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EDUCATION IN ENTERPRISE SYSTEMS AT UNIVERSITIES

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Abstract

The introduction of Enterprise Systems (ES) into the curriculum at Business and IS Faculties and Schools is for many universities a major challenge. However, this problem is in various aspects of special nature: the students' demand is enormous and in many cases product-focused, Enterprise Systems are typically very comprehensive and complex, and knowledge about ES is often missing. By the time textbooks of satisfying quality are available, there are new systems' upgrades and innovation cycles to deal with. This workshop provides lecturers new in this area with practical guidelines for the design and the continuous management of an ES-related curriculum. Experienced academics will get an overview about the worldwide activities and recommendations for further extensions of their activities in form of international collaborative projects, portals and the use of Application Hosting Centers.

Introduction

Enterprise Systems (a.k.a. Enterprise Resource Planning Systems) can be defined as customizable integrated application software that supports the core business processes and the main administrative areas of enterprises of different industries. Extended ES also covers the management of inter-enterprise business processes like Customer Relationship Management and Supply Chain Management as well as analytical applications (Data Warehousing).

The GartnerGroup (GartnerGroup 1999) forecasts that the ES market will be greater than \$ 20 billion by 2002 (with a probability of 80 %). More than 50 % of this will be ES service revenue, while the total ES license revenue covers approx. \$ 9 billion. They estimate that more than 90 percent of Fortune 500 enterprises have purchased a module or a set of modules from an ES vendor. They also estimate that the SME market is the main customer group as more than 50 % of these enterprises still haven't selected a next-generation ES. For 2002 the GartnerGroup anticipates a market growth of 28 %.

Universities reacted to the growing importance of ES with a time-lag in both of their business processes: teaching and research (Gable 1998). However, the number of institutions of higher learning dealing with ES within their curriculum increased significantly over the last years. Institutions of higher learning often work closely with Enterprise Systems vendors to provide students and faculty with unique research and educational experiences. One such alliance, the SAP University Alliance, currently has over 450 universities in its global membership. This network of faculty has collectively made tremendous progress to redefine business education through the continuous redesign and delivery of their curriculum related to Enterprise Systems and E-Business. The IS discipline has taken this development into account and is spending more attention to the need to exchange efficiently knowledge in this area. An indicator for this is the number of panel discussions at the major IS conferences dealing with ES in general and teaching ES in particular (e.g. ACIS 1998: Gable 1998, ICIS 1998: van der Heijder 1998, ECIS 1999: Rosemann 1999, ECIS 2000: Gable 2000, AMCIS 2000: Stewart et al. 2000, ECIS 2001: Gable 2001). Most IS conferences around the globe now have a dedicated ES-track. The first international ES workshop took place in November 1999 in Venice, Italy (Eder, Maiden, Missikoff 1999). The second ES workshop is schedule for September 2001 (Rome).

The major ES providers (SAP, Oracle, PeopleSoft, J.D. Edwards) have internally institutionalized an organization that deals with universities as a customer group with special requirements. In these departments, University Alliance Managers act as regional key-account managers. In order to reduce the complexity of handling the fast growing number of universities, most ES providers currently establish Application Hosting Centers at selected universities, which handle the system administration for a group of

15-40 institutes of higher learning. The worldwide user conferences of the major ES providers (e.g. SAPPHIRE) often include a session dealing with teaching ES at universities.

Teaching Enterprise Systems is a problem of special nature. Distracted by incredible job offers, the students' demand is enormous, but in many cases product-centered. Enterprise Systems are typically very comprehensive and complex. The frequency of upgrades and innovations from one release to the other is impressive. Knowledge about ES is often missing. By the time textbooks of satisfying quality are available, there are new systems' upgrades and innovation cycles to deal with. At least eight major IS journals reacted with special issues about Enterprise Systems in 2000 and 2001 (e.g. Journal of Information Technology, Information Systems Frontiers, Communications of the ACM, Journal of Decision Systems, Journal of Management Information Systems, Business Process Management Journal, Australian Accounting Review).

