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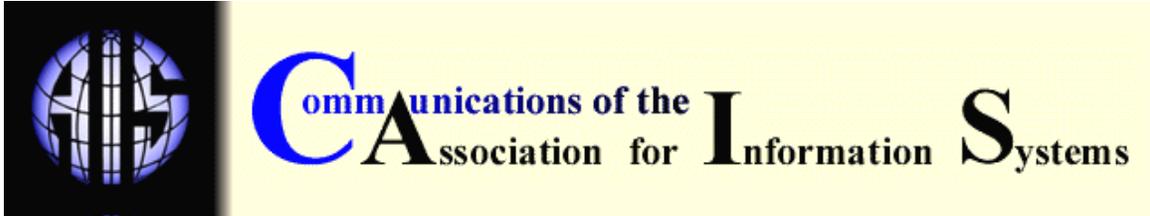
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AMCIS 2007 Panel on IT Service Management: IT Service Management in the IS Curriculum

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ABSTRACT

The fundamental function of information technology (IT), whether internal or external, is the cost-effective provision of IT services that meet organizational needs and align with organizational strategy. With ever-increasing adoption of IT management "best practices," industry now leads the academic community by recognizing the need for IT professionals educated in the IT service management (ITSM) processes -- processes directly associated with the delivery of high-quality, cost-effective IT services. This article presents a summary of panel member presentations and subsequent discussions at Americas Conference on Information Systems (AMCIS) 2007 concerning the need to, and means for, incorporating ITSM concepts into business-school MIS/IS/CIS curricula. Panel members from industry strongly advocated the importance of including ITSM principles and concepts within business-school IS curricula. Academic members of the panel also articulated this need and described initiatives at their and other schools where ITSM concepts have been or are planned for inclusion in business school curricula at both the graduate and undergraduate levels. ITSM research opportunities, faculty preparedness, and possible resistance from within the IS academic community were additionally addressed.

Keywords: IT service management, ISO 20000, IS education, IS curriculum

I. INTRODUCTION

Chief Information Officers (CIO) are under added pressure to increase IT service delivery while their resources remain relatively constant or are even decreasing. Concurrently, organizational IT

infrastructures are under increasing security threats (e.g., cyber attacks) while CIOs face further challenges meeting the regulatory requirements posed by U.S. regulations (e.g., Sarbanes-Oxley, Health Insurance Portability and Accountability Act, and Gramm-Leach-Bliley Act), and a variety of personal privacy regulations promulgated by the European Union and individual nation states. The common thread linking these items is the impact that all these factors have on running day-to-day operations

Relatively few information systems (IS) or computer science (CS) programs explicitly cover information technology service management (ITSM) concepts (ITSM concepts are presented in the following section). Yet, day-to-day IT operations account for 60 to 90 percent of the total cost of IT ownership [Fleming 2005], and executive business management is demanding a shift from a technical view to a business view of the computing resource [Lynch 2006].

ITSM processes focus attention on the business processes needed to align IT activities with organizational needs while not ignoring the technical challenges inherent in achieving such an alignment. Business schools, rather than CS programs, are best able to address this shift to a business view of IT day-to-day operations and service management.

While a growing number of universities are implementing ITSM courses, and a handful of universities offer ITSM degrees/programs, most academics have not heard of ITSM. But industry interest in ITSM is broad based and growing. CIOs noting the lack of applicable knowledge among college graduates, have actively promoted the inclusion of ITSM content in university programs. The itSMF, and industry association promoting adoption of ITSM practices has sponsored and funded academic alliance conferences in Dallas Texas in 2006 and Charlotte, NC in 2007. With more than half of U.S. businesses initiating service management activities [Lynch 2006], ITSM offers a fertile subject area for attracting and placing students and has the potential of revitalizing IT programs by its addition to business school curricula.

