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Integrating the SAP R/3 System into an MIS Program

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Abstract

In this tutorial, the authors share their experience with integrating the SAP R/3 System into their curriculum so that an attendee can walk away knowing how to approach the tasks at his or her university. The authors are part of a team of faculty whose ultimate objective is to develop a cross-functional business school curriculum. An overview of the business plan is presented, some details regarding systems administration is provided, and the majority of the time is spent on identifying opportunities for enriching an MIS program. This paper does not address curriculum content issues but provides information on how a commercial ERP system (i.e., the SAP R/3 System) can be effectively utilized in an MIS program. The opinions expressed here are solely those of the authors.

Overview of Incorporating R/3 into the Curriculum

The SAP R/3 System is the world's most-used standard business software for client/server computing. R/3 is the answer to customer demand for a comprehensive, integrated business system that is both open and flexible. Its powerful information technology (IT) infrastructure allows customers to use "best practices" to meet the challenges of today's competitive business environment. At the core of the R/3 are powerful modules for accounting and controlling, production and materials management, quality management and plant maintenance, sales and distribution, human resources management, and project management. These modules automatically distill operational data into executive information decision support for monitoring and controlling critical factors at all corporate levels.

The following areas are examples of how R/3 can be used to support a College of Business education:

- **Supplementing theory with hands-on application:** The pre-configured R/3 System supplements theoretical learning by illustrating how well-engineered business processes can be designed, configured, and executed to achieve superior business results.
- **Providing students with access to state-of-the-art information technology:** R/3 is built upon state-of-the-art, client/server technology. Students can learn how advanced technological infrastructures are used in business enterprise computing.
- **Grooming students for making strategic financial and operational decisions:** Students can simulate different business scenarios using R/3, evaluate the economic impact of each scenario, and select the most appropriate operational strategy. R/3 is a valuable teaching tool for each of these strategies. The system includes a number of unique features that can be used to illustrate key management concepts:
 - **Business Engineer:** This tool provides proven procedures and models for analyzing, planning and structuring business processes. The business engineer includes the Procedure Model (project management tool), the Reference Models (reengineering and implementation tool), the Implementation Guide (customization tool), and Workflow (business efficiency tool).
 - **Business Object Repository:** This tool contains 170 different SAP business objects, representing business data, transactions, and events within R/3.
 - **Business Information Warehouse:** A built-in intelligent information system that consolidates data from internal systems and external sources, the Business Information Warehouse generates Executive Information reports for making policy, controlling processes, and monitoring critical business factors. It enables students to quickly assess data on the status and profitability of a business.
 - **Open Architecture:** This feature provides optimal technological support for business processes today and in the future. It offers a variety of options for useful add-on operations (including Internet and intranet computing), and eases connectivity among distributed systems. It allows students to learn state-of-the-future methods for building information systems and applications.

In Support of the MIS Curriculum

The following areas identify topical areas that are currently incorporated in classroom lectures and exercises:

- **Project Management:** The extensive R/3 Procedure Model is an excellent tool to demonstrate how important effective project management is, and how structured IS project management must be to ensure success.
- **Business Process Reengineering:** The R/3 Reference Model developed by SAP describes the functionality and business processes of the standard SAP applications in the R/3 System in business terms. Over 1000 best practices are represented within the R/3 Reference model and serve as wonderful 'role models' for class reengineering projects.
- **ERP Implementation Strategy:** Traditional and accelerated approaches to ERP implementation are a rich area to study. The R/3 System includes an Implementation Guide for customizing that lists all actions required for implementing the SAP System and helps you control and document the implementation process.
- **Business Modeling Tools:** These tools are used to perform extensive customization of the R/3 reference models available in the R/3 system. These tools support a business modeling module that includes requirements analysis, process modeling and logic modeling.
- **Reengineering Cross-Functional, Integrated Systems:** The MSI database is complete with a pre-configured company that supports five business processes: Customer Order Management, Procurement, Production, Financials, and Human Resources. Students work through typical transactions to develop an understanding of the functionality and integration supported by cross-functional integrated systems.
- **IS Strategy and IS Outsourcing:** The ERP literature (and specifically, the SAP case literature) is rich with examples that support modules in IS strategy, IS outsourcing, and the IS consulting practice.
- **ERP Partnerships:** The SAP R/3 partnering strategy provides numerous examples of how to leverage partners (consulting, training, software, hardware, university) to support explosive growth.
- **Technical Architecture of SAP R/3:** The SAP R/3 System is a rich example of how a ERP system can take advantage of the client/server platform. Also, the SAP R/3 framework and architecture supports modules on system architectures.
- **Application Development with the ABAP/4 Development Workbench:** The ABAP/4 Development Workbench is SAP's graphical programming environment. The Workbench environment supports the creation of new ABAP/4 client/server applications by a development team.
- **Database Management and Administration:** The Data Modeler is a development tool from the ABAP/4 Development Workbench, which you can use to create data models according to the SAP SERM method (SERM = Structured Entity Relationship Model). In addition to supporting modeling functions, the Data Modeler allows you to map the models you have created to the ABAP/4 Dictionary.
- **ERP Audit and Controls:** The area of ERP audit and controls is a high growth area and one that demands significant knowledge of a specific ERP (e.g., SAP) and knowledge of Audit techniques and protocol. SAP R/3 profiles, objects, and authorizations is an excellent model for teaching security and systems administration concepts and practice.

