

## **2006-2299: INTEGRATING INTERNAL AND EXTERNAL STAKEHOLDERS INTO A SUCCESSFUL ABET ACCREDITATION TEAM**

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# **Integrating Internal *and* External Stakeholders into a Successful ABET Accreditation Team**

## **Abstract**

In early October, a four-person accreditation team, representing the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET), visited the new Industrial Engineering Program at Texas A&M University-Commerce (TAMUC). The purpose of their visit was to conduct a *first-time* program accreditation assessment for the IE Program at TAMUC. In preparation for this significant event in our program's history, the faculty worked diligently to create and document processes that will continue to serve and enhance the educational requirements and professional skill levels of our Industrial Engineering (IE) students for years to come. In this context, internal stakeholders included: IE program faculty members, faculty members from external academic programs, students, librarians, administrators, clerical personnel, and technical support personnel. External stakeholders included: Members of the IE Program Industrial Advisory Board (IAB), area employers who hire students to facilitate completion of their IE Program internships, employers who hire TAMUC students upon graduation, members of the Dallas IIE Chapter 10 (the IIE Senior Chapter for TAMUC), and members from the community and industry as a whole. This paper describes the role and collaboration of various internal and external stakeholders as they prepared for the ABET Accreditation process. A *lessons learned* document is also being compiled to assist future engineering program teams as they prepare for future EAC of ABET assessment visits.

## **Background**

In order to begin a discussion regarding the completion of a successful ABET Accreditation Visit, it is necessary to address the role of stakeholders and the relationships they serve with respect to a modern engineering educational program. Internal stakeholders include: students who are majoring in the discipline, university administrators, faculty members, staff members, and other non-major students who attend class at the university. External stakeholders include: employers, industry leaders, professional associations, accrediting bodies, legislators, parents of students enrolled in the university, and society as a whole. It is not necessary or even feasible to integrate each potential stakeholder group into a given academic program; however, specific stakeholder groups must be included in any dialogue that involves expectations for students to meet Program Educational Objectives. This paper will introduce and describe the stakeholder model used to address specific program objectives during a recent ABET assessment site visit.

## **Role of the Industry Advisory Board in Improving IE Program**

During the preparation of our self-study document leading up to a site visit during October 2005, the faculty accreditation committee was convened to address the ABET assessment process. This committee faced a variety of issues related to assessing the effectiveness of the new Industrial Engineering Program at TAMUC. This new IE program was established by the Texas Legislature in 2002 and the first 70 students to enroll in the program

began class in August 2002. The curriculum was modeled after a number of Industrial Engineering programs in Texas and in other states, and following repeated discussions with experts in the discipline and within the Texas A&M System, the approved curriculum was implemented. This approved IE curriculum was established as the baseline for the initial ABET accreditation cycle, and it was effectively unmodified during the three-years of program operation. Other issues, therefore, became more important in meeting the expectations of the ABET visiting team, including the establishment of an Industry Advisory Board (IAB) for the Industrial Engineering program. It was important to create the new IAB in time to use their guidance and expertise in improving the IE curriculum over time. This task was accomplished in three basic steps over the past year. The first step in the process, assumed by the faculty assessment committee, was to identify desired professional characteristics of potential IAB members. An emphasis was placed on the candidate's knowledge of and employment in industries where Industrial Engineering is a major influence. Individuals who held one or more Industrial Engineering degrees and a designation as a Professional Engineer (P.E.) were also highly desirable qualifications.

Once these professional qualifications were discussed and agreed upon by the faculty, specific companies were identified to help create a broad span of industries from which potential IAB members could be recruited. Six such professionals were identified to create the charter Industry Advisory Board for the Industrial Engineering program at Texas A&M University-Commerce. These first six members met for the first time in November 2004 to create an organizational charter and to define leadership positions and succession policies. At that inaugural meeting, the role of the IAB was discussed, including the need to identify program enhancements, to work with the faculty to improve the academic program over time, to aid in soliciting relevant program resources, and to act as liaisons with industry and government leaders to help insure a long-term, robust engineering program is established to serve constituents in the Northeast Texas area. In February 2005, the IAB members showed their commitment to these goals by participating in National Engineers Week celebrations with IE students from the TAMUC Student Chapter of the Institute of Industrial Engineers (IIE) Chapter #791, where they served as guest speakers, participants in mock interviews, and subject matter experts during off-line discussions held with faculty and students throughout the day.

In addition to these student-centered activities, the IAB members also served as reviewers for the IE Program ABET self-study document throughout the Spring semester, as it progressed from a rough draft document to the final product. During the ABET Visiting Team site visit in October, the Industrial Engineering Industry Advisory Board once again showed their dedication to the IE program by meeting with the ABET Program Evaluators (PEVs) during an hour-long, closed meeting, followed by an informal discussion around the lunch table that also included current students, recent alumni, administrators, and faculty members from the department. These formal and informal commitments of their time and efforts have created an indelible model of stakeholder commitments that each stakeholder group should endeavor to emulate.

