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V Ramesh

Kelley School of Business, Indiana University, Bloomington, IN, venkat@indiana.edu

Anthony B. Gerth

Kelley School of Business, Indiana University, Bloomington, IN

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Communications of the Association for Information Systems



Design of an Integrated Information Systems Master's Core Curriculum: A Case Study

V. Ramesh

Kelley School of Business, Indiana University, Bloomington, IN
venkat@indiana.edu

Anthony B. Gerth

Kelley School of Business, Indiana University, Bloomington, IN
tgerth@indiana.edu

Abstract:

IS master's program curricula around the US vary, but are loosely based on the work that resulted in the MSIS2006 curriculum (Gorgone Gray, Stohr, Valacich, & Wigand, 2005). The recommendations, while well constructed, did not completely meet the needs of the Master of Science in Information Systems (MSIS) program at the Kelley School of Business, Indiana University. In this paper, we present a case study describing how IS faculty, considering local requirements and guiding principles, designed a unique and innovative integrated core curriculum for our MSIS program similar to those used in MBA programs. The design, described in detail, included innovations in faculty collaboration, integrated pedagogy across topic modules, and scheduling. Positive feedback from students and faculty confirmed the expected outcome of students' connecting the dots between concepts and enhanced learning around the soft skill dimensions, such as teamwork. Our contribution to the IS academic community is in the design and execution of such a curriculum block, one that focuses on providing a balance between the technical and managerial aspects of information systems while also integrating soft skill development into the curriculum.

Keywords: MSIS, Teaching, Curriculum, Pedagogy, Case Study.

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I. INTRODUCTION

In this paper, we describe an initiative to develop a "core curriculum" for the Master of Science in Information Systems (MSIS) program at the Kelley School of Business, Indiana University, Bloomington campus. The MSIS program was established in 2002 with an enrollment of 14 students. Over the course of the past 10 years, the program has grown to 128 students in 2014. This growth has been constrained by faculty and facility capacity since the market and student demand indicate a larger program is possible. Partially to address these conflicting demands, we engaged in a curriculum redesign effort focused on creating an integrated core experience, the details of which we present in this paper. The MSIS program was the only program in Kelley that did not have an integrated core curriculum. Aligning the MSIS program to the strategic direction of the school that all programs offer a "core experience" was a significant motivating factor in our redesign efforts. The resource efficiency that could be gained from a core experience was also a key driver. Another driver was feedback from our students that enhanced "integration" and "coordination" would improve their experience in the program. In particular, before the redesign, students were taking 15 credits of classes, split into two seven-week mini-semesters. Hence, at any given point of time, students were in five 1.5 credit-hour classes. Most of these classes, like many business classes, were heavily team oriented. However, students were often in different teams in each of these classes. This often meant that students were often frustrated with the difficulty in coordinating work across these teams and felt that it had an impact on their learning. Finally, we felt that a redesign would also send the message to our external stakeholders, recruiters, that the program was continuously improving, and would reinforce our brand image of an innovative program from which to recruit.

The concept of an integrated core curriculum in business schools is certainly not new. Porter and McKibbin (1988) assert in a commonly cited book the need to redesign undergraduate business curriculum beyond functional silos. The concept of an "integrated" core curriculum has been adopted across many, if not most, business schools in both undergraduate and MBA programs. In addition to program-level designs, functional curriculums have been redesigned in accounting (Walker and Ainsworth, 2001), supply chain management (Closs & Stank, 1999) and management information systems (Gorgone & Gray, 2000; Gorgone et al., 2005; Sutcliffe, Chan, & Nakayama, 2005). Two relatively recent papers describe IS curriculum redesign for undergraduate programs (Albrecht, Moody, Romney, & Lowry, 2009; McGann, Frost, Matta, & Huang, 2007). Albrecht et al (2009) cites IS curriculum redesign efforts at eleven universities between 1997-2005. While many of the issues are similar, our context and challenge of designing a core curriculum for a master's program at Kelley were unique as we will explain.

MSIS curricula around the country vary, but are loosely based on the work that resulted in the MSIS2006 curriculum (Gorgone et al., 2005). That document recommends a 12 credit-hour IS management component (focused on project management and IS strategy among other topics) and a 12 credit-hour technology component (focused on modeling, infrastructure, and enterprise models). As the authors of the document state: "we believe that one-size does not fit all. Implementing these recommendations should reflect local constraints and objectives" (Gorgone et al., 2005, p. 551). We agree and found that the suggested design was not completely adequate to meet the needs of the Kelley School's students and recruiters. Likewise, the competency based model that Sutcliffe et al. (2005) presents was not focused enough for our unique program needs. The MSIS2006 curriculum provided the guidance we needed for the IS subject matter required. However, we had additional needs based on our student profile and our recruiters' expectations.

II. LOCAL OBJECTIVES

A key factor in our design was the somewhat unique demographic of the student population in the MSIS program at Kelley. We draw a significant number of our MSIS students from our undergraduate business program with a variety of majors (see Figure 1). Given the diversity of these student's backgrounds (marketing, finance, accounting, operations, and information systems) we needed to cover a broader range of technology and IT strategy/management topics than the model curriculum suggests. Further, we focus on placing students in consulting firms, and this requires much greater emphasis on soft-skill dimensions. The skills of critical thinking, structured problem-solving of business strategy issues, and writing and delivering effective consulting presentations were of sufficient importance to be emphasized in the curriculum.

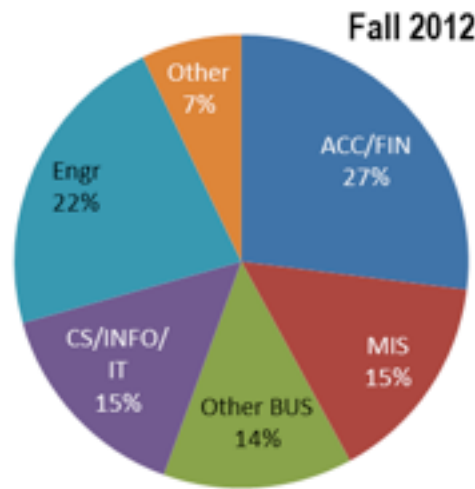


Figure 1. Distribution of MSIS Students' Undergraduate Majors

Another local objective of the MSIS program was to meet the needs of our student and recruiting stakeholders by providing knowledge that spans an IS career path; for example, the progression from an analyst to a manager to an executive. The topics taught in the program provide students with a breadth of knowledge applicable to these various roles. Our typical MSIS graduate does not become a senior leader immediately, but we wanted to expose them to the issues that senior leaders face. Even though they do not have these roles immediately, as consultants (which are our primary recruiting stakeholders), they will better understand the “big picture” of IS issues rather than only an analyst’s technical knowledge. This is also a characteristic that differentiates the MSIS program from our undergraduate degrees. Figure 2 shows how the MSIS program topics align to various stages of the IS career path.

