Financial Records and Admissions/Financial Aid/PREP, and other associated functional areas of Housing/Board/Campus Security/Event Scheduling, Focus/Library/Hospital Administration, and Infrastructure/Miscellaneous Administrative Systems.

During this early stage of the project, the steering committee established the support of the executive committee. At one of the committee meetings, this was reiterated. The support of senior management has been identified as an important factor for the success of any ERP implementation.

The question was raised whether this committee had the clout in getting other departments to be uniform in their system use. Patti stated Fr. Gordon [the President] formed the committee and thought we did have the necessary clout.

During the first year of the project, the steering committee and various subcommittees were meeting every week and sometimes more frequently whenever an issue needed to be discussed immediately. They paid careful attention to all details and did a lot of consultation within and outside the university.

By the end of December 2001, all the subcommittees had completed the assessment and evaluation of their current systems. They used this opportunity to document their processes and

to reveal some inefficiencies in the process along with the problems associated with the current systems. At their December meeting, the steering committee decided unanimously to take the third option — evaluate other ERP systems with the intention of replacing the existing systems. A potential timeline was developed, and a list of vendors also was discussed. At this stage, they discussed more about the merits of keeping the existing systems, the viability of the hardware platform, and how the various areas would influence the ultimate decision.

The next tasks were discussed and a potential timeline developed. It was also agreed that we should bring in system vendors for presentations in an effort to expand our knowledge about the potential of the administrative systems. We should plan to do this before we put together our initial recommendation. The tasks and timelines would be as follows:

Evaluation Reports	*complete by 1/30/02*
Reports Read by Each Committee Member	*1/4/02 thru 2/15/02*
Vendor Presentations	*2/18/02 thru 3/22/02*

The discussion continued on the preparation of the request for information (RFI) to be sent to the vendors by January 30, 2002. The committee wanted to give equal opportunity to all qualified vendors, especially when one of the vendors was the supplier of the current system. While the steering committee was working on the RFI, some vendors had already started prospecting and finding ways to know more about the plan of the university. One member of the steering committee expressed this problem.

Anthony asked how he should handle vendors who have contacted his office to meet and have lunch. Patti asked that we tell them there is a process for a RFI and they will be invited on campus to meet with the end users to demonstrate their software.

By February 2002, the RFI was ready and was sent to the five vendors. The steering committee already was discussing the hardware vendors. There was also more discussion on the process of the ERP system selection. There was a plan that all vendors should visit the university to make a presentation of their system in March or early April 2002. The vendors were asked to send an electronic copy of their responses to the RFI to enable easy sharing within the university community. The committee invited key people to attend specific presentations of the vendors. Evaluation forms to be used to assess each vendor's presentation were also designed. While the details of cost were not required at this stage, the vendors were required to supply a negotiable ballpark figure for the administrative systems. There was deliberation on the possibility of eliminating the vendors with an overly high bid; however, it was resolved that all the vendors should be allowed to make a presentation of their product. A copy of the RFI was sent to the President, and he sent a written appreciation for the good job of the committee and his understanding of the complexity of the work of the committee.

After the presentations and evaluations, Vendor D emerged as the clear winner, and Vendor C was completely eliminated. The decision was based not only on the evaluation but also on other factors like comments from other schools that had experience with the vendors and their performance in general. There was even a plan to make Vendor D the only choice. Many of the groups were not happy with Vendor B and those that supplied and maintained their current system. The committee decided to engage the service of GlobalCon Group during the second phase of the selection. Even with the decision to go with Vendor D, the committee was of the opinion that a consultant could help the university to choose the best system. They contacted

Greg Koloki, Vice President - Education Sector, at GlobalCon Group. A copy of the RFI was sent to Koloki in preparation for a conference call with the committee. During a conference call, Koloki suggested that they should:

Apply six criteria to vendor selection: 15% technology, 20% vision of company and do they know the business, 25% ability to execute implementation, 15% functionality, 15% cost, 10-15% for service and support. We need a good relationship with the vendor we choose. The leaders in the quadrant are Vendor D 3, Vendor A 2, and Vendor B 1. Look at the vision and question strength and the monitoring of the case tools. This is important because we cannot afford to change often. It will take 15-20 years to switch the chosen product.

Koloki presented a thorough analysis of all the vendors based on his experience without making any final recommendation. The committee requested more time to present their report to the President, since the April date was not realistic in view of the complexity of choosing a vendor. Vendor D was expensive, and the possibility of Vendor D's product emerging as the best was already generating some concern for the Senior VP for Financial Services. He requested a five-year breakdown of cost, including maintenance and answers to the following questions:

What is the benefit for purchasing your system for double the cost? What is the return on investment? What is the marginal cost benefit? What is the easiest migration? What will be our best long-term value?