The goals of the AMCIS 2007 ITSM panel were to provide industry evidence of demand for ITSM course offerings and describe representative examples of early efforts to incorporate ITSM offerings in business school IT educational programs. The following sections:

- Summarize key ITSM concepts and generally describe industry efforts to adopt ITSM and the industry demand for ITSM-knowledgeable students exiting business-oriented graduate and undergraduate IS programs;
- Describe university initiatives to introduce ITSM concepts within the context of traditional IS courses, in the introduction of new courses primarily focused on ITSM the presentation of concepts, and finally on the adoption of entire ITSM degree programs;
- Describe research needs and opportunities related to ITSM.

The concluding section presents issues raised during audience discussion and implications for schools seeking to introduce ITSM into their programs.

II. ITSM OVERVIEW AND INDUSTRY ADOPTION

What is meant by IT service management? IT service provision (delivery) and the management of the IT infrastructure is referred to as IT service management or ITSM. The aim of ITSM is to improve the quality of the IT services to customer/business while controlling or reducing costs.

It is important for us to understand what we mean by IT services when discussing ITSM. IT services are a set of related functions provided by IT systems in support of the business and perceived by the customer and user as a coherent and self-contained entity. More importantly, they have to be looked at from an end-to-end user perspective extending across multiple technology silos. ISO/IEC 20000 and the IT Infrastructure Library (ITIL[®]) body of knowledge describes a range of business-oriented processes that should be in place to provide quality IT

services that are aligned with organizational needs. At a high level, these ITIL® processes (Version 2.0) include:

- **Service delivery:** including processes for Service Level Management (i.e., negotiation of service level support agreements), Capacity Management, Availability Management, Service Continuity Management, and Financial Management
- **Service support:** including the Service Desk function and processes for Incident Management, Problem Management, Configuration Management, Change Management and Release Management
- **Infrastructure management:** including processes for the planning and design of infrastructure, infrastructure deployment and infrastructure operations (including systems monitoring and response)
- **Security management:** incorporating security requirements into the overall service level agreements and establishing security planning, implementation evaluation, maintenance and control processes

ITIL® represents business practices for operating an IT service support activity and provides a comprehensive, but not necessarily complete, description of IT service management activities. Not coincidentally, these processes define the business practices that IT activities are putting in place to achieve compliance with the previously mentioned laws and regulations. The latest version of ITIL, Version 3, now follows a lifecycle approach (Figure 1), which includes five core publications in the new ITIL library:

1. **Service Strategy** addresses the need to integrate business and IT so that organizations get the most out of IT services. It ensures that business plans and strategies are linked to IT service strategies. This is where the financial management process is discussed along with concepts of service portfolio management.
2. **Service Design** provides the guidance and maintenance of IT architectures, policies, and documents needed to meet current and future business requirements. It is through service design that innovative solutions and processes are developed to best support the business. This is where the processes, service catalogue management, service level management, availability management, capacity management and IT service continuity management are discussed.
3. **Service Transition** focuses on transforming an organization to become a service-based culture through long-term change management, release and deployment management and service asset and configuration management processes. Service transition is a critical stage within the lifecycle to effectively manage and mitigate risks effectively. Knowledge management concepts are also introduced.
4. **Service Operations** focuses on the day-to-day operations of managing the IT organization. It focuses on delivery and control process activities that effectively manage and stabilize services on a day-to-day basis. This is where the incident management and problem management processes and the service desk function are discussed.
5. **Continual Service Improvement** has always been a strong part of ITIL and continues to be in ITIL 3.0. It supports the importance of following a quality approach to improving service and embraces the importance of standards, especially ISO/IEC 20000, which is the International Standard for certifying service provider organizations in IT service management. This is where the service level management process is discussed.

