Teaching enterprise resource planning in a business curriculum

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Abstract: Given the high adoption rate of Enterprise Resource Planning (ERP) software in both large as well as smaller companies, the majority of economics and business students will almost certainly be confronted with ERP technology in their professional careers, either as an end user or as a manager. Nevertheless, the implementation of ERP systems into existing curricula for economics and business students seems to evolve slowly, partially due to a variety of problems that accompany such an implementation. This article aims at providing teachers with a handle to address the issue of implementing ERP systems in a business curriculum.

Keywords: business curriculum; education; ERP systems; integration.


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1 Introduction

Since the early 1990s, a large number of organisations has implemented enterprise resource planning (ERP) software.1 The most important suppliers of these systems are SAP, Oracle, Peoplesoft and Microsoft but there is currently a large number of smaller ERP vendors which jointly have a substantial market share. The implementation of these
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systems was initially limited to large companies, but more recently small and medium sized companies have also started using these systems on a large scale. A study by van Everdingen et al. (2000) shows that the level of adoption among European small and medium sized companies in 1998 had already exceeded 50% in a number of countries such as Denmark and the Netherlands. These figures were expected to exceed 50% in all major European countries by the year 2000. Such a high level of adoption indicates that the majority of graduates from economics and business programmes will be confronted with these systems during their professional career. Firstly, graduate business students may be confronted with ERP systems in their role as users of these systems. Secondly, they could also be confronted with ERP technology in their managerial role, where they have to manage the impact of ERP systems on business processes, employees’ tasks and organisational structures. Additionally, the fact that ERP systems can be used within virtually all standard business processes indicates that the use of such systems is not limited to a select group of students (e.g. accountancy or logistics students). Instead, every business student, irrespective of his or her specialisation, may be confronted with ERP systems.

Having adequate knowledge on ERP systems is also a requirement that is put forward by employers. A study among 2800 recently graduated business students shows that 76% of all respondents are working in a position where knowledge of IT is perceived to be important or very important. Furthermore, the research concluded that for the employers of business students, the knowledge of IT is an important selection criterion. Graduates that are lacking this knowledge have to be re-educated in this area, partly at their own expense (Heijke and Ramaekers, 1999).

Given these developments and conclusions, there seems to be sufficient reason to address the question of how ERP systems can be dealt with in a curriculum that is designed for economics and business students. Although a growing number of schools and universities have added ERP systems to their curriculum, a recent study among 94 US business schools showed that the adoption rate was still as low as 37% (Bradford et al., 2003). This article, therefore, aims at providing teaching staff with a handle for dealing with this issue, both focusing on the use of teaching materials such as literature and cases but also on the direct use of ERP software.

The article is built up as follows. In Section 2, the use of literature and cases to address ERP systems will be discussed. Next, in Section 3 we will deal with the actual use of ERP systems in a curriculum. In Sections 4 and 5 the problems of using ERP software and the necessary technical infrastructure will be dealt with. Next, in Section 6 a concrete application of the use of ERP systems in a curriculum will be described. Finally, the article will provide a conclusion and some closing remarks.

2 ERP software in the business school curriculum: literature and cases

Existing literature on the use of ERP systems in education has focused on two main issues. Firstly, a number of studies has analysed the adoption rate of ERP systems for teaching purposes across a population of universities. Generally these studies have shown that universities have been both late and slow in the adoption, and subsequent integration of ERP systems into their curriculum (e.g. Bradford et al., 2003; MacKinnon, 2004; Rosemann and Watson, 2002). The results of these studies indicate that only a minority
of universities offer individual ERP courses to their students, either within IS programmes (MacKinnon, 2004), or within business programmes (Bradford et al., 2003).