At the end of April 2002, this was the view of the committee on the vendors:

Vendor C did not have enough history, service, and support for student records. BSR was to be eliminated for Maria's area. Vendor E was in financial distress, and the existing system had problems with functionality and reporting. This leaves Vendor D, Vendor B, and Vendor A for us to consider. Vendor B is iffy because of their Jekyll/Hyde traits. This does not include housing, portal, and alumni. We need to give a best guess for the cost of ownership. We need to conduct visits and contact customers. We had a discussion on Vendor B, and now we are questioning their customer relations. It's about relationship. People feel good about the process of ERP and choosing a vendor for new software on campus. Vendor D is still the leader. We need to do a reality check. We have eliminated Vendor E and Vendor C, and the overwhelming favorite vendor is Vendor D because of their service, Web, and a good platform. The committee is feeling that Vendor B is somewhat lukewarm, and Vendor A seems inconsistent.

During the months of May and June 2002, using various parameters, Vendor D and Vendor B emerged as the finalists in the selection process. Vendor A was dropped for technical reasons.

It has been decided that Vendor A will be eliminated. Two reasons why Vendor A has been eliminated are that it does not work on Macs, and it works on a client server. Patti will notify Vendor A at a later date that they have been eliminated. We will go forward with Vendor D and Vendor B.

Yet, there were still mixed feelings about Vendor B, and the committee was still finding ways to justify the superiority of Vendor D. The committee members felt that they were being manipulated to select Vendor B simply because of the higher cost of Vendor D. Senior management was

really concerned about the high cost of Vendor D, and they made their opinion clearly known to the committee.

We will put the burden on Vendor D to justify why their system cost is so much more than the other vendors. We will ask for five installations and make a case for our recommendation. Salodeck County has Vendor D across the board, and Francis will speak to someone there. The committee feels that Vendor D will get us further into the future. We need to develop a better sense of project management.
We need to work out a plan to investigate Vendor D and Vendor B. Most committee members feel we are being manipulated into selecting Vendor B. We need to give both vendors a chance.

After the two final vendors were selected, the GlobalCon Group was engaged, and the committee prepared a detailed Scripted Scenario to be used in the evaluation and final selection (see Appendix 1 for the sample Scripted Scenario). Vendor D and Vendor B were invited back to the university, and this round of evaluation was coordinated by the consultants from the GlobalCon Group. The committee was also under pressure to present their final selection to the President before the next Board of Trustees meeting in September 2002. At one of the meetings in the month of August and during the preparation for the final evaluation, many of the most senior university executives attended the steering committee meetings to clarify their concern.

The question had been asked why the urgency for the September Board of Trustee meeting. Patti responded that she needed all this information for the Board of Trustees since we would be investing several million dollars in a new administrative system.
Discussion followed on the perception of Vendor D as being of high quality in service, marketing, and sales. Vendor B was thought to not be as good with their reputation for service. Nathan stressed that we work with as many people as we need when we choose a vendor. We can decide post-implementation service and then weight that element higher. The GlobalCon Research will provide information from the industry perspective and find out the total cost of ownership from the vendor in relation to maintenance fees and the cost break down on licensing, hardware, and software. The question was asked whether there would be a need to hire additional staff. Nathan replied we would probably need to hire extra staff for backfilling people that will be working on the implementation. We will also need to add the cost of upgrade for whichever vendor we choose. Traditionally, maintenance is cut off at a certain point, maybe 24 months, and then there will be upgrade costs to move to the next level. This is an additional service cost. We need to understand the total cost of ownership for five years. There is more to the initial snapshot of the vendors. We need to calculate the benefits that may be realized in two, three, or four years after implementation.

In early September 2002, Vendor B was selected after the final evaluation and scoring (see Appendix 2 for the final criteria). All other costs were considered, and the final evaluation was submitted to the President for his presentation to the Board of Trustees. With this selection, the steering committee was able to focus on some related issues. They discussed the selection of a reporting tool and hardware. They choose a name for the project through an open contest within the university. Also, it was estimated that the project duration would be two and a half to three years. The contract would be signed by the end of the year. However, as of December 2002, the contract was yet to be signed due to some issues that needed to be resolved before the committee could agree to sign a 10-year maintenance contract.

