

Suggestions to Simplify ABET 2000 Preparations

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Abstract

ABET 2000 guidelines differ considerably from past documents. ABET gurus at engineering colleges and universities are working feverishly trying to interpret the new ABET 2000 guidelines. Their interpretations are then communicated to faculty and administrators. Responsibility to comply with ABET criteria is ultimately delegated to individual engineering departments, which are coordinated by the department head. Final product is mainly a result of extensive labor among faculty and department head in each engineering department. This process is neither efficient nor practical since many individual participants are required to recreate similar documentation. Information may become corrupted, misinterpreted, forgotten, lost or simply ignored as it is transmitted down through the various layers of administration to the working groups. Also, there is no guarantee that the final products are homogeneous among engineering departments and even among faculty members.

Basic engineering common sense dictates that there must be an easier and efficient way to simplify the arduous process of preparing for ABETS 2000 reviews. For instance repetitious work may be reduced or eliminated if carried out by a few key individuals who can then share their product with the rest of the teams and individual team members. ABET and the colleges can modernize Internet resources so that resources become available directly to working groups. Ideally, synchronous web resources could provide the basis for discussion groups, while bulletin boards could be used to share common resources and experiences. This approach would minimize communication noise and improve process efficiency. Taking advantage of shared web resources at the college and department levels can also reduce replication, redundancy and misinterpretation of guidelines. This paper also discusses some simple-to-implement ideas that have reduced confusion regarding ABET 2000 review requirements in our engineering department at New Mexico State University. Implementation of these ideas has resulted in a more homogenous and reliable product among the faculty in this department and has redirected faculty time to other more productive matters.

Present ABET 2000 Coordination

The Conventional ABET 2000 Review Strategy

The ABET 2000 criteria include many new guidelines and recommendations. This information is transmitted from ABET to the appropriate coordinators at the all the engineering and technology institutions in the United States. At New Mexico State University, NMSU, the overall coordinator is the Dean of Engineering. He delegates most responsibilities related to interpretation of ABET 2000 criteria and implementation of program plans to the ABET 2000 Coordinating Committee (i.e., the Committee). At our institution the Committee is composed of representatives from each department, some department heads and a dean's representative. A faculty member, who receives release time for her activities, chairs the Committee. The Committee is responsible for interpretation of ABET 2000 criteria, transfer of information to the next levels and implementation of college-wide ABET strategies. The information generated by the Committee is then transferred to the individual department heads as shown in the organizational chart on Figure 1. The department head transmits pertinent ABET 2000 guidelines to individual faculty and staff members.

The staff and faculty carry out ground-level work by preparing pertinent documentation, visual aids and other suitable materials. These products are then delivered to the department head, who acts as an editor and overall coordinator of the department programs. The Committee is in charge of overall coordination at the college level and serves as editor-in-chief for all documentation. This strategy is presented in graphical form in Figure 2.

