

Collaborative Supply Chain Decision Support And Multi-Attribute Supply Chain Scenarios

Joseph M. Ragan, (E-mail: jragan@sju.edu), Saint Joseph's University

Ian Faber, (E-mail: hahs4444@aol.com), Saint Joseph's University

Sean Quinn, (E-mail: sequin@kpmg.com), Saint Joseph's University

Michael G. Tecce, (E-mail: juve_mt18@yahoo.com), Saint Joseph's University

Abstract

Today's Global economy is putting a premium on the ability of companies and their professional employees to rapidly evaluate a broad range of decisions in collaboration with both existing and prospective supply chain partners. This includes the development, evaluation and refinement of product designs, the evaluation of alternatives sourcing options, the evaluation of requests for bids, etc. A key difficulty in supporting the collaborative development, evaluation and refinement of alternative courses of action across different organizations lies in the complexity of the solutions involved (e.g. complex production schedules spanning multiple organizations, complex product designs or configurations involving large numbers of parts and components that are procured from a number of suppliers, etc.). Given a growing and ongoing need to revitalize the accounting curriculum and explore eclectic methods to teach accounting information systems, real challenges and opportunities exist to import this material into the accounting systems classroom.

The Business Process Integration Lab at Saint Joseph's University has developed a prototype environment for collaborative development, evaluation and refinement of supply chain management scenarios (e.g. requests for bids, product designs, sourcing options). The environment relies on the use of Enterprise Resource Planning software, using SAP R/3 to streamline and integrate the supply chain. Through the use of application scenarios, students are able to develop a total understanding of the power of the ERP technology tool as a decision maker and problem-solver, while enhancing their knowledge of the system in modules such as Production Planning and Customer Order Management. It is possible to support powerful workflow management functionality in the context of both interactive and highly automated decision making processes. This functionality has been operational for some three years and is coordinated by senior level graduate and undergraduate students who develop and test the scenarios and assist other students as they navigate through the R/3 system.

1. Introduction

The purpose of this paper is to examine a variety of methods used to teach a Managerial Accounting Information Systems (MAIS) course with the use of SAP R/3 technology. In this paper, we will include the model of the course along with some course material.

The use of Enterprise Resource Planning, or ERP, systems in the business world is profound most global Fortune 500 firms use some form of ERP with SAP and ORACLE being the leaders. Nearly 35% of Fortune 500 companies employing ERP systems use SAP. The introduction of ERP into a company's business system greatly alters the accountant's organizational duties. Automating the accounting information system means the accountant no longer has to perform the time consuming functions such as recording journal entries, posting these entries to ledger accounts, and preparing trial balances. Instead, the computer is able to handle these data-processing activities

on a routine basis. As a result, accountants are becoming involved in the more dynamic functions of their organizations, such as aiding in management decision making and designing more effective business information systems to enable strategic analysis.

We believe that the use of ERP systems in an MAIS classroom helps to show students how a simple business transaction, such as a sales order, effects the organization as a whole. By performing transactions, the students become familiar with the structure of the organization, the effect the transaction has on the books (accounting), and how to use this information to solve problems.

2. Background and Prior Research

Albrecht and Sack (2000) paint a dismal portrait of the academic accounting profession as a discipline stuck in the past and exhibiting an unwillingness to change. They observe that technological innovation has rendered the gathering and reporting of information as an inexpensive process in today's environment. Accountants must be armed, they propose, with new skills if they are to find a role in today's environment. They suggest that accounting educators should embrace the unfolding Internet revolution and include this experience as an integral part of the pedagogy of accounting education.

Accounting professionals also recognize this revolutionary change, and promote the implementation of higher technology for business processes. The AICPA (2000b) has made Internet usage one of its top ten technologies for the start of the new century. When professionals were asked what skill other than financial expertise was most critical for success in the accounting discipline, the overwhelming choice was Internet technology (AICPA, 2000a). Educational organizations, such as the Federation of Schools of Accountancy (1999), have offered strong recommendations for specific actions that might be taken by today's universities in an effort to improve technology education. Greater reliance on the Internet is one of the cornerstones of such proposals.

