# An Accreditation Assessment Management System

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## Abstract

Based on the recent program accreditation experience, this paper introduces an accreditation assessment management system, which benefits any campus program or department that is pursuing accreditation, especially when they perform periodical assessment on student learning outcomes and hope to manage the assessment results over years for continuous improvement. The system employs the client server model with the up to date web technologies. Different users, including administrator, accreditation coordinator, and other members, are provided with different tools to conduct the accreditation tasks and activities. The system will greatly facilitate program assessment and reduce the resources needed. With the system, the coordinator can better organize and keep track of the accreditation process, collection of information and materials, documentation, and periodical assessment. It will also save all involved faculty the extra load and time they would otherwise put in on assessment tasks. The system is not designed for a specific accreditation and institutions can use it for different types of accreditations. This paper focuses on the design and architecture of the system and a preliminary version will be introduced.

## Introduction

Students from an accredited program are recognized of receiving quality education for professional employment and advanced studies. In addition to the benefits for students, getting and keeping accreditation is also significant to the program as it keeps the program actively in a continuous self-assessment and improvement cycle. However, the preparation of the accreditation can be a daunting periodic process, and the program must demonstrate documented continuous improvement, i.e., periodic assessments on student learning outcomes and taking actions accordingly. There are many activities related to accreditation, among which program faculty members must periodically collect student work, develop assessment rubrics, assess and plan further actions. Another challenge is the coordination among activities performed by each faculty member for each course and each semester, Industrial Advisor Committee (IAB) meetings, alumni surveys, senior surveys, composing results, self-study report writing, etc.

To better utilize faculty's time and efficiently maintain accreditation work, the authors decide to develop an accreditation assessment management system. The system consists of an accreditation website with a database server (hosting general accreditation information, schedules, instructions, and tasks, etc.), a member module, an accreditation coordinator

module, and an administrator module. The member module enables normal faculty members to keep track of their progress, input assessment result, edit rubrics, upload required materials, and browse previous results. The accreditation coordinator module enables the coordinator to easily track the overall accreditation progress, create and assign tasks, compose data, and run analysis. The administrator module creates and manages accreditation projects and databases.

In the past several years, the authors have led and extensively participated in ABET [1] and ATMAE [2] accreditation activities. The experience led to the development of this system to help organize the assessment in a more efficient way. The paper will focus on the structure design of the system and present a preliminary implementation of it.

**System Design**

Accreditation requires institutions to invest a lot of efforts. The authors' recent accreditation experience shows that, although the faculty members were motivated to work very hard for the initial accreditation, it also means that extra load was added to each member, and more to the coordinator. Since a faculty member could teach multiple courses a semester, keeping track of the progress for each course sometimes becomes confusing and out-of-schedule. For the accreditation coordinator, trying to make sure that the current tasks will be accomplished by related faculty members on time is especially difficult. Normally, email reminders, announcement in meetings, paper notes, and office visits are used to keep things on track. Often, a single task requires rounds of digging through emails, going through accreditation boxes, and check-marking on papers back and forth. This consumes a great deal of energy and motivation of both faculty members and the coordinator, and results in less willingness for the tasks down the road.

To improve the efficiency of the accreditation work, the authors of this paper decide to take advantage of the recent accreditation experience and develop an accreditation assessment management system. On one hand, the system can guide and facilitate faculty members with accreditation policies, procedures, tasks and schedule, assessment, information and repository of documents, etc. On the other hand, it helps the coordinator to organize the collected materials, check the progress, query results, and automate data analysis from different courses and years. In addition, a system that is of just-right size for an institution, free of charge, and easy to be expanded and updated is expected.

Most of the current accredited programs do not use a management system. The 'Start Early' philosophy [3] considers having a faculty member to get training for accreditation by volunteering as a program evaluator of ABET. This approach depends on an experienced faculty member to coordinate the accreditation activities. Yale University uses a web portal [4] for ABET accreditation. In this system, there is no data analysis automation across different courses and different years. In [5], a web-based tool is used for course assessment result input. It also provides a student's result for different courses. However, this tool is designed to meet ABET Criteria 3 only. The authors of this paper believe that a more generic system that is not designed for a specific accreditation is more helpful to the institutions that have different types of programs pursuing different accreditations, such as ABET and

ATMAE. The framework of this generic design should be flexible too, with the extensibility that can easily integrate more functions and features in the future.

