AN EXPLORATORY ANALYSIS OF PROJECT MANAGEMENT COURSES IN IS PROGRAMS AT ACCREDITED BUSINESS SCHOOLS

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ABSTRACT

Project Management is of great importance to the information systems (IS) profession, as systems are commonly developed in a team-based project environment that requires planning, coordination and control. It is not surprising therefore that the IS 2009 Model Curriculum identifies IS Project Management as one of seven core (required) courses for inclusion in an Information Systems program. Based on a literature review, no prior studies have examined the extent to which IS programs have implemented this recommendation. The focus of this study is to assess Project Management courses in the IS curriculum based on a website analysis of a sample of AACSB-accredited IS programs. The results raise questions about whether the current coverage of Project Management in the IS curriculum is adequate in light of the provisions of the IS 2009 Model Curriculum.

Keywords: Project Management; IS 2009 Model Curriculum; Information Systems Education, Website content analysis

INTRODUCTION

According to the Project Management Institute (PMI), a project is, "a temporary endeavor undertaken to create a unique product, service, or result" [14]. To be planned and executed effectively, projects require Project Management which the PMI defines as "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements" [14]. Project Management (PM) encompasses the need to manage time, scope, cost, quality, human resources, communications, risk, procurement, and other elements of a project. Project Management is relevant to a wide range of business activities carried out by different business functions. However, PM is particularly needed for Information Systems work based on complexities such as ever changing technology, the extensive amount of user participation involved, the need to handle change over the life of a project [4], and the need to manage global teams and interdependent projects.

As project complexities have grown, it is not surprising that professional computing organizations have expanded their offerings of project management certifications in recent years. These certifications require passing a certification exam and nearly all of them have PM education and experience requirements to "sit" for the exam. Perhaps the most well known of these organizations, the Project Management Institute, offers five different PM-related certifications: the Certified Associate in Project Management (CAPM), the Project Management Professional (PMP), the Program Management Professional (PgMP), the PMI Scheduling Professional, and the PMI-Risk Management Professional [13]. The PMI's website reports it has granted certifications to more than 300,000 professionals worldwide, with the PMP being by far the most popular certification [13]. Additionally, the Computing Technology Industry Association (CompTIA) offers a Project Management certification called Project+ [2] and the International Association of Project and Program Management (IAPPM) provides three levels of PM certifications: the Certified Project Professional (CPP), the Certified Project Manager (CPM) and the Certified Project Director (CPD) [7].

Organizations such as the American Management Association also offer Project Management certificates based on the completion of a series of PM courses [1]. IS Project Management textbooks are also readily available. Some of the most well-known PM books include those by Schwalbe [17], Fuller et al. [4], and Kerzner [11]. Project Management was cited by *Computerworld* as one of the nine hottest IT skills for 2009 [6]. According to this article, there is a "robust demand for project managers with solid track records" in all economic environments [6, p. 26]. Pratt [15] also notes that beyond technical skills IT workers are expected to have Project Management skills as the line between business and IT continues to blur and IT is called upon to deliver business value. These indicators all suggest the growing importance of Project Management to the Information Systems field.

LITERATURE REVIEW

IS 2009, Curricular Guidelines for Undergraduate Degree Programs in Information Systems, is the latest report on the model curriculum work for Information Systems that began decades ago by leading computing organizations. The two previous versions of this report that became well-known and a powerful influence on IS education and accreditation were the IS '97 and IS 2002 model curricula [8, 9]. These reports were co-sponsored by the Association for Computing Machinery (ACM), the Association for Information Systems (AIS), and the Association of Information Technology Professionals (AITP). The IS 2009 Model Curriculum, a joint effort of the ACM and AIS, is headed by a nine member ACM-AIS Task Force. This curriculum report can be accessed online at a wiki as part of what is described as "an ongoing curricular development process" for IS programs [10].

The IS 2009 Model Curriculum, appears to have elevated the importance of Project Management over previous versions of this report. While the IS'97 and IS 2002 Model Curricula specified "Project Management and Practice" as one of ten required courses in an Information Systems program [8, 9], IS 2009 includes "IS Project Management" as one of seven core (required) courses in an undergraduate information systems major [10]. Since the IS 2009 Model Curriculum is the most recent curriculum version, it will be referred to as the "IS Model Curriculum" or the "IS 2009 Model" for purposes of brevity in the remainder of this paper.

