Introducing Practical Hands-on ERP Labs into Curriculum: Two Cases of Junior Faculty Championing ERP Teaching Initiatives

Thomas L. Ngo-Ye
Assistant Professor of CIS
Department of Computer Information Systems
College of Business Administration
Alabama State University
915 S. Jackson Street
Montgomery, AL 36101
Phone: (334) 229-5729
tngoye@alasu.edu

Abstract: Many schools plan to incorporate hands-on ERP labs into curriculum to prepare students for the job market. The author provides a unique perspective—a junior faculty championing ERP teaching initiatives and adopting a descriptive case study methodology for two empirical cases. This study makes several contributions. First, examining the cases from a project management perspective, the success of ERP teaching initiatives relies on necessary financial resources and senior management support. Second, the paper illuminates the concerns and decision process of college Information Technology (IT) toward hosting ERP server in house. Third, a junior faculty can accomplish the objective of incorporating hands-on ERP labs by building broad alliances and taking an incremental three-step strategy.

Keywords: ERP teaching initiatives, SAP, Microsoft Dynamics CRM, Microsoft Dynamics AX, Junior faculty, Project management perspective

INTRODUCTION

Many companies use customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) to run their businesses. Currently, a strong market demand exists for college graduates with practical ERP/CRM skills. Hence, many schools prepare students for the job market by attempting to incorporate hands-on ERP/CRM labs into curriculum. Several useful studies offer ERP/CRM curriculum packages (Chen & Lee, 2013; Kim & Kim, 2014; Massart, 2014). However, researches have under-investigated the important issue of how to initiate ERP/CRM teaching program. This study approaches the issue from the lens of project management (Vaidyanathan, 2013). First, the study addresses the two critical factors of financial resources and senior management support. Second, the paper explores the role of college Information Technology (IT) department in ERP/CRM initiative. Third, the study considers the support from senior faculties and peers. This study examines these three aspects in a unique context, where a junior faculty leads ERP teaching initiatives. Adopting a descriptive case study methodology, I report two cases of ERP teaching initiatives based on my firsthand experiences. By sharing the lessons learned, the paper contributes to our understanding of why some ERP initiatives fail/succeed and suggests a doable strategy to move forward ERP teaching initiatives.

The paper is organized in the following matter. First, I introduce the background information of ERP/CRM, the need to teach practical ERP/CRM, and relevant studies of teaching ERP/CRM. Next, I present two empirical case studies. Then I discuss important lessons learned. Finally, I conclude the paper.

BACKGROUND

Since 1990s, many big and medium-sized companies in the U.S. have implemented integrated enterprise information systems, such as CRM and ERP (Hingorani, Beasley, & Bradford, 2015; Kroenke & Boyle, 2016). If implemented

right, ERP can mitigate the information silo problem and connect different business functions with a shared central back-end database (Kroenke & Boyle, 2016). ERP implementation may benefit organizations through improved user productivity, effectiveness, and internal efficiency (Lotfy & Halawi, 2015).

Nowadays the entry level IT job market is becoming increasingly competitive. Because so many firms are implementing, enhancing, upgrading, and maintaining their ERP systems, business process and ERP knowledge are critical skills that companies look for when hiring new college graduates (Dunaway, 2015). Compared with graduates who have only theoretical knowledge of CRM/ERP, students with practical experience in a CRM/ERP software package have a clear advantage for IT job hunting (Chen & Lee, 2013). Therefore, to satisfy the growing industry demand for ERP talents, many schools are incorporating ERP content in their curriculum to better prepare graduates with marketable ERP skills for the real-world (Dunaway, 2015; Hingorani, Beasley, & Bradford, 2015).

Many small firms use QuickBooks to run their businesses. Because QuickBooks is more easy-to-use and intuitive than SAP, a QuickBooks tutorial was used to enhance student learning of SAP configuration (Hingorani, Beasley, & Bradford, 2015). However, small firms running on QuickBooks may one day outgrow the capability of QuickBooks and realize that the enterprise level ERP at the next level is really costly (Florentine, 2013). To avoid the expensive upgrade to a more sophisticated ERP system, many growing firms end up dealing with disconnected and complex piecemeal systems – finance, inventory, purchasing, sales, payroll, and web front store and online ordering (Florentine, 2013).

As SAP is one of the leaders in the global ERP software market, many schools attempt to teach students SAP. The SAP University Alliances assists higher education institutions to prepare students with SAP skills by providing free SAP software for teaching and free faculty training on SAP software (Hingorani, Beasley, & Bradford, 2015). Moreover, a lot of SAP curriculum materials are shared through the SAP University Alliances program and are made available to member schools (Hayen, 2015). According to SAP, more than 2,650 member institutions in over 90 countries are part of the SAP University Alliances Network in 2016. However, schools need to pay an annual membership fee to remain in the SAP University Alliances Community to enjoy the above benefits (Chen & Lee, 2013). The annual membership fee is now $8,000 for a school in the U.S. Many of the SAP curriculum materials are largely keystroke oriented step-by-step tutorials for various business process transactions (Hayen, 2015). Some students regard a SAP course merely as a mouse-clicking exercise and concentrate on finishing lab assignments as fast as possible without deep understanding (Hingorani, Beasley, & Bradford, 2015).

Given the importance of business processes and ERP, faculties do teach these contents by focusing more on concept and principle, often with case study teaching method, than on practical aspects (Chen & Lee, 2013). For the "Principle of Management Information Systems (MIS)" course, "Experiencing MIS" (Kroenke & Boyle, 2016) is an excellent undergraduate-level textbook. In this textbook, chapter 2 introduces business processes, and chapter 7 discusses enterprise information systems. Moreover, chapter extension 9 covers ERP systems, and chapter extension 10 covers Supply Chain Management (SCM). For the "Project Management" course, a popular textbook – "Project Management: Process, Technology and Practice" (Vaidyanathan, 2013) – has a running case study, "SAP Project at NIBCO, Inc.", from chapter 1 to chapter 12. Case study teaching method was used to engage business students in learning management information systems (MIS) in a relatively realistic way and was shown to effectively motivate students to learn relevant concepts in MIS (Ngo-Ye & Choi, 2014).