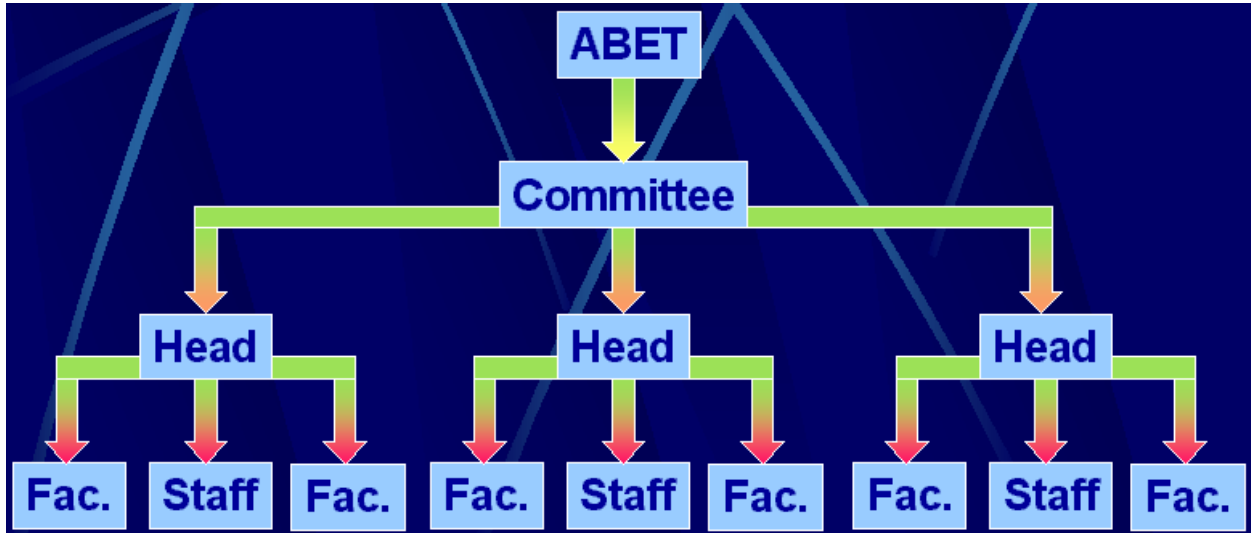


Figure No. 1. Present Model Guidelines Flow

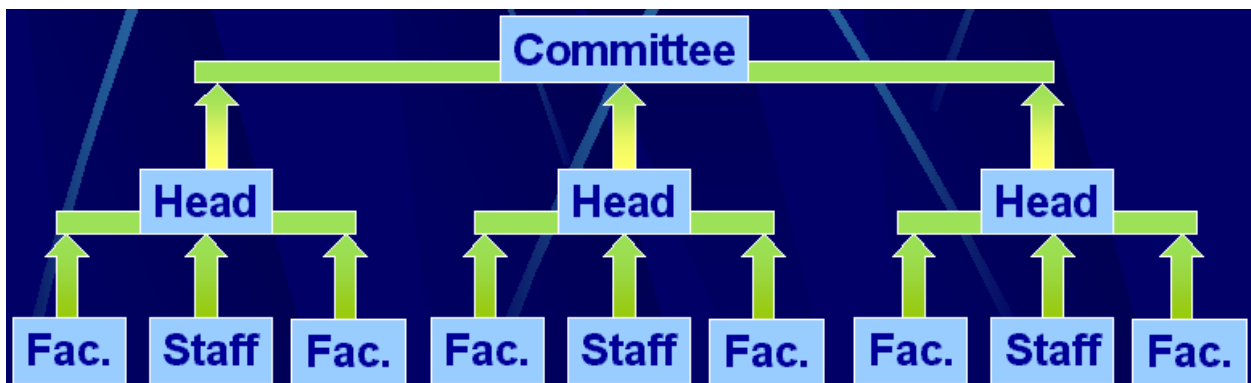


Figure No. 2. Present Model Product Flow

A Critique of the Conventional Model

The present ABET 2000 implementation model has several serious drawbacks. For instance the quality of the information transmitted from upper to lower levels in Figure 1 may not be conveyed in its complete and most accurate format. This information is likely to be altered, misinterpreted or even ignored as the information trickles down through the layers in Figure 1. In the traditional approach individual components, within the same organizational level, are expected to repeat the same work and pass it on to the following layer. The faculty and staff may repeat tens or even hundreds of times identical or similar tasks as appointed responsibilities reach the lower levels. Creation of ABET compliant syllabi represent a good example of this inefficient process. Syllabi within a college unit should share many identical components (if indeed they are made after the same pattern). Individual faculty members are burdened every semester by creating products that are quite similar to other colleagues' (only course-specific material is different for each syllabus).

Under the scenario presented in Figures 1 and 2 each individual syllabus creator must compile significant amounts of common information for presentation in a two-page maximum format; this includes holidays and dates of administrative importance such as class dates and numbers. Up-to-date statements, such as information for students with disabilities, common dynamic links (for web-posted courses) and overall syllabus component information must be replicated many times. Ideally the final result should produce a cookie cutter product. In practice this rarely happens since each syllabus creator is likely to take some literary freedom, such as document format and component order. Editorial and compilation duties normally fall on the department head. He plays the role of a quality assurance inspector and editor in chief. His role calls for a homogeneous high quality product. These tasks are overwhelming and time consuming especially in the larger departments. Each department head within the college must follow the same path. The Committee must compile the departmental products into a single document. In general, the probability for errors to occur in a stratified organization increases with the number of layers required to accomplish the desired end product.

Use of Internet Resources for Process Simplification

Preparation for ABET 2000 review is certainly more demanding than in past years. The sheer volume of information flowing both ways in Figures 1 and 2 can take a significant time and financial toll on the college resources. Fortunately we have resources that few of us had several years ago. Use of shared electronic media and information transmission through the Internet is now a reality. Access to common resources is particularly attractive as a mechanism to assure product quality and to reduce redundant work. Figure 3 is a conceptual depiction of the shared-resources approach. Use of the network allows the faculty, staff and department head to share the same electronic media.

