

DEVELOPMENT AND IMPLEMENTATION OF A MINOR IN ENTERPRISE TECHNOLOGY

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Abstract: This paper discusses the process of developing and implementing an academic minor in Enterprise Technology at the University of Wisconsin-Stout. Included is a history of UW-Stout computing, the development process including a brief review of relevant literature and the documentation for the approved minor in Enterprise Technology. The paper concludes with a look at the effective use of advisory committees and external stakeholders in program operations and the importance of student centered learning and personal learning strategies.

Introduction

The University of Wisconsin-Stout (UW-Stout) is located in Menomonie, Wisconsin, a comprehensive, career-focused polytechnic university where students, faculty and staff use applied learning, scientific theory and research to solve real-world problems. The total enrollment is approximately 9,350 students, with slightly over 8,300 undergraduate students; the remainder of the students are enrolled in masters and educational specialist programs. UW-Stout has embraced using computers to enhance organization efficiency and effectiveness (University of Wisconsin-Stout, 2013).

History of UW-Stout Computing

UW-Stout has implemented various computer systems over the years, beginning with an IBM batch process computer that was shared among UW-Stout, UW-River Falls and UW-Eau Claire. In 1968, UW-Stout acquired an IBM 1130. In 1973, UW-Stout installed a Digital Equipment Corporation (DEC) PDP-11/40 computer. In 1983, Stout moved to DEC VAX/VMS and began a campus-wide networking project. UW-Stout continued to expand its networking in the early 1990's, and this led to an expanded campus-wide networking (Huang, 2000).

In 1995, UW-Stout became one of the first universities in Wisconsin to implement an integrated database system, Datatel. The Datatel system was phased out in 2010, with the completion of the PeopleSoft implementation. In 2005, UW-Stout implemented ImageNow to eliminate paper filing. In spite of a concerted effort to move to a digital campus, many paper and electronic processes are not yet automated (Dahal & Schlough, 2011).

In addition to administrative computing, UW-Stout has a long history with computing as a part of degree program curriculum. In the early nineties, the College of Technology, Engineering and Management began to develop curriculum around a Computer Integrated Manufacturing (CIM)/Computer Integrated Enterprise Model (CIE) (R. Meyer, personal communication, January 3, 2013) (B. Siebold, personal communication, January 3, 2013).

UW-Stout was the first university in the State of Wisconsin to require undergraduates to possess personal computers by providing laptop computers for all undergraduate students, along with campus-wide wireless connectivity. The process of laptop computer implementation began in the fall of 2000 with a pilot project. Beginning in the fall of 2002, all new freshmen received laptop computers, with all on-campus undergraduate students possessing a laptop computer by 2005. The laptop computer, as well as accessories and services, is paid through tuition fees (Schlough, 2001).

In summary, the University of Wisconsin-Stout has a long history with the use of computing. Specifically, the value of Enterprise Information Systems supporting internal business processes is observed. The relevance of Enterprise Information Systems for various degree offerings becomes the focus and opportunity in future curriculum development.

Opportunity

This paper describes how members of the Apparel and Communication Technologies Department (ACT) incorporated Enterprise Information Systems into UW-Stout curriculum. Over the past seven years, the ACT Department has supported a minor in Information and Communication Technologies (ICT). Based largely on recommendations from stakeholders, the decision was made to split the broad-based minor in ICT into two more clearly delineated minors. The focus of this paper is on one of the newly developed minors; Enterprise Technology.

Development Process

Enterprise Technology, and similar enterprise information systems, is not new to UW-Stout. According to former College of Technology, Engineering and Management dean Bruce Siebold (personal communication, January 3, 2013), the beginning use of IBM 400 and Mapix software was successfully integrated into the Computer Integrated Manufacturing (CIM) curriculum in the early 1990's. While this development was positive, various challenges prevented full utilization including complexity of software, scale of the systems development project, newness of the system and push back from faculty who had no room in their curriculum to integrate new systems (R. Meyer, personal communication, January 3, 2013). Until only the recent past, most applications of Enterprise Technology at UW-Stout were largely conceptual with some stand-alone software applications used to give students technical experience (i.e. Microsoft Excel).