Microsoft is another top ERP vendor. Microsoft Dynamics AX, among Microsoft's five ERP products, has the most capabilities and generates the most of the revenue (Kroenke & Boyle, 2016). As a true ERP product for bigger companies, AX is mainly used in manufacturing industry and is very popular in Europe (Kroenke & Boyle, 2016). Microsoft Dynamics CRM is largely a CRM product, offered online as software as a service (SaaS). Dynamics CRM can be customized and extended in ways that enable clients to use it as a platform for custom ERP solutions (Kroenke & Boyle, 2016). Microsoft Dynamics GP, as a general-leger software, is easy to use and can be used as a platform for simpler ERP solutions (Kroenke & Boyle, 2016).

While conceptual knowledge and case studies are useful, a recent study on training students CRM concludes that both theoretical and technical aspects are necessary when running a successful CRM training program (Lee, Lee, Chung, & Chen, 2014). Moreover, many students in general believe that using practical software to learn Business Process Management (BPM) concepts is beneficial (Chen & Lee, 2013). While the value of technical and practical aspects of

ERP software training is generally acknowledged among faculties, in reality only a small number of faculties provide hands-on exercises using real ERP/CRM software (Chen & Lee, 2013). Chen and Lee (2013) offers three potential explanations for this paradox. First, setting up CRM/ERP software all by faculties themselves is very time consuming. Second, very few step-by-step, hands-on materials are available in the market for teaching CRM/ERP software. Third, in research universities, spending too much time on teaching instead of conducting research is generally regarded as an unwise strategy for untenured faculties.

To address the issue of lack of step-by-step, hands-on materials for teaching CRM/ERP software, several recent published research papers generously shared their detailed CRM/ERP curriculum packages with helpful tips for instructors. Microsoft Dynamics CRM program as a tool was used to enrich the content of BPM/SCM courses to help students to better understand the practical side of BPM/SCM (Chen & Lee, 2013). Microsoft Dynamics GP 2010 R2 was employed for an ERP course exploring various ERP topics, such as TQM, BPR, DRP, SCM, as well as detailed system development and implementation issues of Microsoft Dynamics GP 2010 R2 (Kim & Kim, 2014). Another curriculum package integrated Microsoft Dynamics AX 2012 into an undergraduate senior-level course and offered course objectives, course description, student assessments, resources, and a tentative schedule (Massart, 2014). The above three curriculum packages reported in the literature serve as useful CRM/ERP curriculum models. Moreover, a recent study provided valuable insights on how to improve CRM training manual by applying proper user satisfaction survey (Lee, Lee, Chung, & Chen, 2014).

Many business school students do not possess knowledge about business processes and ERP. Introducing students these topics in a way that they can understand and supplementing conceptual discussion with practical hands-on software labs are important (Magal & Word, 2009). In many business schools, besides a Computer Applications (Microsoft Office) course, at most only one MIS course is required for all students. Therefore, this required MIS course is particularly critical for Information Systems (IS) faculties to impart important IS knowledge. Some faculties applied "The Last Lecture" (Pausch & Zaslow, 2008) spirit to this required MIS course as many business students would never take a second MIS course (Ngo-Ye & Park, 2014). Faculties teaching such required MIS course may ponder the practical question: "if this is our last lecture, what should we do to provide the most valuable information on MIS to most students?" Introducing students with theoretical and practical/technical ERP knowledge should be on the top of the list.

While incorporating practical hands-on ERP activities into MIS curriculum is challenging, junior faculties understandably face additional hurdles. Freshly minted PhD graduates and junior faculties confront a lot of challenges at the beginning stage of their professional career (Larson, Nelson, & Carter, 2015). Given the demanding new responsibilities of teaching multiple subjects, advising students, providing various services to their school, college, as well as community, and producing quality research publications, finding time to learn new technical skills and bringing in fresh subject content to classroom teaching beyond latest textbooks are very challenging for junior faculties (Ngo-Ye & Baxter, 2015).

EMPIRICAL CASES

In this section, I present two cases where I undertook initiatives to introduce practical SAP and Microsoft Dynamics hands-on labs into curriculum. The cases chronically document important events, actors, actions, and outcomes as the journeys unfolded. More importantly, critical thought processes and rationales are explicated. In terms of research methodology, I employ the descriptive case study approach, while trying to be as objective as possible in the reporting. Not only relying on my personal memory, I also cross-reference archived documents such as emails, meeting notes, memos, contracts, forms, and proposals. The first-person account tends to reveal rich information about the topic studied. However, I do acknowledge its limitation of potential bias.

Case I – SAP Teaching Initiative

Because I had taken SAP courses and conducted research relevant to SAP when I was a PhD student, I was predisposed to the idea of using SAP as a technical tool to teach students ERP. In September 2013, as a junior faculty, I suggested to several faculties to start a SAP teaching initiative. I argued that SAP would add value to our students in terms of valuable practical technical skills and enhanced career prospect in medium and large companies. I cited that several schools joined the SAP University Alliances and implemented SAP curriculum. Therefore, I concluded that learning SAP gives our students an edge for their future career. I acknowledged that a college must pay a considerable amount of annual membership fee, $8,000, to remain in the SAP University Alliances program. Because the membership fee is so high, securing funding to teach SAP with hands-on SAP software labs would be challenging. Therefore, I suggested two obvious low-hanging fruits.