The overall conclusion to be drawn from recent literature geared toward technological integration is that the current level of exposure accounting students has to Internet-related technologies is too limited. Tuteja (2000) notes that software applications—like enterprise resource planning (ERP) technologies—may generate great risk to educators in an environment of limited resources. Stedman (1999) determined that as colleges and universities adopted ERP applications for their own organizational management uses, they found a “secret resource” for use in the classroom. In customizing this type of system for classroom applications, some educational institutions seem to have found a unique way to attract students back to the classroom. Becerra-Fernandez, Murphy, and Simon (2000) note that demand for trained enterprise resource planning professionals has motivated a number of universities to join alliances with ERP software vendors such as SAP. The primary vehicle such vendors have to make their product work in the educational marketplace is through the Internet. Kaveney (2000) confirms that Internet capabilities enabled his own institution (Syracuse University) to substantially enrich both the curriculum and pedagogy in its business programs.

The issue for study, then, is to show one approach for use by academic accountants, the educators of future professionals, of this important resource. SAP R/3 was chosen because it has a formal University Alliance Program, of which we are a member. As a member, we receive the full ERP suite, which includes 12 major modules including forecasting, production planning, and material requirement planning areas. To date, St. Joseph's University has received over \$100,000 in grants to test implementation of SAP in the classroom.

3. SAP University Alliance Program

The SAP University Alliance Program for the United States, Canada, Central and South America builds upon the best components of such a program originally developed for European institutions of higher education. It has been developed by SAP America to facilitate the use of their software package (and integrated business solutions concepts) in the formal education of undergraduate and graduate students throughout the Americas. The

program has grown from a charter group of five members in 1997 to over 124 member institutions as of March 2003. The Haub School of Business is proud to be among the early schools granted admission in 1998.

Upon admission to the SAP America University Alliance Program, new members receive four significant and valuable items. First, a fully functional copy of SAP R/3 software, or the right to time-share with a major service provider. Second, they receive copies of all professional training materials utilized by SAP. Third, one hundred days of free training for faculty members at SAP professional training classes. The amount of training is dependent upon the level of involvement that a member institution desires. Fourth, access to technical support from SAP. In addition, SAP is actively working with its member institutions to insure cooperation and sharing of course materials among member institutions.

4. Undergraduate Curriculum Innovations

Pedagogical revisions to the undergraduate School of Business curriculum in Accounting at the Haub School of Business encompass two broad categories. First, a newly created three-course sequence encompassing Intermediate and Advanced Accounting has been prepared. These courses are titled as FAIS I, II, and III. The three-course sequence will focus as a single continuous learning experience traversing sophomore to junior year. Each course will progressively build upon and expand the knowledge base acquired in the prior course. This knowledge base will include topical content in Accounting and application ability within SAP R/3. Second, another group of courses taught in the sophomore year incorporates subject matter inherent to cost and managerial accounting. These courses are titled as MAIS I and II. The SAP exposure afforded students within these course sequences will provide hands on experiences in a team-oriented format within a business case context. It is envisioned that a single business case will be used throughout these five courses.

5. Collaborative Learning Model (STAR Scholars)

A unique feature of the course pedagogy is the utilization of STAR Scholars to assist in development and delivery of various SAP scenarios. These scholars are chosen through a highly selective process and specially trained to deal with these application scenarios. To date, there are some eight STAR Scholars comprised mostly of juniors and senior undergraduate majors. These students are compensated for the work done in class and are provided with enrichment activities, such as field visits and special speakers, helping them to understand the essentiality of implementation of state of the art software. They often participate in research-based projects designed and developed by faculty. In addition, STAR Scholars involve themselves in a series of special activities under the direction of a Faculty mentor. Developing scenarios of various computer applications involving Enterprise Resource Planning software and SAP are included. In addition, seminars with entrepreneurs and technology leaders to provide opportunities to interact on a personal and informal level are held with business leaders. Sponsored participation in special events with alumni working in technology and consulting fields is also a component.

