Best Practices of Business Simulation with SAP R/3

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ABSTRACT

The HES Amsterdam School of Business, Netherlands, is teaching ERP software, SAP R/3, for almost ten years for educational purposes. Eight years ago they developed the first simulation company. Now students can choose to work in one of four ongoing business simulation companies. The content of the paper reflects how the school operates the business simulation companies. The use of SAP R/3 supports the business processes and therefore it is a great educational tool. The course integrates processes, ERP knowledge, best practices and other skills. From a didactical point of view R/3 enables problem based learning, in practicing the business simulation, questions are raised and create a need for theoretic backgrounds and solution strategies. Finally, the other uses of the mySAP Business Suite at the business school are described. They are currently developing a course using BW (Business Warehouse) and SEM (Strategic Enterprise Management) but do not provide discussion on this in this paper.

Keywords: Business simulation, enterprise resource planning, SAP R/3, best practice, business process integration

1. INRODUCTION

Honoring a tradition in business studies that goes back to 1867, the HES Amsterdam School of Business is one of the largest single-faculty institutions of professional business education in the Netherlands. The HES Amsterdam School of Business is a school of Higher Professional Business Education (in Dutch abbreviated to 'HEAO'). It offers a wide range of business-related programs preparing students for Bachelor and Master Degrees. Currently, the school has a staff of 300 and some 5,500 registered students. The programs and specializations are:

- Accountancy (AC)
- Financial Services Management (FSM)
- Business Economics (BE)
  - *specialization*: International Financial Management (IFM); Business Consultancy (BC)
- Business Informatics (BI)
  - *specialization*: Business Intelligence Management (BIM)
- Commercial Economics /marketing (CE)
  - *specialization*: Sport management and Marketing (SMM); International Management (IM)
- International Business and Languages (IBL)
  - *specialization*: Event Management (EM)
- International Business and Management Studies (IBMS)
  - *specialization*: Latin American Business Studies (LABS)

- Management and Law Studies (MER)
- Logistics and Economics (LE)
  - *specialization*: Leisure & Logistics (L&L)
- Communication (CO)
- Fiscal Economics (FE)
- Trade management (TMA)

The programs that are involved with the Business simulation using SAP are: Accountancy (AC), Financial Services Management (FSM), Business Economics (BE), Business Informatics (BI), Commercial Economics /Marketing (CE), International Business and Languages (IBL), Logistics and Economics (LE).

2. BUSINESS SIMULATION WITH SAP R/3

2.1 History
In 1994 SAP R/3 was introduced at the HES Amsterdam School of Business. The first attraction for us to get in touch with SAP was not the quality of an ERP system, but the availability of a complete and complex database for teaching purposes (Live AG developed by the University of Würzburg for Siemens). The software to read and maintain the data happened to be an ERP package. The HES was the first business school in the Netherlands interested in integrating ERP into the curriculum using the SAP R/3 release 2.1. The development of the curriculum started with writing a syllabus for hands-on exercises as an introduction within Live AG (later we switched to IDES, client 800). From the first development of our courses we focused on

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the integration between logistics (SD, PP, and MM) and financials (FI and CO) in a production environment. We thought that financial accounting for trading companies can be done with any accounting software, like Exact or Business One. ERP should be explained in a production company, integrating financials, logistics and human resources. Later we developed a working environment that met our expectations about the use of R/3 as a tool for simulating business companies.

Now, in 2004, the students are running four *ongoing* companies in SAP R/3 4.7:

- Phonee HES BV: *producing and selling cellular phones*
- Sjemee HES BV: *producing and selling engineering plastics*
- Bank Fehrmann & Polak: *banking & insurance*
- 3PH : *packaging, printing, physical distribution and handling*

2.2 Ongoing companies

The first two weeks, before the students start to work in a department and project, they get an introduction into some basics of SAP's R/3 by executing the exercises of the study book 'Hands-on with mySAP and IDES'. The exercises cover a complete ERP-process.

For the Business simulations we choose ongoing companies, where mixed groups of students (75 max) of the different programs/specializations work 50% of the time together in departments (see figure 1) and 50% in project teams. The departments represent routine based workflows. The project teams develop new functionality and implement this in the companies. The students have to develop a project plan. Examples of projects are: supply chain management, product liabilities and quality management, inventory valuation, enterprise intelligence, fleet management, fiscal audit and report, product costing with SAP, marketing plan, etc.

