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Communicating the Value of Program-Level Accreditation for Information Systems in a College of Business

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Abstract

Undergraduate programs in Information Systems continue to face challenges to offer a curriculum that is both rigorous and relevant. Specialized college-level accreditation, such as AACSB, and program-level accreditation, such as ABET, offer an opportunity to signal quality in academics while also remaining relevant to local stakeholders and constituents. Computing programs in schools with AACSB accreditation may face challenges in maintaining relevance to meet local stakeholder needs when a technically oriented computing program exists alongside other less technically-inclined programs in business. The challenge is to meet the needs of the technical program as all programs work toward meeting the mission-driven needs of the college. This paper makes the case that program-level accreditation can be used to complement school-level accreditation while carefully managing the needs of a technical program in business computing. The culture and characteristics of ABET and AACSB are discussed with a perspective drawn from recent experiences in attaining initial accreditation from both ABET and AACSB. Data regarding each accreditation is examined to determine why more Information Systems programs are not accredited, or seeking accreditation, now that it has been over 10 years since Information Systems programs have been accredited by ABET's Computing Accreditation Commission. Several threats, challenges, imperatives, and opportunities in seeking both accreditations are discussed. Particular attention is afforded lessons learned from seeking and earning both accreditations simultaneously. This paper holds the position that the benefits of both accreditations outweigh the limitations. However, IS programs seeking ABET accreditation in light of AACSB accreditation must be prepared to communicate the value of program-level accreditation.

Keywords: ABET, AACSB, Accreditation, Assessment, Continuous Improvement

1. INTRODUCTION

Accreditation of academic institutions and programs remains a viable approach to signal and ensure educational quality and adherence to standards. Accreditation has become an almost existential imperative at the institution level in the United States should institutions wish to have access to various forms of Federal funding (SACS, 2012). Beyond institutional-level accreditation, information systems (IS)

programs have options for specialized accreditation which signals compliance with standards that ensure that operations, faculty, programs, and curriculum are of a sufficient quality to achieve the college's mission. At the college level, AACSB represents a specialized accreditation that meets these needs. ABET's Computing Accreditation Commission (CAC) offers program-level accreditation for several computing disciplines, which allows a collegiate program to certify that they have met certain standards that are specific and relevant for computing. These standards are often viewed as those necessary to produce graduates ready to enter the discipline in a professional capacity.

Most specialized accreditations, both at the college and program levels, provide students with greater opportunities for employment, better access to graduate education, and greater mobility in their careers (AACSB, 2013a). Accreditation provides standards and processes to ensure continuous improvement of curriculum, evaluation, assurance and of learning, and faculty qualifications.

This paper proceeds as follows. First, we compare and contrast two specialized accreditations: AACSB at the college level and ABET at the program level. We make the case that both program-level and college-level accreditation are mutually beneficial. We relate the importance and relevance of these two specialized accreditations to the needs of a small regional Computer Information Systems (CIS) undergraduate program. Moreover, we discuss these issues as they relate to our recent experiences in the simultaneous pursuit of both accreditations. We offer insight concerning the challenges in obtaining both accreditations and reflect on the degree to which program-level accreditation must be sold to administrators in the face of the higher-order AACSB accreditation.

We also discuss the culture and history of both AACSB and ABET accreditation standards and processes. We next present a profile regarding the characteristics of AACSB-accredited schools, ABET-accredited programs in computing and information systems, and an overview of ABET-accredited programs in IS as they relate to AACSB accreditation. Next, we present the case that, when an information system program is located within a college of business, both ABET and AACSB accreditations are beneficial. We also conclude with lessons and insights learned during the course of our own experiences.

We continue with an examination of the characteristics of college- and program-level accreditations in terms of desired outcomes as they pertain to students, faculty, parents, employers, and other constituents. We do this by highlighting the demography of accreditation for both AACSB and ABET. We conclude with a discussion centering on why program-level accreditation is a complement to school-level accreditation in that it can help to specify and meet the needs of a technically-focused program in IS. We conclude by discussing how program-level accreditation answers a growing imperative for accountability to ensure learning outcomes and continuous improvement; an imperative for both AACSB and ABET (Beard, Schwieger, and Surendran, 2008; Culver and Warfvinge, 2013; Kelley, Tong, and Choi, 2010; Pringle and Michel, 2007).

2. "CULTURAL" CHARACTERISTICS OF AACSB AND ABET ACCREDITATION

It is reasonable to contrast specialized college-level accreditation standards, such as those provided by AACSB, as being culturally distinct from accreditation standards aimed at specific programs, such as CAC's standards for IS programs. Going back to 1932, ABET's history has been rooted in engineering and concerns related to professional development in the discipline (Prados, 2007). Over the years, ABET has emerged as being a recognized accreditor of college and university programs in applied science, computing, engineering, and technology.

AACSB, originally The Association to Advance Collegiate Schools of Business, was founded in 1916 and was primarily engaged in the accreditation of North American business (AACSB, 2013b). AACSB accreditation is more school- and mission-oriented and encourages a tailored approach aimed at meeting mission and goals for a given school. This focus on a flexible and custom approach is sensible in that a curriculum and program blend may be developed that works for its unique circumstances. However, the circumstances of programs within the college may differ. Some programs must also remain flexible in their curriculum to serve the needs of their profession(s) and needs of local industry. Serving these needs and satisfying these constraints may be challenging when college-level accreditation requirements take precedent.

Given the differing levels of analysis and different aims, AACSB and ABET offer both contrast and complement when program-level needs are considered. The objectives- and stakeholder-orientation of ABET serves as a model for how the unique characteristics of a program can also be accommodated.

Characterizing the AACSB Accreditation Process

The AACSB accreditation process is largely mission-driven in that most accreditation standards flow from an initial set called the *Strategic Management and Innovation Standards* (AACSB, 2013). AACSB characterizes it's mission-driven proclivity thusly: "'*Strategic Management' is based on the principle that a quality business school has a clear mission, acts on that mission, translates that mission into expected outcomes, and develops strategies for achieving those outcomes. It addresses three critical and related components: mission and strategy; scholarship and intellectual contributions; and financial strategies*" (AACSB, 2013). These initial standards (AACSB standards 1 – 3) provide an overarching tone for the balance of AACSB's business accreditation standards.

AACSB also provides standards (AACSB standards 4 – 7) for students, faculty, and staff in regards to how these constituents help to serve and realize a college's mission. There are also standards (AACSB standards 8 – 12) that address learning and teaching. Note that AACSB's assurance of learning (AOL) approach to quality assurance is not prescriptive such that the specific needs of disciplines and programs are discussed. For instance, when it comes to curriculum management, the college is given quite a bit of leeway: "*A curriculum maps out how the school facilitates achievement of program learning goals. It is defined by content (theories, concepts, skills, etc.), pedagogies (teaching methods, delivery modes), and structures (how the content is organized and sequenced to create a systematic, integrated program of teaching and learning). A curriculum is also influenced by the mission, values, and culture of the school*" (AACSB, 2013).