First, for the "MGIS 2201 – Fundamentals of Computer Applications" (Microsoft Office) course, a required sophomore-level course for all business students, I suggested that instructors might incorporate SAP hands-on labs as part of the curriculum. I recommended that faculties could consider the following textbook, "Essentials of Business Processes and Information Systems" (Magal & Word, 2009), which uses a simulated SAP environment. Magal and Word (2009) wrote this textbook for undergraduate business students taking the "Introduction to Information Systems" course. The exercises in the book was based on the SAP system. However, the authors simplified the real SAP system to an error-proof simulation version. The online exercises from WileyPLUS (publisher) complemented the book and offered a way to practice concepts presented in the book. Therefore, I thought that using this textbook might be a good starting point for teaching students ERP/SAP without committing to SAP and paying the SAP University Alliances annual membership fee. This textbook might be used as one of the required textbooks for the MGIS 2201 course.

Second, for the "MGIS 3351 – Management Information Systems" course, a required junior-level course for all business students, I suggested that instructors might incorporate SAP as part of the curriculum. I recommended faculties to consider the following textbook – "Processes, Systems, and Information: An Introduction to MIS" (Kroenke & McKinney, 2013). According to the textbook, chapters 5-8 describe structured business processes and related information systems as well as information. Chapter 5 offers an overview of functional and cross-functional processes, while chapters 7 and 8 are the applied chapters, illustrating how SAP is used in two representative processes – procurement and sales. The appendices of chapters 7 and 8 comprise of process exercises that involve the SAP University Alliances' GBI simulation. Faculties from SAP University Alliances' member schools will be able to use these SAP exercises with their students, while faculties from non-member schools cannot use these SAP hands-on exercises. A newer edition for this textbook is "Processes, Systems, and Information: An Introduction to MIS (2nd Ed.)" (McKinney & Kroenke, 2015).

Somehow I did not receive any response from other faculties regrading to my proposal of the SAP teaching initiative. Multiple plausible reasons might account for this outcome. Some faculties might be interested only in real SAP software hands-on labs, not simulation of SAP software. Both the MGIS 2201 course and the MGIS 3351 course have multiple sessions with multiple instructors. To ensure course consistency, any curriculum change needs approval of all instructors involved before taking effect. As a junior faculty, I did not make a strong enough case to persuade other faculties to come along with my proposal to incorporate SAP content into curriculum.

In spring 2015, in an informal meeting, I brought up the SAP initiative again with the dean by stressing my expertise in SAP and willingness to lead the initiative. The dean explained to me that the school would commit financial resources to SAP only when many faculties show strong interests in SAP. Moreover, a tenured senior faculty would be expected to lead the strategic SAP initiative. Delegating such an important responsibility to untenured junior faculties is inappropriate.

From my first-hand experience of proposing the SAP initiative and the unexpected lukewarm reception, I learned very important lessons. I started with good intention to provide students hands-on experience with live or simulated SAP software to supplement theoretical discussion of textbook chapters on business processes and ERP. I did possess sufficient background knowledge from taking SAP courses and conducting research on SAP. However, good intention and adequate qualification alone are not enough for junior faculties to move forward a SAP initiative. First and foremost, to join the SAP University Alliances program, a school needs to commit at least $8,000 for the annual membership fee. Although SAP provides free faculty training, schools are still responsible for faculty travel expenses.

With so much money at stake, college administrations have to be very cautious to ensure error-proof return on investment. Therefore, the SAP initiative was put on hold while the school was waiting for more faculties getting on board. Moreover, due to a large amount of money at risk, schools cannot bet on inexperienced untenured junior faculties to champion and lead the program. Second, understandably untenured junior faculties are at a relatively weak position in terms of persuasion power, short on both political and social capital to introduce change in a school. While junior faculties themselves have minimum persuasion power, they could build working alliances with senior faculties who are sympathetic with their cause to maximize the impact. Looking back at my SAP initiative, I realized that I did not build broad alliances to support my proposal. These are precious lessons I learned. I would apply these lessons to the next initiative.

Case II – Microsoft Dynamics Teaching Initiative

Unable to move forward with the SAP initiative, I did not give up on the idea of incorporating hands-on ERP software labs into MIS curriculum. In May 2014, I attended the Midwest Association for Information Systems (MWAIS 2014) conference. In a casual conversation with a tenured associated professor, I learned that during her recent sabbatical leave, she just attended a Microsoft Dynamics training. She was very positive about Microsoft Dynamics as an ERP product as well as the training. She strongly recommended that I should explore Microsoft Dynamics as an ERP teaching tool, because many small and medium size companies are using it. I also learned from her that Microsoft Dynamics is accessible for free for teaching. This social exchange planted a seed for the idea of undertaking a Microsoft Dynamics teaching initiative.

At the end of January 2015, I received an email from the Microsoft Dynamics Academic Alliance (DynAA) team inviting me to attend the "Applying Microsoft Dynamics AX in the University Classroom" instructor training in March 2015, in Atlanta, Georgia. This workshop was designed specifically for faculty members from higher education institutions who were considering or had already started to use Microsoft Dynamics AX in their curriculum. The training was free. I grasped this learning opportunity and attended the hands-on training from 3/12/2015 to 3/13/2015.

Knowledge Learned from the Microsoft Dynamics AX Workshop

During this two-day workshop, I learned basic operations of Microsoft Dynamics AX software and run through several applications. Each faculty was given a unique user name and password to create his/her own account (company) on the live AX server. I run a remote desktop application to connect to a virtual machine which runs the desktop version of AX client software. The client software communicated with the AX server software which is hosted in Cloud. With this training configuration, trainees could practice AX from any PC with Internet access, as long as they had the remote desktop configuration file and a valid login account and password. The AX training organizers gracefully made this remote access to AX client and server available for additional two more months beyond the end of the workshop.