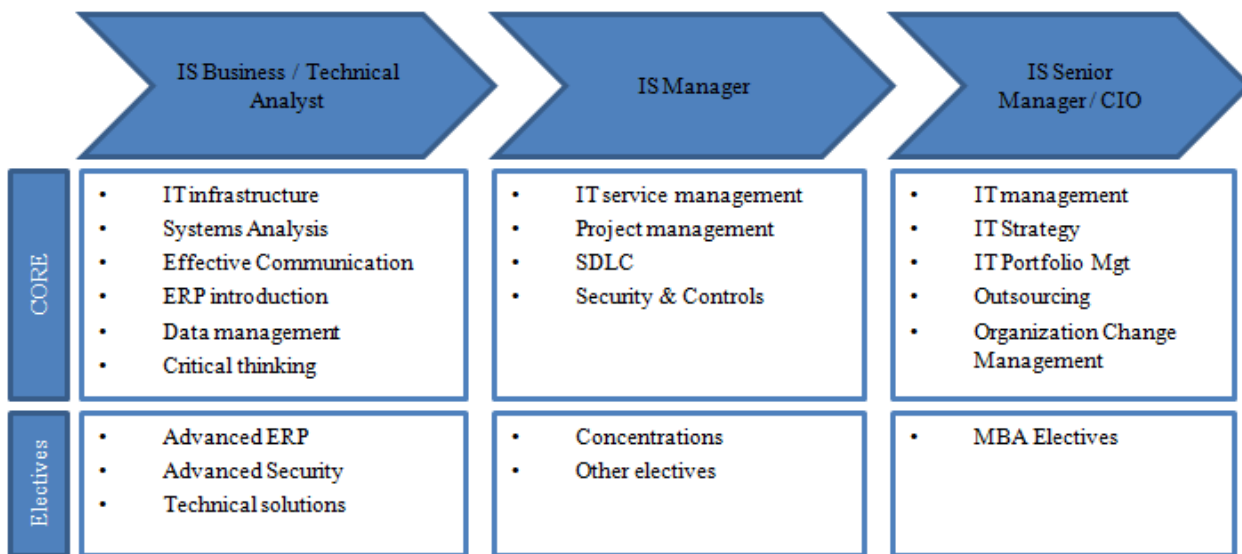


Figure 2. MSIS Program Topics by Career Position Relevance

With these “local objectives” in mind, we convened a group of faculty members to create an experience in the form of an integrated core curriculum that we loosely modeled around the concept of a “MBA core” that is popular in many business schools. Table 1 shows the timeline for the redesign and subsequent implementations.

Table 1: MSIS Core Redesign Timetable	
Date	Milestone
October, 2009	Recognition of the need to redesign curriculum
January, 2010	Curriculum redesign task force kicks off
March, 2010	Establishment of MSIS learning objectives
May, 2010	MSIS curriculum is redesigned with integrated core
October, 2010	Changes approved by academic council
August-Dec, 2011	Delivery of MSIS integrated core v1.0
February, 2012	Review of v1.0 and suggested changes
April, 2012	Completed v2.0 revisions
August-Dec, 2012	Delivered v2.0
2013	MSIS core v2.1 delivered

In Section 3, we overview the MSIS program before presenting the detailed core design.

III. MSIS PROGRAM OVERVIEW

The MSIS program curriculum provides students with a strong foundation of information systems knowledge through the core curriculum (delivered in the fall). In the spring, students gain focused skills in a concentration area. Concentrations are available in business intelligence/analytics, enterprise systems, and enterprise risk management. Every student also works on an industry-sponsored capstone project in the spring semester. Lastly, students are able to take electives that they can use to broaden their business knowledge or deepen their technical knowledge. This format allows students to complete the entire program in one (intensive) year. Figure 3 shows the overall structure of the program.

