

# The Implementation of the AIS/ACM IS 2010 Curriculum by Top US Universities: An Analysis of Catalogs and College Websites

*Completed Research Paper*

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## Abstract

This research analyzes the undergraduate Information Systems (IS) degree programs offered by the 24 most heavily-recruited universities in the U.S. We compared the published program learning outcomes of these IS programs against the AIS/ACM IS 2010 higher-level IS capabilities as well as IS specific knowledge and skills. We also compared the track designs of these programs against the IS 2010 career tracks. Our conclusion is that, IS 2010 has not been explicitly followed by these programs.

## Keywords

IS 2010, Information Systems curriculum, content analysis, undergraduate education.

## Introduction

In 2010, the Association for Information Systems (AIS) and the Association for Computing Machinery (ACM) published the AIS/ACM IS 2010 curriculum as an extensive guideline for the design of undergraduate Information Systems (IS) degree programs (Topi et al. 2010). The objective of our research is to analyze the implementation of IS 2010 among the undergraduate IS programs of 24 top US universities, so as to investigate how much these programs have followed IS 2010.

## The AIS/ACM IS 2010 Curriculum

IS 2010 is the latest version of the model curriculum for undergraduate programs in IS (Topi et al. 2010). It can be tailored for IS programs in business schools, schools of public administration, schools of information sciences or informatics, and stand-alone schools of information systems. IS 2010 is based on a board IS community's assessment of industry expectations for entry-level IS professionals.

IS 2010 defines and fully describes a set of high-level IS capabilities that graduates should master, as shown below:

1. Improving Organizational Processes
2. Exploit opportunities created by technology innovations
3. Understand and address information requirements
4. Design and manage enterprise architecture
5. Identify and evaluate solution and sourcing alternatives
6. Secure data and infrastructure
7. Understand, manage, and control IT risks

The above capabilities are based on three areas: (1) IS Specific Knowledge and Skills, (2) Foundational Knowledge and Skills (leadership and collaboration, communication, negotiation, analytical and critical thinking, creativity, ethical analysis, and mathematical foundation), and (3) Domain Knowledge and Skills (such as finance, accounting, marketing, etc.). IS Specific Knowledge and Skills contains four main categories:

1. Identify and design opportunities for IT-enabled organizational improvement
2. Analyze trade-offs
3. Design and implement information systems solutions
4. Manage ongoing information technology operations

IS 2010 contains seven core and eleven elective courses. It outlines 17 career tracks with their respective electives courses. Under a track, there are some electives playing a heavier role covering the track topics and others playing a lighter role. These career tracks are shown in column 1 of Table 1, numbered (A) through (Q).

## U.S. Undergraduate Degree Programs in Information Systems

According to Topi et al. (2010), the academic discipline of IS began in the 1960s and it has grown in scope and depth. In nearly 50 years, different names have been used for the academic field of IS, including “Management Information Systems,” “Computer Information Systems,” “Information Management,” “Information Systems Management,” and “Accounting Information Systems,” etc. In this paper, the term “Information System program” covers all these programs.

This paper focuses on students whose careers fall in the IS area. Therefore, we are analyzing the curriculum for IS majors, not minors. We include degree programs with a concentration of IS because many undergraduate programs lead to a Bachelor of Business Administration with a concentration in IS. Here, we define a “program” or a “degree program” as an undergraduate four-year degree program with a major or a concentration that is related to IS or Information Technology (IT). A “track” is a further specialization under IS. It should have a name and a designed set of courses for this track. The words “track,” “options,” “concentration,” and “specialization,” are used interchangeably.

## Literature Review

In the area of IS curriculum development, Plice and Reinig (2007) found that graduates of their undergraduate IS program tended to move into managerial positions which required both business and people skills. Thus, they recommended PLOs with more focus on business, rather than technology. Khan (2011) concluded that, the design of the undergraduate IS program curriculum should closely follow ABET criteria, as well as input from the faculty, academic and business advisory council, alumni, and current IS students. Contrary to Plice and Reinig (2007), Babb, Longenecker, Woratschek, and Adbullat (2012) recommended that, PLOs should emphasize knowledge fundamental to the discipline, support students in developing core skills and be sensitive to the needs of industry.