Secondly, a number of studies have considered the impact of introducing ERP systems into the curriculum offered to students (e.g. Becerra-Fernandez et al., 2000; Hawking and McCarthy, 2001; Hawking et al., 2001; Joseph and George, 2002; Shtub, 2001). These studies provide insights into the challenges that faculty are facing when implementing ERP into their curriculum and discuss potential solutions to successfully face these challenges (e.g. Joseph and George, 2004). Some studies provide a discussion of a curriculum plan that incorporates ERP systems (e.g. Becerra-Fernandez et al., 2000 and Hawking et al., 2001). As ERP systems are integrated companywide systems, the implementation of an ERP system can potentially affect the entire organisation. As a consequence, ERP knowledge is necessary within various functional domains. This should be reflected in the business school curriculum. Obviously, ERP is discussed in IT courses like management information systems, but ERP will also be discussed in courses on logistics, accounting or organisational studies (see Becerra-Fernandez et al., 2000; Bradford et al., 2003; Corbitt and Mensching, 2000). Through the combination of these courses, students may eventually get a multidisciplinary view of these systems because the associated literature will emphasise different aspects of ERP (technical, functional organisational or financial). This does justice to the large scope of impact that ERP may have within organisations, therefore, it is not strictly necessary to introduce a separate part in the curriculum that specifically deals solely with ERP systems. Discussing the consequences of ERP within existing courses gives a better context to the role that ERP systems may play within organisations. This approach does require some coordination between different departments to avoid a significant overlap (or inconsistencies) in the various courses that discuss ERP.

To incorporate ERP systems into traditional courses, a variety of teaching materials can be used and it is certainly not always necessary to actually use ERP software directly to learn about ERP. Generally, there seems to be no consensus on the best way to integrate ERP knowledge into courses and it seems clear that most institutes have not yet managed to integrate the use of ERP across the business curriculum (Bradford et al., 2003). Although some studies discuss special tools that are offered to enhance the use of ERP in the classroom (e.g. Hawking and McCarthy, 2001; Shtub, 2001), an initial introduction of ERP systems into existing courses may very well be achieved through the use of literature and cases.

Literature can be used to present the general characteristics of ERP systems, the history of these systems and the general structure of ERP packages. Esteves and Pastor (2001) provide an annotated bibliography of ERP studies published in the second half of the 1990s.

For educators who would like to pay attention to the more practical aspects of ERP systems, the use of business cases can be a practical solution. Using cases stimulates the learning process by analysing real-life events (University of Southern California, 1992). Cases are anchored in reality and allow students to put themselves in managerial positions. Appendix 1 gives an overview of cases in the field of ERP systems. A distinction can be made between diagnostic and decision cases. In diagnostic cases, a description is given of an (un)successful project, to teach students how to causally link certain system characteristics and outcomes. In the ERP area one could think of a description of an ERP implementation where students have to assess the appropriateness of the implementation
method used. In decision cases, students will be asked to make a decision and provide the arguments for the decision. The traditional example in this field is an investment justification case where students have to decide whether or not a firm should invest in ERP.

The descriptions in Table 1 show that most cases on ERP have a rather restricted, narrow focus. The large majority of cases deal with just two topics: selection (including net present value analysis) and implementation (discussing the characteristics of (un)successful ERP implementations). Recently, cases have begun to introduce a third topic; the use of the existing ERP platform as a basis for e-commerce, customer relationship management and supply chain management initiatives. Nevertheless, most of the cases that are currently available are of potential use only in a relatively small number of courses.

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<tr>
<th>Title (author(s), year of publication)</th>
<th>Short description of the case</th>
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<tbody>
<tr>
<td>AMP of Canada (A-C) (Newson and Marchak, 1999)</td>
<td>The business controller of AMP Canada is faced with the question whether SAP software would be suitable to be implemented in her organisation. The case also deals with the problem of how to convince other parties in an organisation of the soundness of investment decisions.</td>
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<tr>
<td>Bayer Canada Inc: The SAP Challenge (Reddin, 1999)</td>
<td>A case that focuses on the organisational resistance towards an ERP implementation and how to deal with such resistance.</td>
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<tr>
<td>Cisco Systems Architecture: ERP and web-enabled IT (Nolan et al., 2001)</td>
<td>This case describes the process of Cisco building its strategic I-net. After implementing ERP, Cisco started to electronically connect with customers.</td>
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<tr>
<td>Conexiones de Calidad, SA (Sprague, 2004)</td>
<td>Management of the manufacturing firm Conexiones de Calidad is about to invest in ERP technology. The case allows students to study the implications of automating assembly supervisors' tasks with an ERP system.</td>
</tr>
<tr>
<td>Deloitte and Touche Consulting Group/ICS and SAP (Upton and McAfee, 1996)</td>
<td>A case that takes the perspective of an IT consultant who is guiding an ERP implementation at a client firm. The case deals with the characteristics of ERP systems, the pros and cons of various approaches towards business process reengineering (BPR) and change management.</td>
</tr>
<tr>
<td>Digital China Holdings Ltd: ERP as a platform for building new capabilities (McFarlan et al., 2002)</td>
<td>ERP implementation case in a leading Chinese company. The purpose of the case is to illustrate the interplay between the installation of an ERP system and e-commerce.</td>
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Table 1  Review of cases relating to ERP systems (continued)