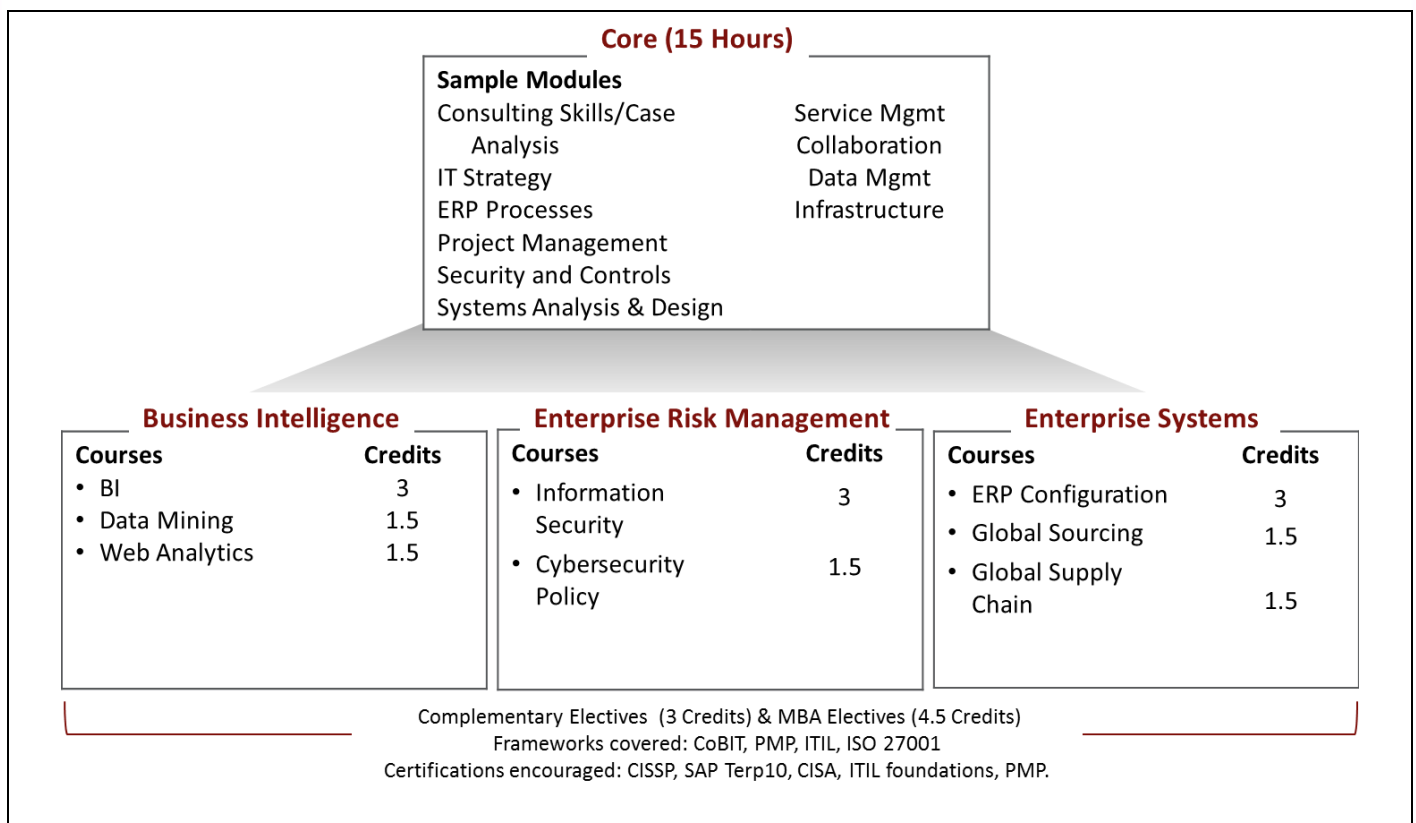


Figure 3. MSIS Curriculum Framework

In the spring prior to our redesign of the core curriculum, we established the MSIS program’s learning goals. Learning goals have been developed at the Kelley School for all academic programs to support more rigor in our assessment of student learning. The faculty team, in collaboration with a Kelley instructional consultant, developed the MSIS program’s learning goals in a way that was aligned with the Kelley School’s philosophy while being specific to the program. Appendix A shows the learning goals. Designing a curriculum that addresses all six of these learning goals presented both a challenge and an opportunity. In the rest of the paper, we describe the innovative design of

an integrated MSIS core curriculum and provide evidence for its effectiveness. The design of the MSIS core experience was informed by our recruiters and our view of the learning goals of a contemporary MSIS curriculum.

IV. MSIS INTEGRATED CORE DESIGN

The fall integrated core experience is the cornerstone of the MSIS program and was designed with the following requirements in mind:

- Deliver more topics than would be covered if 16.5 credit hours were delivered using a “traditional” set of independent courses.
- Sequence lectures and assignments to allow students to receive knowledge in a specific module and also allow them to see the relationships among the modules.
- Plan several opportunities for students to demonstrate integration of ideas from various modules.
- Emphasize case-based learning and teamwork to simulate “real world” problem-solving.
- Professional development activities such as effective teamwork, interviewing skills, networking, and career exploration to go hand-in-hand with content coverage.
- Fulfill the learning goals defined for the program as described previously.

Designing an integrated core curriculum presents foundational challenges. Pharr (2000) identifies three primary issues in establishing an integrated core curriculum: attitudinal issues, infrastructure issues, and resources issues.

Attitudinal issues are issues of change management that occur in every business school environment. These issues arise from all stakeholders in the change initiative ranging from faculty, administration, students, and recruiters. Addressing this change started at the top of the administration. The Associate Dean for Programs was fully supportive of the redesign and communicated his support and expectations at our kick-off meeting with the faculty task force. Faculty members were willing to step away from preconceived notions of course content and program curriculum to consider a new way of approaching teaching. Kelley faculty were willing to do this because the culture of the school encourages such collaboration, but also because they were invested in the program’s success. Many of the faculty teach most, if not all, of their credit hours in the MSIS program. This promotes a sense of pride in the program and investiture in its success. Later, we discuss students’ reactions later how we incorporated recruiters input.

Infrastructure issues (Pharr, 2000) include faculty’s cross-functional expertise, reward systems, and student-related considerations. The design integrates areas of expertise across the information systems domain. Integrating curriculum in a functional area has been shown to be only slightly less challenging than across functional areas (Closs & Stank, 1999; Walker & Ainsworth, 2001). Similarly, our IS faculty have different areas of expertise and experience. However, we found this less challenging than the literature might suggest, perhaps because the faculty were quite experienced with a good knowledge of a broad range of IS topics, teaching, and industry experience. Reward systems were not an issue because the faculty undertook this design effort as a service commitment. Service is a normal part of each faculty member’s portfolio and their participation in the design effort was recognized as such. Pharr (2000) describes student considerations as relating to student quality and an ability to do the more-rigorous work normally associated with an integrated curriculum. Generally, this has not been an issue for the Kelley MSIS program because of high admission standards and a small cohort. However, this challenge grows as we increase the size of the program and the distribution of student ability and motivation widens.

Lastly, Pharr (2000) identifies resource issues that correspond to time, effort, and money. Effort was an issue for our redesign effort, too. While the task force was recognized for their effort with fulfillment of their service requirement, such requirements are always quite different in terms of time required. The redesign effort required significantly more time by the faculty than the typical committee membership. Financial resources to the program were increased by the additional role of part-time “core coordinator”. This role was filled by a full-time faculty member who took on the role as an overload commitment. It cannot be stressed enough that this type of solution is dependent on both the faculty member’s willingness to assume more work (albeit with more compensation) and the administration’s willingness to spend the money.

Detailed Core Design

The faculty team designed the integrated core in a three-step process. These steps were:

Step 1: Define the content modules to deliver. MSIS 2006 and our local objectives were inputs to this decision.



Step 2: Map the modules to the program learning goals to ensure that the content we were delivering would fulfill the learning goals we had defined for the MSIS program.

Step 3: Sequence the content in such a way as to present both a logical progression required and explicitly identify and construct integration points.

