

Industry/College Partnerships: Using industry partnerships, corporate donations, and grants to create an ERP program

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Abstract

The demand for graduates trained in enterprise resource planning (ERP) software and methodology has been steadily growing in the corporate community and there have not been enough employees available to fill industry demands for people able to use ERP software and to do ERP work. The College of Business Administration (CoBA) at the University of Texas at Arlington (UTA) sought to fill this gap by joining an alliance with a major ERP vendor, SAP America. This paper describes the planning, preparation, implementation, and post implementation scenarios of the SAP R/3 software system deployment at UTA. It also discusses the college's efforts to integrate the R/3 software into the curricula as well as efforts to staff and fund the project.

Keywords: ERP, SAP R/3, University Alliance Program

1. The Decision to Choose SAP

There was a growing demand for enterprise software systems such as enterprise resource planning (ERP), supply chain management (SCM), and customer relationship management (CRM) in organizations in the 1990s (Bingi *et al.* 1999, and Chung and Snyder 1999). Many colleges and universities started to offer courses in ERP, SCM, and CRM as a result of increased interest in those subjects (Becerra-Fernandez *et al.* 2000, and Gust and Hayden 1999, and Watson and Schneider 1999).

The advisory council of the Department of Information

Systems and Management Sciences (INSY) at the University of Texas at Arlington, Texas said that many of the companies in the Dallas and Fort Worth (D/FW) metropolitan area need people with a fundamental understanding of ERP systems and some hands on experience.

The advisory council and the faculty believed that one of the benefits of an ERP deployment would be increased recognition by area businesses that would translate into increased recruitment for the college's graduates such as had happened elsewhere (Gust and Okonkwo 1998). The potential for increased financial reward at graduation would also attract more students at the

graduate and undergraduate levels. Many of the other college departments could use ERP software in some of their courses, too, because the ERP concepts and software support so many functional areas.

The department compared the ERP software packages and the opportunities for college and industry alliances that were available from three major ERP software

vendors: People Soft, Oracle, and SAP. They compared programs based upon the degree of commitment required by the university, the flexibility of the programs, and the expense (Bylinski 1999, Grygo 2000, and Table 1).

Table 1

A comparison of three partnership programs

Three companies offering an alliance program	Relative program expense	Relative program flexibility	University involvement required	Number of university alliances in 1999	1999 industry market share
SAP	High	Low	High	71	30
People Soft	Moderate	Moderate	Moderate	20	3
Oracle	Low	High	Flexible	18	5

Sources: Bylinski 1999, Grygo 2000, and AMR

The department decided to seek membership in the SAP America University Alliance Program (UAP) for the following reasons: First, because SAP is the major vendor in the ERP market (30% in 1999 according to AMR, Table 1). Second, because SAP has a well-developed alliance program. Third, because many

companies in the local market already use SAP software and many more are considering using it. And fourth, because the price for the SAP product and support was right (e. g., the software is provided at no cost but there is an annual support and maintenance fee that seemed to be affordable, Table 2).

Table 2

SAP America's support options

UAP Option	Annual Cost	Annual free training days	Annual days of installation support	Annual days of support	Annual days of remote phone support
A	\$ 5,000	75	4	1	1
B	\$ 7,400	105	4	3	3
C	\$ 11,000	145	4	5	5

Source: SAP America

The university agreed to support the college's effort to join the SAP America UAP and the department faculty

members made formal application for membership and formed a 'users group' to develop an ERP curriculum.

2. The University Alliance Program

SAP America is the American subsidiary of SAP AG, the German software company that makes an ERP software product called SAP R/3, or R/3. SAP America sells, supports and services the SAP ERP software package in America. The SAP University Alliance Program (UAP) is a formal alliance between SAP America and a college or university. Membership in the UAP is gained by following a formal process that includes the development of a detailed implementation plan that tells how the R/3 system will be used and integrated into the curriculum. A contract is signed that specifies what software, training, and support SAP will provide; what the applicant will do in return such as implement an ERP curriculum; and how the alliance may be terminated.

SAP gives the members of the UAP the R/3 software; a training database called the International Demonstration and Training System (IDES) database, and the installation of the R/3 system and IDES database. As part of an annual fee that is paid for support, SAP also gives the UAP members some training at a SAP training facility, and some technical support. In return the university agrees to integrate the R/3 software into the curriculum to teach enterprise resource planning concepts, hands on module use and training, and SAP R/3 technical concepts. The IDES database included with the R/3 software contains master and transaction data of a fictitious company that produces and sells motorcycles. The database provides a learning environment for use by SAP R/3 users without having to build a fictional organization database or use a real database for training.