Others in higher education who have valued the use of Enterprise Technology have had similar curriculum goals and implementation challenges. The following are examples found in current literature:

Florida International University's College of Business Administration (CBA) realized that providing an Enterprise Technology experience for both undergraduate and graduate students provided relevant value and was in demand from industry stakeholders. Instead of a traditional business curriculum that emphasized isolation through functional units (i.e., accounting, marketing, finance), CBA curriculum was redesigned to focus on integrated business processes. Supporting the integrated business process approach would be an Enterprise Technology system established through university funded IT infrastructure and the SAP University Alliance. The curriculum in the CBA was designed with a balance between the concepts of contemporary business and progressive experiences with the SAP Enterprise Technology. The challenges experienced by the CBA of Florida International University implementing Enterprise Technology included factors related to cost, training and incentive for faculty and general resistance to curricular change. Proper systems development project management was also emphasized as vital to the success of implementing Enterprise Technology into curriculum (Becerra-Fernandez, Murphy, & Simon, 2000).

University of New Brunswick's Faculty of Business created a capstone course that integrated e-business concepts with an Enterprise Technology system. As with the previous article (Becerra-Fernandez, Murphy, & Simon, 2000), a balanced use of business process concepts with the use of Enterprise Technology was deemed as value-added to the students taking the course. Recommendations noted that adopters of Enterprise Technology systems should not underestimate the planning and preparation needed to get up and running. In addition, due to a lack of curriculum materials for use with Enterprise Technology, educators could expect a significant time investment to build their own materials (Davis & Comeau, 2004).

Victoria University in Australia created an ERP eLearning Model to aid in the development of online Enterprise Technology curriculum. Hawking & McCarthy identified the value of / demand for Enterprise Technology skills / knowledge for Victoria University graduates, as well as students who would gain access to Victoria University online course and program offerings. Similar challenges of developing Enterprise Technology curriculum for on-line learning environments were identified and are much the same as challenges identified in other Enterprise Technology literature. The added challenge, from the perspective of Hawking & McCarthy, reflects the challenges of creating an effective Enterprise Technology on-line learning environment (Hawking & McCarthy, 2004).

Based largely on the UW-Stout special mission as Wisconsin's Polytechnic University (Wisconsin's Polytechnic University, 2012) and the relevance of Enterprise Technology experiences for UW-Stout graduates, the ACT Department decided it would lead in the development of Enterprise Technology course and program offerings.

The first step was to decide where Enterprise Technology best fit into current curriculum. Since the ACT Department has traditionally served the information communication technology (ICT) needs of the Business Administration degree program, it was decided that the course Office Automation Technology (ICT 305 / 505) would be integrated with Enterprise Technology. Office Automation Technology (ICT 305 / 505) was first developed in the early 1980's, to serve the emerging demand for Business Administration graduates to effectively use computing technologies for business purposes. Implied by the name, the computing technologies emphasized in Office Automation Technology (ICT 305 / 505) were what were currently used in the modern office settings. The plan was to revise Office Automation Technology (ICT 305 / 505) to represent an enterprise perspective and incorporate Enterprise Technology experiences. The revised course, Information Systems for Enterprise (ICT 305 / 505), was approved by the campus curriculum committee in May of 2011 and ready for offering in the fall of 2011.

Information Systems for Enterprise (ICT 305 / 505) was an ideal course to first integrate Enterprise Technology. Most of the original course objectives and prior course materials supported applied information systems. The challenge of providing an Enterprise Technology experience was to implement a solution that would give students an appropriate technical experience. Most technical experiences at UW-Stout are generally focused on use of software suites such as the applications of the Microsoft Office or the Adobe

Creative Suite. While software suites applications are valuable, they are by nature isolated by their primary functionality. Hence, the desire to provide an Enterprise Technology experience that represents a holistic, integrated enterprise perspective.