Step 1: Define the Content Modules

Table 2 shows the list of modules covered in the MSIS core and their respective grade weights. Students received a single grade for the 15-credit hour module and one grade for the ERP module. The ERP module was offered as a separate 1.5 credit hour course (integrated into the schedule) for administrative reasons and is hence not reflected in the weights below. However, for our discussion, we consider it part of the core design. The faculty team determined trading weights based on the importance of the module's content to our overall objective of transforming students regardless of the number of course sessions allocated to the module. For example, the IT service management module had the same number of sessions as case analysis, but was viewed as slightly less significant to the students' transformation.

Table 2: MSIS Core Modules, Descriptions, and Weighting

Module	Module description	Percent of total
Case analysis	Case analysis through structured problem solving, critical thinking, teamwork, and presentation skills	10
Collaboration	High performing teamwork and team leadership skills	10
Data management	Fundamentals of data management, relationship modeling and analysis	3
Governance, risk, & controls	Managing and mitigating IT risks through effective governance	12
IT infrastructure	Foundational knowledge regarding information technology infrastructures	4
IT project management	IT project management based on PMBOK principles	10
IT service management	Understanding, managing, and delivering IT services through the entire service lifecycle	6
IT strategy	Overview of the key IT leadership issues that face CIOs and organizations	10
Integrated IT management exercise	Focus on managing the IT function and integrative exercises across core areas	10
Systems development lifecycle	Coverage of the SDLC with focus on business process and data modeling	12
Case competitions	Opportunity to apply core skills in case analysis in a competitive environment	5
Professionalism	Academic contribution and professional presence	8

The faculty team defined and weighted the modules as the first phase of the design. The next step was to review how each module contributed to the program's learning objectives.

Step 2: Map the Modules to Program Learning Goals

After identifying the curriculum topics, we mapped how each topic contributed to one or more of the MSIS program learning goals described in Appendix A. This analysis was necessary to ensure that each module made a contribution to the program-level learning goals. We also used this understanding to communicate to students the contribution of an individual module to their overall learning goals. Table 3 shows a map of how each of the core modules satisfies the program learning objectives (e.g. LG 1 is Learning Goal 1 in Appendix A, etc.).



Table 3: Mapping of Modules to Learning Goals

Module	LG 1	LG 2	LG 3	LG 4	LG 5	LG 6
Case analysis		•	•	•		
Collaboration				•		•
Data management	•					
Governance, risk, & controls		•	•		•	•
IT infrastructure	•					
IT project management		•		•		•
IT service management	•	•			•	
IT strategy		•	•	•		•
Integrated IT management	•	•	•	•	•	•
Systems development lifecycle	•	•	•	•		•
Case competitions		•	•	•		•

The curriculum design team was satisfied that each module contributed sufficiently to the MSIS program’s learning goals and that these goals would be fulfilled by the core curriculum in aggregate. Next, we discuss the challenge of sequencing the class sessions in detail.

Step 3: Sequence the Modules

The modules needed to be sequenced to present an integrated and building-block perspective of the body of knowledge. The detailed schedule also had to meet various constraints of faculty availability, room availability, the school academic calendar, and recruiting activity during the semester. Appendix B presents a detailed schedule of how all the modules were delivered during the Fall 2011 semester. We discuss some key features about the design sequencing in the following paragraphs.

Students were divided into two cohorts: the cream (AM) and the crimson (PM). Each cohort met for two 1.25 and one 1.5 hour block. Students were assigned to one core team (4 or 5 people) for the entire semester. This allowed them to develop best practices for working as a team and apply/improve on them throughout the semester.

An examination of Appendix B shows that the amount of class time devoted to each module was loosely a function of the weighting in the core and the amount of time the instructor deemed necessary for content coverage. For example, since data management was 3 percent of the total grade, it was scheduled for six sessions during the term, while the IT governance, risk, and controls module (12%) was scheduled for 21 sessions.

Also note that, while some modules (e.g., project management) were presented in a traditional one-class-every-alternate-day format, other modules were presented in a more-intensive format (e.g., IT strategy, case analysis, etc.). We coordinated deliverable schedules in each module to ensure that no more than three deliverables were due in any given week, and we also staggered exam schedules whenever possible. We wanted to ensure that students were able to devote sufficient time and attention to each of the modules and their respective deliverables.

V. KEY INNOVATIONS AND BENEFITS

The integrated core design as described has several built-in innovations that enhance student learning. The key areas of innovation are:

- Sequencing of content
- Flexible use of faculty strengths
- Integrated thinking outside of silos, and
- Professional development integrated with coursework.

These innovations were a result of the approach we took to designing the curriculum and the openness of our faculty to non-traditional delivery approaches. We present these innovations in the following sections.

Control Over Sequencing of Content

The ability to plan a sequence of content coverage that allows faculty members to weave in and out of the classroom as necessary is probably one of the key innovations of the core schedule (see Appendix B). For example, IT management and strategy concepts were presented very early to give students a perspective on how IT enables business. A framework such as CoBIT was presented very early (in the lectures labeled mmanagement of IT in week 1) since its coverage is wide and touches on a large number of the topics that follow. Similarly, the case analysis and collaboration modules, both providing students some key skills (with respect to effective communication

and teamwork) that are essential to their success in the rest of the core, were covered very early. We then expected students to apply the principles learnt in these modules throughout the rest of the modules in the core. To facilitate this, after an initial focused content coverage in weeks 1-3, we spread the class meetings and deliverables throughout the semester.

Another example of planned sequencing is that data modeling concepts were taught in parallel with the coverage of the planning and analysis phase of the lifecycle (week 5). By doing this, students had the knowledge necessary to use these concepts in the design and build phases of the lifecycle (without having to repeat coverage). Finally, The IT service management component (week 9) covered some key concepts such as IT change management, release and deployment management, incident management, and so on before the testing/deployment phases were covered in systems analysis/design module. This allowed students to apply knowledge gained in the ITSM module to the cases covering the testing and deployment phases of the lifecycle.

Ability to use Faculty Strengths in a Flexible Manner

In a traditional course-based format, a faculty member is given the responsibility for the entire gamut of topics. This means that, sometimes, a faculty member has to cover topics that are not directly tied to their expertise. In our core design, we were able to use faculty to teach lectures that are aligned with their strengths. A good illustration of this was in the systems analysis and systems design implementation module. This module was divided up as follows: systems analysis in week 4, systems design and implementation in weeks 5-10, and systems analysis coverage in week 10. We planned this integrated design to take advantage of the respective backgrounds and strengths of the two faculty members teaching the modules. One faculty member with significant experience in consulting covered topics (in week 4) around business case development and the planning and analysis phases of the life cycle. This was followed (weeks 5-10) by another faculty member covering the design and build/implementation phases. The initial faculty member then returned to talk about testing and deployment strategies.