### **Stakeholder Model to Support Assessments**

Figure 1 shows one of the key diagrams used in the ABET self study document to describe the role that each stakeholder group serves with respect to the Industrial Engineering

program at TAMUC. The individual stakeholder groups play key roles in establishing and maintaining communications with the faculty and administrators affiliated with the IE Program. These communications include such things as: internship opportunities for students while enrolled in classes and job offers for students upon graduation, senior design projects, capstone course project support, plant tour opportunities, and access to Subject Matter Experts (SMEs) who serve as resources for students and faculty alike. The feedback loops shown on the diagram are supported by periodic formal surveys and through informal discussions, leading to collaborative efforts which are designed to add value to each student’s educational program. The information gained through these formal and informal feedback loops is used to modify and improve the curriculum and to continue to meet the ever-changing needs of industry.

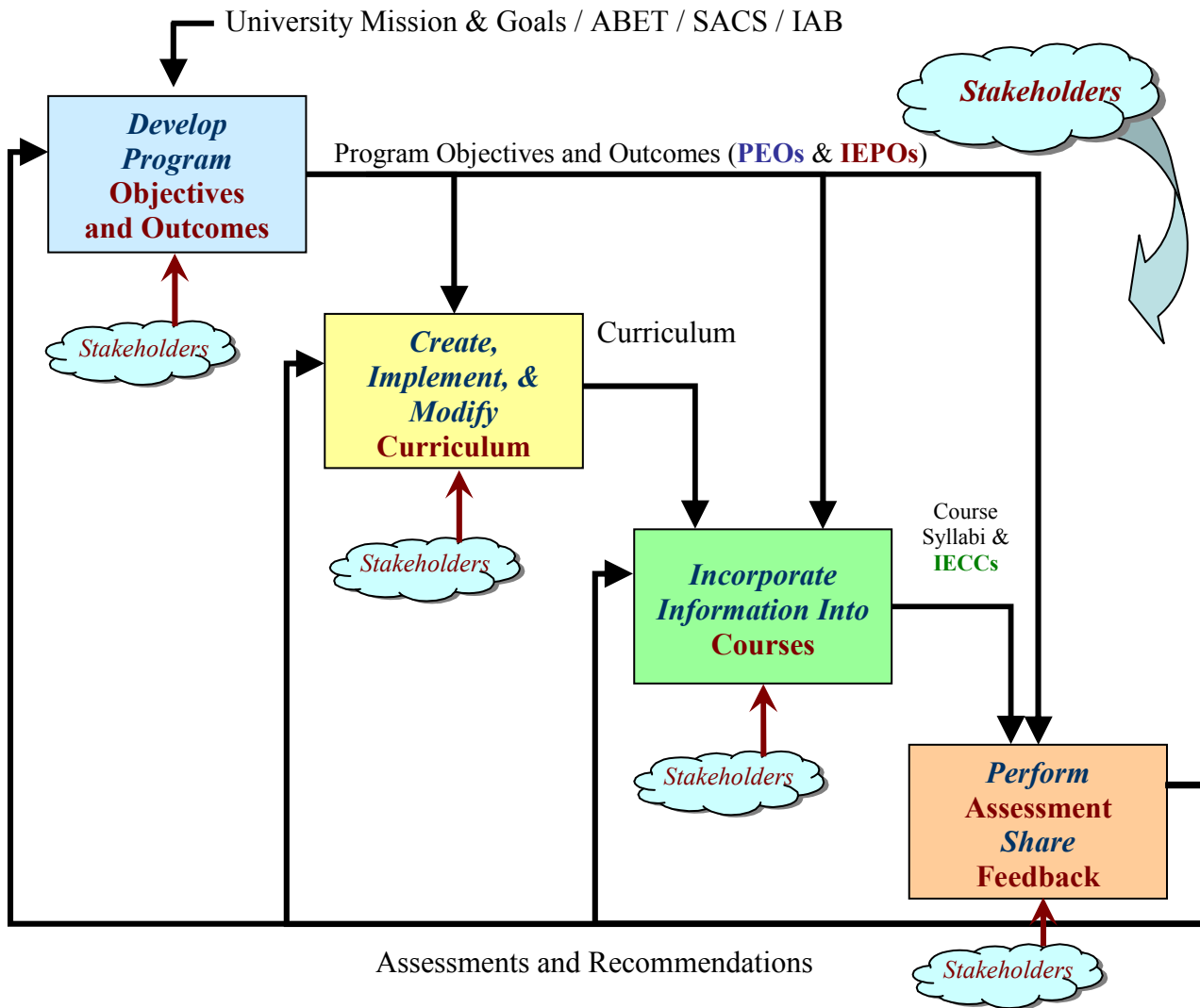


Figure 1. Industrial Engineering Assessment Model at Texas A&M University-Commerce

## The Role of Other Stakeholder Groups in Refining Curriculum Outcomes

A critical component of continuous curriculum improvement is to seek out and evaluate information from a variety of stakeholders, including current and former students. Figure 2 shows a four quadrant matrix that displays the types of assessment needed for an engineering program. These program assessments include: 1) Internal – Formal, 2) Internal – Informal, 3) External – Formal, and 4) External – Informal. Specific assessment methodologies that are currently being used in the IE Program at TAMUC are also shown in Figure 2.