The next decision was to choose the Enterprise Technology to include in Information Systems for Enterprise (ICT 305 / 505). Microsoft Dynamics CRM was selected as well as becoming a member of the Microsoft Dynamics Academic Alliance (Microsoft Dynamics Academic Alliance, 2013). The factors leading to these choices included:

- Lower Cost. The cost to be a member of the Microsoft Dynamics Academic Alliance is very low. The Enterprise Technology software was given at no charge, as well as access to training and support. Most expenses for the ACT Department have come in the form of hardware, networking infrastructure and time. In addition, budget cuts to funding for universities in the State of Wisconsin made being a member of the Microsoft Dynamics Academic Alliance the only reasonable option.
- Microsoft IT Academy. The UW-Stout BS in Information Technology Management was a new participant in the Microsoft IT Academy. There was a familiarity with academic partnerships sponsored by Microsoft.
- Familiar Interface. UW-Stout has a long history with using Microsoft products. It made sense to leverage the familiarity of the familiar Microsoft user interface.
- Industry Partnerships. This element of the Microsoft Dynamics Academic Alliance fit well with UW-Stout’s focus on working with industry stakeholders to develop and deliver relevant curriculum that prepares students for careers. Technical support for implementation of Enterprise Technology systems was also a valuable element of the relationship with an industry partner. SVA Professional Services of Madison, Wisconsin was the industry partner the ACT Department selected to work with (SVA Professional Services, 2013).

The successful use of Microsoft Dynamics CRM as an Enterprise Technology in the Information Systems for Enterprise (ICT 305 / 505) course was a logical step to the incorporation of greater Enterprise Technology program offerings. Further discussions with ACT Department faculty and staff and recommendations made by advisory board members led to a proposal to revise the minor in Information and Communication Technologies (ICT) into two distinct minors. The minor in Enterprise Technology was approved by the ITM / ICT Advisory Committee during its December 2013 meeting. Final campus approval was given by the AAAT committee on Tuesday, January 8, 2013. The minor in Enterprise Technology is available to UW-Stout undergraduate students starting in the fall of 2013.

Minor in Enterprise Technology

Information and Communication Technologies (ICT) is an umbrella term that is not always clearly understood by prospective students and stakeholders. The minor in Enterprise Technology (as well as the minor in Web Technology) would better define the skills / knowledge focus of the minor. Along with clarity of naming, the minor in Enterprise Technology will be a valuable additional credential for a wide variety of UW-Stout majors, not limited to undergraduate degrees in: Apparel Design and Development, Business Administration, Graphic Communications Management, Information and Communication Technologies, and Retail Management.

The objectives for the minor in Enterprise Technology are:

1. Examine the history, current uses and future of enterprise technology.
2. Examine the impacts enterprise technology has on individuals, organizations and the global community.
3. Use planning processes to design and develop business-prudent enterprise technology solutions based on clearly identified needs/goals.
4. Use contemporary enterprise technology that supports contemporary business processes.
5. Identify relevant policy, regulatory issues and international / national standards that affect the use of enterprise technology.

The intended markets for the minor in Enterprise Technology are existing students at UW-Stout including but not limited to students in Apparel Design and Development, Business Administration, Graphic Communications Management, Information and Communication Technologies, and Retail Management. Advisory Boards for all the aforementioned majors have expressed an interest in Enterprise Technology. The minor in Enterprise Technology would also help recruit new students to UW-Stout, as there is high demand for graduates with the skills / knowledge represented by the minor.

Core Requirements (18 Credits)	Credits
Information and Communication Technologies (ICT-103)	3
Information Systems for Enterprise (ICT-305) <i>PRE: ICT-103</i>	3
Collaborative Computing (ICT-309) <i>PRE: ICT-103</i>	3
IT Policy & Audit (ICT-401) <i>PRE: ICT-103 and BUACT-206</i>	3

Enterprise Technology Seminar (ICT-405) <i>PRE: ICT-305, ICT-309 and BUACT-206</i>	3
Introduction to Financial Accounting (BUACT- 206) <i>PRE: Sophomore level or higher</i>	3
Choose ONE of the Following Courses	
Production And Operations Management (INMGMT-200) <i>PRE: STAT-130, STAT-320 or STAT-330</i>	3
337) Procurement, Sourcing And Supply Chain Management (BUSCM- <i>PRE: BUMKG-330</i>	3
TOTAL CREDITS	21