Integration Opportunities that Force Student Thinking Beyond the Silos

The type of powerful integration that is possible using our core structure is exemplified in the way governance, risk, and controls (GRC) and case analysis modules work in tandem. Every week in the GRC module (held on Fridays to allow an industry expert to teach this module), students were expected to create and make a presentation for a case (these cases were created specifically by the instructor based on his experience in industry). The students' deliverable for the same case was then critiqued the following week by the instructor in the case analysis module since the same presentation counted for the case analysis grade as well. The GRC instructor evaluated the content of the student solution and the application of content presented in that module. The case analysis instructor evaluated the rigor of the analysis (e.g., what supporting data did the students present) and the presentation of the analysis in terms of logical flow, consistency, and visual appeal. Thus, students were able to take the feedback on content/approach and analysis/presentation from both the modules and continuously improved their case analysis and presentation deck writing skills.

Another example was the use of the *Timberjack parts: packaged software selection project* (Romanow, Keil, & McFarlan, 1998) case by two instructors. One instructor used the case to analyze systems requirements gathering, while another used the case as an example of the software selection process and related management issues.

In weeks 5 and 10, there was a class session dedicated to the collaboration module. These interspersed sessions and the deliverables associated with them were planned opportunities for students to reflect on their team experiences until that point in the semester, and to provide a plan to improve their effectiveness and efficiency in working as a team. For example, the scheduled collaboration meeting in week 5 required students to develop a team charter and present on some best practices the teams had developed during the past four weeks.

The final weeks of the semester were dedicated to a holistic application of the concepts learned in the first 11 weeks. In week 12, the students worked on a case that required them to apply and integrate concepts from across the various modules that had been touched on thus far. The case was weighted significantly and thus helped serve as a final exam that cut across topics. Weeks 14 and 15 provided further opportunities for integration and application. The ERP module, which includes the ERPSim game (Léger, Robert, Babin, Pallerin, & Wagner, 2007) enabled students to appreciate the integrative nature of ERP in business. The Management of IT module put students in the role of a CIO in a fictitious company and asked them to make a series of decisions/choices where they had to leverage their learning from the various modules. For example, one of the situations required them to opine on whether the company should use agile or waterfall models for their projects. This required students to draw on knowledge learned in the systems analysis module. The content for this course is the book, *Adventures of an IT leader* (Austin, Nolan, & O'Donnell, 2009), which leads students through a fictitious case study of a new CIO and the challenges he faces in his first year in the role.

The above represent some examples of the types of synergies that can be facilitated through an integrated core design. In addition, having an integrated core ensures that any overlap in content coverage is planned and cross-referencing of content across modules by instructors becomes easier. All of this enabled students to better see the connections across the modules and develop a more-holistic perspective on the IS in the enterprise.

Professional Development Goes Hand-In-Hand with Knowledge Acquisition

Professional development is also an important activity that occurred in the fall semester. The program is primarily a one-year program with a significant amount of recruiting in October (about six-weeks into the semester). While the intensive nature of the classes took care of providing students with the content knowledge, students also needed to be prepared for the interviews. Since the majority of the firms that recruit these students use both behavioral and case-based interviews, we built in a session on case interviewing and a peer-to-peer exercise each for behavioral and case interviews. Each student was asked to play three roles: an interviewer, interviewee, and an observer for each type of interview, and to provide a report on the key observations in each of the roles. This provided them with ample opportunities to hone their skills in these areas.

Another professionalism theme that underlies the entire core experience is that teamwork and communication skills. The assignments in the collaboration and case analysis modules lasted the length of the semester and provided ample opportunities for students to hone their skills in these two areas. Further, since the majority of the exercises in the rest of the modules were team based and often required creating presentations or written reports, students were able to apply the skills learned in these modules to other modules. We also sought peer-to-peer evaluations of the team every week to ensure that we could catch and deal with any team conflicts or issues could be caught early.

VI. OUTCOMES

As we indicate in Section 2, the MSIS program at Kelley includes students with little IT exposure in undergraduate study and those with an engineering background and IT experience.

One student without an IT undergraduate described her experience this way:

Before entering the MSIS program this fall, I was somewhat leery of my ability to succeed in the courses because I learned very few IT concepts in my undergraduate studies. Throughout the semester, the MSIS Core modules provided me with the basic knowledge I needed as well as more advanced knowledge so that I could analyze IT business cases. Although the first few weeks of the semester were a bit difficult, I adjusted quickly and began to see the interdependencies between the modules and the business cases, and I also began to understand the application to previous work (experience) and work I expect to complete in the future.

An international student (with an engineering/IT background) described how the core experience included not only content knowledge, but also interpersonal skills.

The core provided for a well-rounded learning experience, and if one focused on what was the aim of the master's program, i.e., education; the rest followed. The "core" gave us the opportunity to not only learn business concepts relevant to the world of IT but also the opening to interact with domestic students and learn to work in teams. I learnt from each of my teachers, as well as my team members.

The following quote from a student probably provides the ultimate evidence that the design of the core actually had its intended effect.

To understand the essence of MSIS Core of 14 weeks, involving 10 modules with multiple team based assignments, we must look at how the modules overlap each other. Data Management, Project Management, IT Governance and Strategy are areas which might be involved in almost every Case we analyze, each of which requires collaboration amongst teammates. Where one module stops, another picks up and continues the learning. In some cases, for instance IT Governance, the overlapping is more prominent. This has helped us as students to look at these modules as one and the same with minor variations. While one module helped us understand how to define and structure a case, another taught us how to evaluate the benefits and another risks that come with the solution. Given such interconnections, it would only be fair to look at the learning log in the big picture of a subject matter broadly classified by time and mode of delivery than individual modules. The concepts of Information Systems that we have learnt, the experiences of team work, scheduling priorities and growth in individual knowledge and skillsets are the key takeaways from the MSIS Core of Fall 2011.