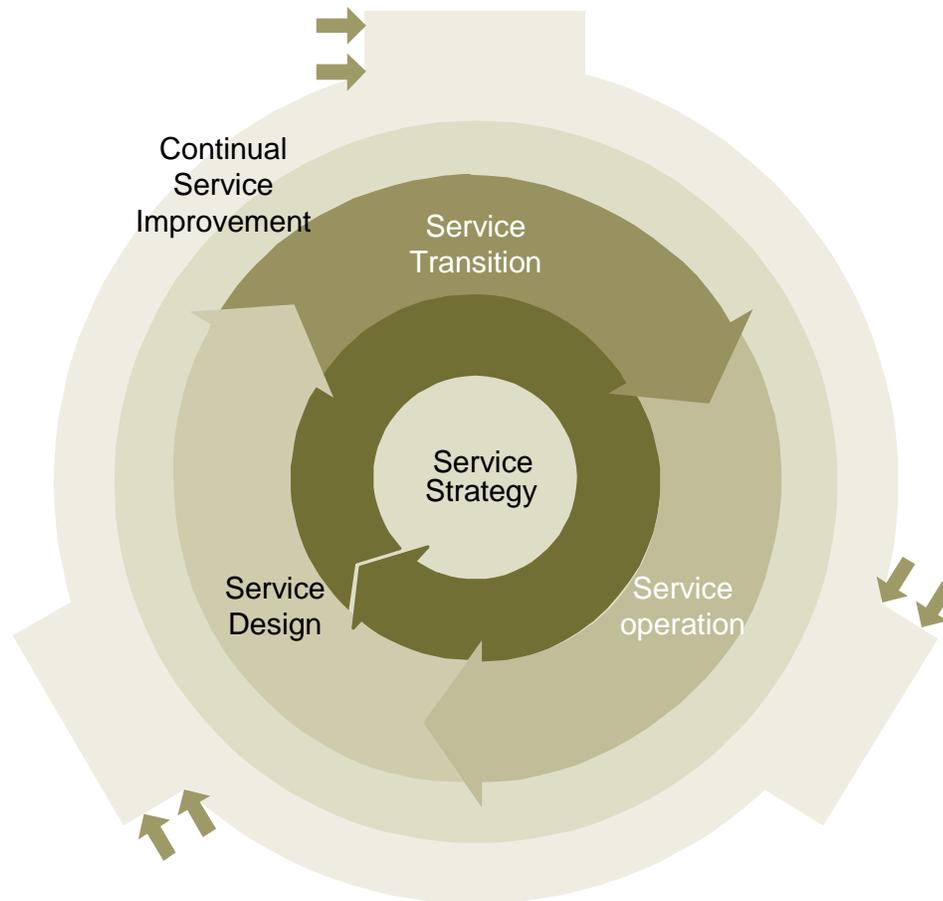


Figure 1. The ITIL Core [adapted from Iqbal et al. 2007, p. 8]

The global popularity of ITIL as a de facto standard of good practice is founded on several key drivers - risk management, financial value return, and operational discipline.

One focus of business governance is the management of business risk. Eighty to 90 percent of today's business processes rely extensively on information technology for transaction processing and productivity [Mercury 2006]. Failure within aspects of the technology domain place the business at risk and can impact revenue, customer goodwill, or have more insidious effects, such as identify theft. To that end, regulators have embodied requirements for business to manage their impact from technology failure or information security events within regulatory standards or legislation. ITIL provides a basis, in key processes, to directly address technical risk and minimize impact to the business. ITIL processes underpin a required capability to understand, plan for, and continually manage the dynamics of the internal and external technical environment with the focus on minimizing business risk.

Another critical driver is return on technology investment. Few would argue that IT is one of the most costly functions within a typical business. Investments in technology and the day-to-day operation of the information infrastructure can consume significant capital and require substantial allocation of the expense budget. Thus, business leaders continually scrutinize IT performance and technology based projects to assure that the value promised as a basis behind technology investments continues to serve both the near-term and long-range needs of the business.

It is not uncommon for financial management to focus substantial attention on the capital return of IT projects and the efficient and effective management of day-to-day IT operations. ITIL provides a solid base for evolving operational and tactical practices and plans to not only assure delivery of

valued IT services but also the metrics and means to evaluate, report and address any operational shortfalls and to clearly understand IT costs. This fact is underpinned by a basic principle of ITIL to deliver optimal services to the business through a cost justified means.