During the training breaks, I strategically engaged in conversions with faculties who already incorporated Dynamics AX/CRM into IS curriculum. From them, I learned valuable insights. I learned that many medium size companies and even some large companies are migrating to Microsoft Dynamics AX systems. Moreover, I heard a successful student job placement story. Because the student was trained on Microsoft Dynamics at Duquesne University and the university had a close working relationship with a Microsoft Dynamics partner, the business school graduate landed a Microsoft Dynamics AX Functional Consultant job.

Regarding to where to host a Microsoft Dynamics AX production server for teaching, I learned that three different approaches were practiced. First, some schools did have an in-house ERP system for teaching. They hired a full-time or part-time IT staff dedicated to maintain an ERP system locally. Second, some schools outsourced the hosting of ERP system for teaching to a cloud service provider and paid fees for the hosting service at an ongoing base. Third, some faculties obtained funding to purchase hardware and then setup and maintained an ERP system for teaching all by themselves, without any assistance or involvement from the college IT department.

Microsoft representatives on the training site told me that a school could join DynAA for free. Once DynAA admitting a school as a member, DynAA would provide the school a free license for Microsoft Dynamics AX and CRM software

for teaching. Moreover, DynAA would provide members with free access to cloud-based Microsoft Dynamics CRM systems. Faculties would not need to setup their own course servers for teaching Dynamics CRM, because Dynamics CRM servers run by Microsoft were already hosted in the cloud and available for use by member schools. Moreover, faculties and students would not need to install any software to use online Dynamics CRM. As long as one had access to a computer with Internet connection, one could have hands-on experience with Dynamics CRM.

During the AX workshop, I learned about the "Journal of Integrated Enterprise Systems", which focuses on research and teaching of Enterprise Systems such as ERP and CRM. From the journal's website (http://clcloud.com/JIES/), I found many papers providing relevant and useful resources about teaching hands-on ERP/CRM labs. Chen and Lee (2013) suggest that because Microsoft Dynamics CRM is easy to understand and is available for free from DynAA, it is very appropriate for an introductory class. After students comprehend CRM, they can move up to a higher level to learn ERP, which is more complex. Therefore, beginning with Dynamics CRM is a good way for most faculties, who just start teaching BPM courses (Chen & Lee, 2013). Based on the information I gathered from the workshop, incorporating Microsoft Dynamics CRM into curriculum is much easier than integrating Microsoft Dynamics AX into curriculum.

Effort to Join DynAA

Because the workshop focused only on AX, no free running Microsoft Dynamics CRM instances were available for me to practice. I faced a practical dilemma. If I only introduced Microsoft Dynamics CRM in the proposing stage, I did not have a concrete live Microsoft Dynamics CRM instance to show to faculties, the administration, and students at the moment. On the other hand, I was well aware of the complexity of AX and the difficulty of obtaining a running AX course server. While DynAA offered CRM server instances in the cloud with free access for member schools, instructors had to host their own AX course servers to teach AX. The AX server instance used in the workshop was hosted in the cloud for a fee. I had three potential ways to obtain a running AX server instance for teaching. First, I might persuade the college IT department to setup and maintain an AX server instance in house to support teaching. I also needed college IT to install AX client software on college lab PCs. This might be an ideal solution for faculties, because college IT would take care of the technical work and faculties would just focus on teaching AX. Second, I might rent virtual machines from the cloud to run an AX server instance. However, this approach required ongoing financial resources, which could be costly. I was not sure where and how to secure a budget to pay for the recurring fee. Third, I might take a "Do It Yourself" approach by purchasing hardware, installing AX server and client software, and maintaining the AX system all by myself. In this approach, I needed to obtain an initial one-time startup fund to purchase hardware, because DynAA would provide AX software license for free. Because all three approaches required resources beyond my personal control (college IT labor, time, and hardware in the first approach, and financial resources in the second and third approaches), the AX teaching initiative had considerable amount of uncertainty. Therefore, I included both Dynamics CRM and AX in my proposal, while focusing on AX.

In the week after the AX training, I reached out to senior faculties who might be interested in Microsoft Dynamics to build alliances. First, I sought opinion from the only tenured faculty in the MIS area. She expressed her wholehearted support. She acknowledged that when she taught the ERP topic in her MGIS 3351 classes, all she could do was discussing ERP in theory. Some hands-on labs with a live ERP system would be a great benefit to students. She even promised to invite me to her class meetings to teach her students the hands-on part of ERP in the future. Next, I asked advice from a tenured faculty with Decision Science background. He demonstrated his enthusiasm for the idea by taking time to watch my live demonstration of AX through remote desktop application.

On 3/24/2015, I proposed to the associated dean and the dean to join DynAA, mentioning the strong support from two tenured faculties. I stressed that unlike SAP University Alliances, DynAA would not charge any annual membership fee. The dean gave me his approval. The dean also advised me to work closely with the college IT director on this Microsoft Dynamics teaching initiative, because the college policy mandated that all technology contracts should be approved by the college IT director.

On 3/26/2015, I visited the college IT director and presented the case to join DynAA. Regarding to my inquiry of whether college IT can setup, maintain, host, and provide its hardware for an AX server to support teaching, the IT director told me that college IT simply did not have additional resources to take on this new responsibility or a budget

to hire a new staff to maintain a new AX production server. Realizing clearly that college IT would not host and maintain an AX server, I suggested that faculties might purchase hardware for, install and maintain an AX server by ourselves. The director discouraged me in this direction. He explained that if the AX server was connected to the college local area network (LAN) and the AX server was compromised, other servers on the college network would be at great risk. Even if faculties installed a server without college IT's approval and awareness, ultimately college IT was still responsible for any damage done. I suggested that I could further secure an AX server by restricting access – only allowing computers on the college LAN to connect to the AX server. The director acknowledged that this would reduce risk. However, even so someone other than college IT still needed to perform the maintenance work. The director mentioned that the only network potentially permitted to host an AX server was the college's Wi-Fi network, where no college servers were hosted. Based on the conversation, the only slim chance to have a running faculty-maintained AX server was to place the server on the college's Wi-Fi network and at the same time restricting access. On the other hand, the director strongly recommended the second approach of third-party cloud hosting. He explained that if a third-party web application on the Internet was compromised, the college network would not be exposed at risk. The director cited a few faculties in our college using third-party off campus cloud hosted applications, such as GoDady (https://www.godaddy.com/), for teaching. He said that cloud service provider had better security measures, backup service, and disaster recovery plan. Regarding to the issue of which party (students, department, or college) paid for the third-party cloud hosting service, the director confided that he did not know who paid the fee. On 3/27/2015, the director sent me a follow-up email informing me that many companies offered Windows servers hosting at a reasonable price. He provided me an example that he found after doing a quick search on Google: http://www.hostgator.com/windows-dedicated-servers.