The flexibility in content coverage in the core curriculum benefited students by providing faculty the ability to provide significantly more content than a traditional approach. We were able to provide students with a broad set of modules that covered the significant knowledge areas we defined as required of all MSIS graduates. In addition, students were enabled to “connect the dots” between the modules due to the way integrated learning was embedded in the curriculum through assignments, lectures, and exercises. Students also had a cohort experience getting to know their classmates that was better than in a traditionally designed curriculum. The single team across modules concept allowed students to hone their teaming skills significantly as well.

Table 4 below provides some evidence of how effective we were in achieving the key benefits with the core redesign (listed in the previous section). We had an independent rater evaluate every student’s core reflections document for comments (either positive “+” or negative “-”) that fell into one of the benefit categories. Note that, in the categorization below, the rater was asked to evaluate whether each category was explicitly addressed and whether the overall reaction to that category was positive or negative.

Table 4: Student Perception of Key Benefits (n = 106, 2011 Cohort)		
Outcome category	Frequency (+)	Frequency (-)
Sequencing of content	23	15
Holistic learning (integration across modules)	76	1
Teamwork	106	0
Individual growth	106	0

The data above shows the overwhelmingly positive reaction to learning related to teamwork and individual growth (soft-skills such as communication, networking, etc.). We were also pleased to the extent to which students were able to discern the integration across modules that was embedded in the core design. The mixed-reaction to the sequencing of content is understandable since this was likely the first time the students were exposed to entire modules being covered in one or two intensive weeks.

Table 5 presents present some representative comments on each of the categories.



Table 5: Representative Student Comments

Topic area	Sample positive comments	Sample negative comments
Sequencing of content	<p>"I think the order of the topics we covered were perfect. I think it was good to have case analysis, collaboration, and IT strategy presented to us first. These really set the basis for the core. I felt that the other modules were presented in a good order as well."</p> <p>"The core was planned brilliantly with respect to content, time management, load management and recruitment."</p>	<p>"The IT Strategy module would have been more effective is spread out across the core. With the current design, IT Strategy is delivered as a continuous block during Week 2 and 3 of the core."</p> <p>"The only major change to the current design of the core would be to have each module start and finish before the next one instead of having each one at different times throughout the semester."</p>
Holistic learning (integration across concepts)	<p>"Each module was able to build on another module, creating a symbiotic learning environment scarcely ever seen before."</p> <p>"I felt that there was good integration in the modules and I really liked how I could apply something I learned in one class immediately over to another class."</p>	<p>"The assignments largely reflect the concepts taught, but unlike the core, they aren't very integrated. A GRC assignment, for example, will lead to only GRC related suggestions, even if it is evaluated by other criteria. To mitigate this, maybe the assignments could try to ask questions that relate to more than one module."</p>
Teamwork	<p>"I always felt like I performed well in prior team interactions, but through the Core I feel like my team was able to optimize performance and adopt best practice techniques."</p>	<p>"Diving in to a semester long commitment with a group of people is a big deal, especially if you aren't familiar with any of the individuals beforehand... I would have liked to see greater emphasis placed on pre-core exercises and information gathering that would help bring any potential issues to the surface."</p>
Individual growth	<p>"From practice interviewing and introducing ourselves in a networking context, to formal classroom presentations, to impromptu classroom participation, the core provided an arena for growth at becoming an effective communicator."</p>	

VII. POST-LAUNCH LESSONS LEARNED

As expected, after we delivered the curriculum for the first time, we discovered several opportunities to improve our design. There were two areas of learning in particular that resulted in revisions after the first delivery of the curriculum. These were:

1. Intensive instruction did not always facilitate learning.
2. Cohorts and teams had limited interaction.

The IT strategy module was delivered in an intensive format (see Appendix B, weeks 1 and 3). In week 1, IT strategy was delivered in three consecutive sessions on Friday for both cohorts. This meant that the instructor taught three sessions consecutively for the morning cohort, had a short lunch break, and then taught another three sections consecutively for the afternoon cohort. In week 3, this schedule was repeated for four straight days. Scheduling the module in this manner was meant to provide the students' knowledge of critical IT management issues at the beginning of the core that would benefit them in both recruiting and subsequent modules. The intensive delivery did not sufficiently achieve this goal. While the module covered the normal IT strategy material of a 1.5 hour course, we found that the students simply did not absorb the material. Every session covered a different topic in IT strategy and the intensive format made it impossible for students to take time and reflect on the material long enough to absorb it. Module assignments were limited to what could be accomplished overnight and in class. This limited the depth into which the students could delve on a specific topic. Instructor fatigue also occurred due to the intensive format. Teaching 9 hours / day for four straight days did not contribute to an optimal class experience for the students. We changed this module to a more typically paced schedule in the next delivery cycle of the MSIS core in fall of 2012.

We also made similar changes to other modules that were delivered in an intensive fashion (case analysis and collaboration).

The second learning was that the cohort and single team module had cons in addition to the benefits. Students shared with us that they felt less connected to their classmates because of the cohort model. In the past, students took classes whose rosters were a mixture of all the students in the program. With the cohort model, students only had close classroom interaction with students in their cohort. The same is true of the single team model. Students commented that working in a single team limited their ability to work with other members of their cohort. This was further exacerbated by the fact that we had assigned seating were the students were seated next to each other. They felt like a more varied team experience would be beneficial to learning to work with a larger set of individuals. We incorporated a second team for one of the more intense and independent modules (ERP) in the next delivery cycle to address this as a compromise. However, we strongly believed that our one team model more closely resembled the experience they will have in the professional world.

VIII. CRITICAL SUCCESS FACTORS

Implementing a core curriculum approach does not occur without addressing some important challenges and learning along the way. Other programs can increase their chance of successfully adopting our approach if they consider the following critical success factors.

Have a committed project champion: support from the associate dean of programs clearly communicated to faculty that this redesign effort was supported from the top and expected to succeed. He rallied support from the faculty and publically recognized the contribution that committee members were making to the school as a whole. He also provided the financial resources needed to support a part-time “core coordinator” faculty role. Top leadership support is always a critical success factor in any change initiative.

Pursue continuous improvement in content allocation: this was not done perfectly the first time. In fact, each subsequent version of the core has been tuned to adjust the number of sessions devoted to a topic area based on the program vision, student performance, and input from our external stakeholders. We conduct an “after action review” of the core every spring. The learning here is to plan for a continuous improvement process. One cannot put the curriculum on autopilot.