6. Model of the Course

The courses are three-credit course required for all accounting majors in the sophomore and junior years. SJU requires all students to have laptops. In addition, the university is a member of the SAP Alliance, having joined in 1998. As a member of the University Alliance, we have access to SAP R/3 in real time (24/7) through the University of Wisconsin at Milwaukee.

7. Description of Pedagogy Used in SAP Scenarios

Scenarios are written in the form of scripts. So the students just follow the script to complete the process. The typical project we give our students takes them through the following steps; master file→report→process→report→analyze. First they create a master file, for example, a customer or vendor master file. We usually have students select a name that they will be able to remember. After creating a master file, students bring up a report and look at a certain critical number, such as stock availability. The report would be one

that will be affected by the transaction they will do in the following step. By going to the report before going through the process students see what the number was before the transaction, then they access the report after the transaction, they can see the difference the process made. This enables the students to better analyze the effects of the process they went through. The last step is analyzing the process in terms of the effects it had on the business.

We found that giving the students a script that has been written out and tested gives them a path to follow so they do not get lost in the vastness SAP creates. After completing the scenario as it is written, students feel more comfortable working in the modular area in which the scenario operates. There are no SAP experts there are only experts in certain modules. We designed this course not to create experts but to make students feel comfortable when operating with the system.

The reports in SAP are interesting to students because they can see the effect the process they went through has on the company's reports.

8. First Class Meeting

The first class meetings are vital in gaining the attention and dedication of the students towards accepting an approach to learning different from anything they have to this point been familiar with.

The meetings are used to effectively do three things first the students must get to know each other and form teams. This is followed up with group projects in later classes to ensure that students understand the importance of communication and working together. A second purpose of the meeting is to show the relationship between the concept coverage within the text and the applications within SAP. A very simple overview of SAP navigation is completed as a third step in the meeting. The students leave with a scavenger hunt assignment using SAP navigation. All SAP assignments can be done alone or in groups, thus further motivating the students to use effective group interface. Students are also introduced to the faculty website and the blackboard location for course documents and assignments.

9. Description of the SAP Method

For classes, we created the SAP Method. The SAP Method means Scenario, Analyze, and Present. We create the scenario for students to analyze and present.

10. Scenario

Students are treated as and expected to act as though they were consultants. The job of a consultant is to take an assigned problem and solve it in a way to improve the business process. In the case of our scenarios students are given a problem using the ERP system and their challenge is to figure out how to resolve the problem and present it.

The objectives of the scenario are stated at the top of the script. This gives students a clear map of what they are going to accomplish by going through the objectives. Next the objectives are written out step by step for the students to follow.

The steps given to the student take them through the process in the ERP system, but it does not solve the problem for them. An example of a problem might be; how do I organize the data I entered in a way that is more useful to me and then how do I use this data to make decisions? In other words what does this data mean? This would make the students go through different reports in the system and configure the report to present the information this particular employee needs to make more effective decisions. This would better the business because it would make the employee more productive because he/she would not have to waste time looking for the information needed.

11. Analyze

Analyzing the data is important because it demonstrates knowledge at work. We previously stated that the accountant's role has changed with the implementation of an AIS system in the business environment. The accountant's job is now more analyzing more than record keeping. So we must teach the students how to analyze the information the system provides. This brings accounting to the forefront of the problem. Cases can be given to the students to solve. The students must find the information in the system and then analyze the information in a way that solves the given case.

For example students will go through a fixed asset scenario and then asked to analyze fixed asset turnover, net margin, total asset turnover, and return on assets. This exercise would demonstrate ability in both accounting knowledge and navigation through the system to gain access to the information needed. Once this process is completed for the first time, the consultants should document it and present the findings to the board of directors to make it easier for all to obtain the information. In their presentation, they must explain how this information is used to make decisions.

12. Present

Presenting the data with the correct analysis is key in the business world. It is important to make the right decision and to solve the problem the student is expected to explain why and how they went through the process, and to explain how their analysis benefits the organization as a whole. In addition, students must be comfortable speaking in front of others. Not all people comprehend accounting. Students must be able to explain what they have done using now-technical terms. The better projects are often made into CD-ROMS and linked with "sapisodes". Sapisodes are student made vignettes that act out a particular aspect of learning SAP within the context of the course.