The IS 2009 Model specifies that the "IS Project Management" course should be organized according to the areas identified in the PMI's Project Management Body of Knowledge (PMBOK) that include: an Introduction to PM, the PM Life Cycle, Managing Project Communication, Project Initiation and Planning, Managing Project Scope, Managing Project Scheduling, Managing Project Resources, Managing Project Quality, Managing Project Risk, Managing Project Procurement, Project Execution, Control & Closure, Managing Project Control & Closure, and Project Management Standards [10]. Leading PM textbooks such as those by Schwalbe [17] and Fuller et al. [4] are also structured according to the PMBOK framework.

In short, the IS Model Curriculum sends a clear message that a Project Management course is important to include in the IS major. Textbooks and other support resources readily exist to implement the IS Model Curriculum's recommendation to include a PM course that follows the PMBOK framework. There is also no shortage of topics to cover in a

Project Management course. For example, the fifth edition of Schwalbe's PM textbook is nearly 700 pages.

Yet, for at least a couple of reasons, it seems questionable how many IS programs currently teach what can be termed a "stand-alone" or "dedicated" PM course that follows the PMBOK framework. First, Project Management appears to emphasize a managerial orientation. This raises a question about whether IS programs that are more technically focused will see a need to offer a PM course. Second, many IS programs teach Systems Analysis and Design (SA&D) or related courses where some PM concepts are likely addressed. For example, popular SA&D textbooks by Whitten and Bentley [19], Satzinger et al. [16], Dennis et al. [3], and Hoffer et al. [5]. include a chapter and other topical coverage of Project Management. The IS 2009 Model also states the core SA&D course in the IS curriculum will provide, "the first exposure to project management concepts and practice" [10].

Thus, the research question underlying this study is: to what extent have IS undergraduate programs implemented the IS 2009 Model's recommendation to include a stand-alone Project Management course in their curriculum? Based on a literature review, no prior studies were identified that addressed this issue. Yet this topic raises an intriguing normative versus positive comparison, i.e., how things "should be" according to a published standard versus "how they are." It also provides an indication about whether IS programs are taking advantage of an opportunity to offer a course, Project Management, that may be potentially attractive to not only IS majors but other business or non-business majors.

METHODOLOGY

This study follows a research approach similar to a study by Lee [12], where website content analysis was used to determine the extent to which college of business programs offered "Business Process" courses. The Association to Advance Collegiate Schools of Business (AACSB) provided the author with a list of 286 U.S.-based universities with accredited Information Systems programs as of November 2008. Data for this study were collected in November and December 2008. Thirty two universities were randomly selected from the AACSB list, which represents over 10% of the population of interest.

The author first accessed the AACSB website to compile university profile information for each school such as the university's affiliation, academic

calendar, and size in terms of college of business faculty and students [18]. These last two measures were used because this source did not provide more specific data about the number of Information Systems majors or faculty at these institutions.

Next, using a link from the AACSB website to the college of business home page at each university, the author analyzed various Web pages about the IS undergraduate program to locate information about the program's name, its list of courses, and whether it was classified as a major, concentration or track. Course titles, descriptions and syllabi (where available) were reviewed to identify Project Management course offerings and collect other relevant information. Finally, the college of business home page was searched, where a search function was provided, using the term "Project Management" to locate any additional PM-related courses or activities. At some sites, this returned college-specific search results, while at others, it provided courses offered in other colleges of the university or through continuing education programs.

These efforts were used to determine whether or not each IS program included a dedicated (stand-alone) Project Management course, and if so, to identify its course number, title, and other relevant information. For purposes of this study, and consistent with the IS 2009 Model, a stand-alone PM course was defined as a course that has PM as its primary focus as indicated by the presence of "Project Management" in the course title (not combined with other topics) and supported by the course description. If a course title contained "Project Management" along with another broad topic such as "Total Quality" or if "Project Management" was included in a course description, it was classified in a separate category as an IS program where "PM is given emphasis in another course." If "Project Management" did not occur in any course titles or descriptions of courses in an IS program, it was classified into a third category as not having any PM emphasis. The results of this analysis are presented in the next section.

While this process yields important insight about the status of PM courses in IS programs, some limitations of this study should be acknowledged. First, this analysis relies on what institutions communicate at their websites. Since some sites are not updated as frequently as they should be, they may not necessarily reflect current course practices. Thus, it is possible PM is given significant emphasis in some programs but this is not conveyed in course titles and descriptions. Second, since course syllabi are often not available over the Internet, this study

had to rely principally on course titles and descriptions to communicate course content. As such, it represents a "black box" view of Project Management course practices. Third, this study is based on a limited sample size, not a census of all AACSB institutions with IS programs, and it considered IS programs only in the United States. The results reported here may not necessarily be representative of all AACSB universities worldwide.