After each semester (14 weeks) the students hand over the company to the next group of students. Handing over is being effectuated by documents. The results of the projects are documented in project reports and are handed over to the departments or, in case of not realizing the goals, to the next project group. The documents per department are divided into: customizing, master data, process information and department report. The first three have to be maintained and/or updated by the students. The department report is unique and starts with a letter of abbreviations to the successors, acknowledgment of achieved results and documentation of the meetings and hours spent by the students.

This way the company data are spanning several years, enabling comparisons of the financial and sales results over the years. A fiscal audit and report, with comparison to former years, are significant. The company and the documentation are developed like 'real' companies. Even the structure of the company sometimes changes due to new and modern insights. For example, the sales department of 3PH recently has been split to sales and marketing departments. Errors are made and sometimes not corrected until the next fiscal year. Process documentation has improved greatly over the years.

2.3 Learning objectives

The learning objectives for the business simulation are the integration of skills and knowledge, the cooperation of students in groups, the application of knowledge in a virtual company, creativity, entrepreneurship and last but not least, to enjoy the classes. The students involved are in their third or fourth year of their study. The applied knowledge depends on the student's program and depends within which department and project the student participates:

- information management
- process management
- business administration
- business economics
- marketing
- fiscal law studies
- informatics
- logistics
- project management,
- business sociology and psychology

The goal is to apply previously gained knowledge not to introduce new theories.

2.4 Business simulation

The focus of the simulation is on the business processes and process integration. SAP's R/3 is used as a tool. Knowledge of the system is process oriented and not module oriented.

How do we start a business process?

The customers are simulated by the teachers and the other companies. For example: the teacher asks for a quotation for 10,000 cellular phones. The students working for the sales department have to use their marketing and business economics skills (product costing etc.) to create a good quotation. Next the quotation is converted to a sales order. This initiates the logistic control department to run a MRP. As a result of this MRP run, the production and the purchasing workflows are started. The purchasing invoices have to be paid by the financial administration. The receiving and issuing of the goods are done by the warehouse department.

We give each company about ten sales orders per semester. We found out that this number of orders is enough to give them routine, but not too much that they get annoyed.

2.5 Starting a new company

A new company was started this year. We gave the students the product, the sales volume, the structure of the company, the number of employees and the fact that we will use SAP. In starting a new company, the projects are equal to the departments. For example: the 'personnel' project group has to set up the personnel department for the new company. We use the documentation of the other companies and the 'help' from SAP. We start a test as soon
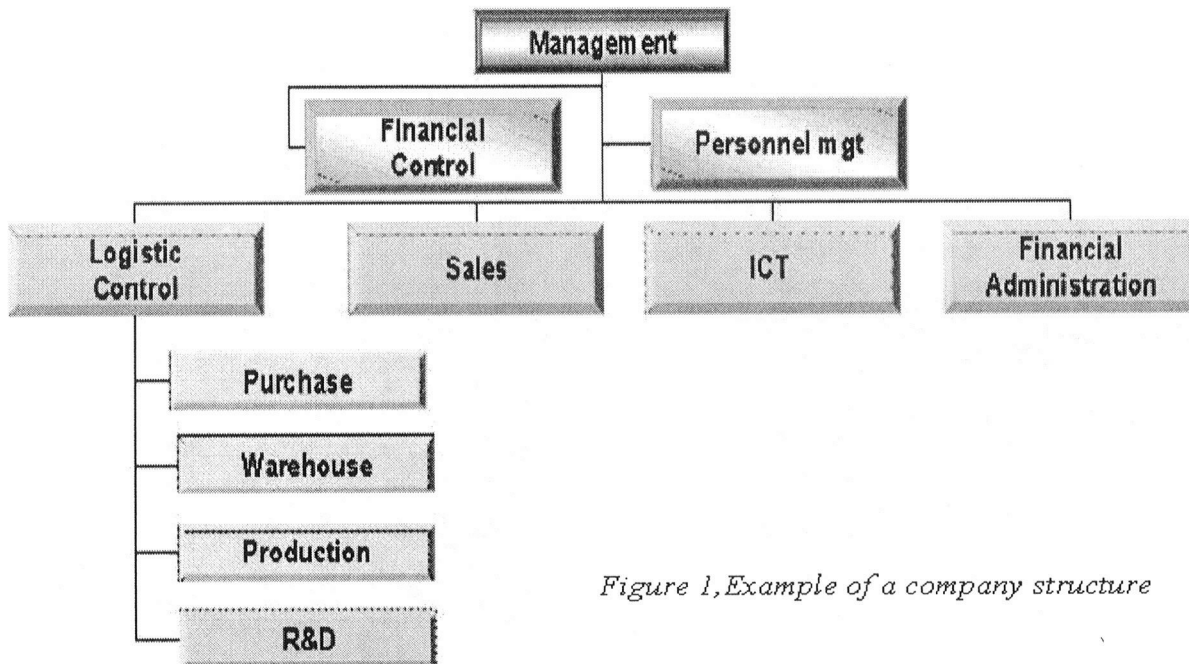
Figure 1, Example of a company structure