The management of college-level curriculum is also described as entailing: "*…processes and organization for development, design, and implementation of each degree program's structure, organization, content, assessment of outcomes, pedagogy, etc. Curricula management captures input from key business school stakeholders and is influenced by assurance of learning results, new developments in business practices and issues, revision of mission and strategy that relate to new areas of instruction, etc.*" (AASCB, 2013). It is worth noting that AACSB does mention "key business school stakeholders," however, the process for identifying these stakeholders, and ensuring that their needs are met, is not explicit.

A final set of standards (AACSB standards 13 – 15) address the degree to which the program remains relevant by providing both faculty and students with opportunities for academic study and professional engagement. AACSB clearly desires that these endeavors intertwine.

In general, the AACSB culture focuses on the needs of the college by way of how a college of business mission describes the college's goals and purpose. Thus, while the aggregate learning needs and goals of the college as a whole are discussed, the acute needs of any one program are not specifically addressed. In the college of business, the more technical disciplines, such as accounting, finance, operations management, decision-support management, and information systems, may have additional needs that are not entirely met by the strictures of college-level accreditation. Certainly it is difficult for the learning goals and assurance of learning to acutely describe the needs of an intermediate programming class as such courses are not college-wide in nature.

AACSB is designed to accredit colleges of business that are deemed to fulfill their mission with processes that ensure assessment and continuous improvement. This process operates against a strategic plan to guide a five-year continuous improvement process. Schools that successfully pursue this process may renew their accreditation.

Characterizing the ABET Program Accreditation Process

The ABET accreditation process also relies on peer review and self-evaluation. However, given the applied nature of most programs accredited by ABET, there is an emphasis on Program Educational Objectives (PEOs) which are heavily oriented towards specific competencies which must be possessed by graduates, and observable and confirmable by industry constituents, in a period of one to five years

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after graduation. This is an outcomes-oriented approach that pervades the ABET assessment culture much as mission-orientation does for AACSB.

The ABET accreditation process moves back into the instructional realm by specifying both general and discipline-specific Student Outcomes (SOs) which must be mapped to a program's curriculum. An accredited program must show compliance with processes that lead to continuous improvement. This process threads from student performance in the classroom, up through the program-level SOs, and beyond to observations on PEO achievement. There is an emphasis on grounding student performance in the tangible artifacts and skills concomitant with applied disciplines.

ABET's CAC provides general and program-specific criteria as standards for accreditation. These criteria focus on students, PEOs, SOs, processes for continuous improvement, curriculum, faculty qualifications and activities, educational facilities, and institutional support. Programs meet these criteria by putting into place, maintaining, and reviewing processes for the management of PEOs, SOs, assessment, and evaluation (ABET, 2013b).

ABET specifies a range of assessment activities which, as is the case with AACSB, sit at the heart of accreditation actions. ABET mentions both an "Assessment" and a "Continuous Improvement" loop of activities which intertwine, inform, and provide feedback between them. Programs that remain in good standing are subject to review and renewal of accreditation every six years.

3. AACSB-ACCREDITED COLLEGES AND ABET-ACCREDITED PROGRAMS

Another means of understanding the contrast and characteristics between AACSB and ABET accreditation is to review basic data about schools and programs accredited. Our review of this data raises curiosity as to why there are so few ABET-accredited programs in IS. We also wonder how an accreditation for the college of business will meet the acute needs of its programs. While others, such as Larson and Harrison (2012), have extensively examined the characteristics of ABET-accredited programs in the USA, our aim is to compare and contrast ABET-accreditation of IS programs as they are situated in AACSB-accredited schools.

AACSB Accreditation Statistics

As of this writing there are 683 schools or institutions holding AACSB accreditation (AACSB, 2013c). Of these institutions, 501 are located in the United States, which constitutes 73% of the world-wide total. In this regard, it is reasonable to believe that the United States system of higher education has significant impact on attitudes towards accreditation.

The high number of accredited programs in North America belies the origins of AACSB and suggests growth opportunities internationally (see Figure 1 below).

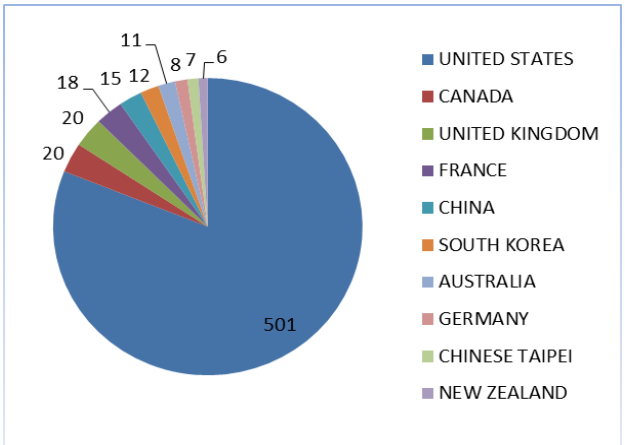

Figure 1. Large number of AACSB-accredited programs in North America

ABET Accreditation Statistics

ABET has over 3,100 accredited programs in engineering and technology-related disciplines (ABET, 2013b). These programs are accounted for in 587 institutions of higher education in 24 countries (see Table 3 in appendix) (ABET, 2013b). Thus, many schools have multiple accredited programs. For some colleges of engineering and technology, the sum portfolio of accredited programs constitutes, more or less, a college-level accreditation. ABET accreditation remains quite important for professional certification and licensure in many engineering and technology related fields.

ABET-accredited programs are governed by four accreditation commissions: Applied Science Accreditation Commissions; Computing Accreditation Commission; Engineering Accreditation Commission; Engineering Technology Accreditation Commission. Table 4

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(in appendix) shows the various criteria for programs covered under each commission. A closer examination of Table 4 also reveals that a majority of these criteria are specific engineering and engineering technology fields. Figure 2 provides a clearer view of the overwhelming influence and presence of engineering in ABET accreditation.