Since the final version of IS 2010 was presented, a relevant research study surveyed a random sample of 138 (out of a total of 286) Association to Advance Collegiate Schools of Business (AACSB) accredited IS programs (Bell, 2012). In addition, 53 follow-up interviews with department heads and program directors were performed. None of the IS programs in his study complied with all the guidelines of IS 2010. The range of IS 2010 topic coverage varied as well. Very few of those IS programs formally implemented the IS 2010 career tracks. Our study uses the content analysis research method instead. Moreover, the IS programs we analyze are not limited to those in business schools.

## Research Methodology

We used the established research method of content analysis for this research. Content analysis follows a set of procedures to make valid inferences from text (Weber, 1990, p. 9). Words in the text analyzed are classified into a few content categories. Units of text (words, phrases, or other units of words) in the same category should have similar meanings or should share similar connotations. It is important that the

coding rules and the classification procedure be reliable and consistent. Different people should code the same piece of text in the same way. More than one researcher has to perform the same action independently and compare their results. Second, a classification procedure should generate variables that are valid in the way it measures what the researchers intend to measure. A major issue here is the ambiguity of certain word meanings and category/variable definitions.

According to Weber (1990, p. 17), an acceptable type of reliability in content analysis is inter-coder reliability, which refers to the extent that different coders/researchers classify the text in the same way. Both authors of this paper worked independently and checked our answers during both the pre-test with six IS programs and during the study with a separate set of 29 IS programs. As for the validity of content analysis, we consider that semantic validity is achieved when words or other coding units classified together in the classification scheme possess similar connotations (Weber 1990, p. 21). Semantic validity exists when people familiar with the text agree that lists of words (or other units) under a specific category share similar meanings or connotations.

We have chosen to analyze all program description text both in the catalogs and on the official websites of these universities. These sources are valid text used for our purpose because it is generally expected that, such information is official. If PLOs and specific tracks have been defined for these programs, such information should be available from these official sources. Content analysis research is different from program evaluation research. It is not our purpose to perform quality assessment on these programs.

To answer the first research question of whether the IS programs studied explicitly follow the IS 2010 high-level IS capabilities and specific IS knowledge and skills via their formally defined PLOs, we decided to match any published PLOs of these programs against these IS 2010 IS capabilities, knowledge, and skills.

To answer the second research question of whether these IS programs follow the IS 2010 career tracks and their required courses, we ran into a technical difficulty. As mentioned in IS 2010 (Topi et al., 2010), the definition and details about these IS 2010 career tracks are on the web site <http://blogsandwikis.bentley.edu/iscurriculum>. This website was not found on the Internet at first. After a few months, this site became accessible but without such detailed description of these designed career tracks. We had no guidelines to use in our evaluation and the results were bound to be unreliable. Therefore, for the second research question, we focused on whether or not an IS program offers separate specializations. We first defined that only a named track, option, specialization, or concentration under IS with corresponding courses counts as a track.

In comparing the tracks named by IS 2010 and those provided by these IS programs in question, we decided only to compare the name of each track. We determined that comparing the course contents of each track would not be reliable due to the lack of available information. The course description of each course in IS 2010 is very detailed with course learning objectives, description, topics covered, and discussion (Topi et al., 2010). However, most universities we analyzed do not define course learning objectives or outcomes for their courses. For example, Cornell University has course learning outcomes in some course descriptions, but not all. Similar to the typical course description in a catalog, the course descriptions of these universities are only a few lines of text, which are far less detailed than those found in IS 2010. Therefore, among those IS programs that offer tracks, we chose to only compare track names instead. Details of the research steps are described below.

### **Research Steps**

Every submission should begin with an abstract of no more than 150 words, followed by a set of keywords. The abstract should be a concise statement of the problem, approach, and conclusions of the work described. It should clearly state the paper's contribution to the field.