Regarding to my proposal to obtain Microsoft Dynamics CRM for teaching, the college IT director wanted a clear answer for the following question – does running Microsoft Dynamics CRM for teaching require a server on the side of the college? For this question, the DynAA workshop already gave me a clear answer. However, the IT director preferred an answer that came directly from the authority (DynAA employees). Therefore, on 4/7/2015, I sent an email to the DynAA contact person to seek clarification on this issue. On the same day, I received a reply confirming that DynAA was offering CRM online access for all members who would like to use the service for teaching and the online version was free. No CRM server or client software were needed to install on the college side. After obtaining the official confirmation email from DynAA, the college IT director approved my proposal to join DynAA. After all the technical and legal issues were resolved, the college IT director finally signed the DynAA contract on 4/9/2015. On 4/17/2015, I received an email providing access to obtain product registration keys (license keys) for Microsoft Dynamics AX Business Value and Microsoft Dynamics CRM On-Premise. At this point, I achieved the goal of bringing the college officially into DynAA.

Three-step Strategy for the Microsoft Dynamics Teaching Initiative

While working on securing the approval from college IT and the administration to join DynAA, I was also trying to persuade relevant shareholders to accept the Microsoft Dynamics teaching initiative. Based on lessons learned from my past SAP teaching initiative, I understood the importance of building strong and broad alliances to move forward the project. After obtaining support from two tenured faculties, and initial approval from the associated dean and the dean, I envisioned a long-term three-step strategy for implementing the Microsoft Dynamics teaching initiative. First, I aimed to communicate and advocate the value and importance of an ERP teaching program to students, faculties, and administrators. To do so, I utilized all possible venues, such as class meetings, MIS club meetings, and faculty meetings. At this initial stage, I placed special emphasis on engaging students. Then I could use students' interest to make a strong case to faculties and the administration. Second, when I am ready to teach Microsoft Dynamics AX/CRM, I would incorporate the hands-on labs into the appropriate classes that I teach. This is meant to be a pilot project to test out teaching methods and AX/CRM systems. I will gain real hands-on teaching experiences with AX/CRM and learn important lessons. Third, after succeeding with a pilot project, I will invite and support other faculties to incorporate AX/CRM into their courses in the future. The final goal is to realize the maximum teaching potential of Microsoft Dynamics AX/CRM.

In March 2015, during class meetings of my "Database Management" class and "Project Management" class, I shared with students what I learned from the AX workshop. I not only discussed the theoretical perspective of ERP/CRM,

but also demonstrated a live AX system by running several applications. The live AX server, provisioned by the workshop, was still remotely accessible at that time. Overall, students showed their interests in the live demo.

In addition to introducing students AX in my class meetings, I also sought broader student audiences through presenting at a MIS club meeting. On 4/14/2015, at a MIS club meeting, I presented a hands-on demonstration of Microsoft Dynamics AX 2012 by remotely accessing the AX server instance provisioned by the workshop. I introduced students the concept of ERP and the background information to use AX. I illustrated the usage of AX in several applications: financial accounting, supply chain management, human resource, and project management. I invited students attending the MIS club meeting to write short informal comments of their opinion on the ERP presentation. Here are a few examples of students' feedback.

> *I found the meeting to be very informational feel that Microsoft dynamics would be a very beneficial ERP system due to versatility and making information available at any computer. ERP systems are an amazing development due to the ability to be either stationary or mobile in information gathering.*
>
> *I enjoyed the presentation and illustration of Microsoft Dynamics AX 2012. This looks to be a great introduction to real world database systems that mid to large companies use to record their business operation. Many useful tools, functions and features integrated into one package.*
>
> *The MIS club meeting on April 14th, 2015 covered Microsoft Dynamics as an ERP software and it was a nice experience to see ERP software being utilized and listening to how it applies to an organization and its projects. The meeting made me question why a class centralized on ERP software such as Microsoft Dynamics doesn't exist at our college, as I think having knowledge of at least one ERP software would be very beneficial in the business world. Applying curriculum and lessons from lectures to an ERP software would be an enjoyable and educational experience.*

After getting students interested in AX, on 4/15/2015, I presented students' feedback as an evidence to the associated dean and the dean. I also requested to make a short presentation on Microsoft Dynamics AX and to discuss the possibility of introducing ERP/CRM into curriculum at the faculty meeting on the same day. The dean approved my request. On 4/15/2015, during the school faculty meeting, I explained to the faculties what ERP is and the value of ERP to businesses. I also demonstrated the live AX system provisioned by the workshop. The presentation was well received and many faculties expressed their interest. One faculty indicated that he preferred me providing face-to-face technical support when he would introduce Dynamics AX/CRM to his classes in the future. I expressed my interest in helping out. The dean suggested me to hold dedicated workshops to train faculties on Dynamics in fall 2015. By the end of this faculty meeting, I essentially accomplished the goal of the first-step of the strategy.