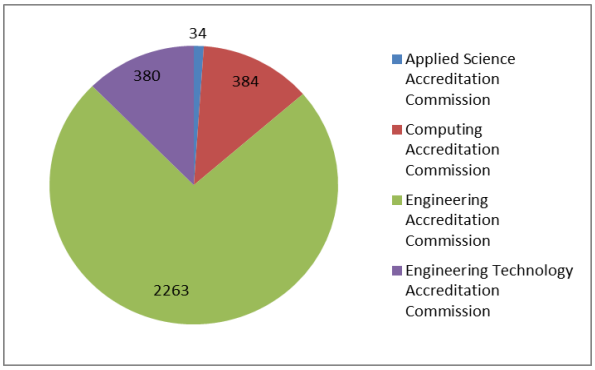

Figure 2. Number of Programs by ABET Accrediting Commission

ABET-Accredited Programs by Computing Discipline

Shackleford et al. (2006) provide useful definitions and descriptions for the major computing disciplines: Computer Engineering, Computer Science, Information Systems, Information Technology, and Software Engineering. The CAC provides accreditation criteria for each of these programs. Given the relative age of the computing disciplines, most of the accredited programs are in Computer Science. Although arguably similar in age to Computer Science, there are fewer (293 vs. 52) ABET-CAC accredited programs in IS (ABET, 2013a). Figure 3 shows the distribution of the five major computing disciplines within the ABET accreditation commissions.

Shackleford et al. (2006) also aptly characterize the disciplines along a continuum spanning from hardware and software (Computer Engineering and Computer Science) to organizational needs (Information Systems and Information Technology), and those that bridge the two (Software Engineering and Information Systems). Further evidence of ABET's engineering grounding and culture is quite apparent in Figure 3 above.

As we ponder the "problem space" of computing (Shackleford et al., 2006), we can understand that, while ABET provides criteria for many engineering, technology, and computing disciplines, ABET is a culture concerned with the applied aspects of its disciplines (see Figure 10 in the appendix).

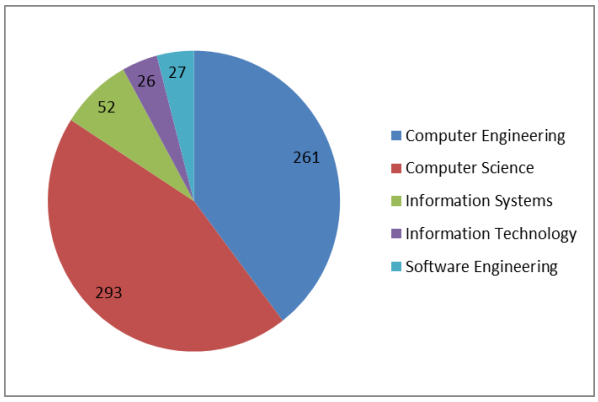

Figure 3. Distribution of Computing Programs Accredited by ABET's Computing Accreditation Commission

ABET-Accredited Statistics Related to AACSB Accredited Colleges

We also review the number of ABET-accredited programs in AACSB-accredited schools.

Although there are 47 ABET Computing Accreditation Commission programs accredited under the "Information Systems" criteria, these programs are known by 15 distinct names. Table 5 shows the distribution of programs names. This confusion in the nomenclature of the IS discipline remains problematic.

Another point of interest is the degree to which ABET-accredited programs conforming to CAC's IS criteria are located within the college of business. This is a matter of concern given the criteria for IS programs requires an additional Student Outcome specific to IS: "*(j) An understanding of processes that support the delivery and management of information systems within a specific application environment*" (ABET, 2013b). Generally, the college of business curriculum, particularly as guided by AACSB accreditation processes, readily supplies the "specific application environment" necessary for the fulfillment of this Student Outcome. Furthermore, the CAC specifies "*…One-half year of course work that must include varied topics that provide background in an environment in which the information systems will be applied professionally*" (ABET, 2013b). These 15-credit

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hours are easily met by the core curriculum provided by most AACSB-accredited schools.

Whereas many programs accredited by the CAC have been accredited for close to 30 years, most of the IS programs have been accredited for 10 years or less (ABET, 2013b). This is likely due to the fact that the CAC didn't expand into Information Systems, Information Technology, or Software Engineering disciplines until recently. Figure 13 (in appendix) shows how many programs under CAC accreditation were accredited from the earliest days of ABET up through the 1980s, 1990s, 2000s, and into present times.

Also of interest would be the accrual of new accreditations under the CAC's IS program criteria. Figure 4 shows initial accreditation for programs in three phases: Early (2000-2003) – 13 new programs; Middle (2004-2009) – 28 new programs; Recent (2010-2013) – 7 new programs. The majority of IS programs have received initial accreditation in the Early and Middle periods (Figure 4).

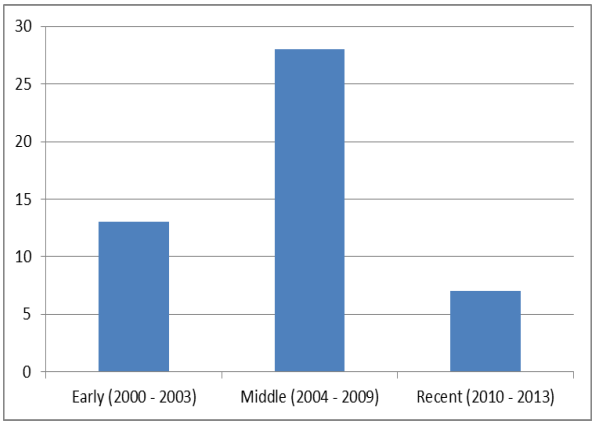

Figure 4. Periods of newly-accredited IS programs

Another interest in ABET-accredited IS programs has to do with these programs' relationship to other entities. How many ABET-accredited programs in IS have ABET-accredited programs in CS at the same school (Figure 5)? How many ABET-accredited programs are located within the college of business (Figure 6)? How many of ABET-accredited programs, regardless of whether they are located in the college of business, have AACSB-accredited colleges of business on campus (Figure 7)?

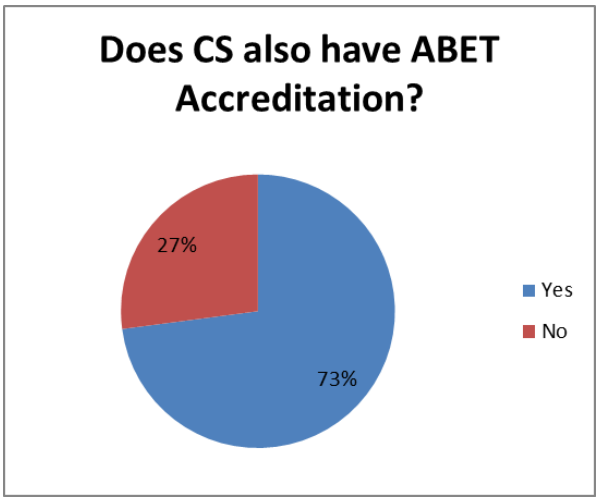

Figure 5. Percentage of Institutions Where CS is also Accredited

Figure 5 (above) shows that in a majority of institutions, the Computer Science program is also ABET-accredited.

