

2016 Proceedings of the Nineteenth SAP Academic Conference Americas: Building the Talent of the Future for the Digital Enterprise

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2016 Conference Proceedings of the Nineteenth SAP Academic Conference Americas

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The Proceedings of The SAP North American Academic Conference 2016, the 19th Annual Conference, held February 16-18, at the Lowes Coronado Bay Resort, San Diego, California, USA.

The SAP Academic Conference Americas is the annual conference created exclusively for faculty in the SAP University Alliances network. It brings together SAP thought leaders, industry experts and educators from universities around the world. The event shares SAP's strategic direction and showcases opportunities to leverage SAP solutions and SAP University Alliances offerings to enhance students' academic and career outcomes.

Review Process: Abstracts were reviewed blindly by at least three independent reviewers and judged on their contribution to the field of Enterprise Systems and to the SAP Academic Community. Abstracts were either accepted, conditionally accepted, or rejected. The authors of accepted abstracts were required to address reviewer comments in the final version, and authors of conditionally accepted papers provided comments on their revisions to the conference papers chairs for secondary review and evaluation. If deemed necessary by the proceedings committee, resubmitted abstracts underwent a third review. Authors of accepted abstracts were asked to prepare an extended abstract for the proceedings. All authors were permitted to make final revisions to their extended abstracts for these proceedings.

Preface

While enterprise systems have been a foundation for many years, digital technologies and the Internet of Things (IOT) has provided new value-producing opportunities for organizations to move toward digital business (Gartner 2014). As academicians we continue to deploy current pedagogy and research surrounding enterprise systems but also strive to keep pace with the ever changing information systems and business landscape. The SAP academic conference provides a venue to share related research in progress and pedagogical advances from our peers. This year SAP has brought this important learning venue back to the North American conference.

These proceedings include extended abstracts submitted by SAP academic members from across North America. Submissions have been peer-reviewed and divided into one of three categories; research, teaching, or mentoring. Among the research and teaching submissions the abstracts represent both full presentations and poster presentations. The mentoring submissions are focused on both mentoring new members to the SAP university alliance and mentoring existing SAP university alliance members.

The research submissions are research in progress representing a mix of pedagogical research and traditional enterprise systems research. The pedagogical research includes the analysis of utilizing a MOOC on the openSAP platform for faculty training (*Léger, Lyle, Feldstein, Eyitayo, Michon, Babin, and Robert*), student success factors in an ERP course between online and flipped learning formats (*Bristow, Serrano, and Mullins*), and multidisciplinary literature analysis of data literacy with suggestions for how SAP University Alliances can be leveraged to teach data literacy competencies (*Ridsdale, Rothwell, Ali-Hassan, Bliemel, Irvine, Kelley, Matwin, Smit, and Wuetherick*).

Traditional enterprise systems research submissions include a global case analysis PLM IS implementation utilizing a three-state research design (*Kimpel*), analysis of team variables in predicting IT-enabled process performance for enterprise system processes (*Bhagwatwar, Bala, Ramesh, and Prabhakar*), the examination of the Hybris Omni-Channel retail systems configurations in Canada (*Alzalabani and Bliemel*), investigation of risk and return on ERP/SAP investments from a stock market perspective (*Boasson and Boasson*), and the identification of influential factors of enterprise visual analytical applications on decision support (*Lea, Yu, Claybough, and Long*).

The teaching abstracts cover a wide variety of innovations and pedagogy in the areas of accounting, analytics, application Development, business process, configuration, and e-Learning. Mentoring abstracts provide advice to new SAP University Alliance Members on how to build an SAP curriculum where more advanced mentoring abstracts focus on existing members providing advice on broadening the SAP curriculum scope, how to involve industry, and advancing TERP10.

Acknowledgements

The Academic portion of this conference was a priority of the SAP North American Board, thank you for your dedication to our SAP university alliance community with additional thanks to Michael Bliemel and Heather Czech who worked tirelessly to bring this portion of the conference to fruition. A special thanks to SAP and the SAP university alliance team for supporting these proceedings and providing the venue for our academic colleagues to congregate and network, not only to learn about new offerings, but to network in order to innovate our pedagogy and advance our research. Finally, thank you to all the authors and reviewers for sharing their expertise and their extra effort to make these proceeding a reality.

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Training Faculty to Use ERPsim Using a Massive Open Online Course: A Post-Mortem

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Abstract

Using ERPsim in an academic context requires technical and instructional training. The current workshop based training model presents some disadvantages and is not best suited to reach a global audience. On the other hand, the virtual and online alternatives also present some shortcomings, such as the lack of hands-on exercises. From May 5, 2015 to June 23, 2015 we ran a massive open online course “Facilitating ERPsim: Running Successful Business Simulation Games with ERPsim” in partnership with SAP on the openSAP platform. A companion website provided a set of weekly exercises and guided tutorials to emulate hands-on SAP system usage. Virtual 1-on-1 coaching sessions were offered to faculty after completing the openSAP online course. We discuss the factors that might explain differences in the completion and success rates for the various components of this training protocol, as well as our own learning from the experience.

Keywords: Massive open online course (MOOC), motivation, dropout/completion rate, adoption.

Introduction

For the past 10 years, ERPsim has been made available to the SAP University Alliances for classroom use. Every year, as new faculty consider adopting this teaching tool, they require both technical and instructional training. Up until recently this has been accomplished with classroom based workshops that typically last 3-4 days.

The major disadvantages of this is that both instructor and trainees must incur travel expenses, and classes can only be offered 2-3 times a year. To reach a global audience, travel and scheduling issues present even greater obstacles in being able to provide training. Virtual and online training offer alternatives, but in the context of training complex systems such as SAP, come with their own challenges; primarily the lack of hands-on exercises due to the cost of system provisioning and support. Without hands on practice, it's likely no one will feel confident enough to use new technologies themselves, let alone feel ready to facilitate and teach a class of students how to use SAP.

From May 5, 2015 to June 23, 2015 we ran a massive open online course "Facilitating ERPSim: Running Successful Business Simulation Games with ERPSim" in partnership with SAP on the openSAP platform (<https://open.sap.com/courses/erpsim1-pc/>). This 6 week course was developed as a substitute for traditional class-room based training, and was available to anyone in the world who was interested.

openSAP, like many MOOC platforms has limitations as to the type of assignments and exams that can be given, primarily multiple-choice style questions only (see Appendix A, example 1). Providing SAP system access for direct hands-on access to thousands of participants was also not viable. Consequently, we developed a companion website and set of weekly exercises that emulates hands-on practice via a set of guided tutorials (interactive training developed with Adobe Captivate, see Appendix A, example 2), that was made available to any verified faculty member of the SAP University Alliances.

After the online course was completed, those who registered for the companion website were also offered to register for a virtual 1-on-1 coaching session, conducted with a teaching assistant. While there was a set agenda for each of these sessions, the context and schedule was open to adaptation so that each trainee could get maximum benefit by focusing on areas which they felt the least confident about. Each session lasted 3 hours, and included each person having live system access to SAP and ERPSim software. Trainees were guided through a set of exercises, sharing their screen so that the teaching assistant could observe and provide assistance and feedback as they progressed.

SAP reported enrollments of almost 4,000 people by the end of the course, and 401 records of achievement earned. Based on enrollments half way through the course, the success rate for the course was announced as 10.9%. 556 (15%) people attempted the final exam.

The companion web-site in comparison, received 133 registrations. Of those, 63 (47.7%) successfully completed the final week 6 exercises. As of September, 2015, 56 (42.1%) people completed virtual coaching sessions. 5 people attended our regular classroom workshop, and another 5 people indicated they would receive further coaching from an experienced ERPSim user in person, rather than undertake a virtual session. Overall, 66 faculty obtain their level 1 certification using this new approach; in comparison to an historical classroom workshop average size of 25.

In this conference, we discuss factors that might explain why the completion and success rates for the companion exercises and training follow-up are much better than the overall course, and for MOOCs in general. We also discuss our own learning from this experience and how we intend to modify the approach for the next time it will be run. We hope to engage in discussion with the conference attendees to receive feedback.

Appendix A

Example 1 – openSAP Assignment Questions

Assignment Week 1

Question 1

1.0 / 3.0

Which of the following are distinguishing characteristics of the ERPsim approach to training?
Note: There are 3 correct answers to this question.

☐ Requires cross-silo communication

Correct Answer

☒ Live, real time SAP

Correct!

☐ Stresses mastery of keystrokes in transactions

☒ Involves teams cooperating with each other

Your Answer

☒ Emulates a full cash-to cash business process

Correct!

Question 2

3.0 / 3.0

Which region in Germany has the greatest number of stores?

☐ West

☐ North

☒ South

Correct!

☐ Equally distributed

Example 2 – Companion Website Exercise

Program Edit Goto System Help

Price List with Release Status

Sales Organization

to

Distribution Channel

to

Price List

to

Condition Type

to

PR00

Document Currency

to

EUR

Material

to

Release

to

Valid On

2015-05-02

Max. hits per table

500

Please try again

Enter Distribution Channel (DC) 10 to 12 and press Enter

Online versus Flipped Learning: Understanding Factors that Shape Student Success in an ERP Fundamentals Course

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Abstract

The purpose of this study is to explain factors that contribute to successful learning outcomes in ERP courses delivered via online and flipped learning formats. The authors conducted a study that collected data from four introductory ERP courses in a single semester: three courses delivered via a “flipped” learning mode and one course delivered fully online. Students who consented to participate in the study were surveyed at two points in the semester to assess perceptions concerning technology and learning, individual traits, and learning styles. Student grades were used to measure student performance. Results indicate that the online students performed more poorly on average as compared to the flipped students, but they still had a significantly stronger preference for online courses and intentions to enroll in future online courses. The learning preferences of students aligned with the course delivery format in which they were enrolled, suggesting that these learning preferences may be particularly salient to students when choosing a course delivery format. Understanding the factors that lead to successful learning across different technology-enabled course delivery systems will lead to improvements in pedagogy that impact effective student learning.

Keywords: Pedagogy, Learning, Performance, ERP, Simulation, Online, Flipped.

Introduction

In the past couple of decades, rapid technological advances have allowed educators to employ an increasing number of tools for technology-mediated learning. Two major course delivery methods that have gained traction in higher education are flipped learning and online learning (Bishop and Verleger 2013; Yukselturk and Bulut 2007). Flipping, or inverting, a classroom has been defined as “events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa” (Lage et al. 2000, p. 32). Generally, asynchronous Web-based content in the forms of online video lectures or electronic reading materials and assessments are assigned to students to complete outside of scheduled class time, and the face-to-face class session is reserved for hands-on applications and extensions of the course content (Bishop and Verleger 2013). Online learning represents the delivery of courses in a fully online format and, in the United States (U.S.), the percentage of fully online programs

continues to increase in higher education; online business programs alone were estimated to be offered at 33% of colleges and universities in 2008 (Allen and Seaman 2008).

Current research suggests that both online and flipped learning yield similar learning outcomes and student attitudes as compared to traditional face-to-face (FTF) learning (Day and Foley 2006; Redpath 2010). Much of the previous research has pointed to the importance of student self-regulation (Yukselturk and Bulut 2007) and learning styles (Dağ and Geçer 2009) as key predictors of learning success in technology-mediated learning environments.

However, there is little research that compares learning outcomes and preferences between online and flipped delivery methods. Furthermore, despite the growing number of studies showing no statistical difference in instructional quality between technology-mediated learning and FTF learning, there is a persistent bias held among stakeholders in the higher education community that views technology-mediated learning as *inferior* to traditional FTF learning (Redpath 2010). As a result, there have been recent calls to more deeply probe success factors in technology-mediated instruction, particularly in the management discipline (Arbaugh et al. 2013).

To address this call, the authors conducted a pilot study comparing student traits, perceptions, and learning outcomes across students enrolled in fully online and flipped classes for an Enterprise Resource Planning (ERP) Fundamentals course. This extended abstract presents preliminary results from this study.

Methodology

The authors collected data from four introductory ERP classes in a single semester: three classes delivered via a “flipped” learning mode and one class delivered fully online. In the study, the four classes employed standardized Blackboard content and design and offered the same assigned readings, lecture video content (created by all three authors), and assessments. The four classes were taught separately by the first two authors. In the flipped learning classes, a nearly-identical Blackboard course was presented to students, with the exception that the students were expected to consume the online lecture content outside of class time and perform the hands-on activities and major assessments in the face-to-face class session, where the instructor was present to guide and instruct on these activities. Students who consented to participate in the study were surveyed at two points in the semester to assess perceptions concerning technology and learning as well as to capture various individual traits. Performance data was captured via student grades.

Results and Discussion

Because there was only one fully online course delivered during the semester of data collection, the study resulted in completed surveys from 22 students in the online course and 57 students across the three sections of the FTF (flipped) course. Between the two groups, there were no significant differences in various demographic factors, so mean values for these factors are presented for the total 79 students. The mean student age was 23, with a range from 19 to 40 years old. Males represented 68% (54/79) of the students, and females represented 32% (25/79) of the students. The majority of students, over 70%, indicated that they were single with no dependents. Only 14% of the students reported full-time jobs, with the majority of the students being either part-time employed or unemployed. Students reported an average of 12 years of experience using computers and/or laptops. In the first data collection point, students indicated their prior ERP experience on a 7-point Likert scale (1=“None” to 7=“A Great Deal”) and reported an average score of 3 (“A Little”) for their ERP experience.

Independent t-tests show significant differences between the online students and flipped classroom students with respect to some of the factors studied. Notably, the key performance indicator—student overall grades (an average of two exams and four SAP lab assignments)—was different between the two groups, with the online students performing more poorly (mean grade=79.3) than the flipped classroom students (mean grade= 85) ($p<.01$). The remaining factors presented were measured using a 7-point Likert scale from 1=“Strongly Disagree” to 7=“Strongly Agree.” In terms of differences in learning preferences, compared to the online students, more students in the flipped classes reported that they learn well from their peers ($p<.01$, mean=5.24 vs. mean=4.19) and prefer to work with others ($p<.01$, mean=5.06 vs. mean=3.94). In contrast, at $p<.10$ significance, compared to flipped students, online students reported a preference to learn on their own rather than from their peers (mean=4.94,

mean=4.20). Compared to flipped students, online students also found the online lecture videos to be more useful to their learning in the class ($p < .05$, mean=5.38 vs. mean=4.27).

Further, despite online students' performing more poorly on average as compared to the flipped classroom students, online students indicated a strong intention to enroll in online courses in the future ($p < .01$, mean=5.5 vs. mean=3.86). There were no significant differences in satisfaction levels of students in either course format at both points of data collection. Thus, a likely explanation for this difference is that students enroll in online courses because the online format meets their needs in dimensions unrelated to learning outcomes (but still salient to them) as compared to the FTF learning environment. For example, the online students in this study suggested that they experience many more social barriers as compared to the flipped students, such as being less adept at making new friends ($p < .01$, mean=4.88 vs. mean=6.08) and at expressing themselves through speech ($p < .01$, mean=4.10 vs. mean=5.16).

Predictors of successful performance across both learning modes included higher levels of technology self-efficacy and personal innovativeness.

Conclusion and Implications

Because the study is limited in its sample size, particularly with the online student group, the findings presented are merely preliminary. Future research should continue to explore success factors across different technology-mediated learning formats and focus on strategies to enhance learning effectiveness in various modalities of instructional delivery (Redpath 2010). The results of this study indicate that certain students may have a strong preference for online course delivery regardless of less optimal learning and performance outcomes. Thus, future research should explore more nuanced determinants of learning success in technology-mediated learning environments.

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The Impact of Culture on a Global Product Lifecycle Management System Implementation

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Abstract

The implementation of a global Product Lifecycle Management (PLM) information system (IS) is a complex and challenging technological and social endeavor. This research explored these difficulties through the holistic analysis of a global PLM IS implementation project conducted by an international company and focused on the following research questions: What are the Critical Success Factors (CSFs) for a global PLM IS implementation? How does culture change the relative importance of CSFs for a global PLM IS implementation?

This mixed-methods case study merged CSFs with grounded theory and progressed through three stages of data collection and analysis: in-depth interviews with the company's PLM steering committee; a survey of the company's PLM project team; and a focus group with the company's PLM steering committee.

The significant findings of this research presented at the Nineteenth SAP Academic Conference in February 2016 are:

- 1. A list of the PLM IS implementation CSFs.*
- 2. A comparison of PLM CSFs with ERP CSFs.*
- 3. A methodology for quantifying the impact of culture on the relative importance of CSFs by project phase.*
- 4. An analysis of variance (ANOVA) of the PLM CSFs by national and professional cultures.*
- 5. A discussion of the how the PLM CSFs with statistically significant differences may be used to identify and mitigate areas of potential conflict in global IS implementations.*

The research fills a gap in the literature associated with PLM CSFs and yields valuable insights for businesses faced with the complexity of a global IS implementation in a multi-cultural environment. By leveraging this research and its methodology, companies can identify CSFs, assess CSF importance, analyze statistically significant differences in CSF importance driven by culture, and identify areas of potential conflict before they become problematic.

Keywords: Critical Success Factors (CSFs), Culture, Global Information System (IS) Implementation, Product Lifecycle Management (PLM).

Introduction

DMS Global, a multinational designer, manufacturer, and servicer of engineer-to-order heavy industrial equipment had disparate engineering information systems (IS) and processes that created a barrier to enterprise growth. In response, the firm launched a multi-year project in 2010 to implement a common enterprise-wide product lifecycle management (PLM) IS. The cross-cultural, cross-functional project team established a broad and compelling vision of success. As the project team began to understand the magnitude of change required to achieve the vision, however, progress slowed and realization of the PLM vision was threatened.

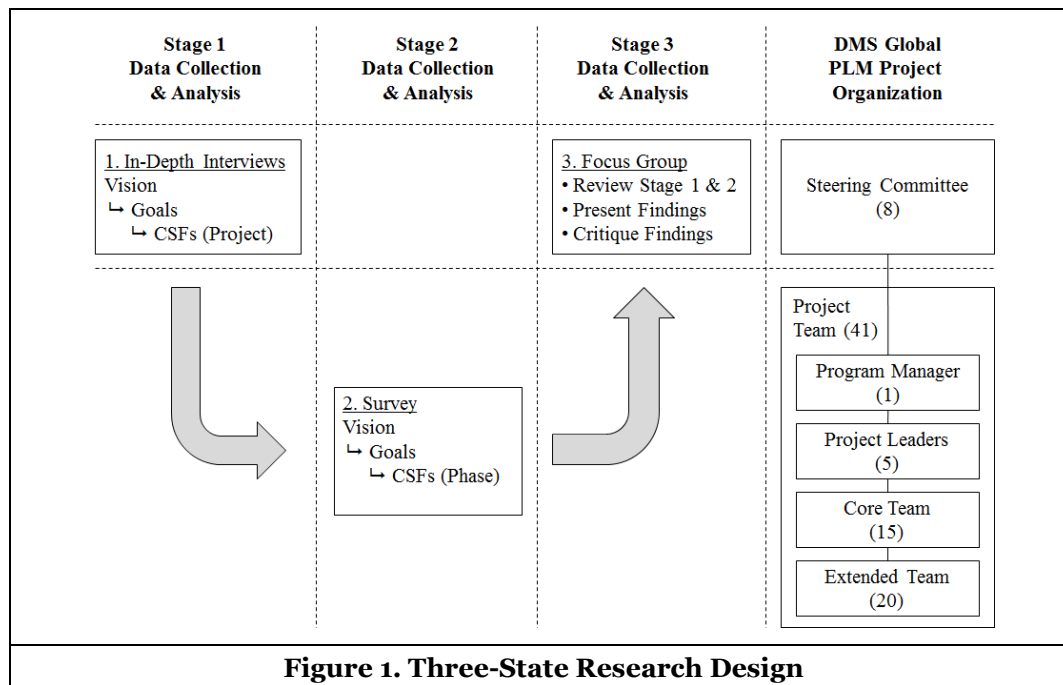
A single integrated global PLM IS required not only new business processes and information technology, but also new ways of thinking, feeling, and acting. In essence, PLM required a new culture (Hofstede et al. 2010, p. 8). Unfortunately, the academic literature was largely silent and offered little guidance (Schuh et al. 2008, p. 210). The problem was the lack of a framework integrating global PLM IS implementations, culture, and critical success factors (CSFs).

Literature Review

The literature asserted that significant changes in enterprise-wide engineering processes, roles, and responsibilities would be required for DMS Global to realize its PLM IS vision of success (Brynjolfsson and Hitt 1998, p. 3). The complexity and challenge of the changes required of DMS Global were compounded by the existence of multiple cultures. CSFs had been used successfully in support of ERP IS implementations (Somers and Nelson 2001, p. 1). Further, CSFs were recommended by Soliman et al. (2001) during their grounded theory research on computer-aided design (CAD) and ERP integration as a means to focus limited management attention, and to help assure success (p. 615).

Methodology

Rockart's (1979) CSF method involved in-depth interviews (p. 85). Somers and Nelson (2001) employed a quantitative survey to identify the relative importance of CSFs during the phases of ERP IS implementations (p. 6). Cooper (2009) utilized focus groups to verify the results of her CSF data collection and analysis (p. 20). Accordingly, this research leveraged and combined Rockart's (1979) CSF method and Strauss and Corbin's (1998) grounded theory methods as the theoretical framework underpinning for a three-stage mixed methods case study graphically depicted in Figure 1.



Results

The data analysis proceeded according to the three stages of the research design. Stage one data collection and analysis involved one and one half hour in-depth interviews with the eight member DMS Global PLM project steering committee. The researcher personally conducted all interviews between June 12, 2013 and July 7, 2013 using an in-depth interview protocol. Interviews were recorded, transcribed verbatim, and then verified by member checking. Microanalysis was the primary method of data analysis (Strauss 1998, p. 57). Inter-coder verification yielded a 92.85% reliability rating. A key outcome of stage one data collection and analysis was the identification of 20 CSFs for the implementation of a global PLM IS. These CSFs were incorporated into the stage two data collection and analysis; a quantitative survey of the DMS Global PLM project team.

Stage two data collection and analysis involved a web-based survey of the 41 members of the DMS Global PLM project team. The survey was established in QuestionPro and available in English and Japanese languages. There were 24 completed surveys from the population of 41 yielding a 58.5% response rate. The data analysis involved the following six discrete steps: establish codebook ; extract QuestionPro survey data; load data into SPSS and apply codebook; generate and analyze descriptive statistics; generate and analyze means; and an analysis of variance (ANOVA) for national culture (Japan versus United States) and professional culture (engineer versus information technologist). The ANOVA yielded the 22 CSFs with statistically significant variances; five driven by national culture and 17 driven by professional culture. The results of the stage two survey data analysis were incorporated into the stage three focus group data collection and analysis.

Stage three data collection and analysis was a focus group with the DMS Global PLM steering committee. The objectives of the focus group were to present the results of this research and to discuss the findings. Five (three from Japan and two from the US) of the eight steering committee members attended the focus group meeting. A verbatim transcript of the focus group was created and verified via member checking. Data analysis followed Strauss and Corbin's (1998) axial coding paradigm which included reviewing the focus group transcript to identify conditions, actions/interactions, consequences, and preliminary hypotheses. The key outcomes of the focus group were modification to the top five ranked CSFs by project phase, and the identification of nine relational statements, or hypothesis (Strauss 1998, p. 135), that led the development of a preliminary theoretical framework integrating PLM IS implementation, culture, and CSFs.