Finally, the main focus of this study was to identify the extent to which undergraduate IS programs include a dedicated Project Management course as specified by the IS 2009 Model based on available course title and description information. This effort is not meant to suggest that those IS programs who do not offer a stand-alone PM course or who do not emphasize PM in another course as defined in this study, do not necessarily address PM in any way in their IS curriculum. For these programs, it is virtually impossible to tell whether PM is given any emphasis or if so, how much since this information is not conveyed in existing course titles and descriptions. With these points duly noted, the results to this study provide an intriguing look at what IS programs are currently doing toward addressing an IS topic of growing importance, Project Management.

RESULTS

University, college and program information for the institutions included in the sample are presented in Table 1. Medians were used instead of means as a measure of central tendency where applicable due to the limited sample size.

As indicated in Table 1, most universities in the sample are public (72%) versus 28% that are private. Approximately 94% of the institutions use the semester system (30) while only 6% are on the quarter system. The median number of full-time undergraduate business majors for these universities is 1,091 and their median number of full-time business faculty is 52.

IS program information obtained from the university websites indicated that the median number of required Information Systems credit hours in these programs is 24. For the two universities on the quarter system, their hours were converted to semester hour equivalents for purposes of this calculation. "Management Information Systems" is the most common name for the IS program at these schools, followed by "Information Systems" and "Computer Information Systems," respectively. Twenty three (72%) of the IS programs are classified

as majors while seven are concentrations, ranging from 15 to 24 required IS hours, and another is a track consisting of 18 required IS hours.

The results of this study for the Project Management course measures are presented in Table 2.

As shown in Table 2, only 13 of the 32 IS undergraduate programs (about 41%) were found to contain a dedicated Project Management course. This course is required in six programs and elective in six others, while this measure could not be determined for another program based on available website information. The PM course offered is taught by the same department that houses the IS program at twelve universities except one where it is offered by the Management department and can be taken as an elective within the IS program. In all cases, the PM course is offered at the 300, 3000, 400, or 4000 levels, suggesting it is an upper level course for juniors and seniors. The PM course is most commonly entitled "Project Management" (at 6 universities), while at five others it is called "Information Technology Project Management," and "Global Project Management" or "IS Project Management and Development" at the remaining schools. Finally, the PM course descriptions of three IS programs state that the course helps prepare students to take PM certification tests; the PMP certification was mentioned in two course descriptions and the CAPM in another.

As indicated in Table 2, this review also showed that Project Management is given some emphasis in five additional IS programs based on course titles or descriptions. In two programs, PM is included in the course title along with another broad topic area. Specifically, these course titles are "Systems Analysis/Project Management" and "Total Quality and Project Management." In addition, PM is included in a course description in three other IS programs. Finally, in 14 of 32 programs (44%), "Project Management" was not mentioned in any course titles or descriptions.

Due to the exploratory nature of this study, additional efforts were made to determine the extent of PM courses and activities beyond the undergraduate IS program at these institutions. Searches on "Project Management" at these websites and follow-up analysis yielded some interesting results. This review confirmed that Project Management is not unique to the Information Systems field. PM was found to be a required course for Operations and Production Management majors at one university and at another university, Management majors are required to take a

series of two PM courses called "Project Management" and "Project Leadership." PM courses were also identified beyond the business college. For example, "Project Management" course titles were encountered in fields such as Construction Management, Graphic Design, and Industrial and Engineering Technology.

Graduate PM courses were identified among universities where the undergraduate IS program included a dedicated PM course as well as where it did not. The graduate PM courses are part of the Masters of Business Administration program at some schools while at others they are included in the Masters of Information Systems program. PM courses were also identified at some institutions as training courses for university employees or courses offered by colleges of lifelong or extended learning. Two universities were found to offer graduate PM certificate programs. Two other schools offer exam preparation courses for popular PM certifications. Thus, the scope of PM course offerings found in this study was broad and diverse.

CONCLUSIONS

It is unlikely that most IS academicians would dispute the importance of Project Management. If information systems are to be delivered on time, on budget, and to meet or exceed user expectations, careful Project Management is required. Yet, the results of this study suggest that the extent to which Project Management is addressed in IS programs is highly variable.

The IS 2009 Model Curriculum specifies that a stand-alone Project Management course should be one of the seven required (core) courses in an IS program. Yet, this study found that only 41% of the IS programs reviewed include a dedicated PM course and this course is required in just half of these programs. This means that only six of the 32 programs comply with the Project Management provisions of the IS 2009 Model. These results raise a question about whether the coverage of PM in some IS programs is currently adequate.

As noted, this study relied largely on online course titles and descriptions. For those programs that lack a dedicated PM course, it is difficult or impossible in many cases to determine the extent to which PM is addressed. In some programs, PM could be given substantial attention but course titles and descriptions are simply outdated. However, it is also possible that PM is not emphasized sufficiently in other programs. It should be recognized for instance that simply

assigning students projects in a course even if done in a group setting does not equate to addressing Project Management.