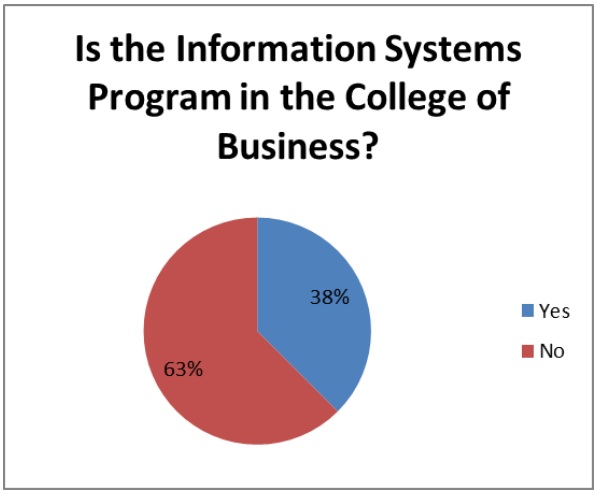

Figure 6. Percentage of ABET-Accredited Programs located in the College of Business

Figure 6 (above) shows that nearly two out of three ABET-accredited programs in IS are NOT in the college of business. This is an interesting fact that is somewhat counter intuitive. Given the history of IS, and the general focus of research in IS, it is usually safe to assume that most programs are located in the college of business. However the data show that a minority of ABET-accredited programs in IS are are found in a college of business.

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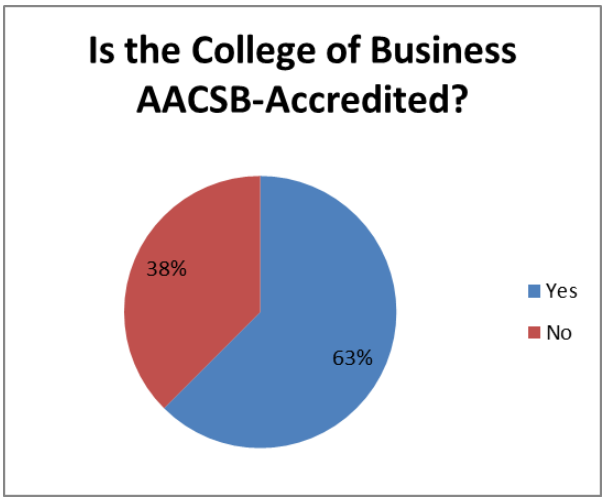

Figure 7. Percentage of ABET-Accredited Programs where the College of Business is AACSB-Accredited

Figure 7 (above) shows that an equal majority of the institutions with ABET-accredited IS programs also have an AACSB-accredited business school. It is likely that these programs fulfill IS-specific criteria curricular needs in cooperation with the AACSB-accredited school of business on their campus.

Table 1 rounds out this analysis by showing that institutions with an ABET-accredited IS program NOT located in the college of business, but where that college of business is AACSB-accredited, are in the majority. In Table 1 below, the total of all percentages in all cells adds up to 100%.

	AACSB	**Not AACSB**
In Biz	21%	17%
Not Biz	42%	21%

Table 1. Distribution of ABET-accredited programs: Presence in College of Business and AACSB-accreditation for College of Business

Relevance to AITP-EDSIG

Another important issue is whether the topic of ABET program accreditation, as it relates to AACSB accreditation, is of any concern to the AITP's Special Interest Group for Information Systems Educators (EDSIG). We offer two quick and non-scientific proxies to gauge this. First, we recorded the institutional affiliation of all authors listed in the 2012 proceedings of the Information Systems Education Conference in New Orleans. There were 199 unique authors/presenters of refereed papers, abstracts, workshops, panels, presentations, and posters. These authors represented 88 institutions of higher education and a handful of organizations or companies. For the purposes of our demonstration, we'll just focus on the 88 institutions of higher education. Ten of these institutions (13%) have an ABET-accredited IS program on campus (most are programs in which the authors are faculty – see Figure 8).

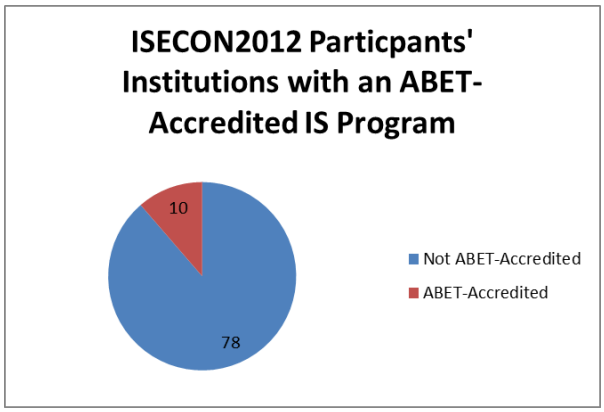

Figure 8. ISECON 2012 Institutions with an ABET-Accredited IS Program

We can also examine how many of the authors/presenters at ISECON 2012 are from institutions with an AACSB-accredited school/college of business. This presents an interesting figure where the number of AACSB-accredited institutions is 37 (42%), which is nearly triple the number of ABET-accredited programs (see Figure 9 below).

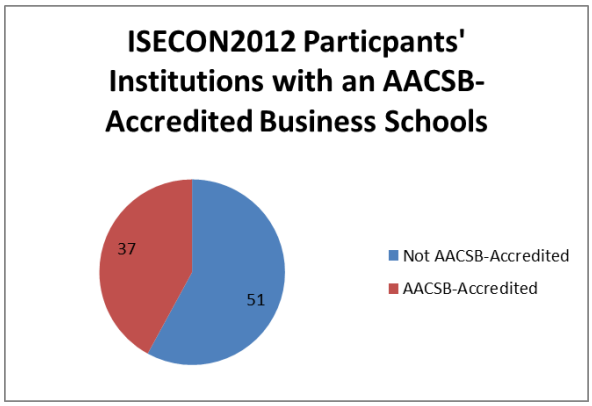

Figure 9. ISECON 2012 Institutions with an AACSB-Accredited Business School

The implication here is that there is potential opportunity for more of these programs where the business school is AACSB-accredited to explore synergy possible by program-level accreditation. Certainly ABET's IS-specific criteria call for collaboration with the business school.

Another "thumbnail" proxy for gauging interest in ABET would be the number of peer-reviewed papers or abstracts submitting and published in the ISECON proceedings. A quick title search and subject search reveals few papers each year on the topic from 2006 to 2012 (see Table 2 below). Data were obtained using the ISECON proceedings website's search feature (http://proc.isecon.org/).

Year	ABET In title	ABET in Keyword	Number of Papers in Proceedings
2012	1	1	66
2011	2	1	74
2010	0	2	103
2009	3	4	99
2008	0	1	97
2007	2	0	129
2006	1	0	126

Table 2. ABET-related research activity in ISECON Proceedings 2006-2012

Opportunity

We believe the data concerning ABET-accredited programs in IS reveal opportunities for non-ABET-accredited IS programs. This assertion raises certain questions: Why colleges of business with IS programs not pursuing (or not planning to pursue) AACSB accreditation? Of the IS programs in AACSB-accredited colleges of business, why are these programs not pursuing ABET accreditation? We address the structures which may lead to answers to these questions in the next section.