Discussion

The primary purpose of this research was to explore the challenges associated with global PLM IS implementations through the holistic analysis of the single instrumental DMS Global case (Creswell 2007, pp. 74–75). Key findings were:

1. The microanalysis (Strauss 1998, p. 109) of the in-depth interviews generated a list of 20 PLM IS implementation CSFs.
2. The differences between PLM CSFs and ERP CSFs were minimal. Accordingly, future research should move away from the generation of lists of CSFs towards application of the CSFs method in multi-cultural environments. Researchers are urged to use the list of PLM CSFs generated by this study, or one of the many lists of ERP CSFs available in the literature (Somers and Nelson 2001) (Soliman et al. 2001) (Plant and Willcocks 2007) (Finney and Corbett 2007) (García-Sánchez and Pérez-Bernal 2007) (Frimpon 2011) (Olszak and Ziemba 2012).
3. The rating of CSF importance by project phase on a 1-7 Likert scale was a fruitful exercise. CSFs provide lead measures, or key performance indicators (KPIs), that offer leverage by allowing project leadership to focus their efforts on the most critical items.
4. The ANOVA by culture identified CSFs with statistically significant differences in importance rating across both national and professional culture. The significant differences represent areas of potential conflict worthy of additional management care. Particular attention should be given to CSFs with statistically significant differences ranked in the top five by importance by project phase.

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Data Literacy: A Multidisciplinary Synthesis of the Literature

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Abstract

Data literacy is the ability to comprehend, create, and communicate data. Data literacy transcends any single discipline, and is still an emerging concept. This team was assembled to provide expert, multidisciplinary input in interpreting existing literature and identifying gaps. We conducted a systematic review, searching relevant electronic databases, grey literature, white papers, and governmental reports and policies for quantitative and qualitative studies to determine data literacy competencies, skills, and abilities, as well as teaching practices for undergraduate students. A synthesis of the literature allowed us to define detailed competencies for data literacy in key knowledge areas around data collection, data management, data evaluation, and data application. Data literacy competencies are then broken down into conceptual, core and advanced levels and mapped to individual skills and tasks. Data literacy education requires methods that engage and motivate students, as well as encourage task commitment. Best practices for teaching data literacy education include collaboration between educators, organizations, and institutions to ensure goals are being met by all stakeholders; diverse and creative teaching approaches and environment including the effective use of technology; successive/iterative learning with complementary skills integrated; emphasizing mechanics in addition to concepts (i.e. practical, hands on learning); and increasing engagement with the content by using real world data. We conclude with a discussion of the implications and recommendations for academic institutions including suggestions of how SAP University Alliances can be leveraged to teach data literacy competencies.

Keywords: Data Literacy, Education, Competencies.

Introduction

In 2012, analysts estimated 90% of the world's data had come into existence within the previous 2 years (Vesset et al. 2014). Organizations in all sectors are struggling with this volume of data, confident that despite the velocity at which it is growing, and the variety of its formats, there is value. The McKinsey Global Institute suggested that at current training rates, in the US alone there will be 140,000-190,000 more jobs than trained data scientists by 2018 (Manyika et al. 2011). On the literacy, fluency, mastery scale, a data scientist would have achieved mastery. However, the same report also estimated a 1,500,000 employee shortfall of “data-savvy” analysts and managers capable of working with the data to make effective decisions (Manyika et al. 2011); IDC suggests a similar number (Vesset et al. 2014). This latter set of skills is what we refer to as data literacy.

Our research attempts to answer the question of “*How can post-secondary institutions best equip graduates with the knowledge, understanding, and skills required for the data-rich knowledge economy?*” We examined existing strategies and best practices for teaching data literacy, synthesizing documented explicit knowledge (from both formal and informal literature) using a narrative-synthesis methodology. We used our team's expertise to aid in synthesizing and summarizing; this expertise spans multiple disciplines, including Science, Computer Science, Business, Information Management, Arts and Social Sciences, and Education.

Defining Data Literacy and its' Competencies

Data has become the currency of the new ‘Knowledge Economy’, and a critical driver of decision making in business, government, and social spheres (Chinien and Boutin 2011; Cowan et al. 2014; Mitrovic 2015; Ikemoto and Marsh 2008; Mandinach and Gummer 2013). In this 21st century context, it is crucial that our citizens have the ability to contribute, interact with, and understand data (Mitrovic, 2015). In other words, citizens must be data literate; based on our synthesis of research, we have crafted the following definition: “*Data literacy is the ability to collect, manage, evaluate, and apply data, in a critical manner.*”

In order for citizens to effectively engage and work with data, they must possess knowledge of the requisite theory and competencies. Data literacy shares the same theoretical grounding as information and statistical literacies, which are often taught at the postsecondary level (Hogenboom et al. 2011; Hunt 2004; Koltay 2014). We define the core skills and competencies that comprise data literacy, using a thematic analysis of the elements of data literacy described in peer-reviewed literature. These competencies are organized under the top-level elements of the definition and are categorized as conceptual competencies, core competencies, and advanced competencies shown in Figure 1.

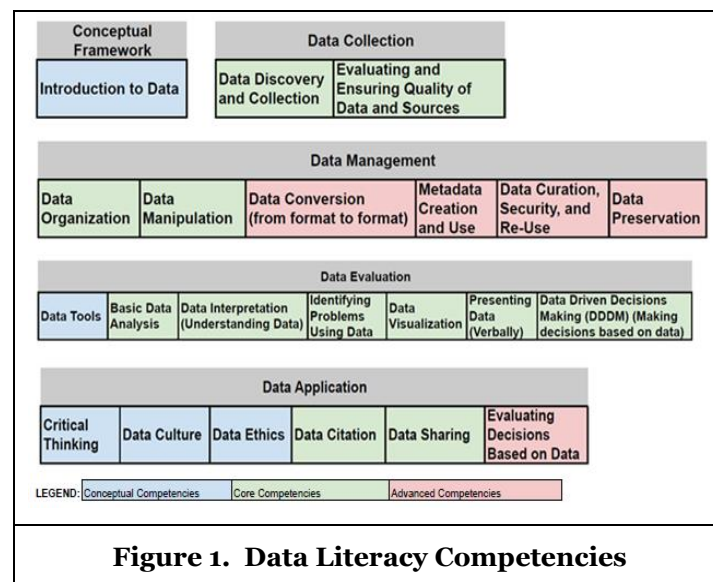


Figure 1. Data Literacy Competencies

Best Practices for Data Literacy Education

We identified several best practices for teaching data literacy in the literature, some of which differ from "traditional" strategies but would be consistent with teaching practices already in use in post-secondary institutions such as incorporating both formal and informal teaching methods into education, and providing students with tools and encouragement to develop skills outside of class, tutorials, and labs. A combination of these methods will improve students' understanding and ability to use data (Wing 2008; Doucette and Fyfe 2013).

Hands-on learning in workshops and labs provides students with the necessary practical experience needed to fully understand a technical skill; students need the chance to figure out processes and methods on their own and make mistakes to readjust their own understanding. Hands-on activities also help students refine their skills with experience (Johnson 2012; Erwin 2015; MacMillen 2014). Using critical thinking to work their way through their processes appropriately allows for mistakes, which enhancing the level and quality of their learning and long-term skill.

Module-based learning allows students to achieve learning outcomes in stages, in a systematic way. Successive, or iterative, learning allows students to build upon previously learned skills, encouraging process over memorization or following rigid instructions, and ultimately making learning an unfamiliar concept more manageable. Beginning small and working up to the more complicated tasks allows students to have confidence in their abilities. Building upon skills can be effective by letting increasingly complex data inform content (MacMillen 2014). Students enjoy discovering their own conclusions, and this approach encourages exactly this.

Real-world data provides students with the opportunity for diverse experiences and caters to a wide range of skills (Carlson et al. 2013; Romani 2009; Davenport and Kim 2013). One approach to successive learning is project-based learning (PBL), a frequently tested and approach to engaging students to build their technical data skills (Romani 2009). PBL is useful when teaching students critical thinking and problem solving (P21 2012), which is useful because data manipulation requires creative thinking. An important aspect of PBL is choice (Burdette and McLoughlin 2010); if students are going to be working on a project for extended periods of time, learning and building on technical skills, they must be engaged, and choice of the topics and data to examine in depth is an important component of this.

Conclusions

There needs to be agreement on what elements of data literacy are necessary in an undergraduate core curriculum, in order to provide a consistent foundational education for those entering an increasingly data-dependent workforce. We have proposed a working definition for data literacy and identified its' related competencies; in addition to this, we have found several best practices for teaching data literacy that can serve to guide faculty designing curriculum in this field.

Working with real data and data systems is paramount to successful teaching of data literacy competencies. This requires partnerships between post-secondary educators, organizations with data that they are willing to share, and access to data processing technologies (hardware and software tools). Ideally curriculum is structured as progressively challenging modules with hands-on learning and working with real data in a problem based learning approach to foster critical thinking skills.

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Impact of Device Type, Demographics, and Computer Knowledge on Effectiveness and Efficiency of Enterprise Visual Analytical Applications

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Abstract

The objective of this research is to identify influential factors of enterprise visual analytical applications on decision support. Factors studied include device type, User demographics represented by gender, age, and country of origin, and Computer knowledge represented by years in school, self-reported IT knowledge, daily computer usage time, and number of computer intensive classes. Results indicate that the type of device used influences efficiency and effectiveness of visual analytical application on decision support. The devices with the larger screens (desktop, laptop, and iPad) had the higher average completion rates (efficiency) and accuracy rate (effectiveness). The Country of Origin influences effectiveness of visual analytical application on decision support. However, the influence of age, daily mobile usage hours, years in school, number of computer classes, and school year are not statistically significant measured by the effectiveness or efficiency of enterprise visual analytical applications on decision support.

Keywords: Enterprise Mobile Analytical App, Technology Acceptance Model (TAM), Device Types, Gender, Computer Knowledge

Introduction

Business visual analytical applications analyze critical business data and provides useful insights (Lim et al. 2015) through the use of graphic rich interactive performance dashboards and scorecards to support effective decision making and are traditionally deployed as desktop solutions (Verkooij and Spruit 2013). As enterprise mobility has changed the way businesses operate and shifts enterprises from a wired to a wireless world (Harvard Business Review 2012), the ability of utilizing mobile and Internet-enabled devices with visual analytical applications to support highly mobile, location-aware, person-centered, and context-relevant operations and transactions create unique challenges and opportunities (Chen et al. 2012). The utilization of performance dashboard, a multilayered interactive visual display mechanism built on a business intelligence and data integration infrastructure that conveys key performance information at a glance (Few 2006; Lea 2012), in business visual analytics applications creates challenges when such applications are used in a mobile device where the screen size and computing powers are not as powerful as a traditional desktop.

Factors affecting technologies adoption identified by prior study include age (Loyd and Gressard 1984), gender (Loyd and Gressard 1984; Badagliacco 1990; Rowel et al. 2003; Crews and Butterfield 2003; Li et al. 2015), race (Lee and Lee 2000; Badagliacco 1990), computer experience (Loyd and Gressard 1984), and academic experience (Wawrzynski 2003). With the influence of social media and ownership of mobile devices among Millennials, it is also important to investigate whether the amount of time spend on mobile devices has influence on the use of visual analytical applications in decision support.

Research Objectives, Research Questions, and Research Model

The objective of this research is to identify influential factors of enterprise visual analytical applications on decision support. Technology Adoption Method (TAM) developed by Davis et al. (1989) and its variations developed by Venkatesh et al. (2003) and Lala (2014) were used to develop research framework. The device type is used to represent external variable (Davis et al. 1989) or the facilitating condition (Lala 2014). Device type desktop/laptop has larger screen and higher computing power to accommodate complex visual analytical applications while device type smart phone has the smallest screen and lesser computing power. The tablet is a device type with the screen size and computing power between the desktop/laptop and smart phone. User demographics including gender, age, and country of origin are used as another external variable (Davis et al. 1989), or social influence factor (Lala 2014). Computer knowledge is used as an external variable (Davis et al. 1989), an Anchor (Venkatesh et al. 2003) or an experience factor (Lala 2014). Computer knowledge dimension investigated in this study includes years in school, self-reported IT knowledge, daily computer usage time, and number of computer intensive classes.

Three research questions and their associated hypotheses were developed as followings.

1. Does the type of device used influence the efficiency and effectiveness of business analytics applications?

Hypotheses: The completion rate/accuracy is affected by the device used. (H_0 : DeviceUsed_i = 0)

2. Do demographics influence the efficiency and effectiveness of business analytics applications?

Hypotheses: The completion rate/accuracy is affected by the students' gender, age, and country of origin. (H_0 : Gender_i = 0; H_0 : Age_j = 0; H_0 : Country_k = 0)

3. Does skill-set influence the efficiency and effectiveness of business analytics applications?

Hypotheses: The completion rate/accuracy rate is affected by the students' year in school, level of IT knowledge, daily mobile usage, and number of IT classes taken.

(H_0 : SchoolYear₁ = 0; H_0 : ITKnowledge_m = 0; H_0 : DailyUse_n = 0; H_0 : ClassesTaken_o = 0)

In this study, completion rate (number of questions attempted divided by the total number of questions in the study) is used to quantify efficiency. Accuracy rate (the number of questions answered correctly divided by the number of questions attempted) is used to quantify effectiveness.

There are 276 students participated in the experiment ranging from ages 19 and older. There are 46 females, 104 males, and one does not wish to disclose gender information. The distribution of devices,

year in school, chosen level of IT Knowledge, daily amount of hours spent on a mobile device, and number of computer courses taken are summarized in Figure 1.

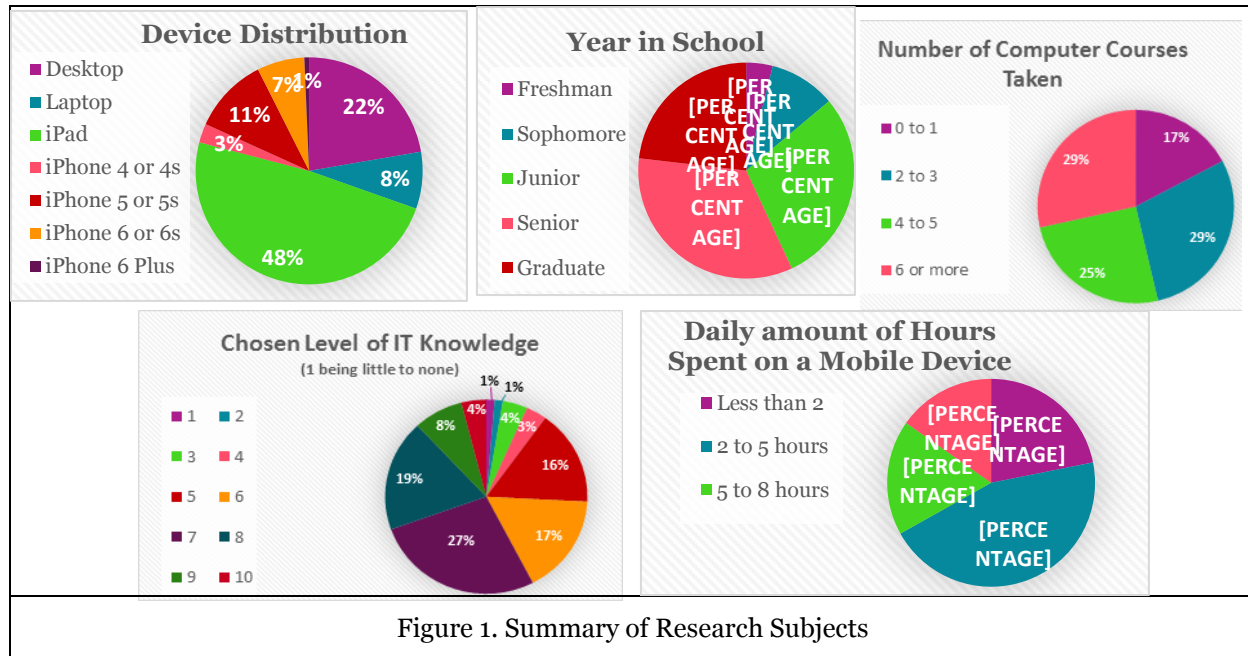


Figure 1. Summary of Research Subjects

Results and Future Research Directions

The results of hypotheses testing are provided in Table 1. Results indicating that the type of device used influences efficiency of visual analytical application on decision support at $\alpha=0.05$ level. It is observed that the devices with the larger screens (desktop, laptop, and iPad) had the higher average completion rates (efficiency) and accuracy rate (effectiveness). The country of origin (race) influences effectiveness of visual analytical applications on decision support and it may tribute to the ability to understand data among different country of origins. The influence of age, daily mobile usage hours, years in school, number of computer classes, and school year are not statistically significant on the effectiveness or efficiency of decision support.

Source	df	Completion Rate (Effectiveness)			Accuracy Rate (Efficiency)		
		Mean Square	F	Sig.	Mean Square	F	Sig.
Device	3	0.423	10.101	0.000	0.790	2.471	0.064
Gender	2	0.002	0.520	0.950	0.011	0.405	0.668
Age	3	0.190	0.398	0.754	0.050	1.793	0.152
Country_Origin	6	0.092	1.967	0.076	0.149	5.317	0.000
IT_Knowledge	8	0.019	0.316	0.955	0.041	0.995	0.475
Computer_Classes	3	0.131	2.170	0.109	0.880	2.136	0.113
Daily_Mobile_Use	3	0.370	0.618	0.608	0.480	1.166	0.336
School_Year	4	0.300	0.496	0.739	0.380	0.919	0.464

Table 1. Results of Hypotheses Testing

One observation is that graduate students (those we assume have the most skill or knowledge) had relatively low accuracy rates compared to the students of other years. As a large percentage of graduate students are male international students, it is important to exam the results with consideration of gender and race. It is observed that sophomores and juniors had the highest accuracy rates and further investigation may yield valuable insights. It is also valuable to perform dimension reduction to eliminate multi-collinearity and to exam interaction effects to reveal additional insights.

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Can My Team Help? Role of Team Variables in Predicting IT-Enabled Process Performance for Complex Enterprise System Processes

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Abstract

Organizations implement enterprise systems (ES) to support business processes and help employees execute these processes efficiently. Research in information systems has focused on understanding the influence of the complexity and the rigidity of these systems and processes on implementation outcomes. In many cases, organizations face a number of challenges to ensure that employees get accustomed to the newly implemented ES and associated business processes. Employees often resist to use an ES and avoid the ES as much as they can while performing their tasks. In some case, employees try to circumvent processes enabled by an ES or seek to find workarounds. Organizations that are not able to overcome these challenges often have to abandon their ES initiatives leading to negative financial implications.

Employees often use the ES as part of a team for executing business processes. Consequently, the role of team members and related factors may play a critical role in influencing employees' perceptions of the team's performance and process effectiveness. One of the important factors that prior research has not investigated much is the role of team processes and characteristics, such as team coordination, shared mental model, and mutual trust, in helping overcome some of the challenges noted above and improve team performance. We conducted an experimental study to investigate the role of these team processes and characteristics in reducing the influence of process characteristics (process complexity, rigidity, and radicalness) on performance outcomes. We posit that even if employees initially perceive a business process to be complex, rigid, and radical, team processes and characteristics can help reduce the influence of these perceptions on performance outcomes.

Keywords: Enterprise systems, teams, business processes, process characteristics, IT change management

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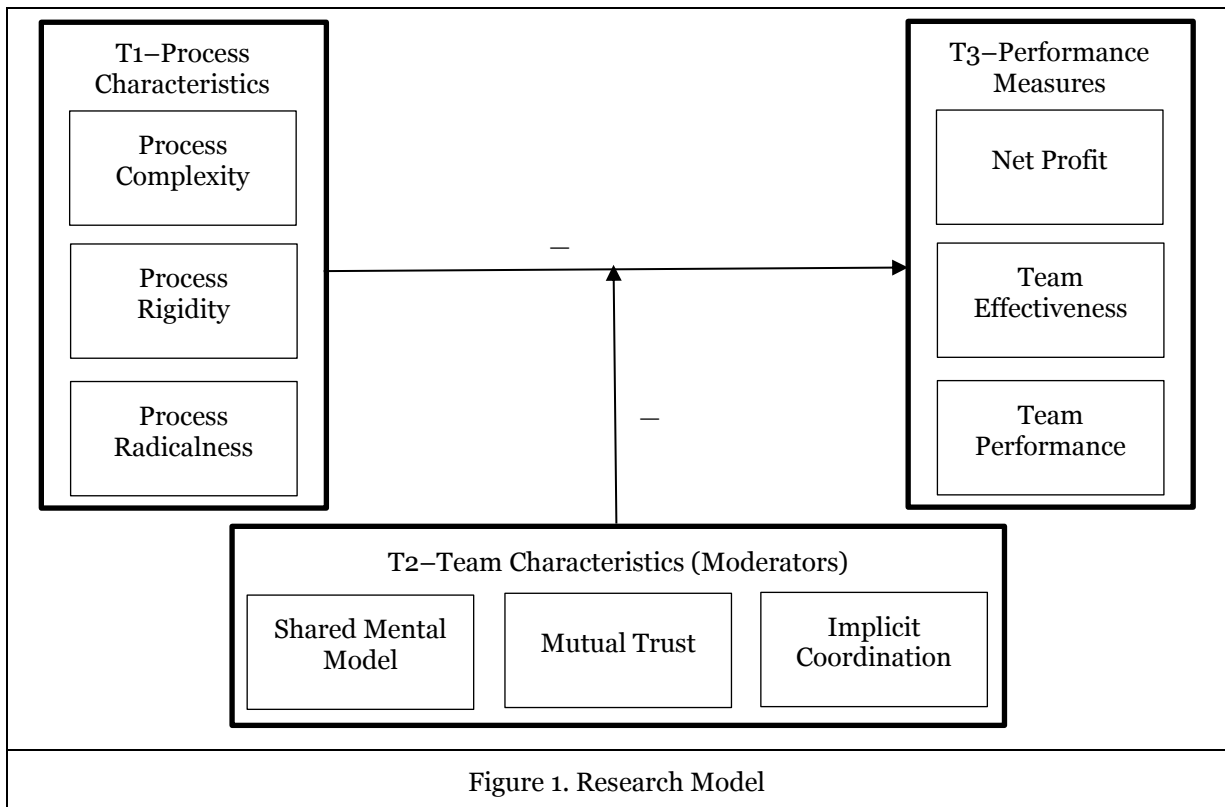
Introduction

Organizations implement enterprise systems (ESs) to support and enable business processes (Bala and Venkatesh 2013; Kim and Kankanhalli 2009). Prior research has suggested that employees typically perceive that these systems make business processes complex and rigid (Bala 2013; Bala and Venkatesh 2013). There is ample evidence in both research and practitioner literatures that implementation of ESs fail due to employee resistance, avoidance, and/or perfunctory use (Lapointe and Rivard 2005; Ortiz De Guinea *et al.* 2009; Venkatesh *et al.* 2010). In most cases, even for employees who use the system are not able to realize any benefits from these systems and often face issues related to performing business processes efficiently. Organizations may not be able to realize intended benefits from these systems and associated business processes because employees find it difficult to execute such complex and rigid business processes (Kim and Kankanhalli 2009; Lapointe and Rivard 2005).

Although IT-enabled business processes are typically performed by a team of employees, there has been little or no research that examined performance of these processes and associated determinants at the team level. In addition, a key question that has remained unexamined to our knowledge is whether the characteristics of a team can help the team improve the performance of a business process even if the process is complex, rigid, and radical. In this research, we investigate this research question to understand if three key team characteristics – shared mental model, mutual trust, and implicit coordination – can help reduce the negative impact of process characteristics on performance outcomes.