Finally, IT management tenets include delivery of value to the customer and the management of their corporate accountable resources: Information technologies. Given the size and complexity of today's IT organization and technologies, standard approaches and disciplines simplify what could be considered a very difficult management task. Through the framework provided by ITIL, IT management has grounding in well respected and globally adopted practices, which form a basis for business-specific application and infrastructure processes, policies, measurements, and roles.

III. ITSM ADOPTION WITHIN BUSINESS-ORIENTED IS CURRICULA

Despite the popularity of ITSM concepts in organizations, coverage of these concepts is still severely lacking in IS curricula. The majority of university undergraduate and graduate IS programs tend to focus on two broad areas: IT concepts and tools, e.g., programming, database design, networking, systems analysis, and design (DFD, UML, etc.), and IT as an enabler of business strategy. However, in most traditional IS curricula, there is very little coverage of IT processes. Thus, while students learn several critical skills in the application development/infrastructure domain, they often graduate without sufficient understanding of common internal processes. Universities can better prepare students for a career in an IT organization if they expose students to ITSM best practices.

At the graduate level, students who aspire to information and computer technologies (ICT) management can gain considerable insight into the best practices of running ICT organizations through ITSM courses. ITSM exposes graduate students to the processes that enable an ICT to function seamlessly. For example, the service delivery content of ITIL incorporates traditional business topics with the special tactical needs of managing an ICT.

Schools and programs that have acknowledged the importance of ITSM concepts have tended to use multiple paradigms for incorporating ITSM concepts into their IS curricula. These include: a) inclusion of ITSM content in traditional IS courses or the addition of specific ITSM courses to the IS curriculum; and b) development of entire ITSM programs/majors. We present following, an example of each of these alternatives.

INCORPORATING ITSM CONCEPTS INTO COURSES

Because ITSM primarily deals with the process-oriented aspects of IT, these concepts can very easily be incorporated into existing courses. For example, in the Introduction to IS course, the service operations and service strategy concepts can be introduced as individual chapters. Similarly, concepts from the service design domain, e.g., change management, release management, and so on, are appropriate candidates for inclusion in a course on systems analysis and design. We present some detailed examples of inclusion as follows.

ITSM Concepts in Systems Architecture and Networking Courses

The IS 2002 model curriculum includes two courses (2002.4 and 2002.6) that are primarily intended to enable students "to explain in systems terms the fundamental characteristics and components of computer and telecommunications hardware, and system software, and demonstrate how these components interact" [Gorgone, et al. 2002, p. 44].

At Idaho State University, instructors present basic system architecture and operating systems as well as networking concepts in the context of IT service management. That is, the courses explicitly seek to link IT infrastructure design and operation to the delivery of IT services. While the courses remain technology oriented, the service orientation allows for the introduction of critical concepts that help tie technology understanding to the needs of the business. The

courses introduce the concepts of IT performance, availability and security and relate these to business needs. They additionally touch upon the management processes designed to ensure that business requirements in these areas are met.

ITSM Concepts in an IT Controls/Information Assurance Course

IT controls/assurance and computer security courses provide another opportunity for reinforcing ITSM concepts. Furthermore, an understanding of ITSM concepts helps students to grasp the business implications of information assurance and the need to align computer security architecture and practices with IT service delivery and support processes. Coverage of ITSM concepts within such a course also enables introduction of various other frameworks such as COBIT (controls), ISO 17799 (security management), and so on. At Indiana University, the IT governance course provides coverage of all these frameworks and the linkages among them while focusing on teaching students the basics of IT controls. Idaho State University includes these topics in its elective information assurance course.

Such courses can cover service management functions such as change management, configuration management, release management, incident management and problem management and directly relate them to the achievement of organizational information assurance goals.