4. THE NEED FOR PROGRAM-LEVEL ACCREDITATION

While the by-product of specialized accreditations, such as AACSB and ABET, may be signals of quality and strength of compliance, it can be argued that the means by which these privileges are earned is through systematic assessment of programs, curriculum, and faculty. Such processes lead to quantifiable and verifiable continuous improvement. Thus, at each level, AACSB and ABET offer concrete and actionable guidance. However, the importance of assessment and continuous improvement are not conveyed or operationalized similarly at each level.

AACSB provides a means of demonstrating, through assurance of learning, that the curriculum, implemented across disciplines and programs, lead to student learning that is consistent with the goals and mission of the college. On the other hand, ABET has a focus on program objectives which are designed to meet the needs of stakeholders. ABET is particularly effective at providing an assessment and continuous improvement process which supports the needs of local stakeholders.

An ABET-accredited IS program benefits from AACSB in that the program-specific aim of ensuring that IS skills and knowledge is enhanced by their application in business. Thus, the business core, and in particular, a business capstone course, provide context for focusing the IS program and its curriculum. In this regard, the imperative for accreditation is somewhat higher for the IS program is it needs accreditation guidance for standards particular to its technical nature and accreditation guidance for its application area.

Our experience with seeking program-level accreditation in parallel to college-level accreditation has revealed three principle concerns: need, relevance, and imperative.

Program-Level Need

The IS discipline spans a unique set of concerns. Whereas organizational issues relevant to IS are somewhat grounded in management, marketing, industrial psychology and sociology, the IS discipline is also very technical and applied (Shackleford et al., 2006). There are changes and trends in areas related to application technology, software methods, and systems architectures which IS programs must respond to. Thus, while our assessment efforts must be used to improve our curriculum, our curriculum, as it responds to trends, presents a moving target. This makes it difficult to develop data for longitudinal assessment comparison. For IS programs, this increases the importance of program objectives.

Given the volatile nature of the technology component of the IS discipline, an objectives- and stakeholder-orientated accreditation process allows a program to grow and adapt in phases. The ABET accreditation process for IS programs provides Program Educational Objectives (PEOs) and Student Outcomes (SOs). PEOs are similar to mission-oriented objectives in AACSB in that programs can tailor these objectives to both industry trends and local needs. The ABET process ensures regular review of PEOs according to the assessment and continuous improvement process which incorporates student performance on SOs and stakeholder input. A strength of the ABET process is the degree to which PEOs are emphasized and dictate the subsequent structure of SOs, Course Learning Outcomes (CLOs), efficacy of mission, etc. Thus, PEOs ensure/enforce synchronization with stakeholders, students, mission, and employers as the program must map from PEOs to these other things.

It is important to note that the act of just assessing does not guarantee any program-level improvements. Entire areas of assessment literature highlight the criticality of developing good assessment instruments with respect to quality and reliability. Moreover, the systematic use of assessment outputs for continuous improvement must also be monitored and managed carefully. That is, the presence of an assessment process alone in insufficient to ensure that meaningful continuous improvement will transpire.

IS programs need a program-level accreditation process as the standards, guidance, and process make it prudent to shape PEOs about stakeholder input and needs. This allows an IS program to use SOs, which are typically prescriptive from ABET's criteria, to "anchor" the program's core curriculum. For instance, in our own program, core courses are used to measure SOs and ensure ABET compliance. We then use electives explore new topics and ensure currency and relevancy. During the course of an 18-month rotation with these electives, we identify the usable and useful aspects covered and move incorporate that into our core curriculum. This approach provides a solution for a rather profound problem for IS programs: how do we reconcile between the application area of business, the need for core traditions in computing education and training, and respond to new and emergent trends in computing?

A program-level accreditation process, such as ABET's, has provided our program with a model to define our core curriculum, via our SOs, around the central concern of IS development – which is an arguably appropriate approach for a Computer Information Systems program. At the same time, we heed an imperative to remain grounded in business. In either case, ABET's SOs also can be designed with the flexibility to define a program as being more managerial of more technical. In our case, our program's mapping of SOs to our curriculum is evenly distributed about our core curriculum with some leaning towards information systems development topics.

Relevance

ABET accreditation of our program has also provided an additional means of ensuring relevance in our program. The PEO-focus of the ABET accreditation criteria is well-suited to meet expectations, needs, outcomes, imperatives from legislation, parents, employers, consumers, industry – and to validate those outcomes. Ultimately, program accreditation assists a program to remain relevant by allowing for constant assessment and improvement. However, ABET's general computing criteria, and criteria specific to information systems, grounds our program in the fundamentals of the discipline. When coupled with an elective strategy that accommodates new technologies and trends, our IS program is equipped to prepare graduates to meet industry needs. It seems that this marks the ultimate goal to establish relevancy – the professional placement of graduates who meet the objectives of the program. In our case, we have little doubt that our ability to prepare students for successful professional placement is among our highest imperatives for the relevance of our program (Fischer, 2013).

Imperative

What seems missing, above all else, for program-level accreditation of IS programs is professional imperative. As many ABET-accredited IS programs exist outside of the college of business (often in engineering schools, technology schools, or a combination of business/engineering/technology schools), it would appear that these programs are governed by a culture that favors more technical concerns (Figure 11). Put another way, the imperative for program-level ABET accreditation has a tradition in colleges of technology and engineering, where professional certification and licensure relies on

these accreditation. As the heritage of IS programs lies more with business and organizational needs, the strong imperative for ABET accreditation for IS programs in AACSB-accredited business schools is lacking.

As we have previously noted, a lack of imperative for program-level accreditation for computing programs in a college of business may be due to both a level-of-analysis mismatch between AACSB and ABET, and some degree of friction from a mismatch of cultures. Generally, a dean of an AACSB-accredited college has little imperative to seek and achieve program-level accreditation. There are exceptions, according to other professional needs (such as in Finance and Accounting), or according to the personal disposition of a dean, or according to other institutional proclivities. However, data on accredited programs provides evidence that AACSB-accredited schools of business are less likely to seek program-level certifications such as ABET.

5. OVERCOMMING CHALLENGES AND OBSTACLES

The motivations for seeking a specialized accreditation at the school-level are completely different from those at the program level. In our experience, this is particularly so for schools with AACSB accreditation. In the ABET culture, particularly in light of licensure and professional certification, the imperative for program-level accreditation is higher. However, this is evidenced more so in the engineering side, rather than in the computing disciplines. The principle challenges we have observed, in the context of establishing need are: finding the imperative we mention above; overcoming cultural biases; the inherent identity crisis of the computing disciplines (in particular IS); and garnering top administrative support.