Research Model

Broadly, we posit that process characteristics would negatively influence performance outcomes. In addition, we propose a negative moderation effect of the team characteristics on this relationship. We hypothesize that for higher level of a team's shared mental model, mutual trust, and implicit coordination, the influence of process characteristics on performance measures would be weakened. Broadly, we propose that the negative influence of process characteristics (i.e., complexity, rigidity, and radicalness) on process outcomes will diminish if a team can work well together during process execution.



Research Method and Findings

We used a lab-based experiment for our study. A total of 66 teams, each consisting of 4 undergraduate students, participated in the study. The study was setup as a two hour long lab session during which students executed a logistics business process on an SAP ERP system. The goal of the students was to work as a team and complete the transfer of different types of goods from the warehouse of a fictitious company to store locations for that company. Next, the students had to design a pricing strategy for the in-store goods geared towards maximizing sales and increasing profits for the company. The eventual goal of the student teams was not only to execute the business process but to also collaborate and strategize the process so that the profits of the team can be maximized.

As shown in figure 1, data were collected at three points of time during the session using three different surveys that consisted of measures related to the constructs in the figure. First, the teams were provided training on the logistics process and the use of the ERP system to execute the process. Each member of the team was assigned one of the four specific roles as part of the logistics process – planning manager, pricing manager, transfer manager, and sales manager. As part of the logistics process it was important that each of the four members would execute the specific business processes associated with their role. Next, the students completed a trial round of process execution so that they can get an understanding of the logistics process and the role. At this point (T1), students were asked to complete survey 1 consisting of perceptual measures related to process characteristics – process complexity, process rigidity, and process radicalness.

Next, we used a simulator - the ERPSim simulation (Léger et al. 2007) – that helped the teams perform the business process for 10 days (each day simulated as 90 seconds on ERPSim). The 10 days of business process execution cumulatively constituted one quarter of business activity. At the end of this period (T2), the students completed survey 2 consisting of perceptual measures related to the team characteristics – shared mental model, mutual trust, and implicit coordination. Next, the students were given a 10 minute break to discuss the business process execution strategy with their team and to make any necessary changes to their strategy. Next, the teams completed another round of simulation, again 10 days with each day simulated as 90 seconds (quarter 2). At the end of this period (T3), students completed another survey consisting of the perceptual performance measures - team effectiveness and team performance. After completion of the survey, the students were shown the final results of the simulation with details such as the net profit and net sales. The students were then debriefed and the session concluded.

For the survey items, we used pre-validated items for constructs published in prior research. We followed standard statistical procedures to ensure convergent validity, discriminant validity, and reliability for the measures used in the study. For testing out model (figure 1), we used regression analysis using SPSS 20.0 and found support for most of the hypotheses.

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Examining the Hybris Omni-Channel Retail System Configurations in Use by Canadian Retailers

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Abstract

Hybris is an SAP Company that offers various products such as Enterprise Multichannel Commerce Software, Product Content Management, Master Data Management, Mobile Commerce and E-Commerce Consulting. Hybris software is an agile, multi-channel commerce software platform that provides services to companies involved in B2C or B2B commerce. This research explores the e-commerce retail industry in Canada and identifies several Canadian retailers using a Hybris system. We then examine how it is integrated with their backend systems using three examples of different system configurations.

Keywords: E-commerce, B2B, B2C, SAP Hybris, Retail Industry, Multi-channels/Omni-channels, Enterprise Systems.

Introduction

Hybris software is an agile, multi-channel commerce software platform that provides services to companies involved in B2C or B2B commerce. Hybris is an SAP Company that offers various products such as Enterprise Multichannel Commerce Software, Product Content Management, Master Data Management, Mobile Commerce and E-Commerce Consulting.

Ecommerce platforms are software solutions that manage transactions and communications between the online store processes and other existing company systems and platforms such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and fulfilment systems. Businesses that want to have a strong online presence are required to build or purchase flexible ecommerce platforms to integrate with the new age of mobile technology and social media platforms and to develop consistent multi-channel strategies. The presentation of the goods and creating a decent customer experience are becoming more and more important in the growing competitive market of online retail.

Hybris was founded in Switzerland in 1997 and grew rapidly with a 60 % average annual growth rate in Europe and then North America (Hybris 2015). Until 2008, Hybris software solution only offered the following channels: B2C, B2B, Print catalog and Marketplace. In 2010, Hybris added multi-channels such as a point of sale, a call center, and mobile and social media. In 2011, Hybris was acquired by a Canadian company called iCongo. The deal allowed Hybris to expand even more in the North American market and combine its Omni-Channel solution with iCongo Order Management, which enabled implementing a complex supply chain to sync up to multi-channel solutions. Hybris was considered the fastest growing multi-channel software even before it was acquired by SAP in 2013. In August 2013, SAP approached Hybris with \$ 1 Billion deal that enhanced and completed what Hybris is lacking. SAP required Hybris to run as an independent company; however, SAP provided the option to integrate its CRM, ERP systems, HANA in-memory database and other components. The research explores Hybris's backend system integrations and features and the architectures that Hybris and industry consultants have reported.

Hybris in Canada

In 2013, Hybris had 463 clients worldwide and it was estimated that 66% of them generate revenue of more than \$100 million in e-commerce channels alone (Sengar 2013). Although Hybris's Canadian clients are less than 3% of all Hybris clients, they are still considered major clients for Hybris due to their magnitude in the Canadian market. Two of the largest Canadian chains in the retail industry use Hybris. Moreover, the scope of Canadian purchasing power using online channels is growing substantially with an estimated \$19.8 billion to be spend by Canadian consumers (Enright 2014). We conducted a survey of the use of Hybris in retailers in Canada which is summarized in Table 1, which shows what channels are supported by this technology.

Table 1. Hybris Multi-Channels Retailer's Use.						
Company/Channel	Website (Online Sales)		Call Center	Point of Sale	Social Media	Mobile App
	Shipping	Pick up				
Canadian Tire	No	Yes	Yes	Yes	Yes	Yes
Loblaw	Yes	Yes	Yes	Yes	Yes	Yes
Shoppers	No	No	Yes	Yes	Yes	Yes
Town Shoes	Yes	Yes	Yes	Yes	Yes	No
Harry Rosen	Yes	Yes	Yes	Yes	Yes	No
ALDO	Yes	No	Yes	Yes	Yes	No
Gildan	Yes	No	Yes	No	Yes	No

Canadian Retailers backend systems

Retailers around the world are investing considerable means in their IT departments and backend systems to stay ahead of the competition and acquire new customers. Backend systems are the main center of the retailer's business processes. Table 2 lists three Canadian retailers who have different kinds of systems that work with Hybris.

Table 2. Comparison of Retailers Back-End Systems				
Retailers/ Systems	ERP	CRM	SCM	WMS
Canadian Tire	IBM	Varies	Manugistics	DCCS warehouse management system
Loblaw	SAP ERP system	SAP CRM System	SAP SCM system	Manhattan Associates
Aldo	Oracle retail suite	Oracle retail suite	Catalyst- Command Suite	Catalyst

System Architectures

The Hybris platform architecture is built on an open-source framework called Spring, which is used to develop web applications on Java platforms. The Hybris platform stands on two layers: service and

persistence. The service layer allow extensions to add services on the platform, and the persistence layer is the support layer for the business logic of a certain extension and the client's databases. Hybris's persistence layer can support several database management systems, such as Oracle⁵, MySQL⁶, PerconaXtraDB Cluster, SAP HANA DB or Microsoft SQL Server⁷. Hybris manages dataflow through the Hybris Data Hub, which is an integrated solution to import or export data to the Hybris platform from external systems such as ERP, CRM and PLM etc. (Hybris-whitepaper 2014).

Conclusions and Future trends

Hybris has an extensive platform built on open-source architecture that assists retailers with their business needs. Due to Hybris's system architecture, Hybris has been connected and integrated with several types of systems reflecting Hybris's high demand. Canadian retailers use different back-end systems that best serve their business objectives and processors. Future trends for retailers are mostly related to social media targeting, marketing initiatives and campaigns; market segmentation and Multi-Channel marketing capabilities; UX/ UI simplification and customization in design and applying analytics on customer's data.

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ERP/SAP Systems Investments and the Market Value of the Firm

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Abstract

This research investigates the risk and return on ERP/SAP investment from a stock market perspective. An investment in ERP systems is one of the biggest long-term capital budgeting decisions in any organization. However, few organizations have a clear idea as to what the risk and return involved on such a big-ticket investment and how to measure the value of their investments. This poses a constant challenge for both investors and corporate executives to value a firm's SAP investments. We attempt to find answer to this question by developing a market-based method on how to measure the market value and financial return on ERP/SAP investments on a risk-adjusted basis. The significance of our study can help decision makers to make better investments in ERP/SAP systems that can maximize shareholder value and firm value as a whole.

Keywords: ERP/SAP investment, measuring IT investment, stock market reactions, market value of the firm, cost and benefit of SAP-HANA adoption, value-drivers for SAP investment.

Introduction

The main objective of investments in enterprise resource planning (ERP) systems is to improve an organization's competitive advantage, operating efficiency and profitability so as to maximize shareholder value. However, an investment in ERP systems is one of the biggest capital budgeting decisions in any organization. An investment in ERP systems such as SAP typically requires an organization to commit its resources and manpower on a long-term basis. Few organizations have a clear idea what the risk and return on this big-ticket investment item and how to measure the value of their investments. Conceptually, an ERP/SAP system is a system of using information technology to link various functions and data including, but not limited to accounting, inventory control, financial management, human resource management, logistics, and market research. ERP/SAP facilitates information and data sharing, business planning, and decision making throughout an organization. From a business strategic perspective, most companies which invest in SAP believe that an investment in SAP is a significant and highly transformative for the business and is a good long-term strategic investment. However, the question is: how do we value and quantify these benefits from ERP/SAP investments? In addition, investors in the capital market have a hard time in figuring out the value and the return on SAP systems investments because such investment expenditure is never disclosed on an organization's income statement or balance sheet. This poses a constant challenge for both investors and researchers to value a firm's SAP investments. As investments in ERP systems require a nontrivial sum of financial resources and human capital, IT/IS managers are under increasing pressure to demonstrate and justify their ERP/SAP investments. Thus, it is crucial to measure and understand the performance improvements from such investments (Kohli and Devaraj 2003).

Research Methodology

Using a sample of 425 SAP user companies from various industries and around the world, this study focuses on stock market reactions and market value of the firm in SAP investments. In addition, we propose a methodology on measuring the value of IT investments using publically available information. We develop several market-based risk-adjusted financial performance measurements of the return on

SAP investment. We collect each company's data on stock returns, financial statements, as well as company characteristics for the period of March 1990 to the current year 2015. We employ event-study method to assess the market reaction towards a company's announcement in ERP/SAP investment. We identify the value drivers for the SAP adopting firms. We hypothesize that since SAP system could help companies cut costs, improve operational efficiency, investments in SAP should generate positive returns and market value on a risk-adjusted basis for shareholders. Our expected empirical results will show a positive relationship between SAP investments and risk-adjusted stock performance.

Expected Contribution

In an age where management carefully weighs the costs and benefits of every discretionary investment dollar, finding evidence of the returns on IT investments is critical. As an old business axiom goes, "you can't manage what you don't measure". A number of researchers have examined the payoffs from IT investments and the results are mixed. While some studies find a positive relationship between IT investments and firm performance, others find an absence of a positive relation between spending on IT and productivity or profitability. The exact economic benefit of IT investment to an organization is uncertain (Melville et al. 2004). As suggested by Tanriverdi and Ruefli (2004), most IS/IT studies on IT investment fail to incorporate risk in their performance measurements (Tanriverdi and Ruefli 2004). This study contributes to this debate by looking specifically at the investment in ERP/SAP systems. Our study focuses on valuing the investments in ERP/SAP systems from a stock market perspective. We contribute to the IT investment literature by developing a market-based method on how to measure the market value-added and financial return on IT investments on a risk-adjusted basis and how investors can use publicly available information to gage the risk and return on a firm's IT investments. Our study results could provide useful guidelines and implications for IT/IS managers to manage these IT investment assets in such a way as to maximize shareholder value and for stock market investors to assess the risk and return on a firm's IT investments. The significance of our study can help corporate executives and decision makers to make better investments in ERP/SAP systems that can maximize shareholder value and firm value as a whole.

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New Course in Emerging SAP Technology: Course Design Strategy and Tools for Integration

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Abstract

Organizations are seeking graduates who can help them transform into digital enterprises where rapid access to big data via user friendly applications is critical to success. Students typically take courses in data management, business process integration, configuration and analytics which employ more traditional technologies such as SAP ERP and Business Objects. To prepare for their role as enabler of transformation, students must acquire skills in emerging technologies that will be critical to this transformation. In this paper we describe a new course that utilizes several emerging SAP technologies to better prepare them for their next generation careers. The technologies included are ABAP, SAP HANA, HANA cloud platform (HCP), SAP Gateway Services, Open Data Protocol (OData), and SAP UI5.

Keywords: Advanced Business Application Programming (ABAP), Gateway Services, High Performance Analytic Appliance (HANA) Database, HANA Cloud Platform (HCP), Open Data Protocol (O Data), SAP UI5 Applications, SAP Integration.

Introduction

In this presentation we will share a pedagogy that addresses how to teach emerging SAP technologies. It is critical for students graduating with an MIS degree, especially those with an emphasis in Enterprise Resource Planning (ERP), to have a broad understanding of emerging technologies and their applications in order to be productive in their current or future jobs. This paper describes a course that incorporates several emerging SAP technologies.

Technology

Attendees will gain a general understanding of the following technologies and how they interact with each other in an enterprise environment:

Advanced Business Application Programming (ABAP)

The ABAP language was created by SAP and is only used in SAP products. ABAP was originally created for writing reports and later became the primary language for the core business logic.

Students will create a “hello world” application to familiarize them with the basics of creating a program and working with the code repository in NetWeaver. Later, students will create an ABAP class that will contain objects and methods to access business transactional data such as a sales order header and sales order line item information.

Gateway services

A gateway acts as a middleman between a front end (typically a web browser) and a backend (an application server or database) performing important functions such as load-balancing, security, etc. A gateway server can be installed one of two ways, as a hub or embedded type. In a hub configuration there is a central gateway on the front-end and a business suite on the back-end. The front-end can route users to multiple back-end systems. An ABAP class will be published and made available as a gateway service to outside applications. Output will be either a JavaScript Object Notation (JSON) file or Extensible Markup Language (XML).

Students will create and configure a gateway service using an ABAP class that they create. After creating the service they will learn how to test and validate the connection by viewing metadata as a response to calling the service through a URL. As part of creating the service, students will need to create a user and a role so the gateway service can be secure and only accessed by proper users when needed.

High-Performance Analytic Appliance (HANA) database

SAP’s new in-memory database, SAP HANA, provides unique features and capabilities for organizations. These capabilities are based on fewer data aggregates, the use of column store (vs. row store), indexing, and compression.

Student will use HANA Studio, an Eclipse Integrated Development Environment (IDE), interact with the HANA database and create various objects such as database tables and load data.

HANA Cloud Platform (HCP)

HCP is the cloud version of the SAP HANA environment. In future versions of SAP applications (e.g., S/4) customizations will be handled via HCP interfaces to the on premise systems.

Student will get familiar with web IDE development environment to create tables, load data, create web applications and connect to on premise systems.

Open Data Protocol (OData)

The OData protocol uses a Representation State Transfer (REST) connection that is stateless to communicate between the web application and the gateway service. It encodes Create, Read, and Update and Delete (CRUD) process in applications development.

Students will first use OData protocol to query data in a HANA database. They will then create and test an OData connection between a UI5 application (see below) and a gateway service. They will do this by creating a view file and a controller file in a UI5 application. Query data through an OData connection.

SAP UI5 applications

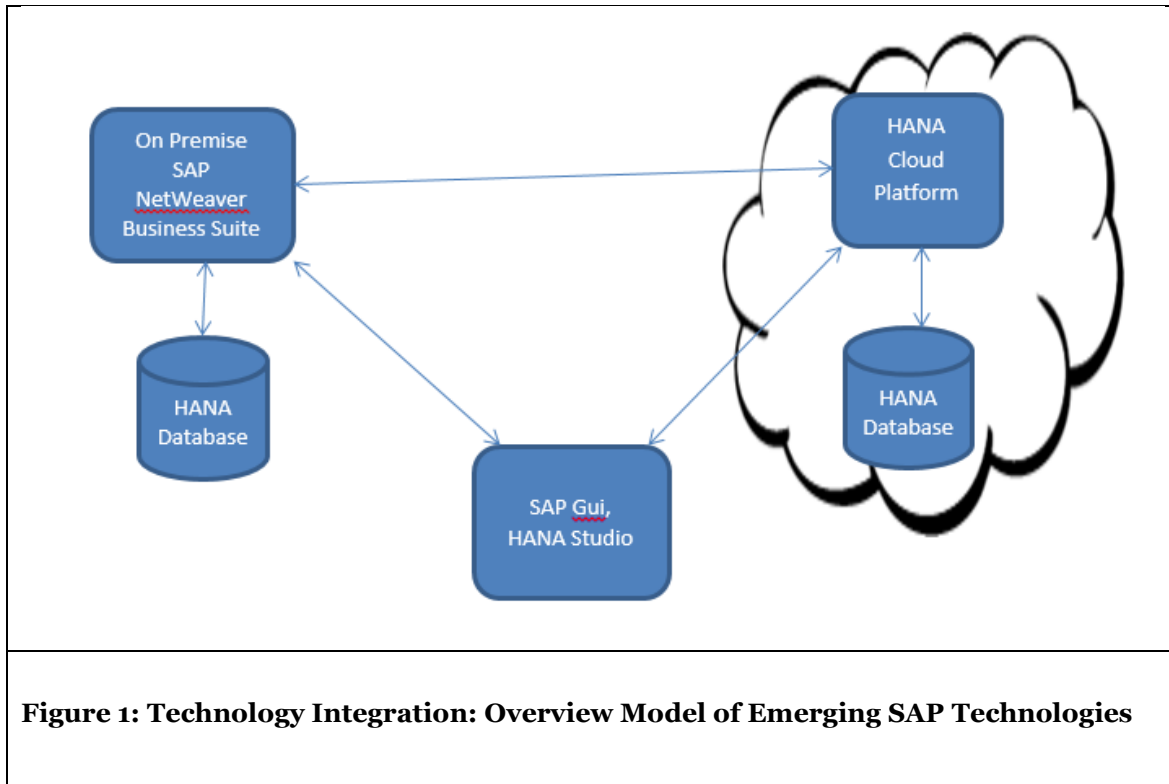
SAP UI5 is a series of programming libraries created by SAP that are based on Hyper Text Markup Language version 5 (HTML5) and JavaScript language. The libraries include a series of controls such as

buttons, text boxes, and list boxes that can be embedded in applications. The application framework is based on the Model-View-Controller (MVC) model that is used to create applications.

Students will create a web application using SAP UI5 that will read a sales order from a SAP NetWeaver system running ECC 6.

Integration

Students will first complete assignments in each of the technologies mentioned above. They will then build a complete application that integrates the capabilities of these technologies as illustrated in Figure 1.



Conclusion

This course will allow students to enhance their skills to prepare them for the next generation career opportunities by providing them with hands-on experience with emerging SAP technologies. These skills are essential to develop innovative applications that require integration of on premise and cloud systems, high-performance databases, with intuitive user interfaces.

Contributed Materials

Course exercises will be provided at a later date.

A Web-Based Health Information System

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Abstract

This project showcases a web-based health information system (HIS) developed using the latest SAP tools including SAP UI5, SAP HANA, SAP HANA Extended Application Services (XS) and SAP HANA Cloud Platform (HCP). The HIS project can be an integral component of a systems analysis and design course looking to provide students with a hands-on experience in building a prototype using state-of-the-art SAP technologies. The project can also be tailored to be part of a capstone project course. All the tools used in this project are web-based that do not require any local install and can be obtained for free from SAP.

Keywords: SAP UI5, HTML5, SAP HANA, SAP HANA XS, SAP HANA Cloud Platform, Systems Analysis and Design, Cloud Solutions, Electronic Commerce.

Introduction

An HIS “integrates data collection, processing, reporting, and use of the information necessary for improving health service effectiveness and efficiency through better management at all levels of health services” (Lippeveld et al. 2000, p. 3). A web-based HIS for a fictitious clinic described in Rosenblatt (2014) is developed. Briefly, Rosenblatt (2014) uses a case, New Century Wellness Group, to illustrate many of the concepts related to systems analysis and design. Daily operation of the clinic involves several business processes that can be completed efficiently and effectively through the use of a well-designed HIS. For professors using a different systems analysis and design book, the project can be easily modified to focus on case studies used in their book. The objective of this project is to illustrate how SAP technologies can be used to develop end-to-end solutions for any organization.

The System

The system is a website hosted on SAP HANA Cloud Platform (HCP). After logging in, an employee will see the home page shown in Figure 1. From there the employee can perform three operations through the three hyperlinks. Two of the operations involve displaying data from a database (appointment list and services) and one involves inserting records into a database (schedule appointment). As such, these operations illustrate business requirements that entail both data retrieval and data update in a database.

The Technology

Table 1 lists the tools used to create the solution to the business requirements.

Table 1. Tools of the Trade	
• SAP UI5	• SAP Web IDE*
• SAP HANA Extended Application Services (XS)	• OData service
• SAP HANA	• Eclipse IDE*
• SAP HANA Cloud Platform	* optional

The frontend of the system is made of the various web pages, which are implemented using SAP UI5, which in turn is an implementation of HTML5. An example is shown in Figure 1. These pages can be created using a text editor or SAP Web IDE, a tool that is available for developing lightweight HTML5 applications on HCP. SAP Web IDE can also be used to develop Fiori apps, the new user interface (UI) of SAP Business Suite, and mobile apps to run on mobile devices.

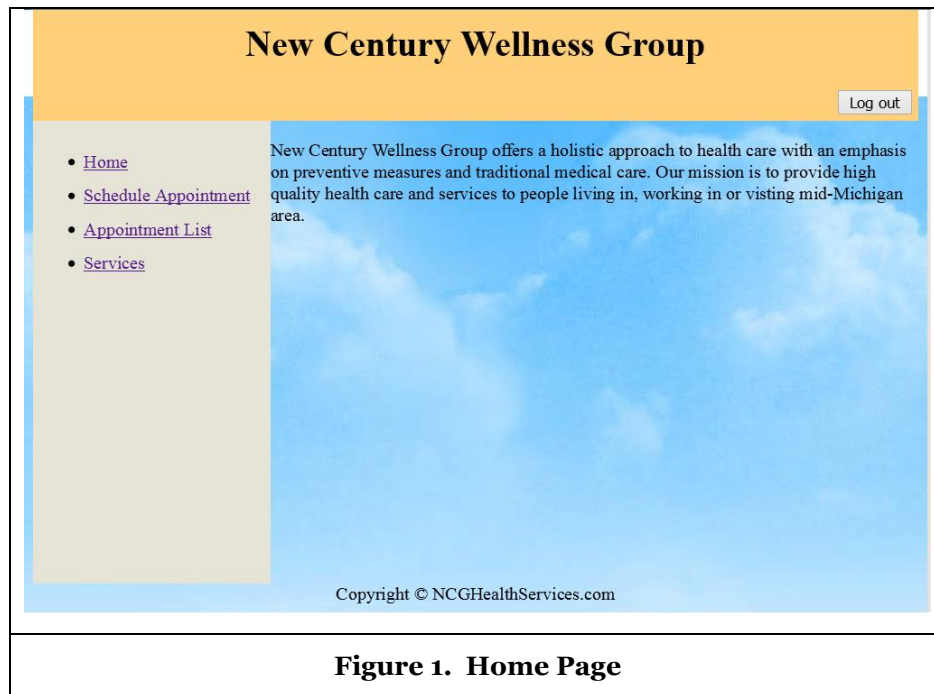


Figure 1. Home Page

The backend of the system consists of a HANA database and an SAP HANA XS (or native) application. The application includes mainly JavaScript pages that can be created using a text editor or the Web-Based Development Workbench on HCP. The Web Workbench is also known as Web IDE (see, e.g., Ganz et al. 2014), but it should not be confused with the SAP Web IDE used to develop the frontend mentioned above. It may seem confusing at first but just remember that they are distinct tools. This project used the Web-Based Development Workbench but not the separate SAP Web IDE for the frontend. Another optional tool is Eclipse IDE, a PC-based tool for developing Java applications. It can also be used to develop SAP HANA XS applications. It is widely used in the industry and is the basis of SAP HANA Studio, the tool for administration and application development of HANA databases. Although not required for this project, knowledge of Eclipse can be beneficial to aspiring SAP HANA developers. Wood (2015) provides many good examples of SAP HANA application development using Eclipse IDE.