Align faculty interests with content: the previous challenge was of curriculum design. Getting alignment from faculty is a separate challenge. Our culture of collaboration made this a little easier, but, practically, we needed to balance the teaching load requirements of faculty, their expertise, and their other teaching obligations. Often a faculty member was assigned to teach multiple topics that helped “smooth” their load in the core. Occasionally, faculty were transitioned out of core teaching because their interests were too narrow to accommodate. Success in this balance will be determined by the culture and breadth of faculty interest and expertise.

Assign a “core coordinator” role: given the complexity of the core, both the faculty teaching the program and the students needed a single point of contact on all administrative matters related to the core. This role was assigned to a faculty member for supplemental pay. This, of course, required funding from the Associate Dean of Programs, another aspect of top leadership support.

Communicate frequently: as we note in Section IV, the core schedule is complex and, when changes do need to occur, they need to be quickly and effectively communicated. Communication with students was accomplished via two channels. One was the course management system, OnCourse, through which announcements could be made. The other was through MS Exchange. A core calendar was set up so that changes to the schedule were reflected automatically in the Outlook calendar of both faculty and students. The core coordinator also communicated with faculty via email and face-to-face meetings. Others attempting to recreate our model should plan on over-communicating to both students and faculty in order to maintain an orderly schedule.

To summarize, you first need to have top leadership supportive and actively demonstrating that support to the faculty. The curriculum design will be a balance of program requirements and faculty preferences and expertise. An integrated core curriculum also requires a level of coordination and communication performed best by the assignment of a faculty “core coordinator”. Finally, plan for a continuous improvement process to monitor and adjust the curriculum as indicated by students, faculty and external stakeholders.

IX. CONTRIBUTION

In this paper, we present a case study on the design of an integrated core for a master’s in information systems program. As far as we know, this type of an integrated core curriculum for IS is unique. Our contribution to the IS

academic community is in the design and execution of a curriculum that is specifically targeted at students going into the consulting industry and one that can be completed in one year. We describe a delivery model that allows more content to be delivered to students in the core semester beyond what is typically possible using traditional three or even one-and-a-half credit hour semester-based formats.

Our approach of assigning different weights to modules and, therefore, different schedules provided just the right amount of content for our students compared to traditional scheduling methods. Our faculty's collaboration and willingness to build bridges between cases and exercises is unique and represents a dramatic improvement from approaches where faculty focus on their own specific topic areas with, often, little thought given to integration across classes.

We were also able to integrate soft-skill knowledge such as critical thinking, case analysis and problem solving, and effective communication (both written and oral) in a formal manner into the curriculum. Finally, we believe that our core design can serve as a model for those programs that want to integrate development of effective teamwork skills and other professional skills into their master's curriculum.

ACKNOWLEDGMENTS

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REFERENCES

Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the paper on the Web, can gain direct access to these linked references. Readers are warned, however, that:

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Albrecht, C., Moody, G., Romney, M., & Lowry, P. (2009). The IS core: An integration of the core IS courses. *Journal of Information Systems Education*, 20(4), 451-468.

Austin, R., Nolan, R., & O'Donnell, S. (2009). *The adventures of an IT leader*. Boston, MA: Harvard Business Press.

Closs, D. J., & Stank, T. P. (1999). A cross-functional curriculum for supply chain education at Michigan State University. *Journal of Business Logistics*, 20(1), 59-72.

Gorgone, J., & Gray, P. (2000). MSIS2000: Model curriculum and guidelines for graduate degree programs in information. *Communications of the AIS*, 3(1), 1.

Gorgone, J. T., Gray, P., Stohr, E. A., Valacich, J. S., & Wigand, R. T. (2005). MSIS2006 curriculum preview. *Communications of the Association for Information Systems*, 15, 544, 554.

Léger, P., Robert, J., Babin, G., Pellerin, R., & Wagner, B. (2007). *ERPsims*. HEC Montreal, QC: ERPsims Lab.

McGann, S. T., Frost, R. D., Matta, V., & Huang, W. (2007). Meeting the challenge of IS curriculum modernization: A guide to overhaul, integration, and continuous improvement. *Journal of Information Systems Education*, 18(1), 49-62.

Pharr, S. W. (2000). Foundational considerations for establishing an integrated business common core curriculum. *The Journal of Education for Business*, 76(1), 20-23.

Porter, L. W., & McKibbin, L. E. (1988). *Management education and development: Drift or thrust into the 21st century?* Highstown, NJ: McGraw-Hill.

Romanow, D., Keil, M., & McFarlan F. W. (1998). *Timberjack parts: Packaged software selection project*. Boston, MA: Harvard Business School.

Sutcliffe, N., Chan, S. S., & Nakayama, M. (2005). A competency based MSIS curriculum. *Journal of Information Systems Education*, 16(3), 301-310.

Walker, K. B., & Ainsworth, P. L. (2001). Developing a process approach in the business core curriculum. *Issues in Accounting Education*, 16(3), 41-66.

APPENDIX A: MSIS PROGRAM LEARNING GOALS

Goal 1: Technical expertise

Students who earn an MS in information systems degree will be able to demonstrate a thorough command of the technical aspects of information systems.

Goal 2: Managerial and organizational frameworks

Students who earn an MS in information systems degree will be able to articulate and/or explain how managerial and organizational issues affect the use of information systems in organizations.

Goal 3: Integration with other functional areas of business

Students who earn an MS in information systems degree will be able to integrate information systems and information technology with other business topics to analyze and recommend solutions to business problems.

Goal 4: Critical thinking and communication

Students who earn an MS in information systems degree will be able to apply critical thinking skills to develop evidence-based recommendations and effectively communicate them to non-technical professionals.

Goal 5: Risk, compliance, and ethical considerations

Students who earn an MS in Information Systems degree will be able to demonstrate an understanding of the risk management, compliance and ethical issues in the use of information systems in organizations.

Goal 6: Teamwork and collaboration

Students who earn an MS in information systems degree will be able to demonstrate effective teamwork and collaboration skills and the ability to work with clients professionally.

