

INTEGRATING INFORMATION TECHNOLOGY THROUGHOUT CORE BUSINESS CURRICULUM: UTILIZING A UNIVERSAL DATABASE TO MODEL PERVASIVE COMPUTING IN MODERN BUSINESS

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ABSTRACT

The typical core business curriculum does not properly prepare students to use information technology in the same pervasive manner that exists in modern businesses. In modern business, “IT is everywhere” and the goal is to use it in as seamless a manner as possible. Contrarily, in business schools, IT tends to be segregated to a few courses or included as a disjointed add-on in other courses. The typical MIS courses in the core prepare students for general MIS knowledge and for personal productivity skills. Modern business usage goes well beyond, particularly using company-wide integrated databases to support interdisciplinary challenges. This paper presents a solution that also aligns with recently proposed AACSB accreditation standards indicating more importance for integrating IT into business functions within the entire business curriculum [1].

INTRODUCTION

It is the authors’ experience and the basic contention for the project described in this paper that a significantly high percentage of new business college graduates are not properly prepared to be immediately productive in today’s technology-rich business environment. In modern business, IT is an integral part of the products and services delivered to customers [6]. Further, businesses have compelling pressures to satisfy customer requirements and queries without delay by any of their representatives accessing information from integrated corporate database [7].

The key phrase is “integrated corporate database.” Parallel to that is an integrated perspective among all business functions. Yet, most business colleges teach information technology concepts and practices in a non-integrated manner [3]. Typically, business faculty teach classes in their disciplines independent of functional activities in other disciplines. Anecdotal evidence indicates this is a nationwide problem [9].

The typical approach in colleges and schools of business is to teach about technology (e.g., computer skills courses and information systems curriculum) and to teach with technology (e.g., use of distance education and computer presentation systems.) There are efforts to integrate technology into a specific course (e.g., case studies on CDs or web sites packaged with textbooks and proprietary general accounting packages with relatively limited capabilities). However, risk is that students in those courses typically gain an impression that IT is an add-on to, rather than integral part of, business functions.

There is very little effort to integrate technology throughout the core business curriculum in a seamless manner so that students gain the impression that such integration is the normal way that real businesses operate [10]. Attempts, such as the SAP University Program, have not accomplished that goal due to lack of wide participation by business faculty. Typical reasons given are that such software is too complex to easily incorporate SAP into student class assignments, the required hardware platform and

its related ongoing management are too costly, and the faculty have no control over timing and content of software revisions as it is a proprietary commercial package [8].

NORMAL STATUS OF INFORMATION TECHNOLOGY IN BUSINESS CURRICULA

Most business curricula include a component of computer literacy, which has a variety of definitions. Typically, it refers to knowledge about the components and interactions within a computer system and the impacts between society and computer usage. While computer literacy is important for most citizens in today's world, it is not nearly the same as integrating information technology into the core business curriculum. Indeed, in some schools, computer literacy is assumed to be prerequisite knowledge for all business students, as it is taught in primary or secondary grades and a significant percentage of college students are already computer literate when they start their college careers.

Likewise, it is important for business graduates to be skilled with personal productivity tools, including word processing, spreadsheet, presentation packages, and web page development tools. Such software can be used effectively throughout a student's program of study. Furthermore, most business school graduates will use such tools on the job in one capacity or another. Like computer literacy, many business students already have a working knowledge of such tools before they enter college. Skills with such tools are critical prerequisites to a business curriculum centered on information technology. However, the latter goal is much deeper than computer tools usage.

A third element in most business curricula is a course in the principles of management information systems. Such a course intends to expose all business majors to the MIS discipline and has become as common in the core as principles courses from other disciplines. Principles of MIS gives a basis for integrating technology into the core business curriculum, but is already too full of valuable content to become the main element in a "business curriculum centered on information technology." Beyond the principles of MIS course are additional courses taken by MIS majors. These would be candidates for the type of technology infusion advocated by this paper. However, such advanced MIS courses are not in the core curriculum and would not be the logical approach for all business majors to learn how information technology is integrated in a seamless manner in modern businesses.