Data exchange between the frontend web pages and the backend SAP HANA XS application can be handled by server-side JavaScript or, more commonly, OData service. An open standard, OData service enables easy creation and consumption of data across heterogeneous systems on the Internet. Each SAP

HCP account comes with an SAP HANA instance in which database tables can be created. OData services can then be created to expose database tables to support the full CRUD operations on the database.

Contributed Materials

Contributed materials include presentation slides and the complete exercise to develop the health information system. Table 2 outlines the steps involved in developing the system.

Table 2.Outline of the Project
• Obtain an HCP developer account
• Create an SAP HANA XS application
• Create tables and load data
• Create and expose an OData service
• Build frontend with SAP UI5
• Define and grant role to execute the application

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Transforming ERPSim© Data Using XBRL Global Ledger

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Abstract

This teaching case is designed to introduce accounting majors to the XBRL Global Ledger (XBRL GL) taxonomy. XBRL GL has recently gained prominence as the recommended form for data capture in the AICPA Audit Data Standards (ADS) (McQuilken 2013) and serves as the foundation for standardization efforts—within and between governments and businesses—around the world. It is designed to replicate the structure of enterprise (ERP) systems and to tag accounting data at the transaction level, embedding XBRL technology more deeply in the Business Reporting Supply Chain. Thus it is both an antecedent and a complement to financial reporting. The exercises in this case provide a context-based approach to understanding the role of XBRL and its capacity to transform accounting transactions into machine-readable XBRL GL which can then be repurposed in a variety of financial reports and data visualizations.

Keywords: ERPSim, XBRL GL, XML, DATA Act, Accounting Transactions.

Introduction

Despite the outcry over the regulatory compliance burden, lack of data quality and tools to access data, it appears that XBRL is here to stay (Harris and Morsfield 2012; Stergiaki 2013; Vasarhelyi et al. 2012). Indeed, the impetus towards adoption of XBRL as an open financial reporting standard has gained critical mass in the US such that it serves as the foundation of the Audit Data Standards (ADS) recently published by the American Institute of Certified Public Accountants (AICPA) (McQuilken 2013; Zhang et al. 2012). XBRL has also been viewed as a supporting technology in the Data Accountability and Transparency (DATA) Act, 2014 (Pub.L. 113-101, 113 Cong., 2nd Sess. (April 28, 2014), Federal Digital System) mandating consistent financial reporting standards across government agencies (Titera 2013; Tornado 2014). Increasingly, accounting firms are citing XBRL-related knowledge and skills as desirable recruiting attributes for accounting professionals and this is also reflected in the XBRL workshops and seminars that have become regular staples of professional meetings and continuing education offerings.

Early adopters in the academic community have developed a number of accounting cases designed to teach XBRL understanding and skills. In addition, Debrecey and Farewell (2010) have provided excellent service to the accounting education community by developing a careful and thorough plan for integrating XBRL into the traditional accounting curriculum. Of importance to this case is the distinction they make between XBRL, as it is currently used for financial reporting, and its lesser-known sibling, XBRL Global Ledger (XBRL GL).

The Case

This case is designed to introduce students to XBRL Global Ledger as an important **complement** to XBRL for financial reporting (Cohen 2009; Garbellotto 2009; Wenger et al. 2011). The underlying data source is an accounting transaction file generated from a popular simulation game built on a real SAP ERP system (<http://erpsim.hec.ca>) (Léger 2006). An Excel comma separated values (.csv) flat file containing data from a simulation game played at our institution is available with this case; however, instructors can readily substitute their own ERPSim data or adapt the case to general ledger data provided by alternate accounting systems.

The case utilizes Altova® Mission Kit software which provides an array of software tools that can be used for data modeling and XML (with specific use case support for XBRL) (Andrews 2010). Four exercises have been created to provide a conceptual framework for understanding the role of XBRL GL in the business reporting supply chain, the taxonomy structure and its relationship to accounting transaction data. The advantages of the XBRL GL approach—in particular, the ability to repurpose tagged data—is made salient through the creation of accounting documents and chart visualizations. The four exercises with corresponding learning objectives are outlined below:

Exercise One – Introduction to XBRL GL

At the conclusion of the exercise students should be able to explain how XBRL GL fits within the Business Reporting Supply Chain and the value of XBRL GL for internal management reporting. Data from the ERPSim game is introduced as an exemplar of real-world accounting transactions that have been extracted and simplified for case illustration.

Exercise Two – Map Transactions and Create an Instance Document

The purpose of this exercise is to enable students to map the ERPSim accounting transactions to the XBRL GL taxonomy using Altova® MapForce. Once the ERPSim data is mapped to XBRL GL taxonomy elements students create a valid instance document. Students will be able to “read” the resulting XML and understand how the schema structure supports machine interpretation.

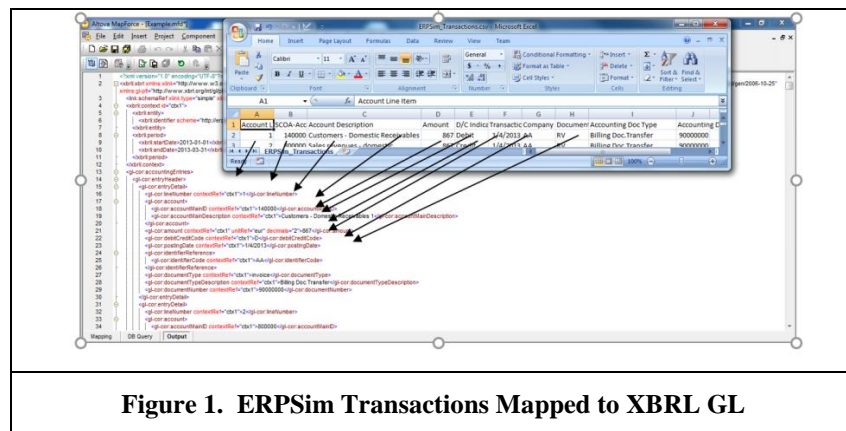


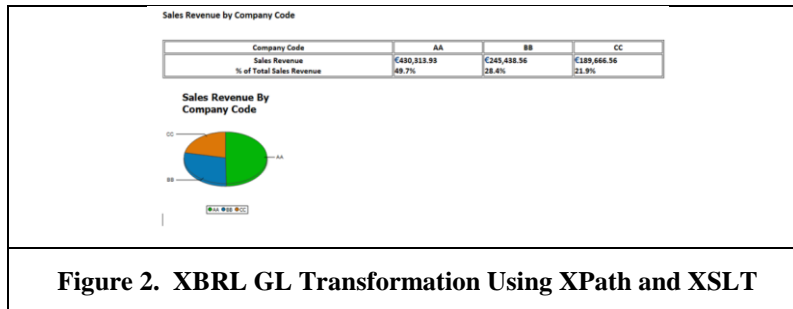
Figure 1. ERPSim Transactions Mapped to XBRL GL

Exercise Three - Create a Dynamic Trial Balance

In this exercise, students use XPath and eXtensible Stylesheet Language Transformations (XSLT) to traverse the XBRL GL instance document information nodes, summarize account balances and dynamically create a trial balance.

Exercise Four - Create Accounting Visualizations

XPath statements and XSLT can also be used as the foundation for graphics information and data visualizations. This exercise builds on XPath extractions and calculations to build a chart representation of the instance document data.



Conclusion

It is important to note that, while the results of the exercises appear somewhat trivial in comparison to the transaction processing and visualization capabilities available in SAP software, XBRL GL represents an open standard that is designed to replicate and connect disparate systems. The underlying XML schema not only preserves the hierarchical transaction structure, but can also be modified to incorporate decision rules as part of the validated instance document. These features enable XBRL GL documents to retain their provenance as a timestamped standalone documents while facilitating data comparisons over time. Thus, XBRL GL has become a particularly attractive option for government standardized reporting initiatives around the world.

Contributed Materials

The materials contributed to the UA community include a student handbook of exercises with corresponding video screen capture, practice data sets and instructor notes.

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ERPSim for High Schools: an Event Guide

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Abstract

ERPSim is recognized as an important pedagogical tool. Its use in post-secondary education has been, and continues to be, well documented (Léger et al. 2016, 2011, 2007). However, via SAP's Young Thinkers program, opportunities exist to expose students outside of traditional post-secondary education to the benefits of ERPSim. Based on our own experiences, we offer a guide for the successful execution of ERPSim for high-school students.

The targeting of high-school students changes what has been an in-class activity into a full blown 'event'. As such, many new variables are introduced that will influence the ultimate success of the event. An 'ERPSim Event' is an exercise in project management. This is especially true for novice faculty who have had little or no experience coordinating such activities before.

Our experience has shown that there are 5 critical success factors for a fruitful and productive 'ERPSim Event': event planning, simulation coaching, well defined event materials, clearly defined team roles, and a nurturing learning environment. We have captured and documented the steps/deliverables necessary to adequately address these critical success factors; along with example deliverables, this document prescribes the steps for a successful Young Thinkers ERPSim event.

Keywords: ERPSim, Young Thinkers, Pedagogy, Secondary Education.

Introduction

The ERP program at Grand Valley is well known and regarded for graduating students with strong business process, ERP and analytics skills. The demand for graduates with these skills exceeds supply. One of the challenges is that there are not enough students interested in pursuing careers that require these skills. When brainstorming ways to address this challenge with our industry advisory board, it was determined that the problem is more a lack of awareness of the program and the tremendous career opportunities that follow. Instead of waiting for students to find the program, a decision was made to proactively promote the program and encourage students to investigate if it fit their career goals. Additionally, a decision was made to reach further back into the talent supply chain and target high school students who had a general interest in business and technology.

Historically, high school students interested in business are guided towards majors in accounting and marketing and those interested in technology, towards computer science and engineering. It is rare for these students to be even aware of majors such as MIS which merge business and technology. Indeed, most high school counselors are unaware of such programs.

The fun, gamified environment of ERPSim was deemed well suited for to provide high school students with a meaningful introduction to business processes, technology and decision making. In addition, it was considered essential to have corporate executives to provide a “real world” perspective to augment the academic exercise while promoting future opportunities for students in their organizations.

Is this right for you?

There are several considerations in determining if a similar event is appropriate in your university. The following questions will guide your decision:

1. Is there a need to grow your ERP program?
2. Are there executives from local companies willing to sponsor and participate in the event?
3. Do you have faculty with the skills to execute an ERPSim event with students that are younger and less experienced than typical college students?
4. Do you have college students who can serve as mentors to the high school students?
5. Do you have the support of college administrators?

What we’ve learned

A High School ERPSim Event is an exercise in project management. Time is both a friend and an enemy. Plan early, in good detail, and build in ‘buffers’ to address the hic-ups along the way. While explicit detailed activities may seem like overkill, they will illustrate the complexity of some tasks and help to better estimate the time needed. There are five critical success factors: Event Planning, Simulation Coaching, Well Defined Event materials, Clearly Defined Team Roles, and a Nurturing Environment.

Event Planning

One needs to look at an ERPSIM event as an exercise in project management. The actual competition/event is analogous to the ‘go-live’ of an information system. Most of the effort will happen before anyone takes a seat. One must first scope out the project with the various stake holders, manage the technical infrastructure needs, establish documentation and training protocols, test the product, and then practice the go-live event to smooth out the rough spots. Logistics involving the venue must also be well planned. Lunch, snacks, drinks, parking, seating etc.... require close attention.

Simulation Coaching

Novice ERPSIM users need support to succeed. Nuances of the software, data, processes, people, and even the event ‘procedures’ may be overwhelming to the uninitiated. A dedicated coach for each team is essential. The bespoke mentor for each team helps to: adhere to event scheduling, facilitate student learning, and provide business and ‘technical’ support. For high school students, strategy and communication require a little more attention; while some non-ERP college students maybe little intimidated by the technology being used.

These mentors can be upper division students, industry partners, or faculty. In our experience, the ‘closer’ the mentor is to the target student, the more relaxed the simulation environment is. For high school students, we used college students currently taking ERP coursework. Mentors receive targeted training in how the simulation works, business strategy and effective communication.

Well Defined Event Materials

The ERPSIM Job Aids are the foundation for event materials. Each Student/role needs documentation that reinforces their duties within the simulation. However, additional documentation focused on the event itself is also needed. Facility maps, chaperone/observer materials, as well as publicity materials are just a few examples.

Clearly Defined Team Roles

In addition to the students, mentors, and the ‘Master of Ceremonies’, there are a wide range of roles needed to properly execute the event itself. For example, a VIP facilitator provides structure and communications for the chaperones and observers in attendance. This helps to prevent interruptions in the simulation activities. The facilitator can answer logistical questions, comment on the execution of the simulation, and discuss strategy separate from the student events. Timekeepers and runners help the MC

in the execution of the simulation. Media coordinators, photographers, help promote and document the event while it happens. Facilities personnel help manage food/environment needs. This does not imply you need a small army, people can hold multiple roles; those roles however, just need to be explicitly identified.

Nurturing Learning Environment

ERPSim, especially for novice participants, needs a nurturing environment that supports the student's questions and discovery. More attitude rather than a 'thing', this type of environment needs to provide students with the opportunity to discover, execute, and possibly fail. Learning from their success and controlled failure is what provides students with experience. Pre-round strategy discussions, post-round debriefing sessions (lead by the mentor) help teams/students identify what "works and doesn't work". Explicit goal setting before the first round (e.g. what is the measure of success) provides the framework that students use to assess their progress.

Contributed Materials

We have developed a 'How To' document that contains the necessary checklists, deliverables and overviews for a successful ERPSim Event. The current deliverable directly supports the water bottle distribution game, but can be easily adapted to other ERPSim games. Topics include: Overview of the ERPSim Event, Initial Planning, Pre-Event Preparation, 'Day of Execution, and Post Event review. For each topic, a number of supporting files are provided: project plans, slide decks, communication material, ERPSim material, and various template documents. Everything from project plans to table tents are provided or referenced.

We trust that these deliverables help to reduce the effort needed to execute an ERPSim event, and that they improve the quality of the learning that will take place. Our hope is that the UA community continues to add and refine these deliverables to advance the value that our students (secondary and post-secondary) will derive from ERPSim.

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Teaching and Assessing Business Process Modeling in an Introductory ERP Course

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Abstract

In an undergraduate Introduction to Enterprise Resource Planning course taught at Georgia College & State University this past fall, the SAP Paper Game, developed by Pierre-Majorique Léger (2015), was incorporated to help students have a better understanding of business processes. The teaching methodology used proved to be very successful. This presentation will provide a platform to share the experience at the SAP conference with faculty looking to incorporate a different method of teaching business process modeling.

Keywords: business processes, business process models, BPM, Visio BPM diagrams, ERP, simulation game, assessing learning.

Introduction

Organizations are increasingly adopting Business Process Management (BPM) approaches growing the need for BPM expertise in the industry (Bandara et al. 2010). This has resulted in “a strong demand for college graduates prepared with the knowledge of business processes” (Lee 2008). Hadidi (2014) pointed out that development of courses and programs in BPM area has received huge consideration in academia during recent times. This paper presents a teaching case for Business Process Management using a paper-based simulation game conducted as part of an undergraduate IS course at an accredited public liberal arts university in the U.S. The presentation will describe the various activities involved in the teaching case such as execution of the simulation game, creation of graphical representations of processes followed in the game, and creation of Business Process models using Visio software. A post-test survey was conducted to evaluate the understanding of BPM concepts learned and analyze the effectiveness of the simulation game. At the conclusion of the presentation, the presenter will provide recommendations for future research.

Teaching Process

The entire teaching process involved five steps. First, the instructor provided a lecture overview of business processes demonstrating examples of various steps in business processes and showing some small models of specific business processes such as order fulfillment and procurement. Next, he students participated in the SAP Paper Game where they were put in teams and told to sell paper to customers, buy supplies from vendors, and produce finished goods. Each team should identify various functional roles for each team member. The game was played over two class period with five rounds per class. This gave the teams opportunity to revisit their strategies and processes. When the game was over, prizes were given to the teams who made the most money.

Following the conclusion of the game, students were given large sheets of paper and asked to develop a business process model diagram from the activities in the game. Once they completed the diagrams, they were asked to post their diagrams around the room. The instructor explained that they were now to

pretend that they were in a “cocktail party” environment. Students were asked to walk around the classroom, look at all of the diagrams, compare the differences, and talk about them informally. After the informal discussions, the instructor allowed one person per team to stand next to their diagram and explain it to the entire class. Verbal feedback was provided by the instructor and students were asked to make note of the feedback for the next activity.

Next, students were asked to watch a video demonstrating how to create a business process model (BPM) diagram in Microsoft Visio. The teams were then instructed to take the model they drew on paper and convert it into a business process model in Visio following the instructions on the video. Again, each team presented their model, in Visio this time, to the class, and the instructor, again, provided verbal feedback making suggestions for improvement. The students were asked to modify their BPM diagrams based off of the instructor’s feedback.

The last part of the teaching exercise was to measure student learning and student perceptions. Each student was provided a survey asking questions about business processes and their individual perceptions of each of the teaching activities. At the end of the survey, students were asked to rank the teaching activities from most effective to least effective.

Presentation Overview

The conference presentation will include an in-depth description of the teaching activities and assessment methodology including samples of student work and the results of the assessment survey. The attendees will be given an overview of the SAP Paper Game, tips for administering the game, suggestions for providing informative feedback to the students on their BPM models, and an assessment tool to assess student learning and perceptions of their learning. Any faculty who is looking for an engaging student-centered technique for teaching business process modeling and a tool for assessing the learning will benefit from attending the presentation.

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The ERPsim Distribution Game as a Comprehensive Supply Chain Management Semester Project

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Abstract

This innovative utilization of the ERPsim Distribution simulation adds valuable content for undergraduate students within a supply chain management curriculum. ERPsim provides an active learning platform, and the project detailed within provides resources for students to simulate managerial roles within a wholesale distribution channel. Teamwork, data analysis, and planning are required as students progress through twelve virtual weeks of supply chain management over a ten “real time” week project. The provided pedagogy includes instructor notes, detailed student instructions, a companion Microsoft Excel workbook, PowerPoint slides, and exercises.

The simulation is run on a week-by-week basis, with the instructor pausing each virtual week Friday for students to collect data and make operational decisions. Short term forecasting techniques are required to predict weekly demand, and then actual results monitored. Sales, purchase orders, inventory, and forecast statistics are tracked, along with financial information and other metrics, to provide students a means to assess the impact of their actions. Active learning from the simulation is enhanced as students summarize monthly results and develop plans for subsequent months. The pedagogy includes live presentations to the class, with the instructor serving the role of upper management.

The project is currently being utilized as a semester project within a Distributor Sales and Branch Management junior level course. Adoption of this project may benefit ERPsim practitioners teaching demand management, inventory management, or any supply chain course considering the cash to cash cycle.

Keywords: ERP, supply chain simulation, managerial role play, demand management.

Introduction

The intended application of the ERPsim Distribution Game (Léger et al. 2007) is a two to three hour simulation to introduce newcomers to the SAP University Alliance and to Enterprise Resource Planning (ERP). The introduction includes basic SAP transactions and establishment of the value of using the simulations available from HEC Montreal. This paper describes an innovative approach to extending ERPsim’s “learning by doing” approach by integrating data analysis and demand management pedagogy within a semester long supply chain learning project.

The proposed project modifies the ERPsim Water Distribution Game into a time-phased, team oriented simulation played over ten calendar weeks on a virtual week-by-week basis. The project integrates ERPsim operational decisions with stand-alone exercises, including materials requirement planning (MRP), forecasting, forecast error, and safety stock, along with data extraction from SAP and analysis

with Microsoft Excel Pivot Tables. Further, the pedagogy develops an understanding of ERP systems, managerial teamwork, and business strategies in an “active learning” environment via structured monthly Sales and Operating Reports.

Undergraduate Student Audience

There is an underlying assumption when using supply chain management simulations that students have a thorough knowledge of business processes, planning tools, and management techniques. However, anecdotal evidence and student surveys suggest that many undergraduates will miss the learning objectives of simulations due to a lack of understanding of how information is created and used. If faculty are to completely exploit the features of ERPsim, students need a firm understanding of fundamental demand management, inventory control concepts, and financial metrics. This project seeks to accomplish this by combining the simulation with supply chain process exercises and managerial reporting requirements. The project is best utilized by students within a supply chain management curriculum, and preferably after experiencing business process management using the SAP UA curriculum content.

ERPsim Distribution Game Modifications

Students participate in the simulation over weeks of time, rather than a single class meeting. Working in three person teams, each student fills a permanent role of a commodity manager, in addition to rotating through positions of sales manager, materials manager, and accounting manager. The simulation is run on a week-by-week basis, with the instructor pausing each virtual week Friday for students to collect data and make operational decisions. Utilizing a provided Excel workbook, teams use SAP data to manually track weekly inventory, purchases, and sales to establish demand distributions, create short term forecasts, monitor forecast error statistics, and determine safety stock. Also, forecast error is used to compare effectiveness of short term forecast methods. Financial information is recorded on a weekly basis to determine the impact of decisions, and assess the company health on a virtual month basis. Rather than doing a game-end review as per the traditional use of ERPsim, students use a structured Sales and Operating Report format to report monthly results along with plans for the next virtual month.

Supporting the project are a series of PowerPoints to briefly introduce the technical aspects of demand and inventory management. The provided exercises reinforce the key concepts and include an instructor led demonstration activity, followed by student exercises. Sales and Operating Planning report guidelines are created for each of the three virtual game months. For each monthly report, the Accounting Manager will summarize the current month results on a product family basis along with plan and market comparisons. Additionally, each student in their role of Commodity Manager will create a plan for the next simulation month on an SKU level. Written report guidelines are provided, and the pedagogy provides time for verbal in-class presentations. Critical to success is a question and answer period at the conclusion of each presentation to test understanding of supply chain knowledge and operational decision impacts.

Conclusion

In general, enterprise system education equips students with a process-centric background that emulates today's corporate climate (Antonucci et al. 2004). Recent research has shown an increase of importance on integration of planning, control, and execution of materials, resources and operations upon business performance, and hence, the relative importance of ERP as a critical system (Su and Yang 2010). The proposed Distribution Simulation Project is designed to deliver an active learning approach to supplement an existing supply chain management pedagogy.