Hosting a Microsoft Dynamics AX Server for Teaching

While the AX server instance provisioned by the workshop served me well in multiple demonstrations to students, faculties, and the administration, I still needed my own AX server instance for the real teaching. On 5/18/2015, I found that I was unable to remotely access the AX server instance provisioned by the workshop. Based on the discussion with the college IT director, I knew that college IT did not have resources to setup and maintain an AX server for teaching. I also did not want to outsource the AX server hosting to a cloud service provider, because finding financial resources to pay ongoing fees might be more difficult. Thus, I explored the third option of obtaining a one-time fund to purchase hardware and then setting up and maintaining an AX server by myself. Due to security concerns, I planned to connect the AX server to the college Wi-Fi network, not the college LAN.

In spring 2015, the college solicited "Campus Enrichment Grant Proposals" from college employees. Each accepted proposal project could be allocated up to $500. I recognized that the grant was a great opportunity and consulted with two tenured faculties, who supported the Microsoft Dynamics teaching initiative. I also discussed my planned grant proposal with the associate dean and the dean. After obtaining their verbal approval, I drafted the proposal – "Build Server for Teaching ERP". On 4/1/2015, I finalized the Campus Enrichment Grant Proposal of Building Server for Teaching ERP. The dean reviewed the proposal and demonstrated his approval with his signature. Then I submitted the proposal to the college grant review committee. In the proposal, I wrote:

In fall 2015, I plan to incorporate Microsoft Enterprise Resource Planning (ERP) technology in two classes: 1) Project Management, 2) Systems Analysis and Design. I expect to have up to 90 students enrolled and they will benefit from hands-on exposure to ERP. This project is aligned with college Goal I – Increase Student Success, Objective 12 – increase faculty development opportunities and expectations for involvement with an emphasis on implementation of evidence-based pedagogy and effect. If funded, this project will enrich business curriculum with ERP technology. With the fund, necessary hardware pieces can be purchased for assembling a computer server to run Microsoft ERP software for teaching. Business students can have hands-on learning experience on ERP. Students will gain a holistic understanding of integrated business processes and interactions among different roles and departments. Learning ERP will help business students to be more competitive on the job market. Itemize expenses: 1) 2 Item Combo: AMD FX-8350 Black Edition Desktop Processor and GIGABYTE GA-970A-UD3P AMD Motherboard for $258.98. 2) G.SKILL Ripjaws X Series 32GB Desktop Memory: $244.99. Total: $503.97.

The hardware components' price quote was from http://www.newegg.com/ as of 3/31/2015. I understood that even if the grant proposal was funded, the $500 could only buy CPU, motherboard, and RAM. I still needed additional funding to purchase other hardware components such as hard drive disk, computer case, power supply, and Wi-Fi adaptor.

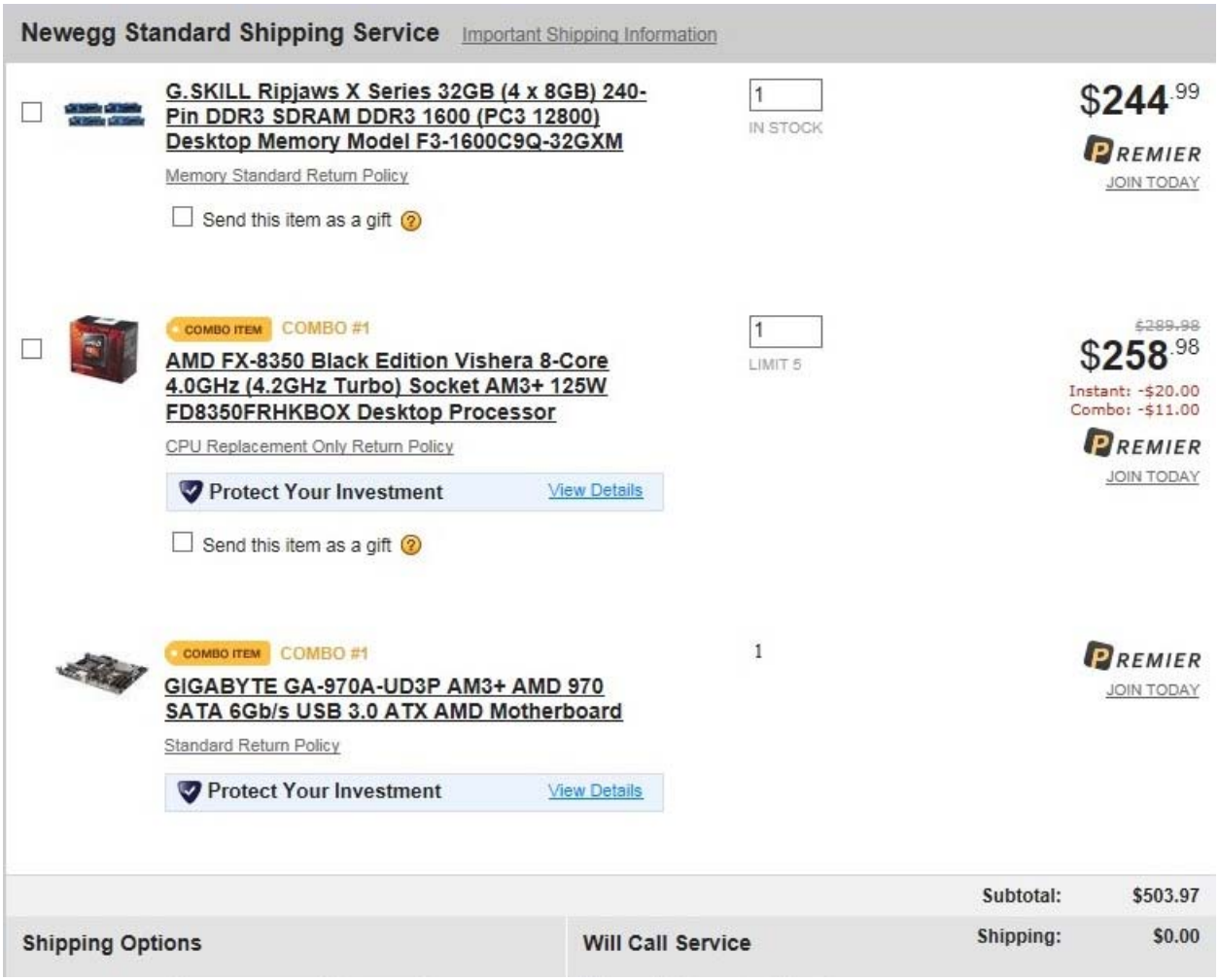

Figure 1: Hardware components price quote from Newegg.com

In May 2015, the college Campus Enrichment Grant review committee informed me their decision of declining to fund my proposal, citing the limited fund to be allocated to other more compelling proposals.