APPENDIX B: DETAILED CORE SCHEDULE—CREAM (AM) COHORT

CREAM Cohort										
Date	Week	Monday			Tuesday			Wednesday		
		8:00 - 9:15	9:30 - 10:45	11:00 - 12:30	8:00 - 9:15	9:30 - 10:45	11:00 - 12:30	8:00 - 9:15	9:30 - 10:45	11:00 - 12:30
22-Aug	0									
29-Aug	1	Management of IT - Nik Lele	Management of IT - Nik Lele	Management of IT - Nik Lele	Case Analysis	Case Analysis	Case Analysis	Case Analysis	Case Analysis	Case Analysis
5-Sep	2	Labor Day NO CLASS	Labor Day NO CLASS	Labor Day NO CLASS	Collaboration	Collaboration	Collaboration	Collaboration	Collaboration	Collaboration
12-Sep	3	IT Strategy	IT Strategy	IT Strategy	IT Strategy	IT Strategy	IT Strategy	IT Strategy	IT Strategy	IT Strategy
19-Sep	4	Case Analysis	Case Analysis	Case Analysis	Systems Analysis	Systems Analysis	Systems Analysis	Systems Analysis	Systems Analysis	Systems Analysis
26-Sep	5	Data Mgt	Data Mgt	IT proj mgt	Case Analysis	Case Analysis	Infrastructure	Data Mgt	Data Mgt	IT proj mgt
3-Oct	6	Systems Design/Impl	Systems Design/Impl	IT proj mgt	Class meets (Module TBD)	Class meets (Module TBD)	Infrastructure	Systems Design/Impl	Systems Design/Impl	IT proj mgt
10-Oct	7	Systems Design/Impl	Systems Design/Impl	IT proj mgt	Case Analysis	Case Analysis	Infrastructure	Systems Design/Impl	Systems Design/Impl	IT proj mgt
17-Oct	8	Systems Design/Impl	Systems Design/Impl	Systems Design/Impl	Case Analysis	Case Analysis	Infrastructure	Systems Design/Impl	Systems Design/Impl	Systems Design/Impl
24-Oct	9	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt
31-Oct	10	Systems Design/Impl	Systems Design/Impl	IT proj mgt	Data Mgt	Data Mgt	IT Service Mgmt exam	Systems Design/Impl	Systems Design/Impl	IT proj mgt
7-Nov	11	Systems Design/Impl	Systems Design/Impl	IT proj mgt	Class meets (Module TBD)	Systems Analysis	Systems Analysis	Systems Design/Impl	Systems Design/Impl	IT proj mgt
14-Nov	12	Systems Design/Impl	Systems Design/Impl	IT proj mgt	Class meets (Module TBD)	Final exams	Data Mgt/Exam	Final exams	Final exams	ITPM Final Exam
21-Nov	13	Thanksgiving Break								

CREAM Cohort continued							
Date	Week	Thursday			Friday		
		8:00 - 9:15	9:30 - 10:45	11:00 - 12:30	8:00 - 9:15	9:30 - 10:45	11:00 - 12:30
22-Aug	0						
29-Aug	1	Case Interview Prep	Case Interview Prep	Case Interview Prep	IT Strategy	IT Strategy	IT Strategy
5-Sep	2	Collaboration	Collaboration	Collaboration	Case Analysis baseline exercise	Case Analysis baseline exercise	Case Analysis baseline exercise
12-Sep	3	IT Strategy	IT Strategy	IT Strategy	Governance Risk & Controls	Governance Risk & Controls	Governance Risk & Controls
19-Sep	4	Systems Analysis	Systems Analysis	Systems Analysis	Governance Risk & Controls	Governance Risk & Controls	Governance Risk & Controls
26-Sep	5	Class meets (Module TBD)	Collaboration	Infrastructure	Management of IT - EA	Management of IT - EA	Management of IT - EA
3-Oct	6	Class meets (Module TBD)	Class meets (Module TBD)	Infrastructure	Governance Risk & Controls	Governance Risk & Controls	Governance Risk & Controls
10-Oct	7	Class meets (Module TBD)	Class meets (Module TBD)	Infrastructure	Governance Risk & Controls	Governance Risk & Controls	Governance Risk & Controls
17-Oct	8	Class meets (Module TBD)	Class meets (Module TBD)	Infrastructure exam	Governance Risk & Controls	Governance Risk & Controls	Governance Risk & Controls
24-Oct	9	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt	IT Service Mgmt
31-Oct	10	Class meets (Module TBD)	Class meets (Module TBD)	Collaboration	Governance Risk & Controls	Governance Risk & Controls	Governance Risk & Controls
7-Nov	11	Class meets (Module TBD)	Class meets (Module TBD)	CASE COMP Kickoff	Governance Final Exam	Governance Final Exam	Governance Final Exam
14-Nov	12	CASE COMP Round 1	CASE COMP Round 1	CASE COMP Round 1	CASE COMP Round 2	CASE COMP Round 2	CASE COMP Round 2
21-Nov	13	Thanksgiving break					



ABOUT THE AUTHORS

V. Ramesh is a Professor of Information Systems and Whirlpool Faculty Fellow at Indiana University's Kelley School of Business. He is currently the Chairman of the Undergraduate Program and past Chairman of the MS in Information Systems (MSIS) program which he successfully grew the program from 14 students in 2002 to more than 125 entering students in Fall 2012. He has published over 25 papers in leading journals, such as *Information Systems Research*, *MIS Quarterly*, *ACM Transactions on Information Systems*, *Communications of the ACM*, *Journal of Management Information Systems*, etc. Ramesh is also a co-author on one of the leading database books, *Modern Database Management 11e*, along with Jeff Hoffer and Heikki Topi. He is the Editor-in-Chief of *e-Service Journal* and serves as Associate Editor for leading journals such as *Information Systems Research* and *MIS Quarterly*. Ramesh holds the ITIL v3 Expert certificate and is an active participant in both the ISACA and the IT Service Management Forum (itSMF) communities.

Tony Gerth is a Clinical Associate Professor at Indiana University's Kelley School of Business where he teaches graduate and executive courses in information systems strategy, management consulting and supply chain management. He is also Director of the Kelley Information Management Affiliates, an organization of industry IS leaders. Tony was previously a partner at Infosys Consulting in London and Deloitte Consulting in Houston, TX where his practice focused on IS strategy and enterprise transformation through IT. Tony has published in *Information Systems Management*, *Production & Inventory Management* and *MIS Quarterly Executive*. He is a frequent speaker at industry conferences on IS topics and the role of the CIO. He is a member of APICS, SIM, AIS and the Academy of Management.

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