Overcoming Bias

Communicating the value of program-level accreditation by appeal to need, relevance, and imperative is not an entirely prescriptive approach. There have been challenges in our initial accreditation process that revealed fundamental biases in how the information systems discipline is perceived and the political/power position of IS programs in the college of business. Whereas in our case administrators have been very supportive, the clash of cultures between business and engineering and technology provides "headwinds" from both our business identity and from prevailing ABET culture of engineering. On the business side, there were times we felt as though AACSB had little consideration for IS as a discipline. For instance, the *2011-12 AACSB Business School Questionnaire (BSQ)* asks accredited schools about undergraduate programs in Economics, International Business, Management, and Marketing, but not Information Systems. Furthermore, while Figure 13 shows that the popularity in ABET accreditation in computing peaked in the first decade of the 21st century, there were clearly more Computer Science programs over time. Perhaps in this case ABET's engineering bias shows here as there is little evidence that accreditation have been actively marketed towards information systems programs.

Identity Crisis

Given that programs which are currently accredited (and are thus classifiable) under the CAC's information systems criteria are known by 15 different names, it seems that information systems, as a discipline, continues to suffer under identity crisis. Whereas Figure 10 demonstrates how a computing discipline can be understood along a dimension ranging from theory to practice, and operating from an organizational down to hardware and architectural level, it is clear that characterizing a computing discipline is somewhat fraught. However, among all of the computing programs accredited by the CAC, programs classifiable as information systems have the widest variation in program name (see Table 5 and Table 6). While the "Computer Information Systems" nomenclature is almost as widely in use as "Information Systems," it is likely some attempt to reinforce and reestablish the technical component of the discipline is needed to minimize confusion for prospective students and employers of students.

A close examination of the CAC's criteria for computing programs in general, and information systems programs in particular, demonstrates that core computing topics remain paramount. In this regard, ABET has remained consistent in characterizing of the core topics in computing:

- Coverage of the fundamentals of a modern programming language
- Data management
- Networking and data communications
- Systems analysis and design
- The role of Information Systems in organizations

On the other hand, guidance from other professional organizations (AIS, AITP, ACM) has been less consistent and variations have been the subject of controversy (Longenecker, Feinstein, and Clark, 2013). Thus, while we may suggest that this "identity crisis," possibly rooted in where IS scholars/educators/employers believe IS functions along a continuum from technology to business/organizational needs, we also hold that program-level accreditation for information systems provides a reasonable means of managing this crisis.

Antecedents and Challenges: Lessons Learned

Among the stated aims of this paper is to both share our conviction that ABET accreditation provides a meaningful complement to AACSB accreditation and share our experiences in seeking these accreditations. We now share some of these observations.

It may not come as a surprise that support from administration was a key factor to earn ABET accreditation. To obtain top management support remains vital received wisdom from our own literature (Markus, 2003). Equally important, however, is the support and "buy in" from program faculty. In our experience, aside from a very low minority of C.A.V.E.-men/women that may be found in any environment, a significant and credible majority of program faculty must completely participate for a program-level certification to work. This is so as success requires complete and reliable engagement in the entire process: planning, collecting, assessing, and evaluating program assessment data for continuous improvement. Given the various "headwinds" we describe in this paper, program faculty must not only be tenacious, but must also seek the cooperation of non-program faculty. This was often only possible due to support from administration. There are also considerable initial and ongoing costs associated with ABET accreditation. Administration must be willing to incur costs for both college-level and program-level accreditation. There are considerable start-up costs over and above what will be required to maintain standards of accreditation. It is important to mention that these costs go beyond money and extend into commitment of time and other resources.

In retrospect, particularly given a significant degree of overlap in the pursuit of AACSB and ABET accreditation, our principle challenges where:

- Resource availability
- Administrative support
- Culture clash – AACSB/Business vs. ABET/Engineering
- Curriculum guidance – Following AIS/AITP/ACM guidance vs. modeling on ABET

While we feel ABET provides a good system for shaping curriculum, solutions to the other challenges were achieved due to good administrative support and tenacious efforts on the part of faculty. Of all challenges, the "culture clash" was at times the most difficult. This may stem entirely from undertaking the ABET effort with some overlap while the AACSB effort was underway. Both processes constituted multi-year campaigns with a significant amount of self-study and self-assessment required before a comprehensive assessment process is adopted.

5. CONCLUSION

Our own experiences illustrate that program-level accreditation addresses the need for an IS program to provide value to program stakeholders. This is accomplished using a core program curriculum to remain grounded in the fundamentals of computing while utilizing electives to address local needs and to explore new and emerging trends. This approach allows our program to remain relevant and creates some imperative for program-level accreditation. Our most vital means of establishing this imperative has been the understanding and support of top administration. As our institution provides a strategic goal that each unit seek the highest accreditations possible, our program has been able to secure ABET accreditation for our CIS program by way of institutional imperative.

Truth to Power

The hurdle of infusing ABET accreditation as a strategy to meet program/stakeholder needs, while also satisfying college-level AACSB accreditation, is perhaps the most profound. This process can be characterized as an exercise in speaking "truth to power" (Wildavsky, 1979). In a college of business, regardless of the stature, health, and efficacy of the IS program, the concerns of any program will not take precedent over those of the college; particularly not when AACSB accreditation is at stake.

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Moreover, it is important to consider which "view" of the business school is dominant. This is significant as AACSB, being mission-oriented, enables matters pertinent to the role of programs and curricula to flow from the "tenor" of the college mission. If the college of business is seen as a "trade school," in keeping with the earliest roots set in the Harvard Business School (Binks, Skarkey, and Mahon, 2006), then the technical nature of the IS program may be accommodated. However, the search for more serious grounding in positivist science from the 1950s and 1960s still pervades the North American business school culture (again, shown as overwhelmingly dominant in AACSB). As such, programs where cognitive and behavioral science are influential (Management, Marketing, Economics) may view the practical needs of the IS program as secondary. Whereas the accounting and finance disciplines have professional certification and licensure as imperatives, IS typically does not.

However, the question remains: how can an IS program in an AACSB-accredited school speak the "truth" of the benefits of program-level certification to the "power" of AACSB-certification? The way forward may lie in demands for accountability - legislative, stakeholder driven, and administration-directed – for measurable outcomes from higher education. Fortunately, program-level accreditation such as ABET's CAC criteria for information systems, asks for assessment and continuous improvement at a granularity that may soon become requisite for AACSB. As it stands, newer 2003 standards for AACSB, which must be implemented from 2013 onwards, are a step in this direction.