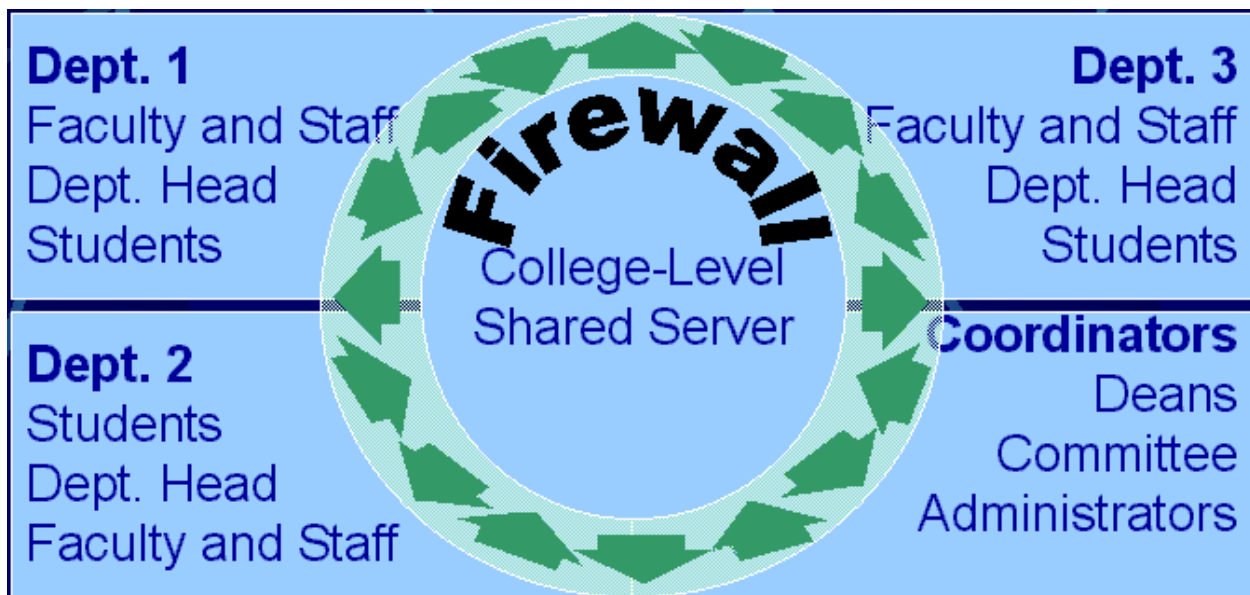


Figure No. 3. College-Level Shared Resources Model

We have successfully tested this model using several ABET components within the Civil, Agricultural and Geological Engineering Department at NMSU. Table 1 highlights some digitized medial that may be easily shared using the proposed approach (the items we have tested are shown in italics). The resources in this table are not comprehensive; they are intended as examples of multiple other resources that can be shared through the web. Also notice that the model in Figure 3 depicts a more ambitious plan – sharing resources at the college level (instead of the department level only).

Table 1. Examples of Web-Shared Resources

Shared Resource Type	Example	Main User(s)
Document templates	<i>ABET-compliant resume</i> <i>Syllabus</i> <i>Course descriptions</i>	Faculty Faculty Faculty, Dept. Head
Documents	<i>Graduate and undergraduate catalog</i> <i>Individual ABET-compliant resumes</i> <i>Tenure and promotion materials</i> <i>Course-specific syllabi</i> <i>Course-specific descriptions</i> <i>Laboratory information</i> Schedule of classes Student Records	Faculty, Dept. Head Faculty Faculty Faculty, students Faculty, students Faculty, staff Faculty, Dept. Head Faculty Advisors
Graphics	<i>Course flowchart</i> Organizational Chart	Students, faculty, department head, dean of students Department Head
Public web resources	<i>Department web pages</i>	Everyone

The advantages of the shared resources model in Figure 3 over the traditional method are obvious. Specific files on the server are accessed using different security levels. For example all faculty, staff, and department heads should have read-only access to common document templates. These include syllabi, and ABET-compliant resumes. Read-write privileges may be granted to group members to alter department-specific files such as catalog descriptions. The web master creates the department-specific web pages based on some of these documents. The Committee must have read privileges to all materials on the server, and it should be allowed to create information of common interest. Finally each participant has full-access to his or her own web page and personal course descriptions. Using this methodical and secure access approach should minimize potential accidental (or intentional) damage to shared web resources.

Integrity of information is more likely to be preserved as the number of organizational strata in Figures 1 and 2 is eliminated and replaced by the radial flow presented in Figure 3. At the same time this approach could greatly reduce labor duplication and quality control duties. Editorial tasks in particular are greatly simplified and accelerated using this model since documents and other relevant information is accessible to all concerned parties while residing in a readily accessible common location. The disadvantages of the model in Figure 3 include capital investments to acquire a computer server and network and also associated management, maintenance and supervision expenses. Fortunately most universities already have such infrastructure in place. Addition of the proposed concept to existing communication and computer resources should not represent a serious encumbrance to the available resources.

A Universal Web-Based Model

Creation of a universal web-based model may be feasible should the proposed model prove effective at the college level during ABET 2000 review processes. This model is depicted in a conceptual manner in Figure 4. This figure illustrates that several (and potentially all) universities seeking ABET 2000 accreditation could share resources via the Internet. The mechanics of such model are not difficult to implement. It is important to notice that presently the present [ABET web site](#) is mainly informational (asynchronous and one-way) and as such it greatly limits participant interaction.