The UAP contract has three support level options, called A, B, and C, with differing annual fees (Table 2). Option A costs \$ 5,000 per year. Option B costs \$ 7,400 per year. Option C costs \$ 11,000 per year. The main difference among the three options is the number of training and support days. The university chose option, A which provides a one-time total of seventy-five days of training, four days of on-site installation support, one day of on-site support per year, and one day of remote telephone support per year. Options B and C have more training days and more on-site and telephone support each year.

The UAP annual fee also provides for R/3 updates, upgrades, and delta (change) training under all three of the options when SAP releases new products. If the college acquires a newer version of the R/3 software, for example, the software and the delta training associated with it are included in the annual fee. The alliance also provides assistance in curriculum development and instructional material for faculty by providing a secure web site to exchange course material among the faculty of the university alliance member institutions.

UTA was admitted to the program in October 1999. The installation of the R/3 software was scheduled in January 2000, and the software was delivered in December 1999.

3. Challenges and advantages

The college faced several challenges in preparing to implement an ERP program with the R/3 software.

First, nobody at UTA had any R/3 training or experience so training at SAP sites was essential. Second, it was soon apparent that some additional hardware was needed to create and operate an ERP facility so the college sought ways to acquire equipment. Third, there was no money available for that purpose in the college and department budgets so the university was asked for additional funds for the project. Fourth, SAP recommends at least one half-time employee be the system basis administrator but no funds were available to hire anyone so a graduate student became the assistant administrator. Fifth, as soon as it was announced that UTA had joined the UAP and would receive the R/3 software there was a demand to introduce SAP-based courses in the spring 2000 semester. That was done and caused major problems for the operational staff of the ERP facility.

At the same time the college had several advantages including a modern, up-to-date campus network, renovated business lab facilities, and willing and capable staff and faculty members who were determined to create an ERP program and curriculum.

4. The network and lab facilities

The university installed fiber-optic cables in 1996 and 1997 and converted to Fast Ethernet at 100 Mbps using the Microsoft Windows NT operating system on an FDDI collapsed star backbone, packet switching network. The college's servers, lab facilities, classrooms, and staff and faculty offices are connected to the campus network by copper cables that are the college's internal backbone structure.

The college's classrooms and lab facilities were renovated in 1998 and 1999. The classrooms are equipped with an integrated multimedia teaching station that contains a computer, a video tape player, and a document camera connected through a switch to an overhead LCD projector. There is also a motor-driven projector screen and a sound system in each of the classrooms, and each classroom's teaching station is connected to the campus network and the Internet.

The college's computer lab facilities were also renovated and have similar (but larger and faster) equipment and teaching stations for instructors to use and desktop workstations for students to use. All of the lab facility computers are connected to the campus network and the Internet.

5. Technical preparations

The college formed a technical team to plan, install, and operate an ERP lab and classroom facility. The technical team consisted of one part-time faculty member as the technical team leader and the R/3 basis administrator, and two part-time technical consultants for hardware and software. A graduate IS student became the assistant R/3 basis administrator, and the database, network, and operating system administrator.

The technical team decided to use Windows NT for the ERP facility's operating system and MS SQL Server for the IDES database server because those are used on the university's network and the college's technical people are familiar with their installation and operation.

The technical team leader attended ten days of R/3 training for basis administrators in the summer and fall of 1999. Nobody else at UTA had any R/3 training or experience before the software installation. The graduate assistant attended eight days of basis administration training after the R/3 installation in the spring semester of 2000, and five more days of training during the summer semester of 2000.

6. ERP preparations

The college started a self-education program of weekly lectures given by guest speakers from local area companies using R/3 in 1999. Several faculty members volunteered to integrate SAP's R/3 software into the curricula in finance, human resource management, logistics, production operations management, information systems, marketing, and accounting courses.

Several of the faculty members went to a two-day course dealing with an overview of R/3 technology. Some of them went to five-day functional area training courses, and many of them also went to advanced three-day training courses in their functional areas.

The faculty started to integrate R/3 into existing courses during the spring 2000 semester, and to develop new R/3-based courses.