Contributed Materials

1. Simulation Game Administrative Files
 - a. Instructor Overview and Lesson Plan
 - b. Student Instructions
 - c. Grading Rubric
 - d. Discussion Questions

2. Resources
 - a. PowerPoints, Exercises, and Solution Files
 - b. Microsoft Excel Data Workbook with templates
 - c. Sales & Operating Plan reporting guidelines

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Experiencing Business Processes in Online Classes

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Abstract

This presentation reports on efforts used to incorporate ERPSim in online classes by professors at three universities. It provides insights into what works and what doesn't, lesson learned, and will provide participants with a bevy of assignments that can be leveraged to enhance their use of ERPSim in online courses.

Keywords: ERPSim, gamification, online games, online education, SAP ERP, SAP Lumira.

Introduction

Following calls a decade ago for business processes to be taught as part of information systems (IS) classes (Peslak 2005) many universities have incorporated this topic into their courses. Coverage of business processes is also becoming more common in IS textbooks (Kronke and Boyle 2015; Rainer et al. 2014). And, at many universities, the SAP simulation games developed at HEC Montreal (Léger et al. 2007) are used to enable students to gain hands-on experience with SAP ERP and how it supports business processes.

The use of ERPSim is also consistent with increasing prevalence of “gamification” of the IS curriculum and the use of serious games to test research models (Putz and Treiblmaier 2015). While the use of games, such as ERPSim, is widespread in colleges and is applauded by both academics and students (Dick and Syzmanski 2013), their use in online classes is less common. This is partly due to the perceived difficulty of replicating student experiences in face-to-face courses in online classes (Hernández et al. 2010). Advocates of using design science to develop and test simulations for use in online classes have emerged (North-Samardzic 2015).

Running the Games Online

With an increasing number of classes being offered online, many schools are attempting to ensure that the educational experience in online courses matches that offered in the traditional classroom (Bella et al.

2008). Some online courses are fully asynchronous with the expectation that enrolled students are not required to come to campus to complete any part of the course. Nevertheless, the argument that a component seen as beneficial and contributing to desired learning outcomes in a face-to-face section of the class, should be available also be available to students in an online section, is a strong one.

This presentation reports on efforts used to incorporate ERPSim in online classes by professors at three universities. It provides insights into what works and what doesn't, lesson learned, and will provide participants with a bevy of assignments that can be leveraged to enhance their use of ERPSim in online courses.

The presentation arms participants with structured materials and exercises for:

- Preparing for the game -
 - Downloading and installing the SAP GUI
 - Individual and group pre-game preparation
 - Promoting collaborative communications among group members
 - Familiarization with game reports and transaction codes
 - Installation of classroom software to enable communication with other teams and the instructor during the game
 - Critically evaluating 'practice game' performance.
- Promoting team engagement between rounds –
 - Analyzing report data 'in place'
 - Extracting and analyzing report data
 - Developing action plans for improving team performance
- Assessing post-game reactions to the simulation
 - Team post-mortem critical self-assessment
 - Individual reflection assignment
 - Using visualization tools to assess team performance

The presentation will also address:

- Problems/issues encountered
 - Technological
 - Interface
 - Instructional
 - Student error
- Instructor reflections of using ERPSim online
 - Instructor time and commitment
 - Technological familiarity
 - Teamwork
 - Value of the exercise

Materials Shared

These will include the instructions developed for online students to prepare to participate in ERPSim. In addition, student assignments will be made available for adaption or use by others wanting to incorporate ERPSim into their courses

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Game Play: Online Delivery of ERP Simulation Game

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Abstract

Many universities are developing or considering online classes and programs. The hands-on nature of high quality ERP education presents a number of challenges and opportunities in online education. The objective of this presentation and extended abstract are to present guidance and lessons learned from the delivery of an ERP simulation game (ERPsims) in a variety of online formats. The target audience for this presentation includes faculty who are familiar with ERPsims in a face-to-face context, and who are considering whether and how to deliver ERPsims in an online format. The online delivery format is applicable to undergraduate and graduate level classes, and can be delivered fully online or in hybrid/blended and flex delivery methods.

Keywords: online, blended delivery, flex delivery, hybrid delivery, simulation, simulation game, synchronous online delivery, ERPsims.

Introduction

When the new president of a southern university system started his tenure, one of the first initiatives was to institute online degrees in many disciplines. As part of the initiative, the system's land-grant and flagship institution designed and delivered online degree programs in several colleges. The first online program offered by the business college is a general business degree. For the transformation of the degree from a traditional face-to-face format to a fully online format, seven departments within the business college developed and implemented an online version of the core business courses. In the next stage of the online degree development process, an array of upper-level business electives were also developed for online delivery. One of these selected upper-level courses was an information systems course focusing on Enterprise Resource Planning (ERP) Fundamentals, a very popular face-to-face elective across all business disciplines in the college.

The ERP Fundamentals course covers the integration of common business processes such as accounting, fulfillment, procurement, and production in the context of an ERP system, specifically SAP. Students first learn the business processes individually with the use of a textbook, classroom lectures, and hands-on computer lab assignments. Then, an ERP simulation game (ERPsims), developed at HEC Montréal (Leger et al. 2007), is incorporated to provide a more complete experience of enterprise integration in an accelerated real-time environment, bringing teams of students together to manage virtual firms in a competitive landscape. When transforming this course into an online format, the most significant challenge was the incorporation of the simulation game into the online experience. The ERPsims experience is fast-paced and requires critical thinking, clear and timely communication, and smooth execution of business processes. Given that the face-to-face and online courses are the same course in the

catalog of studies (only in a different delivery format), a key objective in the design of the online experience was to maintain the high-quality hands-on nature of the course experienced by face-to-face students.

Methodology

ERPsims are available in several variants, including a water bottle distribution game, a dairy logistics game, and a muesli manufacturing game. The objective of the ERPsim game is to maximize profits through the marketing, distribution, and sales of products. ERPsim has been delivered in a variety of formats, including 100% online, blended delivery (combination of face-to-face and online), and “flex” delivery (integration of both online and face-to-face students). For most delivery formats and game variants, students are divided into teams of three to five, depending on the version of the game and the size of the class. Each game consists of multiple rounds of twenty or thirty virtual “days” of around one minute each, punctuated by breaks between rounds that can last minutes or days. Teams are able to make adjustments in real-time while the game is running, and the breaks between rounds are typically used for revisiting higher level strategies and processes. Each delivery method and game variant that has been used at our institution is summarized in the following paragraphs.

ERPsims have been delivered in a blended delivery format (periodic face-to-face meetings with substantial online coursework between each meeting) using all three variants of the game. For blended delivery, the limited face-to-face time highlights the need for meaningful activities during face-to-face meetings, particularly those which are more difficult to accomplish as part of an online course module. In this case, the actual execution of the ERPsim game is an activity that was conducted primarily during face-to-face class sessions. Student lab exercises, in which students navigate individually through accounting, production, procurement, and sales processes, were the focus of several of the online course modules. Other online course modules focused on introducing the game concepts, with recorded presentations and demonstrations highlighting important concepts and steps needed to manage the virtual firms. Teams are assigned to conduct strategic planning exercises, implement initial company setup decisions, and establish team member responsibilities and communication processes prior to the face-to-face meeting. Based on experience using this delivery format since 2007, teams that take this online preparation more seriously are the ones who most quickly achieve operational excellence and strong performance.

The 100% online delivery format has been utilized since Spring 2013. The muesli manufacturing ERPsim game has been the primary game used in the 100% online delivery format. For 100% online delivery, a day and time is determined to conduct synchronous online sessions, and posted into official course listing information. The online synchronous sessions were conducted using a real-time collaboration tool, Blackboard Collaborate (BBC). BBC was utilized to give instructions on how to play the simulation game, how to use the transaction screens within the SAP system to monitor and execute business processes, and how the teams can utilize BBC during the execution of the simulation to maximize communication performance.

At the beginning of the BBC session, students are online in the main BBC room for announcements and instructions. Once teams have been briefed on instructions and expectations, the students are placed into virtual break-out rooms for each team to discuss strategy and prepare for the upcoming round of the simulation game. Additionally, a “coach” (graduate assistant, Ph.D. student, or former student with experience playing the ERPsim game) is placed into the BBC break-out room with each of the teams. The coach’s role is to assist with any technical difficulties the team members may have, and to answer questions while the game is in progress. The instructor monitors activities within the game, floats between break-out rooms for monitoring and assistance, and addresses any emergency issues that a coach cannot address. Once the round is over, the instructor brings the students and coaches back to the main BBC room for debriefing, discussion of results, questions and answers, and preparation for any upcoming rounds. The teams’ performance has been equivalent to the performance of traditional face-to-face format teams.

The “flex” delivery format (integration of fully online students with face-to-face students) was piloted in a business analytics toolkit course in Fall 2015. The water bottle distribution game was used, with teams of two to three members, and the exercise was conducted primarily as a synchronous in-class experience (no pre-class preparation) due to the simpler nature of this game variant. Ten face-to-face teams and one

fully online team participated in the same simulation environment. Face-to-face teams were seated together and were able to communicate using normal methods. The online team used an online collaboration tool, GoToMeeting (GTM), to communicate via voice, text, and screen sharing. The online team was supported by a “coach” who was experienced in the operation of the ERPsim game. The coach was available in GTM, and would provide guidance when team members were confused about an aspect of the game and when it was evident that the team was in need of additional information that would help in the management of their virtual firm. This game was conducted during two synchronous online/face-to-face meetings. The online team, through the support of the coach resource and perseverance on the part of the students, achieved good levels of operational efficiency and finished in a competitive position with the face-to-face teams.

Benefits and Challenges

There are rewarding benefits and inherent challenges with online delivery of an ERP simulation game. A major benefit of this format is the immersion of students in a realistic and complex environment that is similar to the multi-tasking, problem-solving, and communication-driven environments that are increasingly experienced in the modern workforce, where team members may not be physically co-located but are expected to effectively collaborate to solve complex problems. The online simulation game experience enriches problem solving, analytical, communication, and critical thinking skills, and creates a fun and exciting learning environment. Such a rich and immersive experience is almost unheard of in an online course, and can help to differentiate an online course or program.

Challenges were experienced (and lessons were learned) in three broad areas: communication, technology/tools, and coordination. Communication challenges include the inability to read non-verbal communication from the students when assessing understanding, the need for virtual team training and knowledge, team communication challenges during sessions, and effective utilization of break-out rooms for teams. Technology or tool challenges include students having the appropriate hardware and software to successfully participate in the sessions (e.g., headset/mic to avoid extra feedback and noise, virtual desktop software, etc.), limitations of the online collaboration tools, and the students’ need for sufficient desktop work space (e.g., dual monitors to effectively collaborate while managing their virtual firms). Coordination challenges include scheduling of the synchronous online environment and the acquisition of “coaches” for the execution of the game.

While the challenges are substantial, and the synchronous and real-time nature of fully online delivery offers a number of risks, the benefits of offering an experience such as ERPsim as part of a fully online course is of great potential benefit to students and to the programs and departments that deliver such courses. Differentiation of an online course is essential, and the integration of a collaborative and immersive experience such as ERPsim is one avenue to accomplish this goal.

Contributed Materials

Contribution materials to the SAP UA community will include the ERP Fundamentals online format syllabus and schedule as well as a tips document.

Reference

Léger, P.-M., Robert, J., Babin, G., Pellerin, R. and Wagner, B. 2007. ERPsim, *ERPsim Lab*, HEC Montréal, Montréal, Qc.

JIT Learning and Beyond with a Configuration Client

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Abstract

This presentation shares a just-in-time (JIT) learning approach using a configuration client in a Business Process Integration class to teach how different business processes are integrated and what the underlying logic behind executing certain transactions is.

Keywords: Business Process Integration, JIT learning, ERP, configuration, experiential learning, team work.

Introduction

The author will be sharing her pedagogical, just-in-time (JIT) learning approach with the audience. She has been using a configuration client in her Business Process Integration class to teach how different business processes are integrated and what the underlying logic behind executing certain transactions is.

The entire class pedagogy is hands-on learning. Exercises are done together with the instructor where necessary concepts are introduced by her in JIT. There are no lecturing no PowerPoints in this class by the instructor.

Course Objectives

Configuration is getting the system ready to execute processes, setting up the enterprise structure, defining business rules, and master data. Configuration provides a greater understanding of how business processes are executed in the system, helps to decipher the software and is helpful in trouble shooting.

Concepts Learned

The instructor explains to the students that they are hired by a company to configure SAP for their enterprise. Configuration involves several processes, starting with financial accounting (FI), continues with materials management, cost accounting, production, shop floor control and fulfillment process. For each process organizational structure portion involved in that process is defined first followed by master data and some rules, and tested with some transactions. Students learn some information systems concepts as well as business concepts. Students also learn impacts of certain transactions on different business processes such as what is the impact of goods received on inventory and on accounting; which accounts are posted automatically, for what kind of accounts are there open item management. They learn how they can create vendor master data; what are the implications of maintaining it in one way or the other. What kind of processing key is appropriate for what kind of materials requirement planning?

Author's pedagogy beyond JIT learning

The author's pedagogy beyond JIT learning will also be elaborated: such as supporting these exercises with the relevant chapters from the book (Magal and Word 2012), sharing best practices, having students on the LinkedIn group, taking them to ASUG meetings, value of this course for business students and impact of this approach on students' retention and final success. She would also talk about benefits of introducing a new client after configuring SAP for certain number of functional areas.

Reflections, Presentations and Assessments

Students, after every session, write their reflections as teams; one team prepares it as a presentation, the rest submit written reports. Students are requested to write what kind of concepts they have learned while they were doing exercises. They support it with their own screen shots. Presentations are as a team yet assessments are individual. Each team take their turns for presentation. Students are pleasantly surprised to find out that they have already learned the concepts while doing exercises. Yet reading, presenting, being discussant for chapters clarify certain concepts better.

At the end of the term, they write reflections of the entire course as a team so they have a written material they can talk about for their future job interviews. Most of these students find jobs, internships in fortune 1000 companies or they get promoted in the companies they work for.

Final Projects

Most of the interesting part of the class is final projects. Each team comes up with a variety of projects. For example a team defines new materials of their own, new vendors, customers, etc. For finished product, they need to define new bill of materials (BOM), routing etc. While some ambitious teams (usually MBAs) create new work centers too, the majority use existing work centers. Again for finished product or multiple finished products they forecast demand for the next few months. They run MRP, procure materials if necessary, receive invoices, pay vendors, and produce semi-finished product and eventually the finished product. Fulfillment process is completed after selling the product to the customer and receiving payments. Students learn most during this final project development process; they make mistakes for which they are responsible to find out why it happened and correct them. They share this experience with the class during the final project presentation.

Conclusion

This has been a very enjoyable experience for the author and for her students. She would like to share it with the SAP alliance community, with both long time members as well as new comers and with potential members.

Contributed Materials

Syllabus for both undergraduate and for MBAs, PowerPoints of extended version of the presentation will also be shared with UA so that participants have a better feeling of how to incorporate this pedagogy into their classes.

Who can benefit:

Supply Chain Management and Business Process Integration faculty, and any faculty teaching ERP and/or configuration can benefit from this presentation.

Reference

Magal, S. R. and Word, J. 2012. *Integrated Business Processes with ERP systems*, Wiley.

Teaching the Concepts and Demonstrating Business Process Integration: The Flya Kite Fully Integrated Case

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Abstract

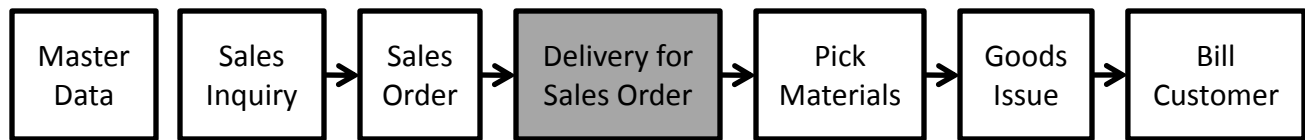
The Flya Kite Case is a fully integrated case that includes introductory-level exercises that allow students to execute business processes in five key areas: sales logistics, production logistics, procurement logistics, accounting and controlling, and human capital management. Additionally students are introduced to SAP navigation and master data creation and use. The case is preconfigured with all control/configuration data and organizational structure necessary to process the unique transactions arising in each area as well as transactions involving integration across functions. The case is considered fully integrated due to the inclusion of the basic SAP PP, MM, SD, FI, CO, and HR modules.

Keywords: Business process integration, master data creation, transaction processing, hands-on SAP exercises.

Introduction

The *Flya Kite Case* was created over fifteen years ago to provide academic-oriented SAP training materials for university students. *Flya Kite* is intended to provide first time student SAP users with the materials and exercises necessary to learn the look and feel of the SAP system, navigation through that system, and the concepts and hands on exercise experience of master data creation, business transaction processing, and the integration of sales logistics, production logistics, procurement logistics, accounting and controlling, and human capital management. The case has been available to SAP University Alliance members since its creation. Over its history, the case has been continuously updated and revised for both new versions of SAP as well as in response to user suggestions. The next iteration of the case will be available in the summer of 2016. The case predates the Global Bike case materials and provides an alternative to those materials. The case can be completed by students in as little as two weeks but is generally a three or four week assignment. The exercises in the case are written in sufficient detail that they can be completed outside of class after a brief introduction to navigation.

The case can be used where the objective is to introduce basic business processes and support areas to demonstrate integration across the functional areas and modules. The premise is that students may not be familiar with the interrelated tasks and data necessary to carry out business processes. Each exercise has an initial diagram presented before the first step that identifies specifically where in the particular business process the steps in that exercise are located. For example, the exhibit below identifies where in the sales and distribution process the exercise related to creating a delivery for a sales order occurs. The highlighted box indicates the “location” of the particular exercise in the process.



Each of the SAP modules included in the case (MM, PP, SD, FI, CO, and HR) has its own unique diagram. This was added to the case based on user suggestions to help students visualize where in the process individual events occurred and how they are recorded/processed in the system.

Client and Shared Materials

The pre-configured data set required to complete the *Flya Kite* case is contained in the *SAP ERP SHSU Client* available through the Milwaukee and the Chico UCCs. The client contains not only the *Flya Kite Case* materials but also the *Quazi Computers Configuration Case* materials, the *RF Clothing Configuration Case* materials, and the *Classic Rockers Case* materials. This allows a UA member to have access to all cases developed at Sam Houston State University in one client. Annually over 100 faculty members at approximately 95 UA member universities use the materials in the SHSU client. The materials for each case in the client are differentiated by student user names and allow one thousand simultaneous student users for each case. For example, a student assigned the user name of FLUSER-xxx (where xxx would be an assigned number from 001 to 999) would be able to complete only the *Flya Kite* materials in the client. When the client is requested from the UCC, the specific case, e.g., *Flya Kite* or *Quazi*, must be specified so that the appropriate user names can be activated by the UCC for that request.

The shared materials for the *Flya Kite* case available to the SAP University Alliance community include:

Flya Kite Student Textbook (62 pages – chapters: Introduction, MM, PP, SD, FI/CO and HCM)

Flya Kite Instructor Text (115 page instructor resource text including suggestions for use in class and grading, error troubleshooting notes, multiple choice questions for each chapter contained in the student text, and solutions for student deliverable screen shots for each set of module exercises)

Flya Kite Student Exercises (81 master data creation and transaction processing exercises keyed to each processing module, 92 pages)

In using the course, the usual process is to provide the students with the student text and the exercises through Blackboard. The instructor text contains a troubleshooting guide that has been continuously updated based on the authors experience teaching the course each semester and more importantly from suggestions made by users. The instructor text also contains multiple choice questions based on the student text that can be used to quiz students to ensure they complete the reading assignments for each chapter. These quizzes are generally administered through Blackboard. These questions are available for upload by users of *Flya Kite* through direct request made to the authors in order to limit widespread dissemination. The student textbook is a collection and abstraction of the SAP online help materials. The exercises are written in sufficient detail to allow students to independently complete each assignment and provide the instructor with screen shots that verify correct completion.

Instructors who use the case should work through it before assigning it to students. The time involved for this by a first time instructor is approximately ten to twelve (nonconsecutive) hours. Users have found the troubleshooting guide in the instructor manual to be a very useful tool in assisting students with errors. The guide is continuously updated but given the recurring nature of student errors from semester to semester, a very high percentage of possible errors with correction explanations are already included.

Case Use

The *Flya Kite* case has been used over many years in accounting, management information systems, management, production, and other courses. The authors use the case one instance as an introduction to SAP as a first step in a configuration course primarily for graduate accounting majors and in another case as an introduction to the required academic course that qualifies students for the university's TERP-10

academy. Feedback from users suggests that the case is useful in cases where time is limited within the course to introduce the concepts of process integration. The case is intended as an SAP-based supplement to the standard course content.

Upcoming Modifications

In the past, the *Flya Kite* case has been configured such that all students in the client are using the same company code. In the version that will be published in the summer 2016, each student will have his/her own unique independent company code. That company code is keyed to the individual assigned student user number. In addition, when the student creates master data and processes transactions for materials, vendors, customers, etc. the names include that same user number which allows tracking of student activity through the various exercises. The case will also be expanded to include some reporting elements.

Where appropriate, the steps within each exercise contain the specific SAP icon that is used to execute that step. The existing *Flya Kite* exercises are being updated to reflect the new icons found in the latest SAPGui release. These modifications will be included in the summer 2016 release of the case.

Existing Related Cases Available to UA Members

As indicated above the *Flya Kite* case is one of a number of cases available in the data set contained in the SAP ERP SHSU Client. Those other cases are:

Quazi Computers Configuration Case - detailed step by step exercise case overview of configuration setting up the key modules in SAP ERP. The case involves the configuration and testing of each module in a consecutive process until the entire client is configured.

RF Clothing Configuration Case – a semi-structured configuration case in which the student creates all organizational structure for the client, creates all master data for the client, and tests the complete configuration with transactions involving all structure and master data. Generally completed as a follow-on to the more structured Quazi Computers case.

Classic Rockers Case - utilizes the same basic processes and exercises as *Flya Kite* but with a substantial emphasis on internal controls and the implementation of internal controls within those processes. The case is used by primarily in Accounting Information Systems courses.

Using SAP Client Configuration to Teach Business Process Management: The Quazi Computers Case

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Abstract

The Quazi Computers Case is a “bottoms up” hands-on configuration case that requires students to complete the sequential configuration of five basic SAP modules (FI, MM, CO, PP, and SD) for a fictitious computer manufacturing company, Quazi Computers. The purpose of the case is to provide a structured overview of configuration that gives students hands-on experience in the creation of organizational structure and master data for an ERP system. It is considered “bottoms up” in that each of the modules is configured in sequence until the entire system for the company is configured. As the configuration of each of the five modules is completed, students complete transaction processing exercises to test their configuration up to that point.

The exercises and tasks required by the Quazi Computers case provide tangible evidence and experience as to how management decisions are ingrained into the business processes of an organization. Through class discussion of the case exercises, an instructor can point out where the decisions of an implementation team are necessary as direction for the configuration of a system. The exercises and tasks provide direct evidence to students as to how the integration of business processes is accomplished by the system. Through other cases addressing business process integration, students can see that transactions, data, and processes are integrated. Quazi Computers can be used to provide an understanding of how that integration is actually accomplished within the system through organizational structure and master data. It is intended to lessen the “black box” view regarding how processing is actually carried out by the system.

Keywords: Client configuration, business process integration, process management, implementation, master data, organizational structure, transaction processing, hands-on SAP configuration exercises.

Introduction

The *Quazi Computers Case* was created over fifteen years ago to provide academic oriented SAP training materials for university students. *Quazi Computers* is intended as an advanced case used to extend students' knowledge of process integration and transaction processing to include an understanding of just how integration and processing are accomplished within and by the system. It was created with the intention of reducing the “black box” appearance of an SAP or ERP system.