The Project Phase (January 2003-)

In the first quarter of 2003, the project was formally named Project IRAWO, and a substantive project manager (Francis Livingstone) was appointed. This project leader was a member of the steering committee. The ERP steering committee was renamed, and the activities of the committee were redefined. The frequency of meetings was reduced to bi-monthly compared to the weekly schedule during the selection phase. A hardware vendor was selected, and the VP for Information Resources, who had been the executive sponsor, stepped down to join the faculty.

Once the vendor had been identified and the contract for the project was signed, the project manager, in consultation with the vendor's consultant, began working on the project definition document. By mid-February 2003, the final version of the project document was agreed upon, and it was approved by the Administrative Information Technology Committee (AITC). This particular document defined the project and would serve as the framework for the implementation process (IRAWO Project Definition Documents, 2003).

Project Definition

The document restated the objectives of the project: (1) enhanced data integrity, consistency of results, and faith in the quality of data; (2) accurate, detailed, and speedy access for students and faculty to whatever information they need; (3) Reduction in the use of paper forms and manual data entry and re-entry; (4) reduction in staff time spent handling routine inquiries; and (5) reduction in the reliance of functional staff upon technical staff for administrative information needs. The scope of the project also was defined to cover the major administrative systems—Student, Financial Aid, Finance, Human Resources, Alumni/Development, and other satellite applications, especially the campus Web portal. Also, this project would implement the Vendor B software following Vendor B's methodology for replacing the Vendor B Plus suite currently in use at Agora.

There was a preliminary plan that the Alumni/Development system would be the first major administrative system to go live in February 2004, followed by Finance, Student Admissions, Human Resources, Financial Aid, Student Registrations, and finishing up with Student Billing in April 2005 (see Table 4 for detailed milestones).

The project definition document discussed the scope of the project; the milestones; assumptions; and other dependent projects, products, and resources. It also covered the issues of budget and how to track expenditures. The issue of risk and constraints and the associated risk of the project were comprehensively highlighted. The document laid out the approaches to change management, documentation, communication, measurement, and training. A significant focus of this document was the listing of the criteria to measure project success.

Success Criteria

- All issues and action items completed and signed off
- All required work products produced and signed off
- All variances logged and signed off
- Verification that the project met project and institution standards
- Validation that the project met the requirements
- Successfully completed functional and physical configuration audits
- A project termination statement existed

Table 4. Project milestones from the original version of project definition document

Milestone	Date
Project Started	Jan. 8, 2003
Project Definition Approved	Feb.14, 2003
Project Schedule Complete	TBD
Vendor B Software	
Start Analysis and Assessment	Feb. 2003
Software Installed (May 23, 2003 Release)	June 2003
Pilot Group Go Live	Sept. 2003
Full Campus Go Live	Jan. 2004
Prospective Student/Alumni (tentative) Go Live	Spring 2004
Vendor B Hardware and Software Installed	March 17, 2003
Vendor B Alumni/Development	
Start Training	March 2003
Go Live	Feb. 16, 2004
Self-Service Go Live	Feb. 2004
Vendor B Finance	
Start Training	May 2003
Chart of Accounts Defined	TBD
Purchasing/Accounts Payable Go Live	June 1, 2004
Budget Development, Fixed Assets, et al. Go Live	TBD
Self-Service Go Live	Oct. 2004
Vendor B Student	
Start Training	Oct. 2003
Admissions Go Live – Fall 2005 Term	Oct. 2004
Registration Go Live – Summer/Fall 2005 Terms	Apr. 1, 2005
Student Self-Service Go Live	Apr. 1, 2005
Billing Go Live	Apr. 1, 2005
Faculty Self-Service Go Live – Grading Summer 2005 Term	End of Aug. 2005
Vendor B Financial Aid	
Start Training	Feb. 2004
Start Loading Federal Records	Jan. 2, 2005
Go Live	March 1, 2005
Vendor B Human Resources	
Start Training	Jan. 2004
HR/Payroll Go Live	Jan. 1, 2005
Employee Self-Service Go Live	Apr. 2005
Project Closeout Completed	

The issue of measuring success is an area that is usually fuzzy and difficult to determine in many IS projects; however, this fact was duly considered and discussed from the onset.

Project Execution

While the project definition discussed the plan to follow with the project, the reality quite often was different. The AITC made all efforts to ensure the success of the project. So far, they had achieved success in selection of the product through a process they considered rigorous, fair, and transparent. The main challenge was for the product selected to fulfill the promise. The burden of responsibility had shifted from the Associate VP of ISS to the project manager, although the AITC still was collectively responsible for the project.

To encourage the active participation of the core implementation teams, some reward and recognition programs were initiated. There was a plan to recognize members of the team as the Star of the Month. A specific amount was budgeted as incentives for people that exhibited extraordinary dedication to the project. Extra funds also were made available to hire extra staff to help with the expected additional tasks that the ERP system implementation would create.