Progressive Curriculum Integration

R/3™ is preconfigured and loaded with a master database representing a hypothetical company Motor Sports International (MSI) for in-class use. The MSI Training Database consists of the complete business data of a hypothetical company. This data includes organizational structures, products, customers, business processes, and transactions. It also contains data that can be used to conduct actual business transactions and reporting. The training database can be used to

- conduct transactions (e.g., posting journal entries, assigning costs to cost centers, place purchase orders, issue invoices),
- analyze company performance (e.g., product line profitability, actual vs. planned sales analysis, financial reporting), and
- evaluate the business structure of the overall company.

We suggest a number of 'integration' levels. Perhaps the goal of using SAP R/3 as a platform for a cross-functional, integrated business school curriculum is the ideal scenario, but we have learned that there are many intermediate steps along the way. The suggested levels follow.

1. Use the SAP R/3 System's extensive on-line help as an introduction to ERP systems and SAP R/3 in particular. This on-line help system provides detailed information regarding business policy, procedures, and practice. Also, the SAP R/3 Business Engineer components are available (i.e., Procedure Model, Reference Model, Implementation Guide, and Workflow) are available. The reference models can be used extensively for process mapping and reengineering assignments.
2. Use the existing Motor Sports International (MSI) exercises directly from the SAP R/3 training class. These courses are essentially designed to teach the participants how to use the SAP R/3 System. This is distinguishable from the use of SAP R/3 to perform business analysis or to make business decisions. At this level, students are exposed to basic business processes, core functionality, business integration, master data, document flow, and organizational elements, for instance.
3. A: Project work with industry is productive if the student has experience with Level 1 and Level 2. Project work in our case generally consists of a reengineering effort that involves understanding an As-Is process in industry (e.g., purchasing, time and attendance, customer order management, etc.) and using the SAP R/3 Reference Model to define a superior To-Be process.
B: Development work using the SAP R/3 ABAP IV Development Workbench.
4. Develop and use exercises independent of the SAP R/3 training class material. Require students to create their own master data and explore features of the software, or business analysis and decision making that extend beyond the scope of the R/3

training material. Create exercises that address the specific needs of a particular course to access required data for report generation, interpretation and analysis.

5. Develop and use exercises that explicitly require an awareness, on the students part, of multiple components of a business systems (e.g., Operations, Marketing, Accounting, Finance, Logistics and Management, for instance) for business analysis and decision making.
6. Develop and use cross-functional case studies that contain the components of Level 4 and also the story/moral of a Harvard Business School (for instance) case study.

This list does not cover the many research opportunities that students may be exposed to. When working with a system such as the SAP R/3 System faculty may find unique opportunities to conduct research on various topics such as Electronic Commerce, ERP Implementation Strategies, Business Applications Development on the Internet, Collaboration Strategy, Data Warehouse, and Change Management.

At the MBA and undergraduate level, SAP can support a cross-functional curriculum. Graduate students and undergraduates will be better prepared for the contemporary business market after working with the SAP R/3 System. Faculty will have the opportunity to develop more dynamic case studies and thus should be able to provide to students a richer and more relevant learning experience.

Sample Syllabi

One example of a course well received by students and recruiters this semester (both graduates and undergraduates) is an elective to the MIS curriculum that explores Enterprise Information System issues. A summary of this courses is presented in Table 1.

Table 1. 15 Week Course on Enterprise Information Systems

| Wk | Topic | Assignments |
|----|---|---|
| 1 | Course Introduction Introduction to BPR and Systems Thinking | -- |
| 2 | ERP Overview & SAP R/3 | Internet & SAP R/3, On-line Help |
| 3 | Reengineering Customer Order Managementj Case Study | SAP R/3 COM |
| 4 | Reengineering Procurement Case Study | SAP R/3 Procurement |
| 5 | Reengineering Financials Case Study | SAP R/3 Financial |
| 6 | Reengineering Manufacturing Planning and Execution Case Study | SAP R/3 MPE |
| 7 | Reengineering HR Case Study | SAP R/3 HR |
| 8 | ERP Application Development | ABAP/IV Development Workbench |
| 9 | ERP Application Development | ABAP/IV Development Workbench |
| 10 | ERP Systems Administration | SAP R/3 Basis |
| 11 | ERP Implementation Strategies | ASAP Roadmap |
| 12 | ERP Project Management | SAP R/3 Procedure Model |
| 13 | ERP Implementation | R/3 Reference Models and IMG |
| 14 | Extending ERP Solutions | SAP R/2 Workflow & 3 rd Party SW |
| 15 | ERP Consultancy | SAP Partners |

References

References are available from the authors (ewatsoN@lsu.edu; hschnei@lsu.edu).