Similarly, discipline-specific information technology courses, such as an accounting information systems course or a human resources information systems course, could be argued to be the appropriate courses for integrating technology into the business curriculum. However, with these courses the same problem exists, that is, they are not part of the core curriculum. Hence, the typical student would only encounter one or two such courses and would not see the big picture that this paper advocates should exist. Trying to fit additional such courses into the core is likely to exceed the credit hour limit on business courses specified within accreditation standards of AACSB [1].

Likewise, it would be difficult to fit into that credit hour limitation an additional specialized course that focuses solely on the seamless integration of technology into a modern business. This latter idea also is counter to the desire that students experience the proper way to use of technology within each discipline. This and other suggestions listed above simply do not accomplish the goal advocated herein.

The only logical approach, then, is to build information technology-related assignment into the courses that are already in the core business curriculum, with the goal of making such student assignments "transparent," i.e., do assignments in marketing, production management or any other discipline without thinking about the information technology as being an "add-on" to the course. Consequently, students

would use technology in a manner similarly modern business owners and workers, for whom information technology is simply a fact of life. Modern business workers assume they will use information technology to deal efficiently with as many tasks as appropriate.

Contrarily, business faculty often teach the fundamentals course of each discipline as theory with a few case studies or other exercises are used to show the application of the theory. While faculty might require students to use personal productivity tools as they accomplish the case or assignment, it is not the same as in the business world for four reasons. First, case assignments are often handled as a team project with the most technology literate team member handling the computer work. Obviously, that approach would not build knowledge levels for all business majors. Second, cases and exercises are usually specific to particular courses with no linkage between courses. This is unlike a modern business environment in which most challenges are by nature interdisciplinary. Third, the cases are often purposefully simplistic so that they can be readily accomplished within the confines of a course. While this is logical in present curricula, it does not give students the impression that this paper advocates. Fourth, the lack of integration across disciplines and the simplistic approach mentioned, as mentioned above, means that if the cases include database work, the database is different for each case in each class. Here also, students do not see the integration across the fundamental aspect where the integration occurs in a modern business which utilizes a massive corporate-wide database.

The latter point gives insight into how a business schools can create a closer approximation to the real world use of information technology. For instance, Shaw [9] presents a convincing argument that one of the main information technology skills needed by human resources students is that ability to access and manipulate data from internal and external databases. She argues for a use of such database skills throughout a human resources major degree program. If such skills are applied in all HR classes, students will see that as the normal manner of business and will be better prepared in terms of skills, knowledge and attitudes to step into a HR career in a modern business.

It is these authors' experiences in industry, that the same scenario is not only true for each separate academic business discipline, but that it is true for the seamless integration of all business disciplines outside of academe. "If there existed a realistic and comprehensive database that was used in all courses in a core business curriculum as well as in other courses in all majors, students in all business disciplines would graduate with ability to access and use those databases. They would graduate with the understanding that IT is not an add-on but a crucial element of normal business operations. Critical thinking and communications skills would also be enhanced through those processes." [3]

THE PROJECT: PAST, PRESENT AND FUTURE

Obviously, there is a great need for improvement in order for business school graduates to be better prepared to enter modern businesses in which computer technology is used in an integrated and seamless manner throughout the business. Such is the intent of a project that began in August 2001 based on published research from 1992 [5] and related case studies [4]. The project will continue for three years.

At the end of the project, the initial outcomes (database and software tools) will be ready for use in business schools and colleges. Ultimately, the product will be portable to other institutions of higher education. As the point of origin of the project, the activities will increase first the vitality of the participating colleges in terms the more thorough preparation of their graduates, and then in terms of their ability to recruit and retain top quality business students. The project will increase the

employability and productivity of business graduates as their knowledge and skills will fit more closely with the needs of modern business. Vitality of any participating business program will be improved.

Students will gain knowledge and hands-on experience with a set of lessons that are seamless across the courses from various business disciplines in the core business curriculum. Those lessons will utilize a web-based interface that runs on any hardware platform that is connected to the Internet. The interface will have a common look and feel in each course.

The applications hit upon a database derived from a Model Universal Enterprise Information System (MUEIS) developed in 1992. The MUEIS model that is at the heart of this research and development is based upon two decades of data collection and has been properly validated [3]. The MUEIS model has been subsequently strengthened based on knowledge the authors have accumulated through extensive work experience in industry as well as thorough academic preparation and consulting.