We followed Weber (1990, pp. 21-24) to develop procedure for answering each of the research questions. Steps 1 through 4 are for creating and testing a coding scheme for answering each research question. Step 5 is for the actual coding or analysis of the IS programs under study.

Step 1 is defining the basic unit of text to be classified. The first author defined the unit of analysis to be words at the sentence level. We looked for the desired categories of concepts sentence by sentence.

Step 2 is defining the coding categories for answering Research Question 1. We investigated the six IS programs of five randomly-selected universities from the 2013 Edition of Best Colleges (US News & World Report, 2012). One university was chosen from each of the following category: national level (University of Pittsburgh, PA), regional level – north (Salisbury University, MD), regional level – south (Columbia College, SC), regional level – Midwest (Butler University, IN), and regional level – west (California State University – Los Angeles). We did not select any from the category of “National Liberal Arts Colleges” due to the lack of IS majors in this type of colleges in general.

To define the coding categories for answering the first question, “Do the IS programs of these universities explicitly follow the IS 2010 curriculum by formally defining their PLOs the way IS 2010 expresses the high-level IS capabilities and specific IS knowledge and skills,” both authors separately analyzed the websites and catalogs of these five universities. The description of the capabilities, knowledge, and skills expected of IS graduates is extremely scant in the catalogs and on the university websites. These sources do not provide enough information to be compared to the detailed descriptions in IS 2010. Therefore, we made no coding categories of the text; instead, we just used word-for-word comparison. The conclusion would either be “Yes” or “No” with documentation for later informal reference. The first author wrote (and shared with the second author) a document explaining the detailed procedure and rules of matching to be used.

Step 3 is defining the coding categories for Research Question 2. For each IS 2010 track name, we consulted the O\*NET listing (United States Department of Labor, 2010) and added other relevant job titles that matched with this track name at 95 percent or higher as stated by O\*NET, are in the field of IS and Computing, and with the IS 2010 track name itself included as one of the “other job titles” reported by employers. Then we added a few that did not match at 95 percent but should be equivalent based on our domain knowledge in the field. Both authors agreed on the final list of equivalent names for each of the 17 IS 2010 tracks (see Table 1). The first author also wrote (and shared with the second author) a document explaining the procedure and rules of matching to be used.

Step 4 is performing the pre-test with the five randomly-selected universities. This is an important step in content analysis to reveal any ambiguities in the rules to suggest improvements of the categories (Weber, 1990). As for the acceptable reliability level of independent analysis done by each author, we agreed to set it at 95 percent or higher. Both authors separately analyzed the websites and catalogs of these five universities in response to the question, “Do the IS programs of these universities follow the IS 2010 curriculum explicitly through formally defining their PLOs in the way and at the detail level of IS 2010?” We recorded our findings on our separate templates and checked our answers for agreement. Matching was achieved at 100 percent. Among the six IS programs offered by these five universities, none of them provide a detailed set of PLOs.

As for the second research question, only the IS program of Salisbury University offers a set of four tracks among the six pre-test IS programs. We initially disagreed on whether or not the track “Business Systems Analyst” is the same as the IS 2010 track “Business Analyst.” We discussed and agreed that they are the same. After our discussion, we achieved matching answers at 100 percent. Among their four tracks, only the track “Business Systems Analyst” matches the IS 2010 track “Business Analyst.” Further, we added “Business Systems Analyst” as an equivalent to the IS 2010 “Business Analyst” and “Human-Centered System Designer” as an equivalent to the IS 2010 track “User Interface Designer.” The final sets of equivalent names for the IS 2010 tracks are shown in column 1 of Table 1. We also include the matching results of Step 5 in column 2 (to be discussed in the next section).