The next iteration of the case will be available in the Summer of 2016 in order to accommodate updates to SAPGui brought about from the most recent release as well as added functionality to help students who are contemplating SAP TERP-10 certification to be better prepared. The case predates the Global Bike case materials and provides an alternative to those materials. The case can be completed by students in as little as five weeks depending on the extent to which the instructor wishes to provide lectures and class discussions of the case. The exercises in the case are written in sufficient detail that they can be completed outside of class if students are familiar with basic SAP navigation and after a brief introduction to the use of the SAP Reference IMG.

Client and Shared Materials

The pre-configured data set required to complete the *Quazi Computers* case is contained in the SAP ERP SHSU Client available through the Milwaukee and the Chico UCCs. The client contains not only the *Quazi Computers Case* materials but also the *Flya Kite Case* materials, the *RF Clothing Configuration Case* materials, and the *Classic Rockers Case* materials. This allows a UA member to have access to all cases developed at Sam Houston State University in one client. Annually over 100 faculty members at approximately 95 UA member universities use the materials in the SHSU client. The materials for each case in the client are differentiated by student user names and allow one thousand simultaneous student users for each case. For example, a student assigned the user name of QCUSER-xxx (where xxx would be an assigned number from 001 to 999) would be able to complete only the *Quazi Computers* materials in the client. When the client is requested from the UCC, the specific case, i.e., *Quazi Computers* or *Flya Kite* or *Classic Rockers*, must be specified so that the appropriate user names can be activated by the UCC for that request.

The shared materials for the *Quazi Computers* case available to the SAP University Alliance community include:

Quazi Computers Textbook (335 pages – chapters: FI, MM, CO, PP, and SD)

Quazi Computers Student Exercises (133 configuration exercises keyed to each of the five basic SAP modules, 154 total pages in five individual documents)

Quazi Computers Business Cases 01 through 04 (54 transaction processing exercises in four documents used to test the configuration of the various modules at each step of completion)

Quazi Error Troubleshooting Notes (13 pages – troubleshooting and error correction instructions derived from the authors and users of the case)

In using the course, the usual process is to provide the students with the student text and the exercises through Blackboard. The troubleshooting notes have been continuously updated based on the authors experience teaching the course each year and from suggestions made by users. The authors have produced sets of multiple choice questions based on the readings in the student textbook that can be used to ensure that students complete the reading assignments. These quizzes are generally administered through Blackboard. These questions are available for upload by users of Quazi Computers through direct request made to the authors in order to limit widespread dissemination. The student textbook is a collection and abstraction of the SAP online help materials. The exercises are written in sufficient detail to allow students to independently complete each assignment and provide the instructor with screen shots that verify correct completion. These materials have been available to UA members for fifteen years and have been continually updated due to user inputs. Instructors who use the case should work through it before assigning it to students. The time involved for this by a first time instructor is approximately fifteen to twenty five (nonconsecutive) hours.

Case Use

This is an advanced case that assumes that both the instructor and students have a basic understanding of SAP or ERP systems, SAP navigation, transaction processing, process integration, data structures, and data relationships. The *Quazi Computers* case has been used over many years in accounting, management information systems, management, and production courses. The authors use the case in one instance as a first step in a configuration course primarily for graduate accounting majors and in another case as part of a required academic course that qualifies students for the university's TERP-10 academy. When used as an introduction to configuration, the authors assign a follow on unstructured configured case (the *RF Clothing Case*). In addition to the authors, a user at one UA member university indicated that he “. . .

finds that the case is an excellent overview of configuration. It allows the students to have a well-documented process of setting up the key modules in SAP ERP. I use it before I give them an unstructured configuration case in which they have to document all the business processes they need to support and connect them to the configuration that is required. I let them do this in teams over the last half of the course.”

The configuration in the case involves the completion of guided exercises to configure the specific elements of organizational structure and master data for each basic SAP module in a specified order: FI, MM, CO, PP, and SD. The sequential nature of this process allows the instructor to demonstrate how each module is related to and in some cases dependent upon other modules and processes. The actual configuration of the five modules involves 133 guided exercises with each module having an approximate average of 25 or so exercises. In order to test their actual configurations as they are completed module by module, at four milestones in the configuration, each student completes a business case in which specified transactions will be processed through the configuration as completed up to that point. These business cases include from seven to twenty-seven specified transaction processing exercises that test the configuration of the specific module and its relationship to previously configured modules. Student submissions for these business cases consist of screen shots of the documents they have produced from processing transactions through their configured modules. The author’s screen shot solutions are available by direct request in order to limit dissemination. However, users should work through the entire case, including business cases, and produce their own solution screen shots for use in their particular environment.

In order to demonstrate the implementation of management decisions, the instructor can discuss the exercises and identify whether the student is creating master data or is defining and assigning organizational structure within the system. For master data creation exercises, the implementation decisions include considerations such as how specific relationships with business partners are structured and processed (e.g., credit terms, account groups, reconciliation accounts, currencies, shipping requirements, customer pricing, etc.). The master data can be demonstrated to indicate how the company is going to do business through its transactions based on the configuration of the master data records used by the individual transactions. For organizational structure exercises, the instructor can demonstrate how the rules and organizational structure of the data will be created to ensure that the transactions are actually processed based on management’s specifications. For example, the organizational structure exercises will include the creation and implementation of factors such as what are the relationships between plant and purchasing organizations, how production orders are scheduled, how and when availability checks are accomplished, what work centers are created, what distribution channels will be created and how they are assigned to organizational elements, what will be the standard and alternative hierarchies for controlling necessary to run the company as desired by management, etc. The fact that the structural configuration can allow similar transaction to be processed in different patterns depending on specific circumstances can be demonstrated.

Upcoming Modifications

Where appropriate, the steps within each exercise contain the specific SAP icon that is used to execute that step. The existing Quazi Computers exercises are being updated to reflect the new icons found in the latest SAPGui release as well as added functionality to help students who are contemplating SAP TERP-10 certification be better prepared. These modifications will be included in the summer 2016 release of the case.

Geospatial Analysis of Calgary Crime Data in Residential Communities

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Abstract

This presentation overviews an exercise developed for students attending a business intelligence and analytics course. Students will learn to extract and integrate different crime and census data sets from the Canadian city of Calgary with geospatial data and then use SAP Lumira and ESRI ArcGIS Online software to analyze and display different crime-related data on a map of the city. Visualizations include maps showing the different levels of various types of crime in the city, the location of police stations, and the distances and routes to high crime communities. The material which will be shared with the UA community will benefit any instructor who wants to include a class exercise with geospatial data, a mapping application, and location analytics.

Keywords: Business intelligence, location analytics, city crime data, geospatial data, data manipulation, data integration, SAP Lumira, ESRI ArcGIS Online.

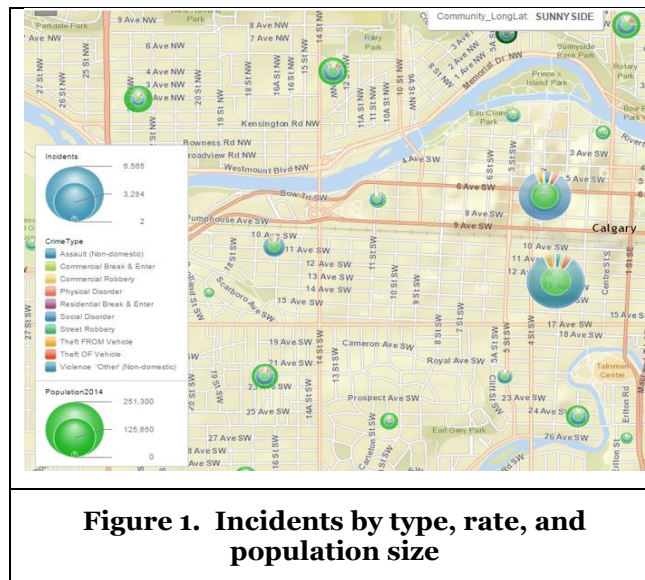
Introduction

With technological advances in the collection, management, access, and distribution of data, there is an exponential increase in the amount of geospatial information available, allowing organizations to provide a wide range of improved products and services at a lower cost (Killpack 2011). The goal of this presentation is to share an exercise that was developed to teach students how to extract and manage geospatial data, integrate it with structured data, create rich mapping visualizations, and perform basic location analytics. The software used is SAP Lumira, ESRI ArcGIS Online, MS-Excel, and Google Maps. The context of the exercise is the Canadian city of Calgary and its crime and civic census data, and police station locations.

Description

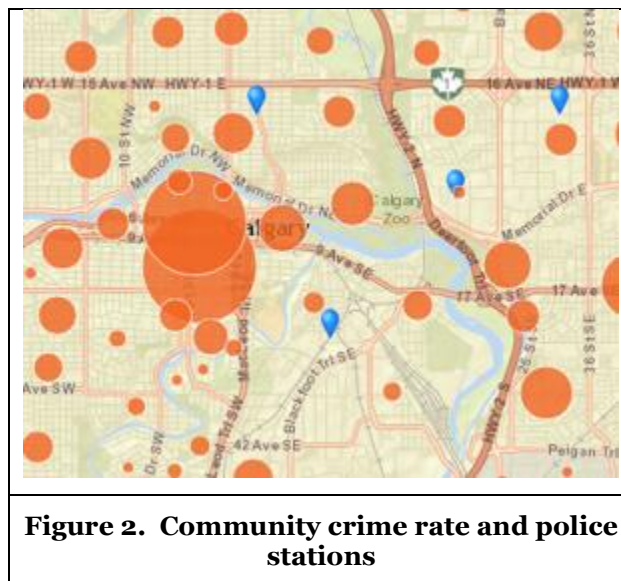
In this exercise students create an ArcGIS Online 60-day trial account and activate the ESRI Geo Map Service in Lumira. They explore, clean, and format the 2015 Community Crime Statistics data (Calgary Police Service 2015a) using MS-Excel. Students load the 2012-2015 cross tabulated crime data in Lumira and explore it. In order to create a geographic hierarchy and display the map of the communities, students have to locate a central point for each community in Google Maps and extract its geographic coordinates (Latitude and Longitude) and add them to the community data. Instead of this labor intensive exercise, students can use the Community Association Points file (The City of Calgary, 2015) which includes geographic coordinates for the communities. Students merge the files in Lumira and explore the crime data using the Geo Map chart option. They visualize the map with different data point types (Choropleth,

Bubble, Marker, and Pie), base map types (Topographic, Satellite, Gray, and Streets) and color palettes, to find answers to a set of questions. Students then enrich the map with population data from the civic census of the city (Calgary 2016). They clean and merge it with the data in Lumira, create new dimensions, and generate different types of rich visualizations such as the one in Figure 1.

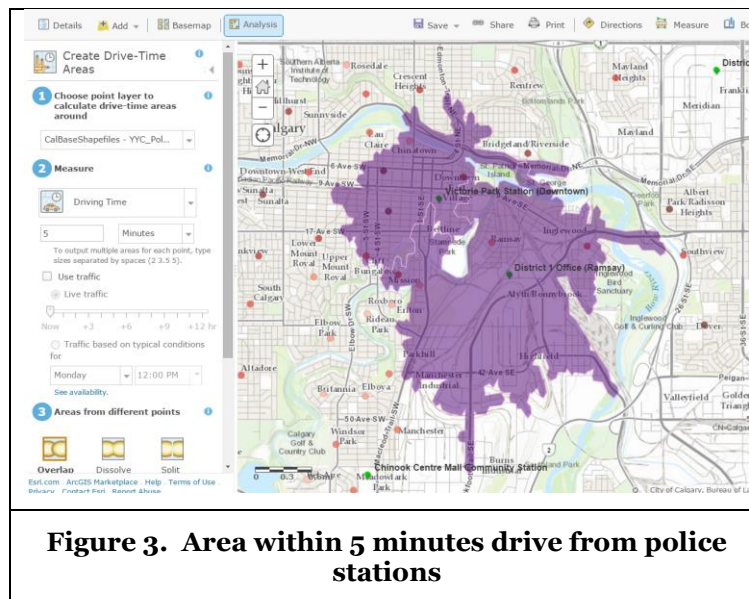


Next, students locate the civic address of the different police stations in the city (Calgary Police Service 2015b) and use Google Maps to find the Latitude & Longitude coordinates of each one. The new data set is loaded into Lumira and the police station locations can be displayed on a map of the city. However, given that blending two data sets is not supported with the map charts in Lumira, the two data sets need to be merged for the police station locations to be displayed with the crime data. Students merge the two sets by creating a dummy variable in the police location dataset and then both map layers are overlaid (Figure 2).

To perform additional location analytics, students login to ArcGIS Online, load the map of the city of Calgary and explore a large variety of existing datasets. They upload the crime data they used in Lumira and overlay it with the existing police station locations map layer and perform proximity analysis such as Create Drive-Time Areas (Figure 3), Find Nearest, and Plan Routes. Students can also explore additional options in ArcGIS like Data Enrichment and Analyze Pattern.



Students then perform further analysis of the maps which reveal that some police stations are not central to the areas they serve and may not respond fast enough to emergency calls.



Conclusion

This exercise helps students gain an understanding of geographic data and geospatial analysis and an appreciation of their value. They learn how to extract and manipulate geographic data, integrate it with structured data, create rich mapping visualizations in Lumira, and perform location analytics in ArcGIS Online. These skills are valuable for students as more organizations are adding geospatial data to business applications to produce greater analytic insight, make better decisions, and improve business outcomes.

Contributed Materials

The material which will be shared with the UA community includes a detailed assignment document with the corresponding data files.

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Experience real-time analytics: Enabling business analytics competency with ERPsim for SAP HANA

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Abstract

The book “ERPsim for SAP HANA – The Reference Guide” is a companion guide for the new ERPsim for SAP HANA released in June 2015. The book uses a rapid appropriation approach to let the participants quickly build and put to the test their analytics skills against a dynamically evolving dataset.

Keywords: Analytics, Real-Time Analytics, SAP HANA, SAP Lumira, Problem-Based Learning, ERP, Game-Based Teaching Approach

Introduction

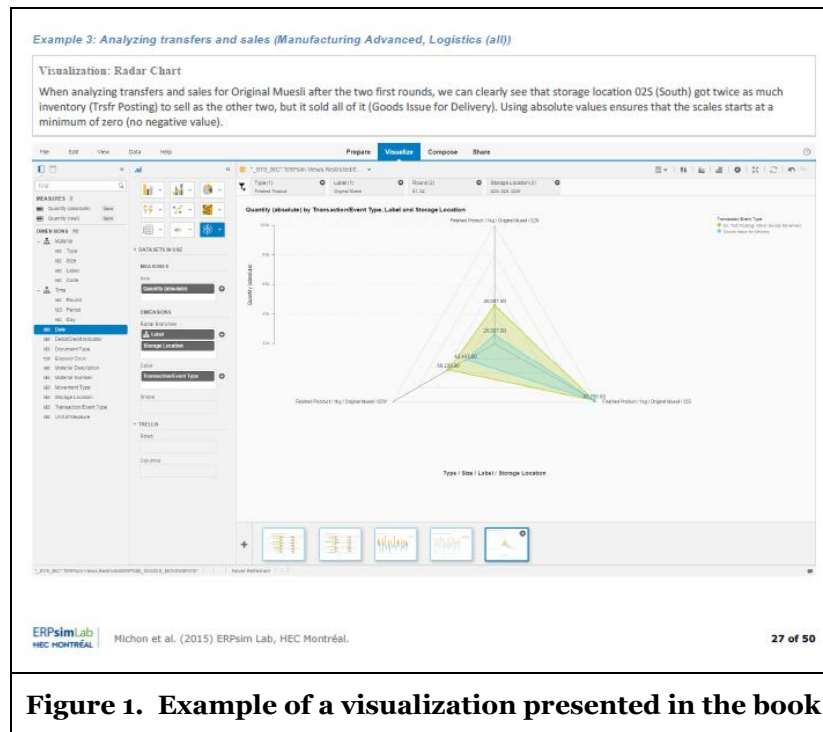
ERPsim for SAP HANA is the new version of our simulation game specifically designed to introduce students to real-time analytics. We have prepared for faculty and students, a reference guide entitled: “ERPsim for SAP HANA – The Reference Guide” (Michon et al. 2015). This guide provides all information students need to know on how to effectively use SAP Lumira with the ERPsim game. The guide is written in a format that allows a rapid appropriation by the students to help them start and apply their knowledge as fast as possible.

New Curriculum Features

One of the key elements of this curriculum is that it allows students to explore the concepts of real-time analytics with a dataset that is their own. The ERPsim simulation has the capacity to generate a market that not only is true to life, but is also reacting to students’ decisions. Having the capability to gain insight on their own data is one thing, but to be able to act based on your findings and to then see the impact on your data can really help to build analytics competence that can be transferable in practice.

The objective of the book is not prescriptive. Our goal is to enact students by giving them the tools so they can explore the dynamically evolving dataset to which they have access. Many views in SAP HANA have been specifically designed for the ERPsim games. For each view, clear definitions are provided for

measures and dimensions, as well as guidelines on how to better use the structure that is presented (see Figure 1). Additionally, a few examples of how each view can be used (see Figure 1) and frequently asked questions are provided.



The solution is also an excellent sandbox to test concepts and determine what works and what doesn't. Students will design visualizations that may seem informative at first, but once they are confronted to the business reality that the simulation provides, they realize that it was not the right choice. The key advantage of SAP Lumira and the views provided with ERPsim is that modifications can be done in a matter of seconds without requiring technical knowledge. It then provides a context where errors can be easily fixed, where business knowledge is more important than technical knowledge, and where students can concentrate on getting it right given the context in which their business is evolving.

The following is the table of contents of the new book (current and projected):

- Part 1: Using SAP HANA Views for ERPsim
 - Complete descriptions of pre-developed ERPsim views;
 - Example of using views with SAP Lumira.
- Part 2: Developing SAP HANA Views for ERPsim (projected)
 - Complete description of views provided with the ERPsim package for development purposes;
 - Step-by-step examples to create custom views and use them with ERPsim.

This guide is freely available to faculty member of the university alliance (please contact erpsim@hec.ca to get a copy). Students can access the guide with the payment of the ERPsim license.

Reference

Michon, J.-F., Robert, J., Lyle, D., Léger, P.-M., and Babin, G. (2015). ERPsim for SAP HANA – Reference Guide. 50 pages.

The ERPsim Game Inter-university Dashboard Collaboration

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Abstract

This presentation describes the deployment of the ERPsim Logistics game across different universities. Students are encouraged to collaborate and are given additional experiences with business intelligence tools and analysis.

Keywords: ERPsim game, dashboards, business intelligence, collaboration.

Introduction

ERP concepts and business processes are taught to university students using a simulation game called ERPsim. ERPsim, developed by ERPsim Lab at HEC Montreal, provides a real-time, simulated competitive business environment where students can experience the power of a fully integrated enterprise resource planning (ERP) system (Léger et. al. 2007; Léger 2006). The software provides a dynamic platform where student teams manage the full cash-to-cash cycle of a small business using a live instance of SAP, and compete for profitability in a simulated marketplace. The ERPsim Logistics game focuses on four business processes of a dairy product wholesaler: planning, procurement, allocation and sales. Utilizing business data to manage their companies, student teams determine optimal sales forecasts, procurement strategies, stock transfer plans, and pricing strategies. Real SAP reports are used to evaluate and make changes to the strategy.

The ERPsim Logistics game also includes an introduction to business intelligence. As part of the hands-on experience, students can create dashboards to monitor their own company's performance during and after the game. The dashboards contain multiple data visualizations that can be updated and used in real-time as a game is played in order to facilitate decision-making. They can also be used after a round or game to analyze the results of decision-making on a company's performance.

The purpose of this exercise is to encourage collaboration across different universities while giving students additional experience with business intelligence tools and analysis.

Collaboration across Universities

Since it is often difficult to arrange an inter-university competition because of varying class schedules, we propose that student dashboards be exchanged between teams in two university classes that are using the ERPsim Logistics game. The students in our classes will create a dashboard for use in their own in-class competitions as well as for use with the inter-university collaboration. As part of the inter-university assignment, students will critique the other team's dashboard. After critiquing the dashboards, they will be required to write an executive summary of their conclusions; a valuable experience to prepare them for today's business world. Another benefit to exchanging dashboards is that students will experience using another dashboard design to analyze two different companies. They can analyze the other company's performance using their dashboard. They can also analyze their own company's performance by using the

other team's dashboard and connecting it to their own company. Students can gain another perspective of their own company using the other team's dashboard.

Anticipated Benefits and Potential Challenges

The spirit of competition between universities should stimulate excitement and interest in this important hands-on exercise. In addition, students may see the influence of different pedagogical approaches and student viewpoints across universities. In our presentation, we will report on the results of our collaboration: expected benefits as well as any unforeseen additional opportunities for learning and challenges.

Benefits to Attendees

Any current University Alliance member who uses the ERPsim game or is interested in using the ERPsim game can benefit from this straight-forward and easy-to-implement collaboration. In addition, as the demand for business analytics skills continues to grow, active learning experiences that utilize business intelligence and dashboards to engage students is valuable.

Acknowledgements

We wish to thank the [ERPsim Lab](#) team at HEC Montreal for their continued development and support of ERPsim.

Contributed Materials

Directions for collaborating between universities and classes will be produced and shared with the SAP community.

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- Léger, P.-M. 2006, "Using a Simulation Game Approach to Teach Enterprise Resource Planning Concepts," *Journal of Information Systems Education*, Vol. 17, pp. 441-448.

SAP for Controls, Risk and Assurance

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Abstract

This presentation illustrates the integration of systems knowledge with SAP in accounting curriculum at The University of Akron. We provide guidelines and proven examples to adapt SAP curriculum for teaching accounting controls, risk and assurance at the senior and graduate level courses. With a process-based, integrated and holistic view of organization, students better understand these concepts and their implementation in an ERP environment.

Keywords: Accounting controls, risk, assurance, Information Security, Financial Statements, Transaction Processing.

Introduction

One of the main features and advantages of SAP in particular and of ERP in general is to provide management with a holistic and integrated view of the organization. Real time information about processes, events, resources and people in an organization enables decision makers to quickly adapt and enact strategies that are effective and efficient to meet challenges and seize opportunities.

This integrated approach to an organization is also useful for teaching ERP systems to students for understanding processes, internal controls and risk in accounting systems. This should facilitate better understanding of governance and assurance issues. With a process-based, integrated knowledge that is complemented with a SAP platform, students, upon graduation, should effectively meet the needs of organizations.

This presentation illustrates the integration of systems knowledge by using SAP in accounting curriculum at The University of Akron for teaching accounting controls, risk and assurance at the senior and graduate level courses. With a process-based, integrated and holistic view of organization, students better understand these concepts and their implementation in an ERP environment. We also provide guidelines and proven examples to adapt SAP curricula for teaching students a holistic view of organizations.

Integration across courses

We have integrated SAP in three undergraduate senior level courses and two graduate courses. These courses incrementally and systematically build on the knowledge to introduce new concepts and reinforce earlier concepts.

Undergraduate accounting courses

In the first course, students learn basic concepts of business process, data bases, and spreadsheet modeling in the core business course “Spreadsheet modeling and decision analysis”. The goal is to help

students understand the relevance of these concepts to support decision making and problem solving in business and accounting. This course is required for all business majors.

This core business course lays the foundation to introduce SAP in the 1st accounting course “Accounting systems and internal control” that is required for accounting majors. The course uses GBI client for students to learn and practice accounting transactions. Using GBI exercises, students learn the interdependencies among transactions within and across five accounting cycles. Students in this course are exposed to the integrated nature of accounting systems in SAP.