as possible and develop the "company processes" by trial and error. We first restrict the company to the primary processes surrounding sales. The normal sales order can be processed, but for instance return deliveries are not considered.

A three day workshop, 'business simulation with SAP', gives all the knowledge and documentation to set up your own company (see reference).

2.6 Student evaluation
The business simulation is evaluated by the students each semester. Each student has to hand in a personal evaluation. The evaluation has three parts: expectations, personal achievements and recommendations. Most students expected to learn everything about SAP, like they know everything about Word. At the end of the project they know that this expectation is not realistic. They always appreciate the cooperation with students from different specializations. A lot of students note that they gathered more insight into both processes within each department as well as overall business process integration. The fact that we use the latest software and that the projects cover the same objects as the innovation projects within 'real' companies is highly appreciated.

The management of the business school considered the business simulation first as pioneering. Now the business simulation, developed by a growing SAP team, is seen as an innovation and a competitive advantage for the HES.

3. DIDACTICS

The statement '*Sometimes advocates of project learning or problem-based learning communicate their ideas to us*

through lectures or frontal teaching. We like to think that we practice what we preach' is the basis of the didactical approach.

We don't want to argue about the suitability of ERP software in supporting information processes within a company. From an educational point of view SAP's R/3 is an ideal tool to illustrate business processes and process integration. For example: 1) sales can't deliver any goods that are not in stock, goods have to be produced first, 2) without an invoice by the sales department, no revenues are realized and noticed by the financial administration department, and 3) no personnel costs are booked without the payroll run (including the posting to accounting).

Students use the 'best practices' incorporated in the system to set up the master data. For example creating bills of material, routings, copying general ledger accounts, using various material types or info types within the HR master data are all standard in the system.

Customizing is done by the students with the help of the implementation guide and we use the settings in IDES as a reference. The choices the students have to make in customizing are based on the 'best practices' of SAP in implementing ERP software for many years. For example, the control keys for the master data for recipes used for Production Planning for Process Industries are copied from the existing examples in R/3. Without such references, students would create their own processes without any reference to existing practices.