Related Work

This university to Enterprise Systems vendor link has spawned new curricula at the postgraduate level, either under the banner of a new breed of MBA program (Winter, 1999), or within the Information Systems area as a Master of Science program (Holmes and Hayen, 1999b). Individual experiences of universities implementing SAP R/3 into their IS curriculum can be found in Lederer-Antonucci, 1999 and Watson and Schneider, 1999. Foote (Foote, 1999) describes a SAP-accounting class and other SAP-related courses in the US. Shoemaker (Shoemaker, 1999) sketches a six hour introduction to Enterprise Systems for sales and marketing professionals. Rosemann et al. (Rosemann, Sedera and Sedera, 2000) and Hawking and McCarthy (2000) discuss Enterprise Systems courses with industrial work experiences.

The impact of reorganising Enterprise Systems subject matter into existing curricula and the special challenges posed to faculty has been reported by Stewart et al. (Stewart et al., 1999). The benefits and pitfalls of teaching conceptual knowledge with Enterprise Systems as a learning vehicle have been critically evaluated in terms of learning outcomes and effort by Noguera and Scott (Noguera and Watson, 1999, Scott, 1999).

Rosemann (2001) discusses issues related to teaching Enterprise Systems in a distance education mode. An example of a syllabus for the remote delivery of an introductory subject via the Internet is given by Holmes and Hayen (Holmes and Hayen, 1999a). They describe the design of a course consisting of 10 lessons that introduces the concepts, fundamentals and framework of Enterprise Systems (see also <http://sap.mis.cmich.edu/sap-esoft00.htm>). Stewart and Rosemann propose an increased international collaboration at universities in order to educate in the area of Enterprise Systems more cost-effectively (Stewart and Rosemann, 2001).

Outline of the Workshop

The workshop follows an extended understanding of ES, which includes the inter-company business processes related to Supply Chain Management and Customer Relationship Management. Though this workshop tries to be generic, the examples quoted will reference in the most cases mySAP applications, which is the by far market leading ES solution concerning the number of installations at universities (and enterprises).

The workshop will have the following outline. During the *introduction* every participant will introduce herself/himself and express the individual background and interests. In a brief overview, the *basics of Enterprise Systems* will be explained. This slot will provide all participants with the same understanding of (extended) Enterprise Systems. In 1999, a *world-wide survey* related to the teaching and research activities of universities was conducted. An overview about the results of this survey will give the participants information about differences between countries, typical ES-related subjects, modules taught, problems, success factors, etc.

The huge interest of students in ES-related subjects is contrasted by the fact that ES software is extremely comprehensive and complex. This kind of software covers the main business areas like procurement, material management, production planning and control, sales, accountancy, and human resource management. From an IT perspective, current available technologies like data warehousing, workflow management, Internet-user interfaces, and client-server-architecture are used. The different *complexity drivers* will be discussed and approaches for how to manage this complexity will be suggested. Different *theoretical learning models* will be discussed regarding their appropriateness for teaching ES (Scott 1999).

The results from the survey (Gable, Rosemann 1999) indicate that hands-on experiences are the main success factor for teaching ES. Thus, every lecturer in this area has to be aware of the *current support* provided by the ES vendors. This includes available courses, teaching and product material and further support that can be expected. In particular, knowledge about the concept of *Application Hosting Centers (AHC)* at universities is indispensable as this allows teaching and researching in the area of ES without dealing with the administration of the system. The information provided in this slot will be of interest for the future customers of these AHC as well as for universities, who will be an AHC.

A main part of the proposed workshop will be the presentation of *selected ES initiatives from various institutions*. The presented subjects and entire ES curriculums are selected from universities from different continents and in a different stage of experience. It will start with examples, in which the ES-initiative just started and end with examples from universities that teach internationally and collaboratively ES in a distance education modus and with the (virtual) involvement of experts from all over the world. This block will finish with a general list of *possible ES subjects*, clustered into the areas Business Administration, Information Systems, and Computer Science.