We had a discussion on how the Star of the Month would be selected. It was decided that someone on the AITC committee would nominate the Star of the Month and that person would receive a gift certificate. We discussed passing out lapel pins for small recognitions. ... We need to celebrate small victories. Overtime and bonus dollars need to be built into the cost and into the project budget. We should have a contingency fund for bonuses and incentives. ... It is critical to commit to dates and report back to the committee to stay on track. Every "go live" will be celebrated! We need to have a kickoff party.

Some groups also expressed concern about the effect of the changes that the ERP implementation might bring; the committee was quite aware of such issues, and their strategies on communication become handy. They were able to talk to all groups and alleviate the concerns.

There was discussion on the letter received by Patti from the Campus Justice Committee. Judy Manny gave information on the Campus Committee and said we do not need to respond to the memo; we just need to be aware of issues on Justice.

There was also a comprehensive training schedule designed by the Vendor's consultant in consultation with the team lead. The training schedule was designed with consideration to the implementation schedule. Adequate provisions were made to train as many users as possible. Some users were designated as Superusers, who received comprehensive training with the plan that they, in turn, would train others in their unit. There also was a comprehensive technical education plan to train core ISS staff on the technology underlining the product.

To address the communication issue, a special task force was formed, and several programs were implemented. The level of importance attached to communication was reflected in the kind of support given to the task force. The committee approved an initial budget of $10,000 to support various promotional activities. The aim was to ensure that people were aware of the imminent changes and that all stakeholders were duly informed.

Stella brought up the need for better communication with the campus community on the IRAWO project. We might need information sessions on the changes people will experience. Stella asked for $??? and gave a breakdown on the cost associated with the promotion of the portal. ... The committee voted and agreed we should go forth with the promo for Vendor B Systems.

During all these periods, the committee continued to meet regularly to discuss the progress of the implementation. As the go-live date of the first module approached, it became clear that the data conversion and some other issues that related to the integration and common files were yet to be resolved. The go-live dates of the Advancement and Finance modules that were scheduled for February 2004 were shifted to June. This did not cause any major problem, since such situations had been expected and a solution was provided in the project definition document. Following the guidelines, they postponed the implementation, since it would grossly disrupt the functioning of the affected unit.

Finally, on a sunny summer day, Tuesday, June 1, 2004, after many trial runs and testing, the Advancement module and the Finance module of the new administrative system for Agora University "went live" without any major event. As planned, it was done with lots of fanfare.

Advancement went live on June 1 and everything seems to be going well. Patti asked how we support people when they are on the road and need to access the Web for work. At the next project lead meeting, there needs to be a discussion on addresses. Financials went live June 1, and everything is going well with purchase orders, checks, etc. The Vendor B consultant was on hand in the event assistance was needed. Tom is going to recommend Peter King for Star of the Month for June.

CURRENT CHALLENGES/PROBLEMS FACING THE ORGANIZATION

Problems

Portal vs. ERP Systems

Four months after the go-live date of the two modules (Advancement and Financial), users of the new system were facing the reality of the implementation. The major problem did not deal directly with the product selected but rather surrounded user expectations. The main problem and concerns from the majority of the users had to do with the functioning of a satellite system — the Web Portal. The portal system was purchased to present a single and common point of contact to the administrative system and other systems within the university. It included an e-mail system with a calendaring functionality and other features. Many users complained about major features of the Portal system, and many users wished to have choices.

The portal postponed the "go-live" date because the e-mail system was deemed not robust enough for some faculty and staff. ... Vendor B said a more robust version of e-mail would be available in June for the August/September go-live date. The portal demos would continue, beginning May 16 through June/July 2004 for employees.

The Portal system directly affected all users within the university and mobile users. Only a handful of the university community was affected directly by the two modules of the ERP system that had been implemented. However, since the portal system implementation was combined with the ERP system implementation, many users were attributing the problem to the ERP system implementation.

Training and Network Problems

There were no major problems reported with the progress of the implementation of the first two modules. This was not because the users were not facing major problems, but the involvement of the users and the well established communication strategy from the project planning stage was working as planned. The users did complain about a lack of adequate training and accused the training consultant of not paying careful attention to their needs. Also, what the committee considered to be an excellent and modern feature in the new system turned out to be a major source of concern. The system was Web-based, and thus, any problem with the network immediately affected the functioning of the system. Not many users were able to separate the problem of the network from the ERP system. They could be disconnected in the middle of data

entry, and the new system was freezing due to network errors. In the Advancement module, the Gift officers, who were always on the move and needed to access the system via the Internet, expressed more frustration. They were hopeful that things would get better in the future.