<p><b><i>Internal - Formal</i></b></p> <p>Course Embedded Assessments/CIP Examinations/Quizzes Project Grades Instructor Evaluations of Projects IEPO/PEO</p>	<p><b><i>External - Formal</i></b></p> <p>Student Internships IAB SACS ABET</p>
<p><b><i>Internal - Informal</i></b></p> <p>Student/Faculty Surveys Peer-to-Peer Evaluations</p>	<p><b><i>External - Informal</i></b></p> <p>IAB Graduate Employment Alumni Surveys Employer Surveys</p>

Figure 2. TAMUC Industrial Engineering Program Internal versus External Assessment Matrix

In the case of alumni, follow-up assessments can only be done if a current mailing address, telephone number, and/or e-mail address is available. This contact information quickly becomes obsolete; however, permanent addresses, parent’s addresses/telephone numbers, and primary next-of-kin contact information can be used to maintain contact with alumni. Networking among students can sometimes be used to maintain contact with former students, even two or three years after their graduation. These techniques were all employed to one degree or another, to obtain updated information from our graduates regarding their current positions in industry.

The success of graduates in industry, from a given academic program is an important indicator of program success; in fact, it may be the best indicator of program success. The question then becomes “How long should we wait before we collect job satisfaction and performance information from alumni and from their employers?” In assessing a new program, this question must be answered in the context of how many students have graduated from the respective program and how long have they been employed. To determine a partial answer to this question, statistics like: 1) hiring salary versus current salary, 2) longevity in a given position before the new employee is advanced to a more responsible position, 3) entry-level job titles versus current job titles, and 4) the amount and frequency of bonuses paid to the employee.

While privacy concerns among students and alumni may be an issue, it has been our experience that alumni of the program are willing to share this information, if: 1) they are contacted directly, by telephone or by e-mail, 2) the information is held in strict confidence and no individually identifiable information is easily determined, and 3) if the information is being used to support improvement objectives, including accreditation.

When collecting information from current students, the data collection effort is much easier to administer, but the quality of the information is subject to other considerations. For example, surveys can be created, distributed, and administered during class times, but the students may be in a hurry to get to their next class, or to go to lunch, or to return to their job ... so they may see the survey process as an opportunity to “*quickly put something down on paper, so that block can be checked off*” rather than giving substantive feedback that can then be used to truly improve the overall quality and effectiveness of the program.

### **Collecting Assessment Information from Employers**

Current employers of program alumni can be an invaluable source of information regarding the individual’s Skills, Knowledge, and Abilities (SKAs), after being in the industry for three to five years, but there are several obstacles that must be overcome before this information can provide useful assessment information to the program faculty and to the assessment teams. One of the first, *and probably the most significant hurdle in obtaining this type of information*, is the reluctance of organizations to share information about an employee with any outside sources, including legitimate requests such as assessment-related feedback. This philosophy is supported, in part, by the legal system and by the risk of liability for disclosing personal information that might otherwise be considered private. The easy answer to such a request from the company’s perspective is “No”, without weighing the merits or the legitimacy of such a request. The next obstacle to overcome is to obtain information from the proper level of supervision within the company. The immediate supervisor is probably the person who is best suited to respond to such requests from the program, but they may be difficult or impossible to define without talking to the alumni-employee directly. By letting the alumni member know in advance that you are planning to ask their boss about their SKAs to support ongoing accreditation efforts, the resulting responses from the supervisor may be skewed for a variety of reasons.

### **An Assessment View of Stakeholders**

From an assessor’s viewpoint, internal and external stakeholders hold an important position with regards to continuous improvements in academic programs. They provide a perspective that is not (generally) tainted by their own personal viewpoints about the academic program since they are one or more steps removed from ownership of the processes that are being used throughout the program. Internal departmental personnel are rarely able to achieve this level of objectivity, since their tenure and job security is often tied directly to the success or failure of a program assessment process. With this in mind, external stakeholders can provide information that will allow the internal process owners (e.g. program faculty and administrators) to make improvements to the curriculum in an attempt to meet long-range Program Educational Objectives (PEOs) and student success in their career field.

## Summary and Conclusions

As the title of this article indicates, the process of integrating internal *and* external stakeholders into a successful ABET accreditation team is achievable, but obstacles to creating an integrated success model still exist. The primary method to overcome most, *if not all*, of these obstacles is to insure an open communication path is maintained between the interested parties. The program faculty and administrators must lead this effort, and it should be noted that it is not something that can be accomplished once every five years when the next accreditation cycle rolls around. The most critical link in managing the necessary data flow is to establish and maintain an effective system of tracking program alumni throughout their career. This must be done at the local, program level and not at the university-level overall. The objectives of the alumni association, as honorable as they may be, do not support any of the accreditation-centric requirements for the academic program. Creating a feedback mechanism within the department for each program, and keeping it active is definitely on the critical path to success. If the connections with program stakeholders and feedback processes covered in this paper are effectively managed and maintained by program leaders, the likelihood of a successful ABET (or other) accreditation visit will be significantly enhanced.

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