Closure of ERP Initiatives

In August 2015, I left the college for a new university. From professors at my previous college, I learned that the college dropped the Microsoft Dynamics teaching initiative after my departure. Instead the college went with SAP because the school hired a new senior professor, who was well trained with SAP. On the other hand, the new university has well established SAP/ERP curriculum. SAP content has already been well incorporated into multiple undergraduate and graduate level courses. "CIS 329 – Business Process Integration" is a junior-level course required for all business major students. Students get heavy hands-on experience with SAP. Given the similarity of SAP and Microsoft Dynamics, as well as the constraint of coursework hours, launching a new Microsoft Dynamics teaching initiative is not an immediate need at the new university. However, on 3/29/2016, while attending a local IT social event to help students networking and looking for jobs, I encountered an IT contractor working for the state government. He told me that he was part of a big project for state Medicare. He was doing web programming to integrate Microsoft Dynamics CRM. He recommended that I teach students writing code to interface and integrate CRM, especially Microsoft Dynamics CRM, in addition to general programming skills.

DISCUSSIONS

In the above sections, I reported two cases of introducing practical hands-on ERP software labs into curriculum. The hands-on ERP experience is very relevant to the job market and will be valuable to business students. I learn several important lessons that I believe to be generalizable to many schools considering incorporating hands-on ERP labs into curriculum. As reported in project management literature (Vaidyanathan, 2013), financial resources, other resources, and senior management support are critical to the success of ERP/CRM projects.

First, because of IS enrollment crisis and state budget cut, many schools are facing similar tight budget constraint. A SAP initiative requires significant financial commitment, beyond the financial capability of many small and medium colleges. While cloud-based Microsoft Dynamics CRM is freely accessible for DynAA member schools, a running AX production server for teaching is not freely available. Faculties need to secure reliable funding to pay ongoing hosting service fees to a third-party cloud service provider. Even if faculties are willing to setup and maintain an AX server by themselves, they still need to obtain funding for a one-time hardware purchase. Hence, to teach hands-on ERP, financial resources are indispensable.

Second, IT departments in many public universities are often understaffed and overworked, due to state budget deficit. Therefore, college IT departments simply cannot take on the additional responsibility of setting up and maintaining an ERP server for teaching. Because of information silo in organization and the sub-culture barrier, faculties may not have a realistic expectation from college IT departments. Just like faculties should think empathetically (Kroenke & Boyle, 2016) toward the administration's perspective, faculties should also think empathetically regarding to college IT's legitimate concerns and decision process. Faculties should show respect to college IT and construct and maintain a positive working relationship with college IT (Ngo-Ye & Baxter, 2015). In return, faculties will obtain maximum amount of support and cooperation from college IT.

Third, when a junior faculty champions and leads a strategic ERP teaching initiative, he/she has to overcome additional challenges. Because budget commitment is involved, whether to fund a practical ERP teaching initiative becomes a political decision. Junior faculties, by definition, are at a relatively weak position, lacking the necessary power, political and social capital in colleges, which are essential for change management and project management (Vaidyanathan, 2013). Administrators and senior faculties understandably may not have enough trust in junior faculties' knowledge, experience, and judgment. Junior faculties have to take time and be patient with earning precious trust and social capital from senior colleagues. Junior faculties need to always consult senior faculties and administration before action. Junior faculties should recognize that they cannot undertake ERP initiatives alone. To make ERP initiatives successful, resources beyond junior faculties' control are needed. An ERP initiative is inherently a social process, requiring approval from administration, cooperation from college IT, and support from fellow

faculties. Junior faculties should also seek peers' support and build broader alliances from colleagues, as well as engaging students in the process.

CONCLUSIONS

In this paper, I present a unique perspective – a junior faculty championing initiatives to introduce hands-on ERP labs into curriculum. I document and analyze two cases based on my firsthand experiences. This study makes several contributions. First, examining the cases from a project management perspective, this study shows that necessary financial resources and senior management support are paramount to the success of ERP teaching initiatives. Second, this study illuminates the concerns and decision process of college IT toward hosting an ERP server in house. This insight is useful for faculties planning where to host an ERP server for teaching. Third, this paper informs junior faculties what to expect realistically from administration, college IT, senior tenured faculties, as well as peers, when undertaking ERP initiatives. This study demonstrates that by building broad alliances and taking an incremental three-step strategy, junior faculties could overcome hurdles and accomplish the objective of introducing hands-on ERP labs into curriculum. While the two cases presented in this paper concern SAP and Microsoft Dynamics, the lessons learned are generalizable and can also be applied to other similar ERP products. I hope this study to be helpful for faculties, especially junior faculties and senior MIS PhD students – who are at their early stage of academic career, considering embarking the journey of incorporating practical ERP/CRM content into curriculum. I am currently exploring the feasibility of teaching students writing web programs to interface a CRM system, such as Microsoft Dynamics CRM. I would like to report the outcome and new lessons learned in a future study.