Exposure to transaction processing in SAP is further enhanced in the 2nd higher level accounting course “Advanced spreadsheet modeling and decision analysis” which provides students with advanced tools for processing and analyzing large data. The SAP component of this course, builds on the previous course and offers the students an in-depth hands-on experience to understand financial statements and transactions processing in SAP by using the GBI client.

The operational mechanics of transaction processing is transformed into controls, risks and assurance perspective in the senior level accounting course “Information systems security”. The course uses IDES client for students to learn and understand implementation of GRC concepts including segregation of duties, roles, responsibility, and authority. Students learn the mechanics and goals of accounting and information security rules in processing transactions. The exercises illustrate students to set up organization units and roles, to assign responsibility, ownership and authority to different assets, and to ensure that the organization follows accounting and information security best practices. Further, using GBI’s SOD module with audit role assigned to users, students learn the mechanics and goals of auditing of and with SAP enabled accounting systems.

Graduate accounting courses

In the graduate accounting curriculum, we have integrated SAP across two courses. The first course “Accounting decision support systems” is the foundation course in the graduate program. Since students enrolled in our graduate program may have taken undergraduate courses sometime in the past either from our university or a different university, this course covers an introduction to financial statement information, databases, spreadsheets, and IT tools to support accounting and assurance services. With the help of GBI client, students in this course learn process perspective to the design and control of accounting systems. Students primarily work on processing transactions within each accounting cycle and generating financial statements.

The second graduate course where SAP is integrated is “Information systems security”. In this course, students are required to write a report and present their findings of their analyses of embedded (technology and systems) controls and their control objectives in one of the assigned accounting cycles. This report for graduate students is in addition to the requirements (discussed above) expected of undergraduate students.

Background

The School of Accountancy at the University of Akron adopted SAP in its curriculum in April 2014. With AACSB accreditation at all levels, including separate accounting accreditation, four core accounting systems faculty, and over 75 area organizations that uses SAP in their operations and are represented in several of our Advisory Boards, the use of SAP as one of the learning tools, was a natural choice. Our SAP initiative is supported by Applied Industrial Technology.

Learning goals

We established the following learning goals for integrating SAP across accounting courses:

1. Illustrate business process view of conducting business.
2. Illustrate transaction cycles, controls, risk, governance and assurance in an ERP system
3. Develop necessary skills-set and competencies among our graduates
4. Foster an understanding of the systems view and a holistic approach to business processes and organizations

Learning outcomes

We measure learning outcomes along the following dimensions:

1. In-class project assessments: The In-class project assessments range from SAP Exercises provided through the SAP Academic Alliance, as well as custom designed quizzes and practice exercises administered during class.
2. Feedback from students: Feedback from students has been positive. For the first offering of SAP in the Advanced Data Modelling course, a majority of students (78% of students had positive comments regarding the introduction of SAP) had reported a positive experience with the introduction of SAP in the course.
3. AOL metrics

Introduction to Managerial Accounting Using GBI

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Abstract

The Conference presentation will provide a quick overview of the contents of the files contained in the case study. The main areas of study for each of the six units will be discussed, providing objectives and scenarios used to demonstrate the specific accounting concept or process.

Keywords: managerial accounting, controlling, cost accounting, production, internal orders, materials management, profitability analysis, asset management.

Introduction to StarQuest

Accounting, whether Financial or Controlling, is a major force within a business and drives the need for new Accountants and Controllers who have studied these fields. Though accounting principles and concepts are taught in class, their actual practice is also required for students to get a firm grasp of the steps required to maintain a set of financial books or to budget and review costs through Controlling. It is this concept of putting principles into practice that initiated the modification of the original Introductory Managerial Accounting Case Study using IDES/AIS into the new Introduction to Managerial Accounting Using GBI. This case study will allow students to practice accounting and controlling principles using the Global Bike, Incorporated (GBI) dataset under a Multi-Company Code client. The GBI-MCC client was selected as it allows each student to work in his/her own Company Code. Only the student's own work will be displayed instead of the whole class' transactions.

Who would use StarQuest?

The Introduction to Managerial Accounting Using GBI case study is based on a popular Management Accounting textbook. Joe Ragan (2008), the original course developer used a text by Garrison, Noreen, and Brewer (2008), and the materials fit the flow of the earlier chapters of that textbook. As this is a modification of the original case study and does not change the flow of concepts, the new case study will follow the same flow. Therefore, students who are enrolled in Management Accounting / Cost Accounting / Controlling courses would benefit from the information provided.

Additionally, some sections, such as Production or Asset Management, can be used as a stand-alone case study as they are not tied directly to the actions taken in previous units.

What is covered in StarQuest?

The Introduction to Managerial Accounting Using GBI Case Study contains six units. The files in each unit, except oo StarQuest Introduction, follow the same format beginning with a text section that contains a description of the concepts involved, accounting terminology, and SAP terminology. A list of objectives to be covered in each file appears at the end of the text section. Process steps are tied through numbering to the objectives. Quiz questions and Essay questions are included at the end of most chapters.

Table 1, which follows, displays a list of files contained in each unit along with the main areas of study for each unit. Space restrictions do not allow the inclusion of objectives covered in each file.

Table 1: StarQuest Table of Contents		
Unit	Unit Files	Main Areas of Study
Unit 1: StarQuest Introduction and Navigation in SAP	00 StarQuest Introduction 01 Navigation in SAP ERP 02 Create Cash Account	Navigation in SAP Chart of Accounts, General Ledger, Cost Elements
Unit 2: Cost Terminology and Responsibility Accounting	03 Cost Accounting Terminology in SAP ERP	Cost Centers, Posting Transactions, Reports
Unit 3: Production Costing and Production System	04 Product Costing 05 Production System	Master Records, Bill of Materials, Routing SOP, MRP, Production
Unit 4: Cost Allocation	06 Cost Allocation in SAP ERP	Cost Centers/Groups, Activity Types, Internal Order, Settlement, Allocation
Unit 5: Profitability Analysis and Reporting	07 Revenues and Profitability Analysis 08A Profitability Reporting 08B Profitability Reporting – Pivot Table 08C SalesdataPivotVO1.xlsx	Sales and Distribution, Profitability Analysis Reporting in SAP, Profitability Reporting in Excel (08C is a GBI Dataset file)
Unit 6: Asset Management and Capital Budgeting Analysis	09 Asset Management and Capital Budgeting Analysis	Materials Management, Asset Explorer, Appropriation Request

Source: Primary

Table 1: StarQuest Units

How is this version different from the original?

Though the flow of data remains the same as the original case study, the new case study incorporates different scenarios for many of the units. The major scenario changes include changes to the Production Unit and to the Internal Order (contained in the Allocations unit). Additionally, the Profitability Reporting unit was changed to include a Pivot Table exercise using Excel. This was done due to a lack of sales data within the GBI-MCC client. Finally, all graphics have been updated to the 7.4 SAP GUI.

The original Production unit went through the steps to plan and produce the Raymond Super Bike, a motorcycle included in the Materials within the IDES client. The new case study changed the planning and production to a new bike for GBI to sell – the StarQuest ElectroCycle. This new Material is based on the DXTR3000 Deluxe Touring Bike (red) as the frame with the inclusion of another new Material, the Electric Conversion Kit.

Another major change comes in the Allocation unit; the Internal Order was changed from an HR Trade Fair to an Annual Cleaning of the Dallas Plant. Materials and Direct Activity Allocations are included in the steps for the Internal Order.

Acknowledgements

I would like to acknowledge Joseph Ragan of Saint Joseph University who was the original author of the Introductory Managerial Accounting / StarQuest Case Study (Ragan, 2008). He provided an excellent base for my modification.

I would also like to acknowledge K. Freyburger and T. Hagen (2013) who authored the Excel Pivot Table exercise I modified for inclusion in the Profitability Analysis section.

Contributed Materials

The six compressed files contained within the Introduction to Managerial Accounting Using GBI case study demonstrate the processes used within SAP ERP 6.0 to practice accounting and controlling functions taught in an undergraduate course. An Excel spreadsheet of GBI Salesdata is included in the Profitability Analysis unit for use with reporting exercises. The remaining exercises will use the GBI-MCC client. A PowerPoint describes the case study and details the topic areas and objectives contained in each file. The case study will be available for download to SAP University Alliance members on the SAP Learning Hub.

References

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Using SAP to Teach the Concepts and Application of Internal Controls in Business Processes – The Classic Rockers Case

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Abstract

The Classic Rockers Case introduces students in accounting information system's courses to transaction processing and master data involved in the basic processes of ERP. The case also develops their skills in SAP navigation. In addition, the case introduces students to fundamental internal control concepts involved in the basic processes of ERP. Further, the case serves as a framework to demonstrate the ERP application of business processes and internal control involving procurement, materials management, production, sales and distribution, financial accounting and controlling. The intention of the case is not to replace but to supplement instructor discussions and explanations of the various processing steps and related internal control procedures that are necessary to help carry out these business processes efficiently and effectively. The exercises in the case are provided to demonstrate how those instructor-discussed transactions are recorded, processed and controlled for in the SAP system. Accounting information system's instructors with minimal ERP knowledge can successfully use the case.

Keywords: internal controls, business processes, accounting information systems, transaction processing, hands-on exercises.

Introduction

This presentation will debut the upcoming modification (for Fall 2016) of the existing SAP University Alliance Accounting and Finance Library curriculum Classic Rockers case that has been used in its current version annually on average by more than 50 University Alliance member schools since 2011. The presentation will highlight the changes included in the update (primarily suggested by users) and, for attendees not familiar with the case, outline the way the case can be used in the classroom. Attendees will be asked to provide their input as to additional modifications or enhancements, which they would like to see in the Classic Rockers Case. While the primary users are generally accounting information system's faculty, the case has been used in management, production planning, and management information system's classes by faculty who want to include the elements of internal control for non-accounting students. Non-accounting faculty have found the instructor materials provided with the case to be

sufficient to support the case coverage of basic internal control concepts and procedures. The presentation will include real time demonstrations of student exercises. The paragraph below describes the case for those not familiar with its design.

The Classic Rockers Case provides students with both instruction in the concepts and hands-on application of internal controls present in transaction processing and creation of master data for the basic business processes carried out in an SAP system. The internal control concepts covered include the identification of applicable internal control objectives, application controls, preventive and detective controls, and proper separation of duties as related to transaction exercise processing. How internal control concepts apply to business processes is taught using hands-on student exercises and through questions and assignments that require students to recognize and understand the various internal control elements involved in transaction processing and master data creation. The basic business processes addressed by the case include procurement logistics, production, sales and distribution, and financial accounting and controlling.

Client and Shared Materials

The pre-configured data set required to complete the Classic Rockers Case is contained in the SAP ERP SHSU Client available through the Milwaukee and the Chico UCCs. The client contains not only the Classic Rockers Case materials but also the Quazi Computers Configuration Case materials, the RF Clothing Configuration Case materials, and the Flya Kite Case materials. The materials for each case in the client are differentiated by student user names and allow one thousand simultaneous student users for each case. For example, a student assigned the user name of CRUSER-xxx (where xxx would be an assigned number from 001 to 999) would be able to complete only the Classic Rockers materials in the client. When the client is requested from the UCC, the specific case, e.g., the Classic Rockers Case, Flya Kite Case or Quazi Computers Configuration Case, must be specified so that the appropriate user names can be activated by the UCC for that request.

The shared materials for the case available to the SAP University Alliance community include:

Classic Rockers Student Textbook (103 pages – chapter: Introduction, MM, PP, SD and FI/CO)

Classic Rockers Student Exercises (66 exercises involving master data creation and transaction processing exercises keyed to each processing module, 111 pages)

Classic Rockers Instructor Text (265 pages of instructor resource text including suggestions for use in class and grading, error troubleshooting guide, multiple choice question bank for each chapter in the student text, solutions for student deliverable screen shots for each set of module exercises, and question bank for assigning to students upon completing each set of module exercises)

Upcoming Modifications

In the past, the Classic Rockers Case has been configured such that all students in the client are using the same company code. In the version that will be published in the summer of 2016, each student will have their own unique independent company code. That company code is keyed to the individual assigned student user number. In addition, when the student creates master data and processes transactions for materials, vendors, customers, etc. the names include that same user number which allows tracking of student activity through the various exercises. The case will also be expanded to include some reporting elements.

Where appropriate, the steps within each exercise contain the specific SAP icon that is used to execute that step. The existing Classic Rockers Case exercises are being updated to reflect the new icons found in the latest SAPGui release. These modifications will be included in the summer 2016 release of the case.

Existing Related Cases Available to UA Members

As indicated above the *Classic Rockers Case* is one of a number of cases available in the data set contained in the SAP ERP SHSU Client. Those other cases are:

Flya Kite Case - utilizes the same basic processes and exercises as *Classic Rockers Case* but with no emphasis on internal controls. The case is used primarily in management information system's courses.

Quazi Computers Configuration Case - detailed step by step exercise case overview of configuration setting up the key modules in SAP ERP. The case involves the configuration and testing of each module in a consecutive process until the entire client is configured.

RF Clothing Configuration Case – a semi-structured configuration case in which the student creates all organizational structure for the client, creates all master data for the client, and tests the complete configuration with transactions involving all structure and master data. Generally completed as a follow-on to the more structured Quazi Computers Configuration Case.

Using SAP UA Resources to Reinforce ERP Concepts in *Modern ERP 3e*

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Abstract

Modern ERP: Select, Implement, and Use Today's Advanced Business Systems was written to provide instructors with a vendor agnostic ERP-focused textbook that helps students understand why ERP systems are central elements in the business computing infrastructures of many organizations. The textbook addresses the business drivers of ERP adoption; the evolution of ERP architecture; how ERP systems support strategically-aligned business processes; ERP implementation issues and challenges; ERP operation and maintenance; ERP accounting processes; ERP HCM, SCM, and CRM processes; ERP security and auditing; and ERP and business analytics. Although the concepts covered in the book may be illustrated with any ERP system, the SAP University Alliances (UA) provides the widest range of resources that are appropriate for illustrating concepts covered in *Modern ERP 3e*. This presentation focuses on how SAP UA curriculum resources can be paired with *Modern ERP 3e* concepts to provide a rich learning experience in higher education.

Keywords: Business analytics, business processes, ERP, ERPSim, GBI configuration, GBI SCC, SAP Lumira, supply chain.

Introduction

Faculty members at an increasing number of universities are recognizing the value of using ERP systems to illustrate business processes and best practices, business analytics, system configuration, and programming. By giving students hands-on experience with ERP systems and business analytic tools, instructors prepare them for the business process-centric, highly-technical, and data-intensive nature that is pervasive in today's organizations.

Despite a growing faculty interest in bringing a stronger ERP focus to university curricula, there is a limited range of texts that address ERP concepts well. Although ERP systems are the centerpiece of business computing platforms in today's organizations, most MIS textbooks from the major publishers are focused on traditional MIS concepts and systems and only include abbreviated discussions of ERP systems. Other ERP texts focus solely on one ERP vendor software and are more of a software tutorial than including the bigger picture (concepts, theory, implementation, security, etc.). The rarity of ERP-focused textbooks in the product line-ups of major publishers has slowed offerings of ERP-focused courses at many universities. A lack of viable ERP texts has also deterred universities from becoming more involved with the SAP University Alliance.

This presentation illustrates SAP UA resources used in ERP courses at two different universities where *Modern ERP 3e* (Bradford 2015) has been adopted as the main textbook.

Use of Modern ERP 3e at Georgia Southern University

Modern ERP 3e (Bradford 2015) is used in CISM 4336 – ERP and Enterprise Performance – at Georgia Southern University. This course couples HEC Montreal’s ERPSim Paper Game (Léger 2015) Manufacturing Games (Introduction, Extended, and Advanced) (Léger et al. 2007), and SAP Lumira (SAP Lumira 2016) to concepts addressed in *Modern ERP 3e* chapters. The Paper Game (Léger 2015) is used to illustrate the text’s discussion of business processes in Chapter 3. The Manufacturing Introduction and Extended Games (Léger et al. 2007), are used to reinforce the text’s discussion of how ERP systems may be configured and customized to support specific businesses (Chapters 1 and 2) as well as to illustrate how an ERP is used to support sales (Chapter 8), procurement (Chapter 9) and manufacturing/production processes (Chapter 9). The Extended Game is also used to reinforce *Modern ERP 3e*’s discussion of ERP Financial Management (Chapter 7), and especially to illustrate ERP support for the complete cash-to-cash process. SAP Lumira (SAP Lumira, 2016) is used to illustrate the textbook’s ERP and Business Analytics chapter (Chapter 12) via an SAP UA exercise (Magal et al. 2015) and an instructor-developed second exercise that requires students to apply the visualization tool to ERPSim data.

Use of Modern ERP 3e at North Carolina State University

Modern ERP 3e (Bradford 2015) is required reading in ACC440 and MBA515—undergraduate and graduate ERP systems courses—at North Carolina State University. Global Bike 2.4 (Magal et al. 2015) is used to illustrate the accounting and fixed assets concepts and processes in Chapter 7, the order-to-cash process in Chapter 8, purchase-to-pay process in Chapter 9, manufacturing, warehousing, and plant maintenance processes also in Chapter 9, and human resources functionality outlined in Chapter 10. *Modern ERP 3e* (Bradford, 2015) is the only ERP textbook that emphasizes ERP security and implementation assurance (Chapter 11). To reinforce this chapter, GBI configuration (Wagner, 2013), GBI 2.4 (Magal et al. 2015), and author-developed materials (in conjunction with Ernst and Young and Price Waterhouse Coopers) are used to illustrate security concepts such as tolerance limits, tolerance groups, segregation of duties, role based access controls, duplicate vendors control, and audit trails. Similar to GSU, Chapter 12 of *Modern ERP 3e* is also coupled with SAP Lumira resources available from the SAP UA (e.g., World Cup Soccer case, [Smith 2014] as well as material developed by the author of *Modern ERP 3e*. A case written by the author, and published in *Issues in Accounting Education* (Bradford, 2011) also reinforces the concepts of best practices, systems implementation risk, change management, project organization, and the ERP life cycle. Finally, best practices inherent in SAP are reinforced with process redesign and process mapping exercises developed by the author of *Modern ERP 3e*.

Conclusion

This poster presentation is designed to help SAP Academic Conference attendees and the SAP Academics Alliances Community better understand how SAP UA curriculum and resources, including ERPSim (Léger et al. 2007) Global Bike (Magal et al. 2015; Magal et al. 2016) and SAP Lumira (e.g., Smith 2014), can be used to illustrate concepts addressed in ERP-agnostic texts, specifically *Modern ERP 3e* (Bradford, 2015). By providing specific guidance on how SAP UA resources can be used to reinforce ERP and business analytics topics, instructors may develop more confidence and willingness in using SAP UA resources. It is hoped that this presentation will also inspire instructors to create new generally-focused ERP courses.

Contributed Materials

Materials provided to textbook adopters by the *Modern ERP 3e* author will be made available upon request to SAP Academic Conference attendees. These materials not only reinforce GBI transaction processing, but also help teach the over-arching concepts of ERP planning, package selection, implementation (including risk concepts), and operation and maintenance. Additional contributed materials include multiple structured hands-on student exercises and an ERP teaching case. These exercises illustrate: SAP ERP (in-place) report filtering, the SAP ERP procure-to-pay process, the SAP ERP plan-to-produce process, the SAP ERP order-to-cash process, and the use of SAP Lumira to analyze ERPSim data. A table that maps exercises as well as SAP UA curriculum and resources to *Modern ERP 3e* chapters will also be contributed. All materials and exercises will be uploaded to the SAP Learning Hub, Academic Edition to enable them to be widely shared with the SAP UA Community.

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How to Utilize Hands-On In-Class Process Flowcharts to Derive ERP Principles

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Abstract

A challenge instructors often face is how to make abstract concepts concrete for their students. This poster session, used in conjunction with the SAP University Alliance Global Bike curriculum, explains a hands-on in-class interactive exercise that professors may use to allow students to experience, reflect, abstract, and act upon ERP principles.

The experiential-learning activity focuses on the purchase-to-pay end-to-end process and begins with the instructor eliciting process steps from students. The process steps are captured in a Microsoft Excel worksheet, and then placed in their proper sequence by the instructor. Next, the class identifies which business function (engineering, purchasing, warehousing, quality assurance, or accounting) performs each step. Students are divided into teams. Each team creates a swim-lane process flowchart using post-it notes and brown-paper hung on the classroom walls.

Once the flowcharts are complete, the students reflect on the experience. Key ERP principles to be identified include: the functional organization of the people versus the cross-functional nature of the process; business processes are hierarchical, interdependent and permeable (pass information); the need for an enterprise system to integrate and automate business processes; the various types of data required such as organizational data, master data, and transactional data.

The ERP principles are later abstracted into a five-layer enterprise architecture (EA) framework that provides a context for organizing and understanding how people execute business processes that are supported by software, data, and hardware. Focusing on each layer of the EA framework allows the professor to actively engage students and to verify their comprehension.

Attendees of this poster session will take-away:

- 1. An entertaining and engaging pedagogical approach that introduces ERP principles via a hands-on in-class swim-lane process flowchart exercise.*
- 2. An EA framework that may be used to provide a context for organizing the Global Bike curriculum into people, process, software, data, and hardware layers.*

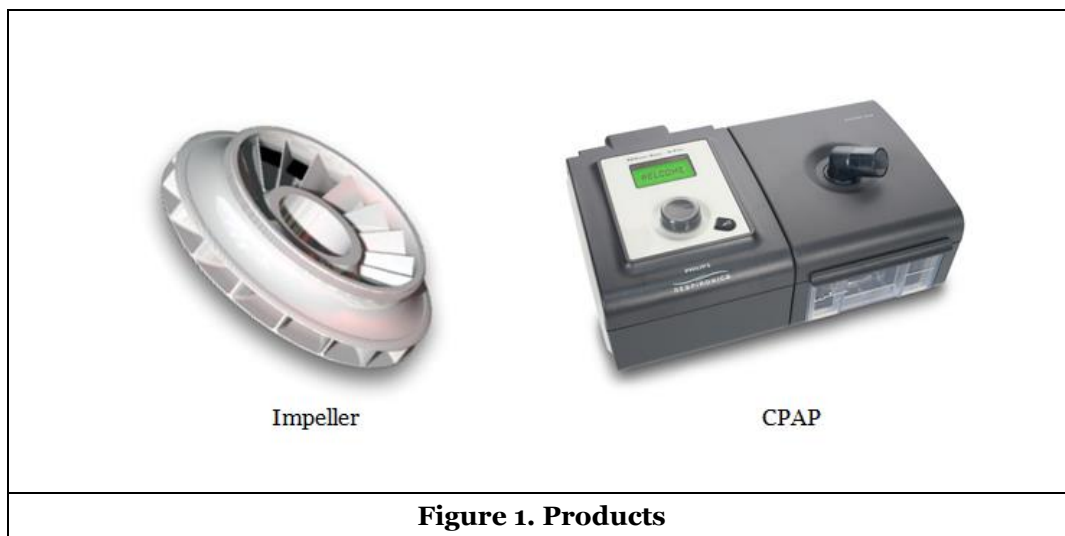
Keywords: Cross-Functional Business Processes, Enterprise Architecture (EA), Enterprise Resource Planning (ERP), Functional Organization, Silo Effect, Systems Thinking.

Introduction

A challenge instructors often face is how to make abstract concepts concrete for their students. Drawing on experiential-learning theory (ELT), Baker, Jenson, and Kolb (2002) recommend a procedure that moves students through a four-stage process of experiencing, reflecting, abstracting, and acting (p. 52). Leveraging the work of Baker et al. (2002), this poster session offers an experiential-learning method that: allows students to experience the end-to-end purchasing process via a hands-on in-class interactive swim-lane process flowchart exercise; reflect on the components of the purchasing process; abstract ERP system principles in the form of an enterprise architecture (EA) framework; and then take action based on the knowledge gained.