Unexpected Changes and Increased Workload

The users were daunted by the amount of changes involved and the unexpected rise in the workload. Despite the unflinching willingness of users to make the systems implementation a success, they could not endure the frustration of the significant changes in the new systems. They were satisfied with how they did things in the old system, which many considered to be a better system. The number of data input screens for a particular process had increased, in many situations by more than 500%. This was due primarily to the fact that data conversion, data entry, and data cleaning were still in progress. The users acknowledged that they had some problems with the old system, but they were familiar with it; all their aspirations and hopes that the new system would bring relief to their frustrations and eliminate the limitations of the old system had not yet been met. The users expected some changes and the need to compromise, but they complained about the fact that no one told them how extensive the learning curve would be.

Challenges

The project has been running without budget overrun. Apart from a few changes in the timeline, the project is going according to schedule. However, measuring the project success remains a challenge. The project teams are finding ways to ensure that the project progresses as scheduled, that the users' expectations are met, and that all the main problems associated with implementation are addressed.

The Report Generation System is still a challenge. The system cannot be used to support decision making and planning without effective reporting systems. There is pressure on the committee to fix the problems with the portal system in order to control proliferation of multiple e-mail systems, which emanates because of problems with the portal.

Some users also have begun to complain about the choice of the product; they heard through the grapevine that financial consideration was part of the major decision that forced the committee to select Vendor B over a more preferred product. The university, through the AITC, will need to convince the users about their choice and, more importantly, prove that the product will deliver on its promises.

During a workshop organized about 10 months after the first two modules went live, there were discussions about the problems and the challenges highlighted earlier and the lessons learned during the pre-implementation and implementation phases of the project.

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APPENDIX 1

Sample Functional and Technical Scenario

AGORA UNIVERSITY
Technical Scenarios

Description: **Third-Party Software**

1. Demonstrate the different methods that your system is able to interface with an outside system.
2. If the third-party system expects large files of data as opposed to just data on call, what methods do you have available for creating custom data feeds?
3. Under what conditions can your reporting tools report on data from both systems?
4. Demonstrate adding data elements to support the third-party system and making them retroactive in the database for historical purposes.
5. Demonstrate setting up a security profile for these fields to allow the third-party system to interact with them but preventing generic users from updating the fields.
6. Under what conditions can your system display information from the third-party system? For example, there is a new field in the third-party system, and a user does not want to have to switch between system interfaces to get the information. Demonstrate adding a field to a screen in your ERP system that displays information from the third-party system.
7. What file types and layouts are acceptable to your system as input from a third-party software?
8. Once an outside feed to the ERP system is completed, what would be involved in backing out the information if an error is discovered at a later date? Is the original file required?
9. What impact does integration of third-party software have on system support agreements?

AGORA UNIVERSITY
Financial Accounting Scripted Scenarios

GENERAL LEDGER
A.   Chart of Accounts

1. Show how your account structure differentiates between these different fund groups.
2. Demonstrate setting up new accounts and their attributes and how to make changes/modifications to existing accounts.
3. Show how to delete accounts from the chart of accounts.
4. Show how security is maintained in preventing unauthorized people from viewing accounts.
5. Demonstrate the functionality of attributes associated with the accounts and how they work.
6. Demonstrate how activities in multi-year grants that span over several fiscal years are maintained.
7. Demonstrate how object codes are established and how to add them to various accounts. Are object codes used in general ledger accounts the same way as subsidiary ledger accounts?
8. Show how the chart of accounts can be viewed online without printing a paper copy.
9. Show the number of characters that can be displayed in the account name and the object code name.

APPENDIX 2

ERP Evaluation Criteria

	Rank	Weight
Functionality	1	50 points
Implementation/Service and Support	2	25 points
Technology	3	15 points
Vendor Profile	4	5 points
Value Add	5	5 points

Functionality is worth 50 points. This was divided into three subgroups including:

Revenue 45%	Students 35%	Back Office 20%
Admission 45%	Student Records 70%	HR/Payroll 40%
Development 45%	Bursar 20%	Finance/Budget 40%
Financial Aid 10%	Housing 10%	Reporting 20%

Implementation/Service and Support is worth 25 points. This was divided into these four areas:

Ongoing support 40%	Implementation 30%	Documentation 20%	Training 10%
Frequency of updates	BPR		Functional
Patches	Configuration		Technical
Friendliness			

Technology is worth 15 points. It includes:

Integration
Tools

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