The last module of this workshop will cover a new project with importance for universities teaching Enterprise Systems. The SMARTS project aims to establish a global business process, which covers the roles of suppliers, manufacturers, retailers and end consumers. Five universities (3 US universities, Brazil, Australia) are currently designing the business blueprint for this initiative, which will allow all participants a hands-on e-Business experience. The presenters are involved in this project and will present the latest project progress to the audience. This session will be followed by a general discussion on teaching Enterprise Systems in a distance education mode (Rosemann, 2001).

The workshop ends with various *practical recommendations* that summarize the content of this event. These recommendations include besides issues directly related to the design and the establishment of an ES curriculum also information about *how to promote the ES initiative* (e.g. in the form of awareness seminars).

Expected Audience and Duration

The targeted audience are lecturers, who are currently teaching Enterprise Systems or who will (have to) teach ES in the near future. The workshop addresses the interests of novices as well as those of rather experienced lecturers in the ES area. As the event discusses how to teach ES in order to teach Business, ES-issues or Information Systems, it is of interest for academics from Faculties or Schools of Business as well as from the Information Systems discipline. The duration for this workshop is 4 hours (2 x 90 minutes).

The Presenters

Dr. Michael Rosemann is teaching Enterprise Systems and SAP R/3 at universities since 1994. He had first hands-on experiences with SAP R/2 at the University of Münster, from where he received his Masters in Business Administration in 1992 and his Ph D in Information Systems in 1995. In 1994 he consulted a German retail company during the implementation of SAP R/3 FI, CO, AM and HR. From 1992-1999 he worked for the Department of Information Systems at the University of Münster. Since August 1999 he is working as a Senior Lecturer for the School of Information Systems at the Queensland University of Technology, one of the first mySAP Application Hosting Centers outside Europe.

Besides teaching-related publications, he published various articles in books and journals about ES and SAP applications in the areas of reference modelling, implementation, performance measurement, and knowledge management.

Michael Rosemann presented his approach of teaching SAP R/3 as an invited speaker at the SAP user conference SAPPHIRE in Melbourne, Australia (November 1998), Nice, France (May 1999), Singapore (November 1999) and Las Vegas (June 2000). He was an invited speaker at SAP's International Research Congress in San Diego (February 2001) and at the first Scandinavian workshop about teaching SAP R/3 (Lund, August 1999). As a guest lecturer he is regularly conducting lectures in the MBA course "Enterprise Systems" at the Business School of the Nanyang University, Singapore. He organized ES-related mini-tracks at AMCIS 1999 (Milwaukee) AMCIS 2000 (Long Beach) and AMCIS 2001 (Boston). As a member of the program committee he was involved in the first international ES workshop in Venice, Italy (November 1999). Michael Rosemann gives commercial seminars about Customer Relationship Management and Process Management in Australia organized by SAP Australia.

Dr. Ed Watson is an Associate Professor of Information Systems and Decision Sciences in the E. J. Ourso College of Business Administration at Louisiana State University. He holds the Marjory B. Ourso Center for Excellence in Teaching Professorship and was awarded the *Erich Sternberg Foundation Award for Excellence in Teaching* (1998-1999) and the *Dean's Award for Service* (1998-1999). He serves as the Associate Director of the Center for Virtual Organization and Commerce and, to this end, is responsible for content development and coordination for this research and education repository. Since its inception, Dr. Watson has been program manager for the SAP University Alliance and is active in this global network of researchers and educators in studying and developing new forms of e-business, e-government, and e-learning. Dr. Watson has directed the SAP University Alliance Program at LSU, and has helped bring international attention to the innovative curriculum initiatives underway there.

Dr. Watson's interests include Enterprise Systems implementation, adoption and diffusion of technology and change in organizations, supply chain management, process-centered organizations, process analysis, and systemic performance analysis. Dr. Watson's doctoral and master's degrees are in Industrial Engineering from Penn State, and his B.S. in Industrial Engineering and Operations Research is from Syracuse University. He is published in the following peer reviewed journals: *Decision Sciences*, *Decision Support Systems*, *International Journal of Production Research*, *Quality Engineering*, *Interfaces*, *European Journal of Operational Research*, *International Journal of Industrial Engineering*, *Journal of Manufacturing Systems*, and *Communications of the Association for Information Systems*.

Related Publications from the Presenters

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