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<tr>
<th>Title (author(s), year of publication)</th>
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<tr>
<td>E-Government in Cambridgeshire A and B (Evgeniou et al., 2004)</td>
<td>This case recounts the successful implementation of an ERP system at Cambridgeshire County Council. The (B) part of the case illustrates the use of IT across organisational boundaries (E-government).</td>
</tr>
<tr>
<td>ERP at IST A, B and C (Whitaker and Gordon-Brown, 2003)</td>
<td>IST is faced with the necessity to implement an ERP system. The ERP steering committee has to make a choice between Oracle or Great Plains. The case series looks at the entire ERP implementation process.</td>
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<tr>
<td>IBM Technology Group (McAfee and Herman, 2000)</td>
<td>This case deals with the management of large ICT projects. The case illustrates how packaged software from SAP was used to build an IT platform.</td>
</tr>
<tr>
<td>Kent County Council: Implementing IT for E-Government (Evgeniou et al., 2004)</td>
<td>This case describes the successful implementation of an ERP system in a governmental organisation.</td>
</tr>
<tr>
<td>Lipton Canada (Newson and Volkoff, 1999)</td>
<td>The case focuses on the problems concerning the configuration of an ERP system. How should a company deal with its unique processes that are not supported by the standard ERP software that has been bought. It specifically deals with the problems and consequences of partially adapting the SAP package to support specific and unique business processes.</td>
</tr>
<tr>
<td>Metalco: The SAP Proposal (Huff and Murray, 1997)</td>
<td>Metalco is an Australian mining company that has recently decided to centralise its IT department. In this context, the case deals with a discussion on whether an ERP system would be a good investment given the situation of the company. Also, the use of specific methods to guide an investment decision in ERP is part of the case.</td>
</tr>
<tr>
<td>Moore Medical Corp. (McAfee and Bounds, 2001)</td>
<td>Describes a trading company in the middle of a process where the sales process through traditional channels is replaced by the use of Internet technology. The current ERP system does not meet the E-commerce requirements of the company. Students have to analyse to what extent further investments in the ERP system as well as customer relationship management software, is sensible for the company.</td>
</tr>
<tr>
<td>Provincial Power Corporation A &amp; B (Newson and Minsky, 2000)</td>
<td>A case that describes the implementation of SAP in a power company. The case focuses on the pros and cons of ERP systems, the success factors related to an ERP implementation and the risk that are involved with implementing ERP software.</td>
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3 The (ir)relevance of hands-on experience with ERP software

Although there may be some opposing views with regard to the way that literature and cases can be best applied, in general there will be little debate on the value of literature and cases on ERP in the business curriculum. However, with respect to hands-on experience in ERP software, there is often much more controversy. The suggestion of using software packages as part of the curriculum often meets strong resistance, especially among academics, based on the premise that providing hands-on experience with software packages is not a part of the academic skills that students should be provided with. For this reason, many economics’ graduates who are blessed with a broad and thorough knowledge of accounting issues, have never actually seen an accounting software package, and certainly have never entered data in such a package. Within the same line of reasoning, broad resistance against the use of ERP packages can be expected, especially since the use of these packages is not limited to one single functional area and, therefore, cannot be considered the responsibility of a particular course or functional area within a curriculum.