In the first weeks as teachers we give a short introduction to the business simulation and to ERP. During the business simulation we only give the sales department a few sales
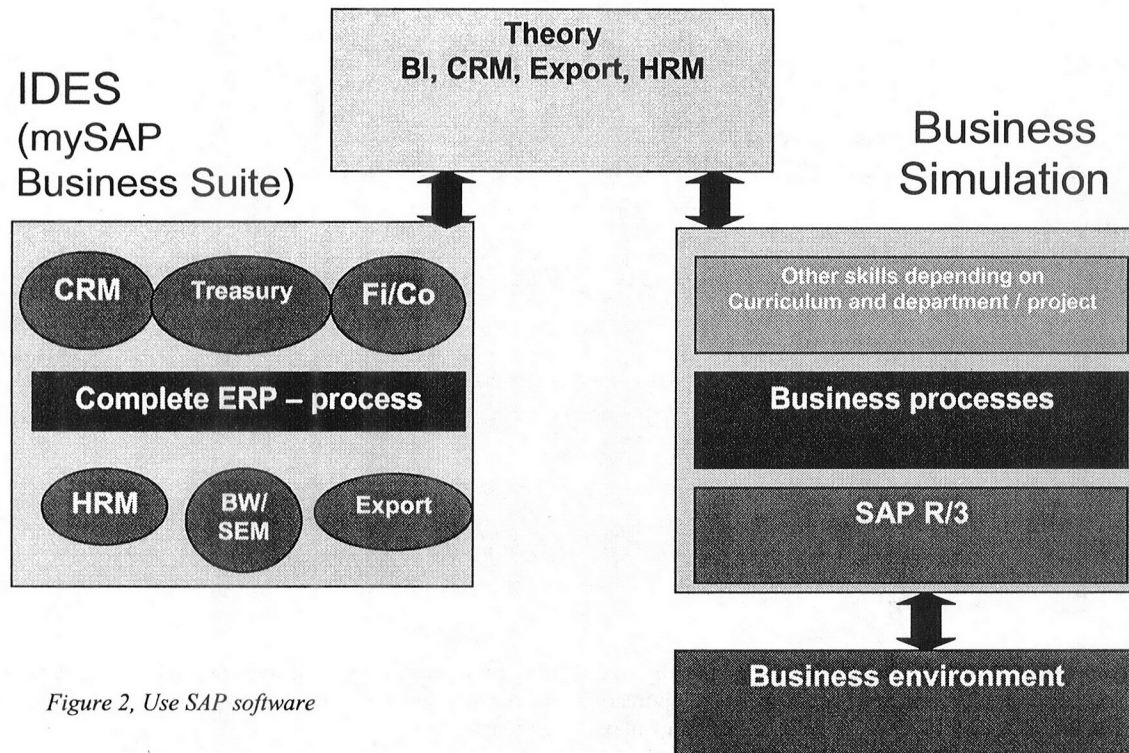
Figure 2, Use SAP software

orders and as managing directors we define the projects (one sentence per project). The procurement is based on prices found on the internet and pro forma quotations given by real vendors (often SAP-users).

We are present in the same room as the students work and we coach and assist on demand. We never have to provoke problems, when 75 students are working in ten different departments -- there are always a lot of miscommunication.

4. OTHER USE OF SAP

Next to the business simulation we offer a separate module for treasury and a module for controlling. The marketing students are introduced to R/3 in an earlier stage of their study with an introduction to Customer Relationship Management illustrated with SAP. We are developing new modules to support personnel administration as a part of the theory about Human Resources Management. The same approach will be used to trigger questions about international trading by creating master data and processes for export in R/3. Together with California State University, Chico, and Bentley College, we are developing a course using Business Warehouse and Strategic Enterprise Management.

In figure 2 the use of SAP software at the HES Business School of Amsterdam is summarized. The IDES is used to demonstrate a complete ERP-process using 'Hands-on with mySAP and IDES'. The same system is also used for separate modules like CRM (Customer Relationship

Management), Treasury, Fi/Co (Financial controlling), HRM (Human Resource Management), BW/SEM (Business Warehouse and Strategic Enterprise Management) and Export. We use the treasury functionality of R/3 to illustrate and apply the theory about cash management and financial planning for example.

The other R/3 system is used for the business simulation. The business simulation focuses on the business process, but the students also get acquainted with an ERP system and develop other skills depending on their curriculum and department or project.

5. SYSTEM MAINTENANCE

The HES Amsterdam is the UCC (University Competence Center) for the Netherlands. The HES is the hosting center for other business schools and universities using SAP for teaching in the Netherlands. We use the IDES system, 4.7 Enterprise. Each summer we do a fresh install of the latest version of IDES available by SAP. This way all the data created by the students in IDES disappear.

The R/3 system used for the business simulation is upgraded each summer to the same version as IDES. We need to upgrade this system, for all the data have to be saved. Each company has two clients. One client is used as the production system and the other is used as a test and development system. The test system is a copy of the production environment, made every half year.

The hands-on approach motivates students and supports their understanding of business processes. The 'best practices' incorporated in the ERP software from SAP make the business simulation more realistic. The ongoing companies motivate the students to create comprehensive documentation for their successors. The use of mySAP Business Suite stimulates the use of the latest developments in software and the use of this software in business environment, such as Strategic Enterprise Management.

6. CONCLUSIONS

The hands-on approach motivates students and supports their understanding of business processes. The 'best practices' incorporated in the ERP software from SAP make the business simulation more realistic. The ongoing companies motivate the students to create comprehensive documentation for their successors. The use of mySAP Business Suite stimulates the use of the latest developments in software and the use of this software in business environment, such as Strategic Enterprise Management.

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