Experiencing

The experiential-learning exercise begins with the instructor showing the students physical examples of two products (Figure 1): a high-variety, low-volume engineer-to-order impeller for a turbine and a low-variety, high-volume make-to-stock constant positive airway pressure (CPAP) medical device for the treatment of obstructive sleep apnea.



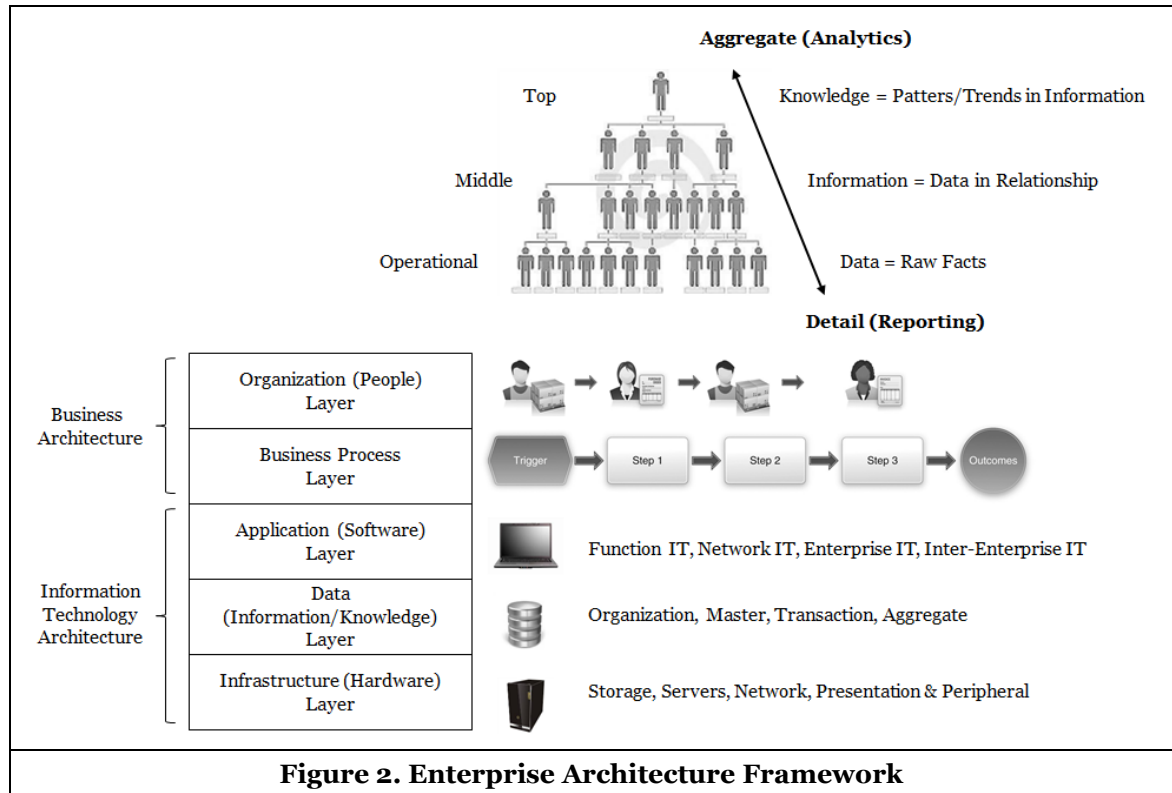
Students identify the process steps required to purchase an impeller casting versus the steps required to purchase an injection molded heated humidifier for the CPAP. The instructor documents the purchase-to-pay process steps raised by the students in a Microsoft Excel worksheet. Next, working as a class, the process steps are placed in their proper order and the business functions (engineering, purchasing, warehousing, quality assurance, or accounting) that execute each step are identified. Following a brief introduction to swim-lane process flowcharts, the class is broken into teams. One half of the teams create a swim-lane process flowchart for the impeller casting purchase-to-pay process using post-it notes and a strip of brown paper hung on the class room walls. The remaining teams do the same for the purchasing of the heated humidifier.

Reflecting

When the flowcharts are complete, a volunteer from each team walks the class through their process flow. The other teams are asked to note where their process flowcharts differ significantly. The instructor asks probing questions to draw out principles inherent in the swim-lane process flowcharts. For example: functional (vertical) organization design versus cross-functional (horizontal) business processes; the need for enterprise resource planning (ERP) software to integrate and automate business processes; organizational data, master data, transactional data, and aggregate data. These principles align nicely with the content presented in chapters one and two of the textbook "Integrated Business Processes with ERP Systems" (Magal and Word 2011).

Abstracting

Following the period of detailed reflection, the instructor moves to a higher level of abstraction by introducing the five-layer EA framework graphically depicted in Figure 2.



The lecturer observes that people need to execute business processes. The business processes are automated by software that manipulates data that is supported by a hardware infrastructure.

Acting

Proceeding layer-by-layer through the EA framework, the professor engages the class in a discussion regarding the implications of the framework; actively testing students to insure comprehension (Baker et al. 2002, p. 52). For example, the instructor may ask the class to compare and contrast the business objectives of the purchasing, warehousing, and accounting functions. Typically there are competing objectives among these functions that leads to a fruitful discussion of the “silo effect” (Magal and Word 2011, pp. 2–3).

Conclusion

Hands-on in-class experiential-learning activities, such as swim-lane process flowcharts, offer instructors an entertaining and engaging pedagogical approach to make abstract concepts concrete and to increase student learning.

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Application of the Water Distribution Game in Finance/Accounting Courses

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Abstract

This discussion outlines an application of the water distribution simulation game for use in undergraduate and graduate accounting and finance courses. The game is used as the basis for 1) teaching financial statement analysis concepts 2) reinforcing the calculation of ratios and 3) highlighting the correlation between managerial input decisions and statement outcomes.

Keywords: Simulation, ratio analysis, ratio calculation, statement analysis, trend analysis, peer analysis.

Introduction

A common struggle in business courses is helping students connect theory with application. Business simulation games have been suggested by some as a way to bridge this gap. In fact, proponents argue that games and simulations help participants apply and integrate their knowledge of business principles. This benefit makes games valuable for use in the classroom. For example, Wellington, et al (2011) concludes that the marketing simulation experience used in their study led to an improvement in knowledge and application of accounting/finance principles. They go on to suggest that the results provide further support for the use of business simulation games in the classroom.

ERPSim (Léger et al. 2007) games are also suitable for this use. While designed to give students hands on experience with enterprise systems and software, ERPSim games can also be used to help students understand and apply accounting/finance concepts. This document explains how the Water Distribution Game may be used in accounting/finance courses.

Game

Before the first round, students spend time discussing and documenting the strategy to be employed. After each round, the students are asked to download the financials, discuss the results among the group, and use that information to plan the strategy for the next round. Those results are used as the foundation for the team's final group and peer financial analysis. Having the students download and review the financial data between each round encourages them to connect financial analysis to decision and outcome.

Once the game has concluded (which is played as usual), the students complete a written assignment that calculates ratios, summarizes strategy, inventory control, performance, and lessons learned. In addition to the written assignment, students discuss group results with other groups. They discuss differences and commonalities in financial data as related to strategies chosen. This discussion can be formal or informal.

While this study focuses on the Water Distribution Game, the materials can be used with any of the other SAP simulation games. The only criterion is that students are encouraged to think fully about the role of the financial data and not merely focus on Net Income. In fact, more complex games such as dairy or cereal game should lead to richer result.

Conclusion/Results

This document describes how SAP ERPSim can be used to help solidify accounting/finance related concepts and decisions. This activity has been employed with success in both a graduate and undergraduate setting. Students are typically engaged and enthusiastic. Many have commented that the activity helped understanding. Anecdotally, while the authors have not noticed a difference in test performance, responses on exams are noticeably more spontaneous. Instead of giving definitions and examples memorized from the text, student responses tend to be more thoughtful and bring out points relating to the simulation activity.

Contributed Materials

The project includes three supporting items. The first is the set of slides already provided to the SAP UA community explaining how to navigate the game. They are used to explain the rules of the game and ensure the students understand how to manipulate the system. The second and third were created by the authors and will be made available to the community.

The second is a simple form that each group fills out prior to each round. It is used to record the intended strategy and implementation for the upcoming round (price, advertising, and quantities). The students also capture strategy changes that may have occurred in the previous round. They do not need to record each transaction change, just strategy. For example, the group may have decided to lower prices to move slow selling items. The group would record “lowered prices”, not record each adjustment. It is designed to help students think about their decisions and then correlate those decisions to performance outcomes. Instructors may or may not ask students to submit this document for review.

The third item provides instructions for the assignment to be submitted. The assignment is a written summary that requires students to discuss strategy, inventory control, performance, and lessons learned. To do this, students must calculate ratios and perform a trend analysis and well as a peer analysis. The assignment can be contracted or expanded to meet the needs of the course. Additionally, the assignment is designed to easily convert from a written assignment to a presentation format.

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Going Live with the UA Curriculum: You Can Do This!

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Abstract

In this panel presentation the speaker shares his experience with faculty members and institutions that are just beginning to work with the University Alliances curriculum.

Keywords: Curriculum, Lessons Learned, Pedagogy, Student Recognition Award, University Alliances.

Presentation Overview

This is a workshop panel presentation by the listed speaker, who will also participate in the panel discussion and Q&A session. UTA is a major research university with enrollment exceeding 50,000 students, and the speaker has led the effort to integrate the SAP University Alliance curriculum into UTA's business and engineering programs. UTA joined the UA in 2013 and began offering the SAP Student Recognition Award in 2015.

The speaker will share his experience with faculty members and institutions that are just beginning to work with the University Alliances curriculum. In addition to offering strategies for gaining administrative and faculty support, the main purpose of the presentation is to convince participants that "You can do this!"

Who Will Benefit

Instructors and administrators working to introduce the University Alliances curriculum, to integrate UA materials into courses and programs, and to qualify courses for the Student Recognition Award will benefit from shared experience in successfully addressing these issues.

Description of Materials

Extended PowerPoint presentation file will be made available to conference participants.

ERP Building Blocks: How to Integrate SAP Curriculum to Create an Exciting Learning Environment

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Abstract

This mentoring session presents a teaching case aimed at helping faculty learn how to introduce SAP curriculum, how to grow their use of SAP in their curriculum, and how to create an SAP Student Award.

Keywords: Management Information Systems, Human Resource Management, Curriculum Integration and Development.

Introduction

Organizations are in need of business school graduates who understand how enterprise systems and integrated business processes work. Business schools are increasingly incorporating Enterprise Resource Planning (ERP) Systems into their programs to address this need. Which leads to the following question. How can business schools integrate hands-on ERP exercises to ensure that all business graduates have the opportunity to develop this knowledge and skill set? The Management Faculty at the University of West Georgia joined SAP's University Alliance Program in 2012. Hands-on SAP ERP exercises and case studies have been integrated into the Management Information Systems' (MIS) courses and Human Resource Management courses. UWG has recently received approval to offer an SAP Student Award Certificate.

Overview

We will discuss the SAP ERP initiative undertaken at UWG. Why ERP and SAP were chosen to implement. The industry forces and the marketability of students who have ERP skills, and why active learning methods such as the ERP hands-on exercises were implemented. The courses using SAP hands on activities are the following.

- Management of Information Systems (core MIS business course)
 - SAP GBI Modules (Sales and Distribution, Materials Management, and Financial)
 - SAP BI Pivot Table using GBI Data
- Enterprise Architecture (A new course for senior level MIS and Graduate MIS)
 - ERPsim
 - User Experience and Design Thinking
 - Fiori, Persona, UI5 development
- Enterprise and Decision Support Systems (MIS senior design course)
 - SAP ERPsim with Big Data
 - HANA
 - Predictive Analytics and Business Objects
- Human Resource Management (upper level Management select course)
 - GBI HCM
 - Success Factors

Next, we will present how the above courses were selected, and how the SAP curriculum was integrated. We will discuss our pedagogical research and show how integrating SAP into the courses have enhanced student overall knowledge of integration, business processes, and has created an exciting learning environment. This will include the creation of our survey instrument, and the data collection process. This section will end with discussing our data results, lessons learned, and a road map for others to use.

Then, we will cover the steps taken to build an SAP Student Award Certificate, and how we are working with Industry to promote our program, students, and for guidance of our program. This will allow others the ability to apply lessons learned to incorporate SAP curriculum and real life technology into their courses.

Conclusion

The attendees will come away with ideas of how SAP curriculum could work for them, including course calendars and course diagrams illustrating the integration of SAP curriculum, a roadmap to assist in SAP integration in their courses including both technological and pedagogical matters, and suggestions (instruments and references) for how to test and measure the impact of SAP curriculum implementation in their courses. This will allow others the ability to create their own courses, to learn from our research, and to obtain tips for developing industry partnerships.

SAP Across the Curriculum: Start a Movement

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Abstract

The presentation is designed to be interactive with the audience in order to share key success factors building an SAP curriculum across curriculum. The presenters will share their experiences of building their SAP curriculum including achievements and challenges.

Keywords: SAP Curriculum Development, Advisory Board, Learning Outcomes, Implementation Challenges.

Introduction

Integrating SAP into curricula can be challenging. The UA community can learn from member experiences in integrating and expanding their SAP offerings.

Developing and Expanding SAP Curricula

The University of Findlay, College of Business, recognizing that the “E” in ERP stands for Enterprise, collectively decided to take an “Enterprise” approach to introducing SAP into the their classes throughout the undergraduate curriculum. Going in on its fifth year, this initiative poses achievements and yet there are challenges along the way and more to come. Discussion, along with a question and answer session, will address.....

- 1) Starting a movement by having an SAP champion at the helm
- 2) How the decision was made to engage in this process
- 3) Timeframe and progress
- 4) Resource commitments required
- 5) Faculty training
- 6) Integration of SAP into existing courses; How, when, who
- 7) Curricular integration
- 8) Looping our SAP initiative into student learning outcome assessment processes
- 9) Forming an SAP Advisory Board
- 10) Successes to date
- 11) Challenges: now and in the future

How to involve industry in your Capstone class to create an authentic IT project experience: The experience of HEC Montréal

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Abstract

The involvement of an industry partner within a capstone IT course provides valuable learning outcomes for students. This presentation shares an approach to building industry involvement within a capstone course and the pedagogical findings.

Keywords: IT project management, ERP implementation, Industry involvement, Problem based learning.

Capstone Course Overview

The IT capstone project course is the last course taken by IT majors in the BBA undergraduate program at HEC Montreal (https://zonecours2.hec.ca/sdata/c /attachment/3-785-10.H2015/OpenSyllabus/3-785-10.H2015.00_public.pdf, In French). In this course, students experience the deployment of a major IT project using SAP. By offering an experience as realistic as possible, the course provides the students with the opportunity to apply their IT skill at solving problems, developing IT business solution, and IT project management. Also, we seek to have them apply in a risk free environment their communication skills, their ability to elicit business requirements from a 'real' customers, but also to convince them of the feasibility of their solution. The following video presents the course:

<https://www.youtube.com/watch?v=zg6p05w1mKg> (in French).

Building Industry Involvement into the Curriculum

Each year, a partner company is involved in the course and acts as the customer of the students' teams. This provides a very realistic context to this project. Building upon the relationship between HEC Montreal and the Montreal business community, we were able to establish strong relationships with numerous partner companies, including Deloitte, L'Oreal, IBM, and UniSelect (see complete list in appendix 1). The partners also benefit from this relationship as it allows them to develop special relationships with the graduating students. This video presents the partnership with Deloitte in 2015: <https://www.youtube.com/watch?v=xswB577HN8o> (in French).

The role of the students is to prepare a proposal as a response to a call for proposal from the partner. One of the constraints of the call for proposal is the requirement to provide a live demonstration of a working prototype of the proposed solution. This requires the students to demonstrate their ability to use the SAP technology to resolve business problems. It also serves to show the partner their level of IT competency provided as by the program. Note that the final presentation of the proposals is done in a large amphitheater in front a large number of representative of Montreal IT community. Many students find jobs on the spot right after the presentation! This video presents testimonials of students who have completed the course: <https://www.youtube.com/watch?v=18cg7uEk6jE> (In French).

The involvement of the partner is many-fold. First, they provide the context for the project case. The problem selected is typically a major problem faced by the partner. It required substantial reflection by

the student teams. In particular, this may be a real problem the company faced or a problem for which the company has already identified a solution, or a project in the foreseeable future. Second, representatives of the partner will interact with the students during the course of the semester: i) presentation of the problem, ii) elicitation of the requirements, iii) mid-project presentation, iv) final presentation of the solutions.

The partner understands that the case is public and therefore sensitive details are approved by the companies. The final presentation is done in front of Montreal's IT community and therefore is public. Most of the time, the details of the case they provide are fictitious, but based on real cases or problems the partner company faces.

Key Learnings

Here are some key learnings we have made over the year regarding this pedagogical approach. The success of the approach depends on the quality of the business problem identified. The problem should be sufficiently challenging for the students so they need to apply everything they learned in the IT major. If the problem is too simple, students will lose interest. If the problem is too complex, students will lose confidence that they can provide a solution. Therefore, the identification of the problem should be done considering the skills of the students and the level of challenge to achieve.

Although students prefer to select their teams themselves, experience has shown us that it is better to impose the team composition. We ask students to provide a self-assessment of their skill levels during the first class. We also ask them which skills they would like to improve during the semester. During the break, we use this information to create balanced teams, making sure every skill is covered at approximately the same level in each team. We also try to pair up students such that a student wanting to improve a specific skill is assigned in a team where an expert on that skill is available. Finally, the instructor must be able to quickly adjust to the evolution of the project as the semester moves along. Course content can be changed on a weekly basis based on the needs from the teams. More information on the delivery of this course, and specifically on the learning goals and pedagogical approach, can be found in Léger et al (2013).

Appendix 1

Here are Capstone projects from the last five years:

- 2015 In partnership with Deloitte, student teams had to propose an architecture to support the customer relationship management in the solar panel industry.
- 2014 In partnership with Uniselect, student teams had to reorganize the order to cash process for an autopart distributor in North America
- 2013 In partnership with Metro, student teams had to implement the human resources module for a large grocery chain in Canada.
- 2012 In partnership with Metro, student teams had to reinvent the mobile customer experience in grocery by developing a mobile application connected to an SAP system.
- 2011 In partnership with l'Oréal, student teams had to reengineer the process to launch new cosmetic products in stores.

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Combating the experience gap in TERP10 academies: A view from the trenches

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Abstract

Students without significant business exposure struggle to grasp the essential concepts during TERP10 academies and are likely to perform poorly on the certification examination. In addition to what the official TERP10 material covers, students benefit immensely from a common-sense introduction to the relevant business processes and terms. We present an approach and a process flow for achieving this.

Keywords: SAP pedagogy, Terp10 Academy, Business Process.

Introduction

When conducting the TERP10 student academy for university students, we have found the “experience gap” of students to be a considerable hurdle. For reasons that we detail below, many students find it difficult to absorb the information presented in the official TERP10 course material. As a consequence, using only the official course material leaves many students unprepared to reason their way through answering questions on the certification examination; many rely on memory instead. We present an approach to combat the problem. Our experience leads us to believe that this approach has caused a significant increase in student success rates on the certification examination.

For each business process, our approach involves first providing students a common-sense introduction to the business process with contextual examples they find relevant, followed by reinforcement through review questions. Armed with a broad, intuitive understanding of the business process, students are then in a position to appreciate the subtle details presented in the official SAP course material.

We have gathered our descriptions of key business processes and the supporting material in the form of a text (Viswanathan and Szymanski 2015).

Implications of the “Experience Gap”

Many undergraduate students and some graduate students who attend the TERP10 academy lack significant work experience – we call this the “Experience Gap”. The official SAP TERP10 course material implicitly, and quite understandably, assumes a good grasp of generic business processes and common business terminology. It launches directly into an SAP-specific view of each business process, freely using SAP-specific terminology as well.

The official material is also a loose assemblage of material extracted from larger courses dedicated to each business process without much connective narrative. This is not a serious problem for a person who is familiar with business processes in general. However this can be very intimidating and overwhelming for business neophytes.

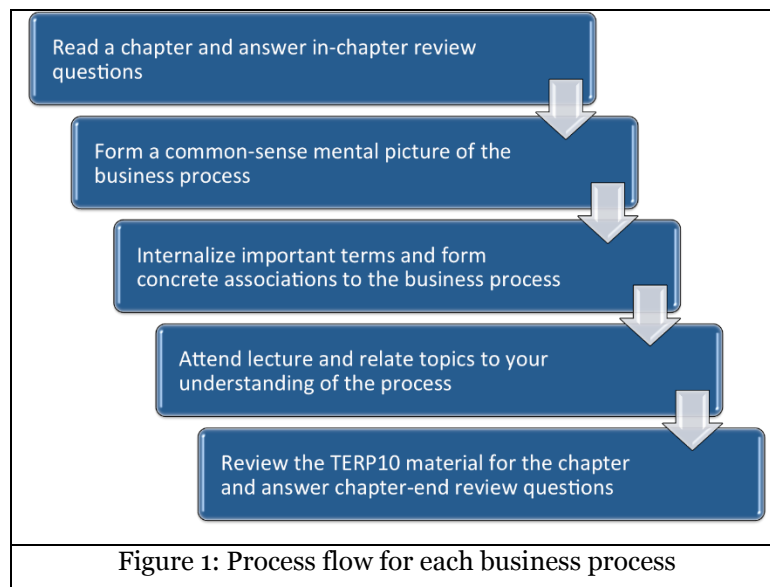
Take, for example, the Order to Cash process. To someone who has even a little business exposure, the graphic overview of the process communicates a lot of information; the steps in the process make intuitive sense; readers can immediately grasp the fact that the process integrates steps occurring in disparate parts of the organization, perhaps separated by thousands of miles. In contrast, the graphic does not speak as eloquently to a student who has little or no understanding of business processes.

Similarly, students who do not have a good grasp of the implications of concepts like *safety stock* and *lot size* will face serious challenges in grasping material planning as covered in the official SAP course material.

One could argue that such situations ought not to occur because the students who are in a TERP10 academy would generally be higher-level students who have already completed several business courses and at least three courses with SAP content. In practice, we have found that despite all the prior academic preparation, students still tend to lack the level of concept-internalization needed to absorb SAP TERP10 materials directly. A cogent and *friendly* presentation of just the material needed for each business process helps immensely.

Suggested approach

As mentioned in the introduction, we have gathered our process descriptions in our book (Viswanathan and Szymanski 2015). Before the academy starts, we ask all students to acquire the text. The key mindset that students need to adopt for TERP10 success is “Reasoning over recall.” Even a rudimentary understanding of business processes and a good grasp of the meanings of various terms used in SAP can enable students to better reason their way to correct answers on test questions. The first chapter of the text uses a very simple example to show this method in action. We ask students to read this chapter and answer the review questions before the start of the academy. Subsequently, for each business process, we require students to read the corresponding chapter and answer the review questions *before* we cover it in class using the official SAP course material. We then have students answer a comprehensive set of review questions on the process (also included in the text). Figure 1 depicts this flow.



Conclusion

We have used the suggested approach in several academies and found a significant increase in students' comfort level with the official SAP TERP10 course material, as well as their ability to reason their way to correct answers. Overall, we found big increases in the proportion of students passing the certification examination after we adopted this approach.

References

Viswanathan, V. and Szymanski, R. 2015. *Understanding SAP ERP Integration*, Infivista Inc.