ITSM Concepts as IS Management Capstone Course

Reflecting the argument that IS students need at least some education in the area of ITSM, Beachboard revised the existing IS management capstone course at Idaho State to explicitly incorporate IT service and operations management concepts. The course addresses IT service management in the context of three dominant ideas: (1) IS governance [Weill and Ross 2004]; (2) IS management; and (3) the integration or overlap of the two functions. The distinction between IS governance and IS management, too often blurred in the trade press, is used to orient students to nuances of IS management in complex organizational environments. Peterson [2004, p. 44] distinguishes the two concepts as follows:

Whereas the domain of IT management focuses on the efficient and effective supply of IT services and products, and the management of IT operations, IT governance faces the dual demand of (1) contributing to present business operations and performance, and (2) transforming and positioning IT for meeting future business challenges.

Thus the course is able to emphasize the importance of aligning IT strategy with business strategy as well as the processes, the IT service management processes outlined above, required to effectively execute the IT strategy.¹

Adding an Introductory ITSM Course

An alternative to weaving ITSM concepts into existing courses is to develop an introductory course for existing undergraduate or graduate program(s). Florida Atlantic University has added a single course on ITSM to their MBA concentration in IT and their Master of Science in Information Technology degrees. The course is an overview of the new ITIL version 3 that includes Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement. Case studies and software simulations are incorporated into the course in addition to guest speakers from the local itSMF local interest group (LIG) (www.itSMFUSA.org).

¹ Beachboard and Beard [2005] more completely describe the logic for and structure of the course as it was taught in 2005. While the underlying course logic remains approximately the same, the course has continued to evolve.

DESIGNING AN ITSM PROGRAM/MAJOR

When designing an ITSM program, it is important to consider the benefits that the student will derive from the program, the target audience, and faculty readiness and willingness to deliver tactical and operational ITSM courses.

What Do ITSM Curricula Look Like?

One of the key questions when designing an ITSM curriculum for a university is the focus of the course delivery. There are graduate and undergraduate programs as well as single overview courses. Most universities offering ITSM courses use materials from the British government’s Office of Government Commerce (<http://www.ogc.gov.uk>) with companion cases plus textbooks to explain the underlying theories (e.g., W. Edward Deming’s quality management philosophy).

One of the first decisions when developing a program is whether the courses will prepare students for the international ITSM certifications. The series of examinations currently include Foundation, Practitioner, and Service Manager Certifications [Galup, Dattero, Quan, and Conger; forthcoming]. The APM Group governs the certification process. In 2006, APM Group (<http://www.apmgroup.co.uk>) signed a contract with the Office of Government Commerce (OGC) to become the new accreditation body for ITIL®. The Information Technology Infrastructure Library (ITIL) is the primary component of ITSM. Following are two sample university programs.

Undergraduate Programs

Missouri State University is one of the first universities in the United States to offer a comprehensive undergraduate program in Information Technology Service Management. The following table enumerates the courses that constitute the program.

Table 1: ITSM Undergraduate Courses at Missouri State University

Traditional IS Courses	Service-Management Courses	Project-Oriented Courses
Computer Technology I	Introduction to IT Service Management	IT Services Project Management
Computer Technology II	Incidents and Problem Management	Internship in Computer Information Systems
Application Development I	IT Service Level Management	
Computer Security	Advanced OM: Business Management	

Graduate IT Service Management Program

The University of Dallas is one of the first universities in the United States to offer a comprehensive graduate program in Information Technology Service Management. Along with traditional MBA and MS core courses, the following courses constitute the UD ITSM concentration:

- Process Mapping and Management
- Foundations of IT Service Management

- Advanced IT Service Support
- Advanced IT Service Delivery
- And one of: Foundations of Project Management. Foundations of Information Assurance, IT Governance

IV. ITSM RESEARCH OPPORTUNITIES

We have scant knowledge about IT servitization as a general topic area even though there are highly publicized successes for ITSM using ITIL, such as Proctor & Gamble (P&G), Unilever, and Associated Computer Services (ACS). P&G saved over \$500 million in its IT Operations budget in its first full year of ITSM practice and continues to reap savings with its continuous improvement programs [Dubie 2002]. Unilever, the itSMF-USA Project of the Year in 2006, developed the ability to evaluate ROI from its IT investments as an outcome of its ITSM efforts [Sherman 2006]. ACS has experienced improvements in many areas as a result of its ability to achieve ISO/IEC 20000 certification for 13 organizations in six countries within two years [Conger and Schultze 2006].