Nevertheless, there are a number of reasons why it may be useful to provide business students with hands-on experience of ERP packages. Historically speaking, a typical business curriculum is often linked to functional areas. The structure of economics faculties is usually based on departments of marketing, accounting, finance or logistics which all provide courses relating to their own functional area. In such a structure it is often left to the individual student to consider the cross-functional links that exist between these functional areas. In this respect, universities and business schools often lag behind the reality of the business world where there has been a movement since the late 1980s to break down the traditional barriers between functional areas by applying

Table 1 Review of cases relating to ERP systems (continued)

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<tr>
<td>Tektronix, Inc.: Global ERP Implementation (Austin et al., 1999)</td>
<td>A case that describes the implementation of an ERP system in three divisions of Tektronix. The case deals with the problem of balancing the specific demands of each separate division and the standardisation that is enforced by an ERP implementation.</td>
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<tr>
<td>Tubos E Conexoes Tigre (Liuz Correa and Caon, 2001)</td>
<td>This case describes the implementation of an Oracle ERP system at a Brazilian company.</td>
</tr>
<tr>
<td>Vandelay Industries, Inc. (Upton and McAfee, 1996)</td>
<td>This case focuses on a discussion of the unique characteristics of ERP systems and the pro’s and cons of various approaches to business process reengineering (BPR).</td>
</tr>
<tr>
<td>Whirlpool Europe (Balachandran et al., 2001)</td>
<td>Based on this case, students have to evaluate an investment in an ERP system, using a traditional discounted cash flow approach.</td>
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techniques such as business process reengineering or business process redesign. As a result, modern companies tend to be more orientated towards business processes instead of functional areas. The employment of an ERP system links to this development because these packages bring together the operational data of all various functional areas. This applies both to business practice and business education. Therefore, the use of ERP software in a business curriculum may provide the opportunity to link the various functional areas that are part of such a curriculum, in the same way that these packages have linked the functional departments within business organisations. In this way, students are provided with an active approach towards the development of cross-functional links between functional areas. This is one of the reasons why the use of ERP software by US universities is favourably evaluated by accreditation committees (Corbitt and Mensching, 2000).

A second argument for the use of ERP software is the fact that it is very difficult for students to grasp the essence of an integrated information system and the effects that these systems have on organisations and individual employees, based on literature and cases alone. Using a software package may confront students much more directly with the consequences of using an integrated system, where the input of one module is seriously affected by the output of other modules. In this sense, working with an integrated system may be necessary for students to understand the managerial problems that are a result of the use of these systems in large organisations.

A third argument for the use of ERP systems is linked to the implicit signal that is provided to the market-place. Universities are often criticised for the fact that they are not sufficiently aware of the needs of the business world. As a result, academic scholars are often portrayed as scientists, working on academic, theoretical issues with virtually no interest in or knowledge of practical issues. Through the implementation of ERP systems in their curriculum, universities and business schools signal to the business world that new developments are being incorporated into the materials offered to students. Additionally, it should be mentioned that knowledge of these systems also results in an increased value of graduates on the labour market. A US study has shown that skills relating to the use of an SAP system may result in a salary difference of $10,000 annually for graduates (Corbitt and Mensching, 2000). A similar effect has been shown with respect to the IT knowledge of Dutch business graduates (Heijke and Ramaekers, 1999).

The arguments mentioned above lead to the conclusion that the use of ERP software results in relevant knowledge and skills for business students. The next question that arises is how the transfer of such skills and knowledge can best be organised. To a certain extent, the use of ERP software will result in practical training that aims at familiarising students with the user interface of such packages. However, it should be obvious that an academic curriculum cannot be aimed at, nor limited to, the transfer of these types of skills. The challenge of using ERP software lies in finding a structure such that students:

- May experience what it means to support your business processes with an integrated software package.
- Understand the potential and limitations of ERP systems when it comes to supporting management decision making on an operational, tactical and strategic level.
- Learn that business processes often have a multidisciplinary character which limits the successful application of a traditional approach based on functional disciplines.
Given the fact that the remainder of this article will focus on the more practical possibilities and limitations of the use of ERP software, we will only briefly address the issue of how to realise the goals mentioned above in a specific curriculum. The main challenge lies in using ERP software in such a way that the interdisciplinary and cross-functional nature of ERP is demonstrated. This would probably result in the creation of student teams that would be confronted by teaching material that focuses on business processes or value chains instead of separate functional areas. The main purpose is to demonstrate how every particular functional area links to the rest of a company. An example may be the way management accounting topics such as activity-based costing, cost-volume-profit analysis or budgeting are addressed. The use of ERP software provides an environment where students should extract the relevant information from the ERP system, so that they can actually experience how the various business processes collectively provide the data that are necessary to apply these management techniques. For further ideas on how to use ERP software in practical situations, we refer to Becerra-Fernandez et al. (2000) and Watson and Schneider (1999).