IS Track Name and Equivalent Names in the Same Category (1)	Matching Track in Subject Programs Studied (2)
(A) Application Developer Software Developer, Systems Software Software Developer, Applications Computer Programmer	1. Rutgers University, Program 2: Theme 3 Information System Designers/Developers 2. University of North Carolina, Program 1, Chapel Hill NC: Track 7 Programmer/Analyst
(B) Business Analyst	3. University of Wisconsin: Track 1 Information Systems Analysis and Design

Computer Systems Analyst Management Analyst Business Systems Analyst (added after pre-test)	4. University of Virginia: Business Analyst, the only track for IS students  5. Rutgers University, Program 2: Theme 3 Information System Designers/Developers (this matching was not agreed upon)  6. University of North Carolina: Track 7 Programmer/Analyst
(C) Business Process Analyst (no equivalent names)	7. NONE
(D) Database Administrator (no equivalent names)	8. University of North Carolina, Program 1: Track 1 Databases
(E) Database Analyst Database Architect	9. University of North Carolina, Program 1: Track 1 Databases
(F) eBusiness Manager (no equivalent names)	10. University of Wisconsin: Theme 3: E-Business Management  11. Rutgers University, Program 2: Track 8 E-Commerce/E-Business
(G) ERP Specialist Document Management Specialist	12. NONE
(H) Information Auditing and Compliance Specialist (no equivalent names)	13. NONE
(I) IT Architect Computer Systems Analysts Software Developer, Application Software Developer, Systems Applications Computer Hardware Engineer	14. University of Wisconsin: Track 1 Information Systems Analysis and Design  15. Rutgers University, Program 2: Theme 3 Information System Designers/Developers  16. University of North Carolina, Program 1: Track 7 Programmer/Analyst
(J) IT Asset Manager IT Manager Computer and Information Systems Managers	17. University of Wisconsin: Track 2: IT Infrastructure Operations and Management  18. Rutgers University, Program 2: Theme 1 Management
(K) IT Consultant (no equivalent names)	19. University of Southern California: Track 2 Consulting
(L) IT Operations Manager Computer and Information Systems Manager IT Manager	20. University of Wisconsin: Track 2: IT Infrastructure Operations and Management  21. Rutgers University, Program 2: Theme 1 Management
(M) IT Security and Risk Manager Business Continuity Planners Information Security Analyst IT Service Continuity Supervisor Information Security Manager	22. NONE

(N) Network Administrator Network and Computer Systems Administrator	23. Texas Tech University: Track 1 Telecommunications/Network  24. University of North Carolina, Program 1: Track 6 Networks
(O) Project Manager Information Technology Project Manager	25. Rutgers University, Program 2: Theme 4 IT Project Management  26. University of Southern California: Basket 4: Project and Program Management
(P) User Interface Designer Human Factors Engineer and Ergonomist Human-Centered System Designer (added after pre-test)	27. Cornell University, Program 1: Track 1 Human- Centered Systems  28. Cornell University, Program 2: Track 1 Human- Centered Systems  29. University of North Carolina, Program 1: Track 3: Human-Computer Interaction/ Interface Design/Interaction Design
(Q) Web Content Manager Web Developer Web Designer Web Administrator Webmaster Corporate Webmaster Web Site Manager	30. University of North Carolina, Program 1: Track 8: Web Development  31. University of North Carolina, Program 1: Track 9: Web Designer  32. Texas Tech University: Track 2 Web Application Design  33. Rutgers University, Program 2: Theme 2 Web Design

**Table 1. Equivalent Track Names and Matched Tracks**

Step 5 is performing the analysis on the subject IS programs. We decided to analyze the undergraduate IS programs offered in the top 25 universities as ranked by The Wall Street Journal (2012). The Wall Street Journal ranked these universities based on 479 direct responses from recruiters and these candidate universities were not limited to business schools. Since the opinions of a global group of practitioners in industry was also included in the creation of IS 2010, using this ranking system would align better with IS 2010. As for other rankings, such as the US News & World Reports (2012), Forbes College Rankings (Forbes, 2013), Tanabe and Tanabe (2011), and Fiske (2012), none of them used information from recruiters or employers as the basis of their rankings. Information was collected in late January 2013.