The Internet allows any of the participating universities to host a web-based resource, should ABET decline to take the initiative. Unix-based software, such as [Web-CT](#) can be used as a common platform to provide access to the participants who use off-the-shelf browsers (Netscape® or Internet Explorer®). The universities would access the platform as “students” while ABET (or the hosting institution) would be the “professor” (i.e. course designer). Both, designer and universities can then have access to various built-in synchronous and asynchronous web resources. Synchronous resources, such as the chat rooms and the built-in white board could be used to convey information at predetermined virtual ABET conference times.

The built in internal mailer and the bulletin board are useful asynchronous interactive tools. The bulletin board would play an invaluable asynchronous role by providing a common web-based location where ideas can be shared. Successful examples of ABET 2000 documentation can be posted by participating universities. Posted hints, examples and sharing potential pitfalls should greatly reduce duplication at the institutional level while increasing the quality of the product. Such novel concept can also be used by ABET itself to disseminate timely comments, documentation and other relevant information. One interesting aspect of this concept is the use of this medium as an outcomes assessment tool for the accreditation board itself. Outcome evaluations provided by the “students” (i.e., the participating universities) would be of value to ABET to improve its organizational performance. ABET can then implement strategies, based on results from outcomes assessment, to improve its performance, products and services.

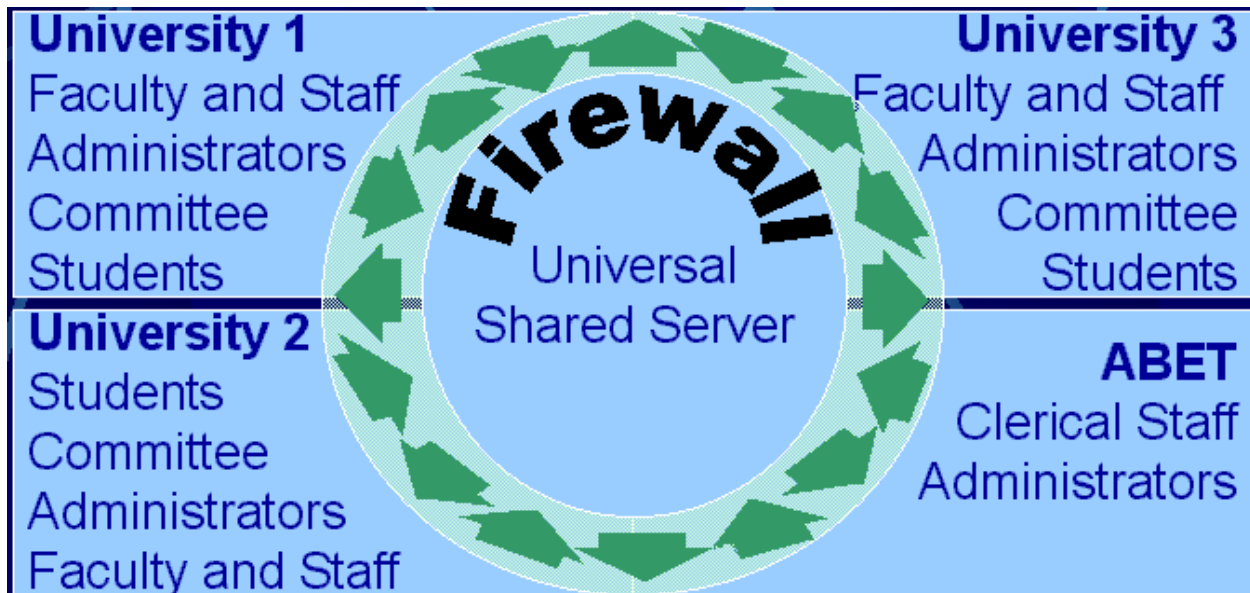


Figure No. 4. Universal Shared Resources Model

Conclusions

ABET 2000 reviews demand more extensive documentation and additional materials that were not needed in prior reviews. Fortunately most universities have built an extensive electronic communications infrastructure that can be easily adapted to minimize many of the tasks created by the new guidelines. Using shared electronic resources at the department and college levels may reduce inadequate information delivery and inefficiencies created by labor redundancy. Similarly, product quality improvement and product homogeneity is anticipated through effective shared network resources. Capital cost to accomplish network communications is immaterial since most universities already have such resources at hand. This novel concept should be easily adaptable from the department to the college level. It is in fact technologically possible to use a remote server (perhaps within ABET's jurisdiction) to carry out many clerical, informational and interactive communication tasks for all nation-wide ABET reviews. Faculty, department heads, administrators and ABET personnel should consider how to utilize these readily available resources to optimize the ABET 2000 review process.

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