It is advisable for many Information Systems programs to reevaluate their coverage of Project Management in the undergraduate IS major. A topic analysis can be performed to compare the provisions of the IS 2009 model, which follows the topics of the PMBOK framework, to what is currently taught in specific IS courses. This analysis can reveal whether the coverage of essential PM topics in existing courses is adequate. If significant gaps exist, it may suggest revising certain courses to include selected PM topics or adding a dedicated PM course to the major. The feasibility of adding a PM course will depend in part on factors such as the expertise of faculty, the available hours in the IS program, and the coverage of PM topics in existing courses.

Even if an IS program chooses not to comply with the IS 2009 Model, which is of course strictly voluntary, it should consider whether it is overlooking an important opportunity by not offering a dedicated Project Management course. As noted earlier, all business functions need Project Management, not just Information Systems. With the problem of declining or flattening IS majors in recent years, implementing a dedicated PM course may be a way to offer needed course content to more business majors and attract these students to courses offered by the IS department. Since PM in many ways is an inter-disciplinary topic, if the IS program does not seize this opportunity, it may give it up to another department such as Management. IS programs may have a limited "window of opportunity" to act. If an IS program builds a competency in Project Management, it can decide whether to extend this expertise over time by offering MBA or MSIS PM courses, online courses, or even certificate or PM exam preparation courses.

Offering a PM course is also a way for an IS Program to distinguish itself from other majors such as Computer Science. The addition of a PM course is congruent with the focus of many IS programs that emphasize the convergence of business and technology. Finally, a PM course can help students gain a competitive advantage in the job market by aiding their progress toward attaining a professional certification such as the PMP or CAPM.

Lastly, from a research perspective, the results of this study probably raise as many questions as answers, but that is not necessarily a bad thing. An analysis of Web site information is an important starting point

toward understanding the emphasis given to Project Management in IS programs. However, it is only a partial view and there is a need for more research. Follow-up studies could examine the possible relationship between certain independent variables such as program size or the number of IS credit hours and whether an IS program offers a PM course. This could help identify characteristics that distinguish IS programs who teach PM courses versus those who do not. In addition, since little is known about the extent of PM coverage in many programs since it is not contained in course titles or descriptions, surveys of faculty could be conduced to determine the actual extent of PM coverage. Faculty perceptions of PM issues may also be revealing. For example, one key question appears to be: where a dedicated PM course is not offered, which PM topics tend to get "short changed" the most? What is the impact of this on IS majors and graduates? Finally, surveys of IS professionals about the use and perceived importance of Project Management would also be beneficial. The insights generated from these studies would aid academicians and curriculum developers in making decisions about how to address Project Management most effectively in the IS curriculum to prepare students for the workplace.

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Table 1. SAMPLE CHARACTERISTICS

	Percentage (Number):
University Affiliation:	
Public	71.9% (23)
Private	28.1% (9)
Academic year:	
Semesters	93.8% (30)
Quarters	6.2% (2)
Median full-time undergraduate business majors	1,091
Median full-time college of business faculty	52
IS Program Information:	
Median IS semester hour equivalents required	24
Program Name:	
Management Information Systems	53.1% (17)
Information Systems	18.8% (6)
Computer Information Systems	9.4% (3)
Business Information Systems	6.3% (2)
Other, 1 each: Business Computer Information Systems; Information Systems Management; Information Systems Technology; Decision Sciences And Information Systems	12.5% (4)
Nature of Program:	
Major	71.8% (23)
Concentration or track	25.0% (8)
Information not available at Web site	3.1% (1)

Table 2. RESULTS

	<u>**Percentage (Number):**</u>
IS Program Includes a Dedicated PM Course	
Yes	40.6% (13)
No, but PM is given emphasis in another course*	15.6% (5)
No, no mention of PM in course titles or descriptions	43.8% (14)
PM Course Offered is:	
Required	46.2% (6)
Elective	46.2% (6)
Information not available at Web site	7.7% (1)
Department Offering the PM Course:	
Same as the Department Housing the IS Program	92.3% (12)
Another academic department (Management)	7.7% (1)
Course Level:	
300 or 3000	38.5% (5)
400 or 4000	61.5% (8)
Course Title:	
Project Management	46.2% (6)
Information Technology Project Management	38.5% (5)
Global Project Management	7.7% (1)
IS Project Management and Development	7.7% (1)

* "Project Management" is included in a course title combined with another topic such as "Systems Analysis" or "Total Quality" or "Project Management" is contained in a course description within the IS program.