All of the top 25 universities are shown in Table 2. There are two universities ranked 19th and two ranked 25th. Therefore, the total number of universities is 26. Among them, two do not offer undergraduate programs in IS. Therefore, they were excluded from this study. Four of them offer more than one relevant degree. In summary, there are 29 different IS degree programs in this study. Columns 1 to 4 of Table 2 list the general information about them. Column 5 shows the track matching results in Step 5 (to be discussed in the next section).

Rank (1)	University (2)	College or School (3)	Degree Program (4)	Track Design (5) (A blank cell means none)
1	Pennsylvania State University, University Park, PA	Smeal College of Business	B.S. Major: Management Information Systems	

2	Texas A&M University, College Station, TX	Mays Business School	BBA Major: Management Information Systems	
3	University of Illinois, Urbana-Champaign, IL	College of Business	BS Major: Information Systems and Information Technology	
4	Purdue University, West Lafayette, IN	College of Technology	BS in Computer and Information Technology with an Information Systems Technology Concentration	
5	Arizona State University	W. P. Carey School of Business	BS Major: Computer Information Systems	
6	University of Michigan, Ann Arbor, MI	Stephen M. Ross School of Business	BBA with electives in Business Information Technology (web site), called "Technology and Operations" instead on the information sheet	
7	Georgia Institute of Technology, Savannah, GA	Ernest Scheller Jr. College of Business	BS in Business Administration with Concentration in Information Technology Management	
8	University of Maryland, College Park, MD	Robert H. Smith School of Business	BS in Information Systems	
9	University of Florida, Gainesville, FL	Heavener School of Business	BS in Business Administration Major:	

		inside Warrington College of Business Adminis- tration	Information Systems	
10	Carnegie Mellon University, Pittsburgh, PA	Tepper School of Business	BS in Business Administration with track in Computer and Information Technology	
11	Brigham Young University, Provo, UT	Marriott School of Management	BS in Information Systems	
12	Ohio State University, Columbus, OH	Fisher College of Business	BS in Business Administration with specialization in Information Systems	
13	Virginia Polytechnic Institute and State University, Blacksburg, VA	Pamplin College of Business	BS in Business Major: Business Information Technology	Two tracks: (1) Computer-based Decision Support Systems
				(2) Operations and Supply Chain Management
14	Cornell University, Ithaca, NY	College of Arts and Sciences	Three degrees:  (1) B.A. in Information Science	Three tracks: (1) Human-Centered Systems: IS 2010 TRACK P
				(2) Information Systems
				(3) Social Systems
		College of Agriculture and Life Sciences	(2) B.S. in Information Science	Three tracks: (1) Human-Centered Systems: IS 2010 TRACK P
				(2) Information Systems
		College of Engineering	(3) B.S. in Information Science Systems and Technology	Two tracks (options): (1) Information Science
(2) Management Science				
15	University of California, Berkeley, CA		NO UNDER- GRADUATE IS	



			PROGRAMS	
16	University of Wisconsin, Madison, WI	School of Business	BBA Major: Information Systems	Three tracks
				(1) Information Systems Analysis and Design: IS 2010 TRACKS B, I
				(2) IT Infrastructure Operations and Management: IS2010 TRACKS J, L
				(3) E-Business Management: IS 2010 TRACK F
17	University of California at Los Angeles, Los Angeles, CA		NO UNDER-GRADUATE IS PROGRAMS	
18	Texas Tech University, Lubbock, TX	Rawls College of Business	BBA Major: Management Information Systems (MIS)	Two tracks:
				(1) Telecommunications /Network: IS 2010 TRACK N
				(2) Web Application Design: IS 2010 TRACK Q
19	North Carolina State University, Raleigh, NC	Poole College of Management	Two Degrees:	
			1. BS in Business Administration with concentration in Information Technology	
			2. BS in Accounting with concentration in Information Systems	
19	University of Virginia, Charlottesville, VI	McIntire School of Commerce	B.S. in Commerce with concentration in Information Technology	The concentration is the track in which students become Business Analysts: IS 2010 TRACK B