The fact that the project can be accomplished has been proven through prior and ongoing projects over the past decade. The basic idea has been presented at academic conferences where it has met with very favorable response from business faculty [2][3]. Suggestions from those faculty at conferences, as well as the faculty from other disciplines who are participating in the project, have strengthened the project.

The design of the modules that comprise the project is done in cooperation with faculty from other disciplines who will use the modules in their classes. Accounting and marketing professors have provided invaluable advice on the proper design needed for use by future students in their classes. The quality of what has been and is currently being accomplished is furthered by demonstration of the products created by students, which is tied into the formal assessment process for the management information system program. The design of the modules follows the best practices of the MIS field.

In addition to the invaluable new learning experiences gained by all business students, another set of students will benefit tremendously from the project. Management information systems and business computer information systems students have been creating and will continue to create both client-side applications and server side support modules in capstone courses. The knowledge gained by those students will increase their employability as well.

Through the project, business faculty has gained and will continue to gain an appreciation of how a truly integrated business computer technology platform operates. They will be able to pass that knowledge on to students. They also will be motivated to create interdisciplinary case studies for use in their classes and by other faculty. Furthermore, they will be able to document improvements in teaching and learning.

From the period of 1992-2000, a few selected students created a number of free-standing applications utilizing the MUIES database. Advent of mature web-based technologies then allowed a more seamless integrated approach. Hence, in the fall 2001 semester, a group of students engaged in a project that proved the workability of the concepts that form the basis for this proposal. In spring 2002 semester, a second group of students engaged in a project to design and build a prototype of user interfaces for applications that eventually will be used in beginning accounting classes. In spring 2003, a third group of students are refining the basic accounting prototype and adding a marketing research application that can be used in introductory marketing classes. In all cases, the students are supervised by faculty.

At the end of the spring 2003 semester, there exist five user modules for basic accounting and a sixth user module for marketing research. The five accounting modules are general ledger and financial

statements, sales and customer accounting, purchases and vendor accounting, payroll and employee accounting, and inventory control. Presently, the six modules are relatively simplistic in nature, but demonstrate that the concepts at the core of this project are achievable. Future classroom applications will be created using those six and other modules.

Students created modules using a variety of tools. The MUEIS database is housed on a Pentium 5 server employing SQL Server. From the overall MUEIS database, subsets are created for each student or faculty user for each application in each course, using a combination of SQL and MS Access. Those individualized database subsets and user modules are housed on a client-side Pentium 5 computer and are created using Dream Weaver or similar web-page authoring tools. Security, individual account space monitoring, and interface modules are created using ASP and XML. Database updates and queries are handled through MS Access and exports for other proprietary software applications are provided in MS Excel format. Both servers are connected to the campus network which in turn is connected to the Internet. This allows access by students and faculty from any location on any workstation that has an Internet connection.

Over the next three academic years, those six basic modules will be expanded and refined, additional modules will be added, and all modules will be tested through implementation in respective business courses. Also, additional faculty from other disciplines and universities will be trained so that they can participate in the project in their respective fields and locales. During subsequent phases of this project, these authors will study other similar packages. As noted above, other efforts have been either too simplistic or too complex. Nonetheless, those proprietary packages most likely contain features that can be incorporated into future versions of the applications created by this project.

Annually, the status of the project will be presented at appropriate scholarly conferences. As the project matures, the applications created will also be demonstrated at similar conferences. The project processes and results will be documented into articles to be peer refereed. This will insure the quality as judged by the academic community. The ultimate evaluation of the project will be in terms of the effectiveness of the use of the applications created. First will be the use of the applications by students within accounting/marketing classes in the original college. Second will be use at another institution.

In the long run, the project is intended to have impact upon the employability of graduates. This college surveys its graduating seniors and its alumni annually. The survey will be expanded to measure enhanced employability.

CONCLUSION

The ideal is to blend information technology into each and every course in the core business curriculum, so graduates will be better prepared. The key is access and manipulation of a comprehensive, realistic database [3]. The project described in this paper will accomplish that. This project will also encourage faculty to teach their respective disciplines in a manner that integrates all disciplines through application of IT. The success of such a project can only be determined through appropriate assessment. The Periodic survey of students, alumni and businesses should provide feedback to determine whether the efforts are successful. Portability to other educational institutions is possible due to similar core courses.

REFERENCES

(Available on request)