13. Evaluation

Students are graded on the following components:

Project Presentations	100
Midterm	100
Final Exam	<u>100</u>
Total Points	300

The midterm and final are standardized exams consisting of 60% multiple choice and 40% essay based on textbook coverage and SAP/ERP terminology. Within the project presentations, there are three areas that are assessed: group performance, individual performance, and the contribution of the individual to the team.

References

1. AICPA (2000a). "AICPA Core Competency Framework for Entry into the Accounting Profession," <http://www.aicpa.org/edu/func.htm>.
2. AICPA Top Ten Technologies Task Force (2000b). "The AICPA Top Ten Technologies for 2000," <http://www.toptentechs.com>.
3. Albrecht, W. Steve and Robert J. Sack. *Accounting Education: Charting the Course Through a Perilous Future*. Sarasota, FL: American Accounting Association, 2000.
4. Becerra-Fernandez, Irma, Kenneth E. Murphy, and Steven J. Simon. "Integrating ERP in the Business School Curriculum," *Communications of the ACM*, April 2000, pp. 39-41.
5. Federation of Schools of Accountancy (1999). "Recommendations for the Design of Empirical Studies Examining Curricular Efforts to Develop Student Critical Thinking Skills," <http://www.thefsa.org/publications/studies.htm>.
6. Kaveney, Michael. "Syracuse University to Have New ERP Lab," *Business Journal* 14 (2/18/00), p. 27.
7. Stedman, Craig. "College ERP Success: May Take Custom Fit," *Computerworld* 33 (11/29/99), p. 12.
8. Tuteja, Akhilesh. "Enterprise Resource Planning: It Can be Risky," May 1, 2000, <http://www.itaudit.org>.

Appendix

The appendix includes two scripts given to the students for two different projects.

Customer Order Management (Appendix A)

STAR Technologies

- You work for STAR Tech Enterprises. This consulting firm has recently been hired by IDES Corporation to implement a number of the R/3 application components.
- You have been assigned to a team whose assignment is to demo the use of the SD module by going through a process and showing a report that will demonstrate the affect the process you went through had on the business.
- The process has been written out for you, you must go through it and present it to the executive board members of IDES. You will have to tell them the process you went through and how it affected their business.

Customer Order Management- Process to Report

Objective 1) Creating a Sales Order

Logistics→Sales and Distribution→Sales→Order→Create

Order Type: Or
Sales Organization: 1000
Distribution Channel: 10
Division: 00



Sold to Party: your customer number
Ship to Party: your customer number
Purch. Order No: P0001
PO Date: Today's Date
Material: P-109
Order Quantity: choose a number between 1 and 20



*Make sure you write down the required delivery date that is on this page you will need it for the next step. **Date is**



Return to the SAP Easy Access menu using the yellow arrow

Objective 2) Creating a Delivery

Now that a sales order has been created we must let the shipping department know that a delivery must be made.

Logistics→Sales and Distribution →Shipping and Transportation→Outbound Delivery→Create→Single Document→with reference to sales order

Shipping Point: 1000

Selection date: Req. Delivery Date



(Enter)



(Save)

*Write down the delivery number

Return to the SAP Easy Access menu using the yellow arrow

Before the goods can be loaded onto trucks and posted as sold we must pick them from the shelves in the warehouse.

Logistics→Sales and Distribution→Shipping and Transportation→Picking→Create Transfer Order→Single Document

Warehouse number: 010

Delivery: (It should default if not enter the delivery number you wrote down)



(Enter)



(Save)

*Write down the transfer order number

Return to the SAP Easy Access menu using the yellow arrow

Now that the goods are picked we can post them which means they can be recorded as sold.

Logistics→Sales and Distribution→Shipping and Transportation→Post Goods Issue→Outbound Delivery→Single Document

Outbound Delivery: Delivery number you wrote down (it should default)

Click on the “Post Goods Issue” Button

The message “Delivery xxx has been saved” should appear at the bottom of the screen

Return to the SAP Easy Access menu using the yellow arrow

Now that they are sold we must be the customer for the goods.