7. R/3 installation

One of the problems was solved when Dell Computer donated a server to the college for the ERP program. Dell gave the college a PowerEdge 6300 in July 1999.

Another problem was solved when the university granted some funds for an ERP facility in October 1999. Then the college was able to purchase a Dell PowerEdge 2300 and a Dell PowerEdge 1300 server in December 1999. The college also purchased some support software, some tape backup units, and some tapes in order to start the ERP facility.

The Dell servers acquired and used in the ERP facility have the following technical characteristics:

Dell server:	6300	2300	1300
Processor	<i>PII</i>	<i>PIII</i>	<i>PIII</i>
Speed (MHz)	400	500	500
RAM	<i>1GB</i>	<i>1GB</i>	<i>500 MB</i>
Disk Space	<i>90GB</i>	<i>54GB</i>	<i>27GB</i>

Hardware preparations for the R/3 installation started in December 1999 after all the Dell servers arrived. A separate domain named ERP was created on the UTA network using two Dell Pentium II Dimensions workstations that were defined as the ERP domain controllers. That makes it possible to reach the ERP servers from any office, lab facility, classroom, or personal computer that has the SAPgui installed and whose user has a valid ID and password for both the UTA network and the R/3 system.

A SAP America consultant arrived on Friday afternoon on January 7th, 2000. He and the graduate student started installing the R/3 system on the ERP servers at about 3:00 pm that afternoon. The installation took was completed on Monday, January 10th, 2000 at about 9:00 am.

A browser called SAPgui was installed on the teaching station in every classroom and lab facility teaching station so instructors can use the R/3 system through the campus network. SAPgui was installed on every lab facility desktop workstation so students can use the R/3 system from any of the college's lab facilities. SAPgui was also installed on the desktop machines of faculty members to work on the ERP curriculum and to prepare for their classes.

8. Temporary ERP lab and classroom

A small, temporary ERP facility was created using some furniture and twelve workstations that were being replaced with newer equipment. A LCD projector and a Smart Board were borrowed to use in the temporary facility, and it was opened for classes on January 18th, 2000.

The temporary ERP facility was used for a basis administration class, for demonstrations of the R/3 system, and for ABAP course exams.

A larger ERP classroom with new furniture, multimedia equipment, teaching station, and eighteen new Dell Pentium III computers opened in August 2000, and the temporary classroom became a permanent ERP lab facility.

9. Making the system work

Three major tasks had to be accomplished after the installation was completed. The first task was to get a permanent license key for the R/3 software because its temporary license would expire one month after installation. The second task was to secure the well-known R/3 special users, SAP* and DDIC, by changing their default passwords so no unauthorized person could use those IDs. Those tasks were finished by the start of the semester on January 18th, 2000.

The spring 2000 semester started on January 18th, 2000, only eight days after completion of the R/3 installation. The R/3 administrators made the R/3 system available for ten faculty, and ninety-two students in a basis administration class and two ABAP programming classes by January 25th, 2000.

The R/3 system operated satisfactorily for about a month. The R/3 administrators were able to tune the system, create some activity groups and user profiles, and to generate the organization profile during that period because the system was performing well.

There was panic on February 17th when the R/3 system would not restart after an offline backup of the Dell 6300 was completed. The assistant administrator and a SAP America consultant spent three days exchanging error logs and suggestions via e-mail. Many area companies with R/3 systems volunteered information and suggestions by email when their help was sought. The cause of crash was a corrupted file and the error was finally corrected by renaming the file. A back up of the system was conducted offline, and the system was restarted without further complications on February 21st.

A second major halt occurred about a week later. An offline backup job was scheduled, but the job failed and the system denied any access to the scheduler. The job was hung up at the database so the jobs were deleted and normal operations resumed.

The third task to be accomplished was to create a new client for instructor and students to use so the original installed client could be kept clean. The first attempt to copy a client failed with a 'run time exceeded' error because some tables in the source client were too large, and because the database was too small. There is a default parameter that terminates any program that runs continuously for more than 300 seconds. The parameter value was changed to 600 seconds solving that part of the problem. The database did not have sufficient space defined for its operation to create another client copy. Increasing the database space solved that part of the problem. After those changes were made a new client was successfully created.

The system became stable once the turbulent one-and-a-half month period was over and the after the system administrators became familiar with the R/3 system.