4 Bottlenecks in ERP usage in education

In order to use ERP software for educational purposes, the following problems may have to be dealt with:

1. Overcoming resistance to the use of software and resistance to fundamental changes in the existing curriculum (staff).
2. Acquiring the necessary (financial) resources for the use of ERP software.
3. Composing a multidisciplinary team of faculty members.
4. Implementing and maintaining a technical infrastructure for ERP usage.

Numbers 1 and 2. Acquiring support for using ERP software is essential for succeeding in such a project. One could choose a fundamental debate among faculty staff regarding the role of software in academic education. An alternative would be to choose a bottom-up approach where the applicability and use of ERP-software is first shown in an isolated part of the curriculum. Afterwards, this case can be used to realise a broader usage of ERP software in the curriculum. Irrespective of the method chosen, management support is always a strict requirement. This support is also needed to safeguard the provision of financial means. Although a bottom-up approach can be accomplished with very limited financial means, a more extensive use of ERP software in classes will always be accompanied by organisational, infrastructure and educational expenses. Safeguarding time is just as important as safeguarding financial means. Implementing ERP software in class is not a task that a typical assistant professor can easily combine with his/her regular educational and research activities, especially for the project leader. The ERP-project should be a structural part of his activities.

Number 3. As a consequence of the firm-wide character of ERP, the composition of a project team is rather complex. In order to make sure that ERP usage will truly add value to the curriculum, coordination is a prerequisite. A multidisciplinary project team is, therefore, of the utmost importance. Given that the success of ERP software depends on enrolment levels, it might be a good idea also to involve students. Although students
will not bring any pedagogical or technical knowledge to the project team, their input can 
be vital in balancing the educational value of an ERP system and ‘customer demand’. 

Number 4. A last problem is related to the design and maintenance of the technical 
infrastructure, consisting of hardware, software and personnel. At a first glance, ERP 
expenses may seem to be related to the acquisition of hardware and software. As a result, 
other expenses of ERP projects are often underestimated. The organisational and personnel 
expenses can be a multiple of the pure infrastructure expenses. These organisational and 
personnel expenses are often hard to quantify and are, therefore, often ignored in the 
preparation of ERP budgets. The question of how to set up the infrastructure of an ERP 
course will be addressed in the following section.

5 Technical aspects of the use of ERP software

With respect to the technical infrastructure that is necessary to implement ERP software 
into a business curriculum, there are two general options:

- The ERP software can be installed on a local server that is linked to the local area 
  network of the university or business school and that is maintained by local IS 
  personnel. The main advantages related to this approach are the high level of 
  control and the potential flexibility that can be applied to the use of the software. 
  A definite drawback of this approach are the high costs. Corbitt and Mensching 
  (2000) mention a figure of $200,000 related to the initial investment in hardware, 
  software and training for a complete faculty-wide implementation, whereas 
  Becerra-Fernandez et al. (2000) refer to an amount of $50,000 relating to hardware 
  and software only, excluding a total of 105 days of training for faculty staff. Both 
  examples indicate that the investments under this alternative are substantial. 
  Additionally, it may not be very easy to acquire the necessary expertise to run and 
  maintain a local ERP application and such knowledge may be very expensive to 
  hire. Many institutes may therefore, opt for the second alternative, which will be 
  described below.