The Effective Use of Advisory Committees and External Stakeholders in Program Operations

As mentioned previously, the impetus for creating the minor in Enterprise Technology came primarily from stakeholders via advisory committees. The University of Wisconsin-Stout uses advisory committees as a means to obtain input for program development and operation. Directors of professional academic programs will share best practices to work with and engage with professionals in the field that result in active, relevant and meaningful work that systematically improves program curriculum and operations. The use of advisory committees in Career and Technical Education programs has been a practice guided by federal legislation to, in part, ensure that what is being taught in secondary and postsecondary institutions meets the needs of the labor market. The University of Wisconsin-Stout, Wisconsin's Polytechnic University, has historically used advisory committees to develop programs and maintain relationships with program stakeholders. The university offers professional programs that lead to employment in business, industry and education. By engaging professionals in the field with program operations, directors are able to ensure curriculum is meeting the needs of present and future labor markets. This unique approach has resulted in consistently high employment for graduates of the university, as well as significant external stakeholder support for the programs.

Before the minor in Enterprise Technology went through the final campus curriculum approval steps, the ICT / Information Technology Management (ITM) advisory committee reviewed the proposed minor and provided feedback at not only the level of the courses in the minor, but also at the level of specific conceptual and skill outcomes. The advisory committee affirmed the value of the minor in Enterprise Technology.

Student Centered Learning and Personal Learning Strategies

The reality of using Enterprise Technology, or any software, hardware or other technology, is skill training. Past models of skill training have focused on the traditional training model that put the responsibility on the stand-up trainer to know all and do all to bring about the desired skills in the trainees. While the traditional training model has a place, it doesn't fit well with the ever changing nature of Enterprise Technology applications. Student-centered learning strategies need to be incorporated into curriculum to help students become adaptable to the necessity of rapid change in Enterprise Technology and all computer-based technologies they are likely to encounter during their careers (Cullen, Harris, & Hill, 2012). This philosophy of teaching and learning includes the on-line learning environment where self-directedness is needed for student success (Palloff & Pratt, 1999).

An outcome of curricular strategies to create a student-centered learning environment is the notion of students taking the initiative to develop their own personal learning strategies (PLS's). PLS's are those informal learning strategies that are developed, managed and controlled exclusively by the individual. Those individuals who have well developed PLS's tend to be more adaptable when facing change (Sveum, 2010). While people may have distinct learning preferences, the ability to develop diverse PLS's is possible when aided by the vast amounts of information available today through the Internet and the evolution of search engine technologies from organizations like Google and Microsoft (Friedman., 2007) (Overview of Microsoft Dynamics E-Learning, 2012). Specifically related to the opportunity with the minor in Enterprise Technology, curriculum in the courses tends to be student-centered with an emphasis on the development of PLS's for the students.

Summary

This paper discussed the process of developing and implementing an academic minor in Enterprise Technology at the University of Wisconsin-Stout. Included was a history of UW-Stout computing, the development process (including a brief review of relevant literature) and the documentation for the approved minor in Enterprise Technology. The paper concluded with a look at the effective use of advisory committees and external stakeholders in program operations and the importance of student centered learning and personal learning strategies.

As stated by UW-Stout Microsoft Dynamic's industry partner John Baltes of SVA Professional services, "We are looking for college graduates who are curious about learning, creative problem solvers who are able to adapt to inevitable change and have a solid foundation in technical skills. The demand for college graduates of this skill and mind-set is high. The supply is low" (J. Baltes, personal communication, January 18, 2013).

The minor in Enterprise Technology is a step in the direction of providing the kind of college graduates who are curious, creative problem solvers, adaptable to change and technically sound. The minor also meets stakeholder identified needs related to use of Enterprise Technology in both private and public organizations. The special mission of UW-Stout is met as "... students, faculty and staff use applied learning, scientific theory and research to solve real-world problems" (Wisconsin's Polytechnic University, 2012, ¶. 2).

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