Then the system administrators set out to create and administer some additional users and activity groups.

The basis administration students were given the assignment to create user IDs and passwords for students in five courses using R/3 to teach accounting, production and operations management, information systems, ABAP/4 programming, and logistics. Each of the basis administration students created twenty users, and assigned them to user groups and activity groups that had been created by the basis administrators.

The ABAP instructor tried to run his first ABAP program and learned that a developer key is needed to create programs. It seemed that all of the students in the ABAP class would need developer keys, but we learned that it is possible to have multiple logons using the same user ID on the 4.0B version of R/3. The R/3 administrators created two users IDs and generated one developer key for each of them. All eighty students in the ABAP courses were able to use either of the two users IDs and its associated developer key to complete their programming requirements during the spring 2000 semester.

This solution negates the need to have developer keys for each student in the programming courses. The ABAP programming classes are isolated on a different client (called a sandbox or playbox) so their programs cannot crash the entire system. At the end of each semester of the all IDs, passwords, and programs from the ABAP students are cancelled so the next classes have a sanitized client for their course work.

10. Online help and documentation

The SAPNet Web Frontend, known as the Online Service System (OSS), provides support for customers and UAP members. OSS also lets SAP examine the R/3 systems of customers and UAP members and provide online support if they have a problem. The OSS was not available during the spring and summer semesters because the campus network would not make the connection. Part of the difficulty the administrators had during the times of crisis in February was due to the non-availability of the OSS. The college is connecting to OSS using a frame relay router in order to use the SAPNet R/3 fronted for help during times of crisis.

SAP's online documentation was included on a CD that contains the R/3 library, glossary, an introduction to the R/3 system, and an implementation guide. The R/3 administrators installed the online documentation files on the ERP domain so those tools are available to everyone using the R/3 software.

There is an online 'help' CD available for the IDES database that was not shipped with the rest of the software package. SAP shipped the CD to the college after it was requested and it was also installed on the

ERP domain and on all of the ERP lab facility's workstations.

11. Funding and partnerships

Funding has been a critical issue in the planning and the implementation of the SAP program. UTA awarded a grant of \$ 120,000 to the college to create ERP lab facility and classroom in 1999.

This money was used to purchase hardware, software, and to furnish the ERP lab facility and classroom. This money has almost been exhausted and more will be needed to assure the continued success of the program.

The college formed an industry partners group with forty-three participating companies in 1999, and the interest of the partners has been very high. Many of them sent guest speakers to the ERP self study sessions in 1999. An event called the SAP Gala was held in February 2000 to celebrate the SAP R/3 installation. GTE, Ericsson, Texas Instruments, MCI Worldcom, Grant Thornton, Siemens, IBM, Arthur Anderson, and Nokia attended the event to learn more about the ERP program and tour the college's ERP facilities. They also contributed funds for refreshments during the event.

12. Conclusions

Three major lessons were learned about projects of this sort, scope, and size. First, they cost more than ever imagined. Second, they take longer than ever imagined. Third, they take more effort than ever imagined.

The R/3 deployment at UTA was done using existing resources with the addition of one part-time graduate student. The implementation phase of the project started with only one of the technical team members having any hands on experience with R/3, and that was several months before the installation. The R/3 installation and configuration went smoothly in spite of that handicap with the exception of a few sleepless nights of hard work.

Although the installation was completed eight days before the start of the spring 2000 semester, the college was able to integrate the R/3 software into the curriculum during the semester despite some initial setbacks. The basis administration class started using the system immediately. After the system was configured, the R/3 system was made available to two ABAP programming classes and two accounting classes. The faculty was given access to the system in February so they could try the software before introducing it in their classes.

More classes started to use the system during the spring semester, and a hundred and fifty-five students were using R/3 by the end of the spring semester. A

human resources class also started to use the system in the fall 2000 semester, and now there are over two hundred users.

The college's students showed their support for the program by a huge demand for SAP-based ERP courses. The demand was so large that the college had to limit enrollment in the courses.

The college's industry partners showed their support for the ERP program by creating approximately twenty new internship opportunities for UTA business students during the turbulent first semester of the program. Additional internships have been created for the college's students in many different majors.

The student demand for SAP-based ERP courses is strong and interest and support of the college's partners has been active, but continued support by the administration and the college's industry partners is needed for the continued growth and success of the ERP program.

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