- The maintenance of the application and database server is outsourced to an 
  external party, referred to as an Application Service Provider (ASP). In this 
  scenario a client server architecture is applied based on a structure that 
  distinguishes between a presentation component, an application component and 
  a database management component. On the local PC that is used by students, 
  only a client component is installed that deals with the graphical user interface 
  (GUI) of the ERP package. The local client links to the application component, 
  through the use of internet technology. The application server is reached by the 
  client through the use of an IP address. The servers that are necessary for running 
  the application component and the database component are located and maintained 
  at the site of the ASP. The advantages of this type of infrastructure are that the 
  upfront costs are minimal (for example the annual licence fees for 50 users amount 
  to approximately $3000) and there is virtually no need for any technical expertise 
  related to the ERP package. The disadvantage of the structure is the dependence 
  on a third party and the more limited control over the application which may 
  result in less flexibility in adapting the software to the teaching environment.
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It seems that most institutes are still opting for the first variant and Bradford et al. (2003, p.448) have shown that in their sample of 35 US business schools that had adopted an ERP system into their curriculum, only 12% had opted for the hosted solution. It should be mentioned, however, that the option to host an ERP system was made available in the US only since 2000, by SAP. In Europe, SAP IDES was already available several years earlier.

6 SAP IDES

The German software vendor SAP (Systems, Applications and Products) is the market leader in ERP software. SAP is also the frontrunner when it comes to facilitating the usage of their software for educational purposes.4

SAP offers universities a fully-fledged, complete ERP package for research and educational means. SAP delivers SAP IDES (International Demonstration and Education System), a completely configured version of SAP. The central database has already been filled with transaction and master data. The business processes as they are incorporated in the software, have been documented in what is referred to as ‘business scenarios’.

The demonstration company in IDES is a multinational concern with various subsidiaries in Europe, North and South America and Asia. These subsidiaries are active in various industries. The IDES organisation in Frankfurt is a manufacturing firm, the IDES organisation in Paris is a sales organisation. These organisations can be used individually or interactively. This creates numerous opportunities for teaching purposes. An instructor who would like to emphasise logistic problems could work with the IDES organisation in Frankfurt, whereas a lecturer that is interested in the treatment of inflation in the financial statements could work with the data of the IDES organisation in Mexico City. This allows every individual instructor to use IDES in a way that matches the course contents.

Universities can enter a contract for the licensed use of SAP for an agreed maximum number of users. An external firm creates a separate training environment. Via the internet, students get access to the application and database server. Students get their own ID and password. This user-ID is related to a limited authorisation. Students are allowed to enter data in all modules, but they are not allowed to make any changes in the configuration of the package. By allowing students to use all modules, it is possible to underline the integrated nature of these packages. If a customer accepts a sales quotation (sales module), this has an impact on accounts receivable (accounting module) and the distribution planning (distribution module). By following an order ‘through the system’ students can truly experience what single entry of data implies.

There are several sources of SAP IDES course material available, but obviously it also possible to develop IDES assignments from scratch. A useful approach is to have students enter master data in various modules (e.g. creating a new customer, supplier, finished product, bill of material, routing) and use these master data in a series of transactions in later parts of the training. When all students have entered their master data it may be useful to have them ‘browse’ through the database and inspect their own as well as other students’ entries. This is very useful in understanding the nature of a central database with integrated modules.
The list of assignments that students can finish in SAP IDES is almost infinitive. Depending on the course content, the following assignments could be mentioned:

- perform an activity-based costing analysis (management accounting course)
- perform a currency or interest risk analysis (finance course)
- perform an MRP run (logistics course)
- evaluate the effectiveness of various recruitment instruments (human resource management course).

Obviously, the ERP concept is best illustrated by developing a set of assignments where the interplay between different modules is shown. Following the entire sales process (from the initial quotation through the manufacturing of the sold items and the delivery of goods/invoice) is an ideal assignment in this respect.

7 Concluding remarks

This article has tried to illustrate how knowledge of ERP systems can be integrated into a curriculum for economics and business students and has dealt with a number of issues that teaching staff will be facing when integrating ERP software in an existing curriculum. First of all, the use of literature and cases is a valuable, though often an insufficient way of familiarising students with ERP systems. Given the focus of most of the existing cases on selection and implementation, it will be hard to address the integrative nature of these systems through the use of cases only. Therefore, the use of ERP software may be helpful. Although the use of software packages in academic educational programmes is expected to meet resistance, there is no doubt that even in the academic world there is a lot of interest in this theme. For example, the University of Arkansas has a discussion forum on its website where teaching staff from universities around the world can share their experiences with the use of ERP systems in their educational programmes.