Moving Forward

Solutions to the various impediments and "head winds" we have described here may not quickly arise or offer uniformly prescriptive actions. However, while we see clearly a symbiosis and synergy between AACSB and ABET accreditation, reconciling these cultures is challenging. A future direction for work in this area is to develop an explicit process model that better describes the interplay between college-level (AACSB) and program-level (ABET) accreditation. Each approach offers a level of analysis for assessment and continuous improvement which can be used to understand and improve the IS curriculum. We believe that this understanding can be achieved for other disciplines in the college of business as well. Among the greater value-added benefits for college-level AASCB processes in the addition of program-level ABET accreditation is how ABET accreditation uses program-level objectives to meet local stakeholder needs. It is likely that meeting these needs are the ultimate test of the success of both the college and the academic program.

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APPENDIX

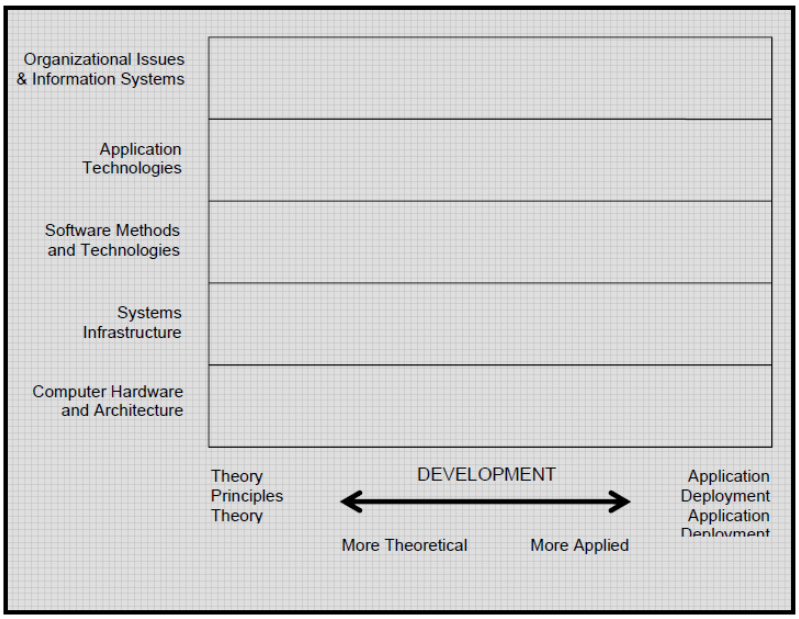

Figure 10. The Problem Space of Computing (Shackleford et al., 2006)

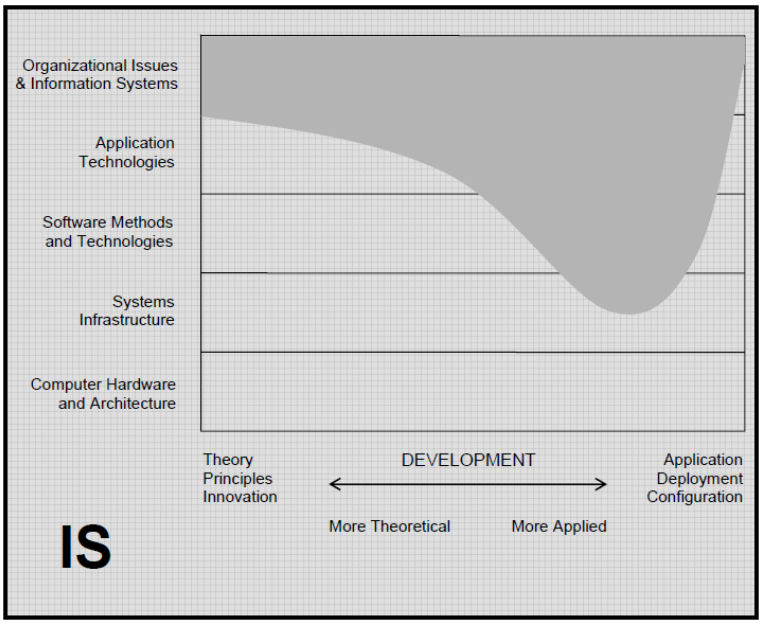

Figure 11. The Problem Space of Information Systems (Shackleford et al., 2006)

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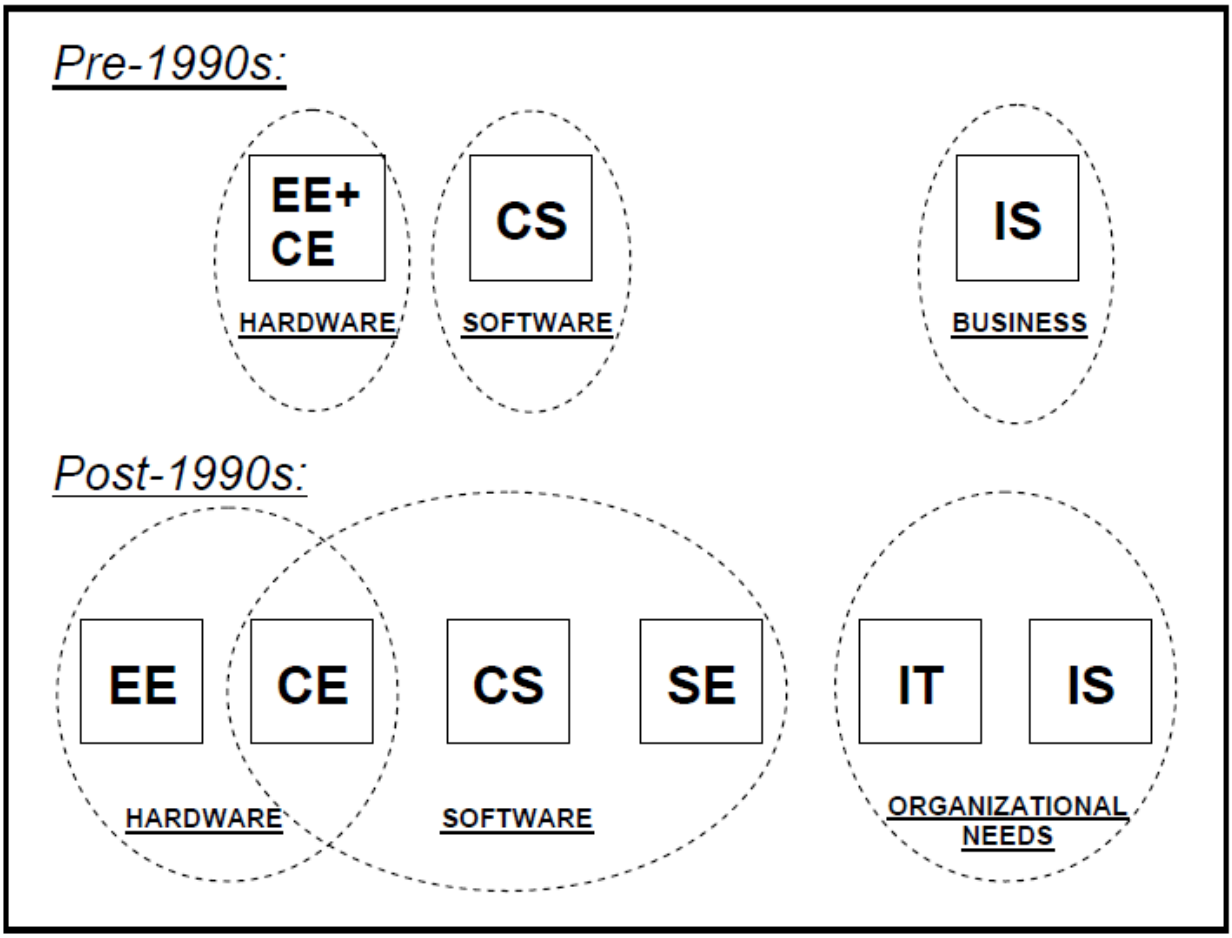