Despite these successes, many companies apply a discipline to their organizations and assume that they are practicing ITSM. There is conceptual confusion about the exact nature of service management, which is variously called SLM, ITSM, IT Governance, IT Management, or even (IT) operations management [Winniford, Conger, and Erickson-Harris 2007]. Conceptual confusion is evidence of immaturity of the discipline and the need for research in this field. Therefore, research to better define ITSM and the breadth and depth of its domains is needed.

Areas for research include the development of service strategy, use of frameworks and standards, project organization, monitoring change efforts for ROI, and compliance effects of ITSM. Take, for instance, the use of standards and frameworks. Companies might select as a guiding framework ISO/IEC 20000, ITIL, CMMI, COBIT, a home-developed set of practices, or some other framework. Research in this area might address framework selection contingencies, or might evaluate the relative effectiveness of different frameworks and standards, or might evaluate the appropriateness of different frameworks for different purposes, such as compliance. Other framework research might develop mental maps to facilitate adoption of the myriad "shall" statements in a single framework.

If one wishes to view an adoption through a theoretical lens, many organizational theories could be applied including change, social network, quality, innovation, resource, and communication theories [Wade, et al. 2007].

One question on how to merge ITSM with operations service management research [OSM, cf. Pullman and Gary 2002; Chase and Apte 2007] raises another avenue of research opportunities. OSM seeks to answer questions about how to profit from improved-product supply-chain management. Joint research in this area might address issues of how well IT servitization efforts (e.g., help desk, incident management, problem management, change management) serve the company's OSM. With longitudinal before-after research, measures of IT contribution to profitability should be possible.

In summary, research opportunities in this area can provide useful theoretical development as well as contribute to practice-oriented research.

V. DISCUSSION AND CONCLUSIONS

As evidenced by the previous examples, ITSM concepts can be integrated into courses commonly offered in traditional IS programs. Our industry advisors suggest that these efforts represent a good start for graduating students that are better prepared to meet their needs. Whether the depth and breadth of coverage represented in some of these examples is sufficient

remains an issue that universities must individually determine. However, audience participants at our panel questioned the appropriateness of incorporating ITSM concepts in traditional IS curricula and also questioned whether existing IS faculty are prepared to effectively offer such content. Our thoughts on these issues are presented as follows.

SHOULD ITSM CONCEPTS BE TAUGHT AT THE UNIVERSITY LEVEL, AND IF SO, WHERE WITHIN THE UNIVERSITY?

We hope that the need for such ITSM education can be recognized from our discussions, particularly within the first two sections of this article. However, the proposals outlined above represent a change from the content offered within traditional, business-oriented IS programs. This is best exemplified by the omission of ITSM concepts from the learning objectives and course recommendations of the IS 2002 curriculum model. In this section, we specifically address the question as to whether such content is appropriate for AACSB accredited business school IS, MIS, or CIS curricula relative to being better supported in CS or ITM programs offered outside colleges of business.

The four academic members of this panel teach and research within colleges of business; we confess that this shared experience strongly influences our views. Our shared professional and academic experience has led each of us to conclude that ITSM core concepts should be included within the education of all university-educated IS professionals and should be offered in business-oriented IS programs.

Just as with the systems analysis and business application development knowledge currently emphasized in IS programs, ITSM concepts represent an inseparable blend of managerial and technical knowledge to be effectively implemented within complex organizational environments. That is, possession of the technical knowledge to provision IT services without understanding the business context within which they will be used inevitably undermines the delivery of services best suited to satisfying business needs. Conversely, knowledge of the managerial processes without concomitant technical understanding leaves business and IS managers at the mercy of technical staff who may or may not appreciate the necessity for disciplined IT management processes that they too often see as unnecessarily constraining their technical prerogatives.