Faculties that are planning to implement ERP systems into their existing curricula for economics and business students, may benefit from the following practical guidelines:

- Ensure that the natural resistance among some part of the faculty staff towards the use of software in a business curriculum is addressed. Either a fundamental debate on the use of software may be started or a bottom-up approach may be chosen to convince sceptical staff by demonstrating successful uses of ERP systems in isolated parts of the existing curriculum.
- Acquire the necessary financial resources to realise the access to an ERP system and to ensure compensation for staff involved in the ERP implementation project.
- Compose a multidisciplinary team of faculty members to facilitate the firm-wide character of an ERP system.
- Decide on and implement the technical infrastructure. The ERP software can either be installed on a local server, which is maintained by local IS personnel. Alternatively, an external party may be approached to host the ERP software, an option which has only become available throughout the last few years.
Although many universities and business schools are still taking their first steps into the process of introducing ERP systems into their curriculum, a number of institutes have already taken the next step and are using their ERP software to enhance their educational practices. For example, Hawking and McCarthy (2001) report on an e-learning initiative to facilitate the teaching of ERP systems in Asian universities. In this scenario, one university is hosting its educational ERP system, thus acting as an Application Service provider for other universities. Additionally, a virtual classroom facility is offered which provides a two-way communication facility for students and teachers that are located at different universities. This technology allows for online teaching in a setting where the student can actually address the lecturer during the lecture. Finally, an environment is offered to the teaching staff for building electronic tutorials based on the ERP environment that is hosted. Using this tool, local teachers can build electronic tutorials based on their own assignments, or it enables teachers to reuse tutorials built by others.

In Europe and the USA, a similar initiative has been launched under the umbrella term of the SAP University Competence Center. These initiatives help institutes not only to deal with the technical problems related to the implementation of ERP into a curriculum, but also provide assistance with the educational difficulties of realizing such an implementation.

References


Notes

1 The term ERP is still widely used in the popular press but for a number of reasons some authors prefer the term enterprise systems. Firstly, the term ‘enterprise resource planning’ suggests that the main purpose of this software is planning. Although this may be true in some cases, ERP software is mostly used to record transactional data from operational processes (such as production, distribution, sales or human resources management) and its application is not limited nor specifically focused on the task of planning. Secondly, the term ERP suggests that this type of software is an evolution from the MRP-I (Material Requirements Planning) or MRP-II (Manufacturing Resources Planning). Although this may be true for some ERP packages, a large number of ERP suppliers have never been active in MRP software and, therefore, for many ERP systems today there is no direct link to MRP packages. We will use the term ERP throughout this article since ERP is still the most dominant term. We expect that teaching staff looking for ways to implement these systems into their courses will be more likely to use ERP as a search term than ES.

2 This article specifically focuses on the role of ERP in a business curriculum, which may differ substantially from the implementation of ERP in an Information Systems (IS) curriculum (e.g. Hawking, Ramp and Shackleton, 2001).

3 In this context the opportunity costs related to the time spent by educational staff in the ERP project team are probably the most important but also the most often ignored part. These costs might include training of educational staff, the development of teaching material and the implementation of changes in the existing curriculum. In most cases these tasks will require additional activities that are not easily integrated in the regular educational or research activities.

4 Other ERP vendors have started similar initiatives, for example Oracle (see http://oai.oracle.com/en/) and Peoplesoft (see http://www.peoplesoft.com/corp/en/products/industry/higher_ed/on_campus/faqs.jsp) which also includes the JD Edwards University since November 2003.


6 For details on the US initiative, see http://sap.uwm.edu.

7 The numbers refer to the publication numbers of Harvard Business School and the European Case Clearing House.

Appendix 1

Reference cases (see Table 1)


Evgeniou, T., Sengupta, K. and Westenberg, A. (2004) E-Government in Cambridgeshire (A) and (B), INSEAD (904-007-904-008-1).