Figure 12. Continuum of Fundamental Concerns for Computing Programs (Shackleford et al., 2006)

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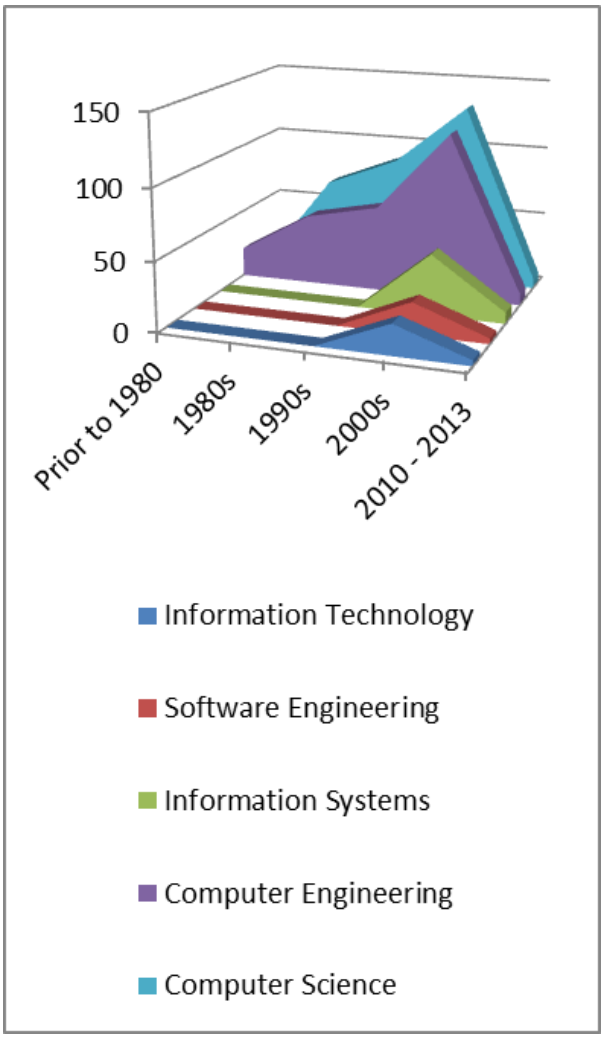

Figure 13. Trends in Newly-Accredited CAC Computing Programs Over Time, By Program

Country	Number of Schools	Percentage of Overall Schools
UNITED STATES	501	73%
CANADA	20	3%
UNITED KINGDOM	20	3%
FRANCE	18	3%
CHINA	15	2%
SOUTH KOREA	12	2%
AUSTRALIA	11	2%
GERMANY	8	1%
CHINESE TAIPEI	7	1%

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NEW ZEALAND	6	1%
SPAIN	4	1%
NETHERLANDS	4	1%
MEXICO	4	1%
TURKEY	3	0%
SWITZERLAND	3	0%
SINGAPORE	3	0%
PERU	3	0%
BELGIUM	3	0%
THAILAND	2	0%
SOUTH AFRICA	2	0%

Table 3. Countries with the highest number of AACSB-Accredited Schools

ABET Commission	Criteria Covered Under Commission
Applied Science Accreditation Commission	Environmental, Health, and Safety Health Physics Industrial Hygiene Safety Surveying and Geomatics
Computing Accreditation Commission	Computer Engineering Computer Sciences Information Systems Information Technology Software Engineering
Engineering Accreditation Commission	Architectural Engineering Bioengineering and Biomedical Engineering Biological Engineering Ceramic Engineering Chemical Engineering Civil Engineering Construction Engineering Electrical and Electronics Engineering Engineering Management Engineering Mechanics Engineering, Engineering Physics & Engineering Science Engineering Environmental Engineering Geological Engineering Industrial Engineering Manufacturing Engineering Materials Engineering Mechanical Engineering Metallurgical Engineering Mining Engineering Naval Architecture and Marine Engineering Nuclear and Radiological Engineering Ocean Engineering

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	Petroleum Engineering Surveying and Geomatics Engineering Systems Engineering Telecommunications Engineering Welding Engineering
Technology Accreditation Commission	Aeronautical Engineering Technology Automotive Engineering Technology Bioengineering and Biomedical Engineering Technology Chemical Engineering Technology Civil Engineering Technology Computer Engineering Technology Construction Engineering Technology Drafting and Design Electrical and Electronics Engineering Technology Electromechanical Engineering Technology Engineering Technology (General) Fire Protection Engineering Technology Industrial Engineering Technology Information Engineering Technology Instrumentation and Control Systems Engineering Technology Manufacturing Engineering Technology Mechanical Engineering Technology Naval Architecture and Marine Engineering Technology Nuclear and Radiological Engineering Technology Surveying and Geomatics Engineering Technology Telecommunications Engineering Technology Welding Engineering Technology

Table 4. ABET Accreditation Commissions and Respective Criteria

Program Name	Number of Programs Using this Name
Information Systems	19
Computer Information Systems	16
Management Information Systems	5
Computer Science - Information Systems Option	1
Computing and Information Sciences: Information Systems	1

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Computing and Information Systems	1
Computing with concentration in Information Systems Science	1
Informatics	1
Informatics: Information Systems	1
Information Science	1
Information Science and Systems - Information Systems Concentration	1
Information Science and Systems - Web Development Concentration	1
Information Systems and Technology Management	1
Information Systems Engineering	1
Information Systems Management	1

Table 5. Variations in the Names of Programs Classifiable as "Information Systems" under the CAC Criteria

Criteria	Number of Programs	Number Known by Criteria Name	%
Computer Engineering	261	215	82%
Computer Science	293	283	97%
Information Systems	52	19	37%
Information Technology	26	18	69%
Software Engineering	27	26	96%

Table 6: Number and Percent of Programs Called by their CAC Criteria Name