21	Rutgers University, New Brunswick, NJ  (The MIS major is in Newark only, not included in this study)	Rutgers Business School	Two Degrees: 1. BS Major in Management Science and Information Systems with concentration in Business Analytics and Information Technology	
		School of Communication and Information	2. BA in Information Technology and Informatics	<p>Nine Tracks: One specialization: Game Production and Innovation</p> <p>Eight themes:</p> <p>(1) Management: IS 2010 TRACKS J, L</p> <p>(2) Web Design: IS 2010 TRACK Q</p> <p>(3) Information System Designers/Developers: 2010 TRACKS A, I</p> <p>(4) IT Project Management: IS 2010 TRACK O</p> <p>(5) Help Desk Analysis</p> <p>(6) Knowledge Management</p> <p>(7) Instructional Technology/Training</p> <p>(8) E-Commerce/E-Business: IS 2010 TRACK F</p>
22	University of Notre Dame, South Bend, IN	Mendoza College of Business	BBA Major: Information Technology Management	
23	Massachusetts Institute of Technology, Cambridge, MA	Sloan School of Management	BS Major: Management Science with concentration in Information Technologies	

24	University of Southern California, College Park, CA	Marshall School of Business	BS in Business Administration with electives in Information and Operations Management	At the time of data collection, only one brochure (not the catalog) described 4 job baskets with courses designed:
				(1) Supply Chain Management
				(2) Consulting: IS 2010 TRACK K
				(3) Digital Transformation
				(4) Project and Program Management: IS 2010 TRACK O
25	Washington State University, Seattle, WA	College of Business	BA in Business Administration Major: Management Information Systems (MIS)	
25	University of North Carolina, Chapel Hill, NC	School of Information and Library Science	Two Degrees:  1. BS in Information Science	Nine concentrations:
				(1) Databases: IS 2010 TRACKS D, E
				(2) Geographic Information Systems
				(3) Human-Computer Interaction/Interface Design/Interaction Design: IS 2010 TRACK P
				(4) Health Information Systems / Medical Information Systems
				(5) IS Generalist
				(6) Networks: IS 2010 TRACK N
				(7) Programmer/Analyst: IS2010 TRACKS A, B, I
		(8) Web Development: IS 2010 TRACK Q		
				(9) Web Design: IS 2010 TRACK Q
		Kenan-Flagler Business School	2. BS in Business Administration	

**Table 2. The Top 25 Universities Ranked by the Wall Street Journal (2012)**

## Discussion

### **Research Question 1**

We analyzed the 29 subject IS programs the same way as we analyzed those programs in the pre-test. The matching of separate analysis results by two authors was at 100 percent. Both authors agreed that none of the 29 program descriptions explicitly followed the IS 2010 set of IS capabilities, knowledge, and skills, via formally defining their PLOs at the level of detail similar to that of IS 2010. Among these 29 program descriptions, only four published PLOs: Brigham Young University (BS in IS, Rutgers University (BA in IT and Informatics), University of Notre Dame (BBA in IT Management), and University of North Carolina at Chapel Hill (BS in Information Science). A comparison of these outcome statements and those of IS 2010 clearly indicates that these learning outcomes are not as detailed. Some outcomes, such as writing skills and presentation skills, are in IS 2010 Foundational Knowledge and Capabilities area instead. None of these IS program descriptions explicitly mentions IS 2010.

### **Research Question 2**

As for the second research question of whether or not these IS programs follow the IS 2010 tracks, only 11 degree programs in nine universities have program tracks. They are shown in column 5 of Table 2. The other 18 programs studied do not offer any specific tracks.

We analyzed the 11 programs that offer tracks and compared these track names to those in IS 2010. The two authors' results matched at 96.97 percent (32 matching answers out of 33). The matching results are shown in column 2 of Table 1 and column 5 of Table 2. Some of those programs offer some of the IS 2010 tracks and some offer others. Only three programs (those of University of Wisconsin, Texas Tech University, and University of Virginia) provide tracks that are subsets of those designed in IS 2010. University of North Carolina has six out of nine tracks matching with IS 2010. The BA program of Rutgers University has five out of nine tracks matching. University of South Carolina has two out of four matching.