We argue that the blending of technical and business understanding, as instantiated in the teaching of ITSM concepts, represents the fundamental basis for IS managers to effectively align IT investments and strategy with the business strategy. We acknowledge that the ability to analyze business processes and design and implement appropriate business applications remains important. But in an era when information technology is embedded in so many of an organization's critical business processes and so much of the application software is bought off the shelf (or developed off-shore), understanding how to design, implement and operate the IT infrastructure required to reliably and securely support those business processes is paramount. Thus, we want our IT professionals to not only be educated in the core concepts of finance, accounting, marketing, and operations management, but also to understand how to apply these concepts within the context of managing the IT function.

Both academic and professional members of this panel believe that the existing offerings in systems analysis, application development, databases and networking do not adequately prepare our students to be IS professionals. Knowledge of the internal IT management processes and the knowledge of how to manage them represent a critical piece of knowledge that is lacking in graduating students. We view IT programs in the college of business as an appropriate place for the development and teaching of such knowledge. In fact, embracing these concepts and integrating them into our courses might well provide the magic differentiator "elixir" that the IS programs in business schools have been seeking for the past 20 or so years.

IS YOUR FACULTY CAPABLE AND WILLING TO DELIVERY ITSM COURSES?

After the panel presentations, several attendees raised the question as to whether current faculty is capable and willing to teach ITSM concepts. Each point deserves a separate albeit equivocal answer. Despite their importance, the fundamental vocabulary and concepts of ITSM management are not all that complex. The difficulty with ITSM is in the execution. Consequently, the presentation of the basic material is not that difficult. However, as with most of the other topics taught within the IS domain, practical experience will certainly allow faculty members to enrich the classroom experience. As outlined earlier, research opportunities do exist to help faculty members deepen their understanding of ITSM.

The issue of willingness may prove even more problematic. The argument in favor of introducing ITSM concepts into IS curricula can be seen as an attack on existing content. That is not our intent. Requirements will continue to exist for qualified business and systems analysts, applications developers, and database administrators. In fact, knowledge of these areas is complementary to any ITSM knowledge that may be imparted in the curriculum.

It has been argued that the content area lacks academic rigor. We do not deny that some of the technical skills and knowledge associated with managing service delivery are associated with entry level IT positions taken by those having received vocational education and technical training. However, the basic programming skills taught in most IS programs necessarily include skills often taught in vocational programs. We view these technical skills, whether programming, systems administration, or networking, as foundational to the IS profession. Certainly, if an ITSM program emphasizes only technical skills, then it more appropriately belongs in a vocational education program. However, as alluded to in the introduction to this article, it is in the blending of technical skills and managerial knowledge that business schools will be able to make a significant contribution to the IS profession. A technical knowledge foundation is required to apprehend and communicate the challenges of truly aligning business IT infrastructure with business strategy.

As the IS industry continues to mature, the need for ITSM skills and knowledge will increase in demand. This, in addition to the growth of ITSM related academic research, will draw academic interests and the gradual growth of ITSM curricula.

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EDITOR'S NOTE: The following reference list contains the address of World Wide Web pages. Readers, who have the ability to access the Web directly from their computer or are reading the paper on the Web, can gain direct access to these references. Readers are warned, however, that:

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2. The contents of Web pages may change over time. Where version information is provided in the References, different versions may not contain the information or the conclusions referenced.
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John Beachboard is associate professor of Computer Information Systems at Idaho State University. He has more than 25 years of IT experience, including project management experience implementing large-scale information and telecommunications systems and directing the Army's Data Network Control Center in Europe. In 2004, he received an AIS Award for Innovation in IS Education for his work incorporating IT service management concepts into the CIS curriculum at ISU. He is a member of AIS, ACM, and itSMF.

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