REFERENCES

Chen, K. L., & Lee, H. (2013, August 31). Using Microsoft Dynamics CRM for business process management: A curriculum package for business process management or supply chain management courses. *Journal of Integrated Enterprise Systems, 2*(1), 44-79. Retrieved May 28, 2016, from http://clcloud.com/JIES/V2N1/9_P015JIESV02.pdf

Dunaway, M. (2015). Teaching case: A situated learning approach to ERP role adaptation and business intelligence. *Issues in Information Systems, 16*(2), 195-208. Retrieved May 28, 2016, from http://www.iacis.org/iis/2015/2_iis_2015_195-208.pdf

Florentine, S. (2013, October 28). *ERP Comes to the Cloud and (Finally) Smaller Businesses.* Retrieved May 28, 2016, from CIO.com: http://www.cio.com/article/2381419/enterprise-resource-planning/erp-comes-to-the-cloud-and--finally--smaller-businesses.html

Hayen, R. (2015). Structured assignment pedagogy: An SAP enterprise software deployment. *Issues in Information Systems, 16*(2), 17-26. Retrieved May 28, 2016, from http://www.iacis.org/iis/2015/3_iis_2015_17-26.pdf

Hingorani, K., Beasley, B., & Bradford, J. (2015). Enhancing student learning of ERP configuration through a Quickbooks tutorial. *Issues in Information Systems, 16*(1), 132-141. Retrieved May 28, 2016, from http://www.iacis.org/iis/2015/1_iis_2015_132-141.pdf

Kim, G. C., & Kim, S. S. (2014, August 31). Using Microsoft Dynamics GP 2010 R2 for an enterprise resource planning course: A curriculum package. *Journal of Integrated Enterprise Systems, 3*(1), 39-85. Retrieved May 28, 2016, from http://clcloud.com/JIES/V3N1/9_JIESV3N1003.pdf

Kroenke, D. M., & Boyle, R. J. (2016). *Experiencing MIS* (7th ed.). Upper Saddle River, New Jersey, U.S.A.: Pearson.

Kroenke, D. M., & McKinney, E. (2013). *Processes, Systems, and Information: An Introduction to MIS.* Upper Saddle River, New Jersey, U.S.A.: Prentice Hall.

Larson, E. C., Nelson, M. L., & Carter, M. (2015). The first+ year information systems faculty experience. *Communications of the Association for Information Systems, 36*. Retrieved May 28, 2016, from http://aisel.aisnet.org/cais/vol36/iss1/32

Lee, S., Lee, H., Chung, S., & Chen, K. L. (2014, August 31). A study of training handouts and user satisfaction for customer relationship management (CRM) software. *Journal of Integrated Enterprise Systems, 3*(1), 86-97. Retrieved May 28, 2016, from http://clcloud.com/JIES/V3N1/10_JIESV3N1004.pdf

Lotfy, M., & Halawi, L. (2015). A conceptual model to measure ERP user-value. *Issues in Information Systems, 16*(3), 54-63. Retrieved May 28, 2016, from http://www.iacis.org/iis/2015/3_iis_2015_54-63.pdf

Magal, S. R., & Word, J. (2009). *Essentials of Business Processes and Information Systems.* Wiley.

Massart, J. N. (2014, August 31). Designing a Dynamics AX class: A curriculum package for an enterprise models course. *Journal of Integrated Enterprise Systems, 3*(1), 9-25. Retrieved May 28, 2016, from http://clcloud.com/JIES/V3N1/7_JIESV3N1001.pdf

McKinney, E., & Kroenke, D. M. (2015). *Processes, Systems, and Information: An Introduction to MIS* (2nd ed.). Upper Saddle River, New Jersey, U.S.A.: Prentice Hall.

Ngo-Ye, T. L., & Baxter, J. (2015). Faculty informal self-learning and ways to engage students. *Proceedings of the Southern Association for Information Systems Conference (SAIS 2015)* (pp. 1-6). Hilton Head Island, SC, U.S.A.: Association for Information Systems. Retrieved May 28, 2016, from http://aisel.aisnet.org/sais2015/34

Ngo-Ye, T. L., & Choi, J. (2014). Pre and post class case discussion: Engaging business students in learning management information systems. *Issues in Information Systems, 15*(2), 367-374. Retrieved May 28, 2016, from http://iacis.org/iis/2014/140_iis_2014_367-374.pdf

Ngo-Ye, T. L., & Park, S.-H. (2014). Motivating business major students to learn computer programming – a case study. *Proceedings of the Southern Association for Information Systems Conference (SAIS 2014)* (pp. 1-6). Macon, GA, U.S.A.: Association for Information Systems. Retrieved May 28, 2016, from http://aisel.aisnet.org/sais2014/26

Pausch, R., & Zaslow, J. (2008). *The Last Lecture* (1st ed.). Hyperion.

Vaidyanathan, G. (2013). *Project Management: Process, Technology and Practice.* Upper Saddle River, New Jersey, U.S.A.: Prentice Hall.

Acknowledgement

The author would like to thank Microsoft Dynamics Academic Alliance (DynAA) 2015 workshop for the informative training program. The author also thanks Georgia Regents University for its provision of remote access to the live Microsoft Dynamics AX server used in the workshop for an extended period of time.

Biographical Notes

Thomas L. Ngo-Ye is an Assistant Professor of CIS at Alabama State University. He received his Ph.D. in MIS from the Lubar School of Business, University of Wisconsin-Milwaukee, in 2011. His research interests are in data/text mining, sentiment analysis, e-Commerce, and enterprise information systems. His research has been published in *Decision Support Systems*; *ACM Transactions on MIS*; *International Journal of Intelligent Information Processing*; and *Issues in Information Systems*. He has also presented his research at premier IS conferences, including the

International Conference on Information Systems (ICIS), *Americas Conference on Information Systems* (AMCIS), and *Workshop on Information Technologies and Systems* (WITS).