Among the IS 2010 tracks, the most popular track is Web Content Manager (Q). It has four matching tracks among these studied programs. IS 2010 tracks that have zero matched tracks are Business Process Analyst (C), ERP Specialist (G), Information Auditing and Compliance (H), and IT Security and Risk Manager (M). It is interesting that much in-demand areas, such as IS 2010 tracks H and M, are not offered as a track in any of these IS programs.

Among the program tracks offered, there are some not found in IS 2010, such as Operations and Supply Chain Management, Management Science, Management, Instructional Technology/Training, Supply Chain Management, Geographic IS, and Health IS/Medical IS.

### **One Follow-up Interview**

Since not many IS programs published their PLOs in the catalogs and on their websites, we pursued a more in-depth understanding of the relevant issues by interviewing Dr. `Jon (Sean) Jasperson, Assistant Department Head, and BBA Program Director of the Department of Information and Operations Management (INFO) at Mays Business School, Texas A&M University. As presented in Table 2, Texas A&M University was ranked second by the Wall Street Journal (2012).

According to Dr. Jasperson, the department recently completed a two-year process to re-design PLOs for the MIS program. The basis used for re-defining these PLOs included PLOs of other similar programs in the country, a part of IS 2010, and the more general PLOs of Mays Business School. These PLOs will be used for regular learning assessment after they have been finalized and approved. In addition, the department plans to publish the PLOs on their website to better inform constituents (e.g., current/former students, recruiters, and faculty) about the PLOs for the MIS program.

As for IS 2010 itself, Dr. Jasperson stated that, the breadth and depth of coverage are definitely the strengths of IS 2010. He has great respect for the process used and the people involved in creating IS 2010. Dr. Jasperson sees the de-emphasis of coding as a core requirement as a weakness of IS 2010.

Dr. Jasperson works with recruiters and program advisory board members from industry. These recruiters emphasize well-rounded skills (such as people, analytic, and communication skills) and self-

motivation in their future employees. In general, these professionals are not asking that the MIS curriculum at Texas A&M University match the IS 2010 model curriculum.

As for having concentrations (tracks) within the MIS major, Dr. Jasperson shared the present difficulties of formally defining required courses for tracks: (1) The lack of available credit hours for a track. With General Education, core Business courses, and the foundation MIS courses that students must take towards their BBA degrees, there are not enough credit hours left for in-depth formal tracks. (2) The lack of faculty capacity to offer the enough courses for a track.

## Future Research Directions

As our word-for-word comparison indicates, none of the subject IS program descriptions explicitly adhere to IS 2010 guidelines via closely following the PLOs and track designs, which leads to several future research directions. The first direction is studying how the directors of IS programs view various program requirements and curricula, such as those of AACSB, Accreditation Board for Engineering and Technology (ABET), and IS 2010, to understand the reasons behind the adoption of a particular one or the lack of it. The second direction is studying how company IT recruiters and recent IS program alumni see IS 2010, to help gain a practical point of view about IS 2010. The third direction is studying why and how tracks are designed in various IS programs, so as to give insight to professional organizations. It seems that in some areas, such as Information Security, IS 2010 is more advanced than the IS programs we studied. On the other hand, some IS programs offer tracks that are not in IS 2010, such as Health Information Management.

## Conclusion

This research studied 29 undergraduate IS degree programs among the top-ranked universities in the nation. None of the 29 IS programs we evaluated follow the ACM/AIS IS 2010 curriculum by presenting their PLOs using a comparable level of detail in their catalogs or websites. Further, 18 of these degree programs do not offer further tracks with specific designed courses. As for the 11 programs that offer such further specializations, only 3 have all the offered tracks as a subset of those of IS 2010.

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