Logistics→Sales and Distribution→Billing→Billing Document→Create

Document: Delivery number you wrote down earlier (it should default)



(Save)

Objective 4) Receive the incoming payment

Accounting→Financial Accounting→Accounts Receivable→Account→Display Balances

Customer: The customer you sold to earlier
Company Code: 1000
Fiscal Year: 2002

Execute 

This will bring up the account of the customer you created and sold the goods to.

Write this number down. Normally when receiving a payment the person responsible for entering the data would receive the check and just enter the amount on the check as receive.

Accounting→Financial Accounting→Accounts Receivable→Document Entry→Incoming Payment

Document Date: Today's Date

On the back data area enter the following data
Account: 113100
Amount: The amount you calculated

On the open items area enter the following data.
Account: Your customer number

SAVE 

If there is an error of some type hit the process open items button and what might have happened is the calculation may have been wrong. If this occurs it is not a problem just enter the amount that is in the not assigned field in the box above it and hit save again.

Objective 4) Analyze Report

In the Transaction Code box bring up KE30.

Operating Concern: IDEA

This is the MRS (Management Reporting System). Access report IDES 050 which is a profitability analysis by product division and customer. Answer the following questions.

Sales organization: 1000
Period from: in these two spaces enter the time period you wish to
Period to: view sales orders

- 1) Which is the most profitable division? Why?
- 2) Which is the most profitable product?
- 3) What is the profitability of your customers?

Purchase Order Management (Appendix B)

STAR Technologies

- You work for STAR Tech Enterprises. This consulting firm has recently been hired by IDES Corporation to implement a number of the R/3 application components.
- You have been assigned to a team whose assignment is to demo the use of the AM module by going through a process and showing the result of the process using reports within the system.
- A process has been written out for you, you must go through it and present it to the executive board members of IDES. You will have to tell them the process you went through and how it affected their business.
- Finally find the fixed asset turnover, net margin, total asset turnover, and return on assets after you have gone through the process.

Objective 1) Creating an Asset in the books

Accounting→Financial Accounting→Fixed Assets→Asset→Create→Asset

Asset Class: 3100
Company Code: 1000
Number of Similar Assets: 1

ENTER 

Description: Mercedes for Sales Manager

Choose the Time-Dependent tab

Business Area: 9900
Cost Center: 4120
Plant: 1000

 SAVE

Write down the asset number that you created it will appear at the bottom left hand corner.

Return to the SAP Easy Access menu

Objective 2) Create Purchase Order

Logistics→Materials Management→Purchasing→Purchase Order→Create→Vendor/Supplying Plant Known

Vendor: 1000

On the header screen click the Org. Data tab

Purchasing Organization: 1000
Purchasing Group: 007

On the Item Overview screen enter the following data in the corresponding fields

A: A
Description: Mercedes for Sales Person
PO Quantity: 1
OU: PC
Delivery Date: Four weeks from today's date

Net Price: 30000
Currency: EUR
Material Group: 012
Plant: 1000
Storage Location: 0001

In the Items Detail section enter the following data

Asset: the asset number of the asset you just created



Write down the purchase order number that appears on the bottom left hand corner


Return to the SAP Easy Access menu

Objective 3) Posting the Goods Receipt

Logistics→Materials Management→Inventory Management→Goods Movement→Goods Receipt→For Purchase Order→PO Number Known

PO Number: (in the field next to where it says PO Number) enter the PO Number you just wrote down



Check the box at the bottom of the screen that says Item Ok and SAVE 

Write down the material document number given

Objective 4) Posting the Invoice Receipt

Logistics→Materials Management→Logistics Invoice→Verification→Document Entry→Enter Invoice

Invoice Date: Today's Date

Purchase Order: Your Purchase Order



Change the tax to V0 it defaults to VN in both the bottom screen and in the Basic Data tab above

Amount: 30000



Objective 5) Displaying the Asset in the Asset Explorer

Accounting→Financial Accounting→Fixed Assets→Asset→Asset Explorer