**System Architecture**

The ultimate goal of this system is to help a program organize their effort and manage the material collection and assessment for an accreditation, such as ABET or ATMAE. Therefore, the system is designed to support different user roles. The system consists of a web server, a member module, an accreditation coordinator module, and an administrator module. The web server is also a database server that hosts accreditation information, schedules, instructions, tasks, collected work, and assessment results, etc. The information is saved in databases and web interfaces are provided to users. Different roles in the system reflects users' responsibilities in the accreditation. The member module allows normal faculty members to keep track of their progress, download requirements and instructions, upload materials requested, input assessment result, edit rubrics, and browse previous results. The accreditation coordinator module enables the coordinator to easily track the overall accreditation progress, create and assign tasks, send messages, monitor progress, compose data, and run analysis. The administrator module creates and manages accreditation projects and databases. Figure 1 shows the relationship among the three roles.

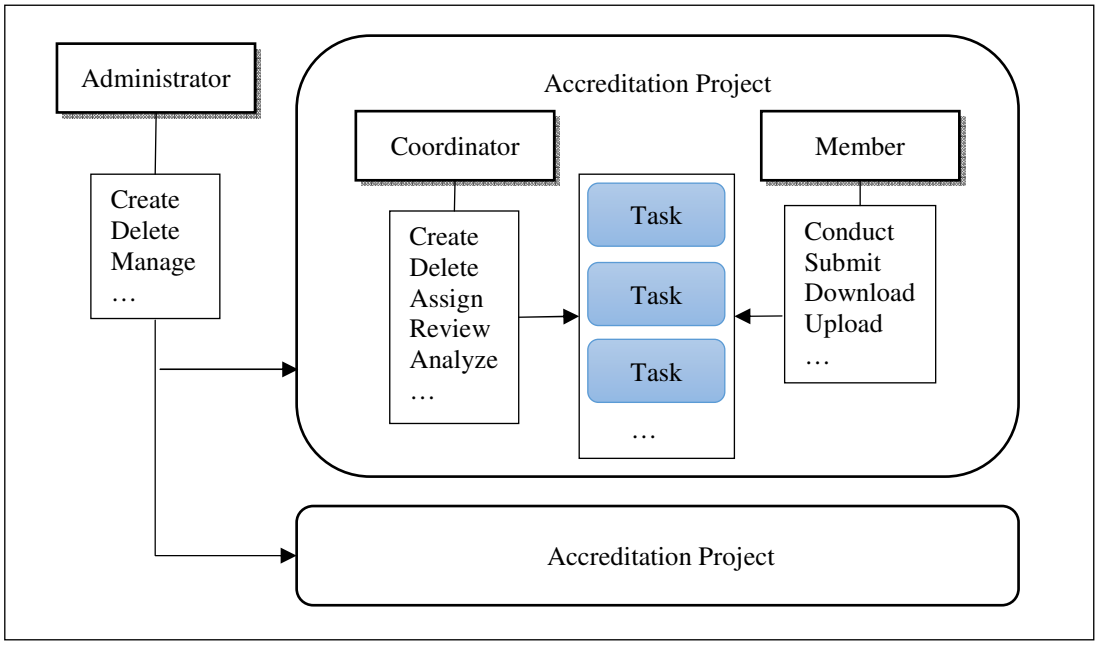


Figure 1: Relationship of Administrator, Coordinator, and Member

Administrator's responsibility is to create an accreditation project and assign it to the coordinator. Similar to the IT department of an institution, administrator understands the technical side of the system and doesn't have to be part of the accreditation. With the system's ease of use, the administrator role can be taken by anyone who has the basic

computer and database skills. Multiple accreditation projects can be created and carried on at the same time, with each assigned to a different coordinator.

A coordinator is usually the head of the department or the program pursuing the accreditation, but can be any faculty member who is assigned the role. Coordinator should understand the entire process and all the tasks required by the accreditation. In the system, coordinator can create and manage the tasks and assign them to other members of the project. In the meanwhile, coordinator can review the status of the tasks and analyze the materials uploaded by the members. The submitted data can be composed and summarized by the system and presented to the coordinator.

A member is a person who participates and contributes to the accreditation. Usually, they are the faculty members who are involved in the program pursuing the accreditation. However, other parties on campus could be a member too. Some of the examples are instructors of general education courses, department chair (if not a coordinator), dean's office, provost's office, etc. Members can see the tasks assigned to them by the coordinator and conduct the tasks. Tasks may include online discussion, course material upload, course data submission, related information review, etc.

The system follows the client-server model with a database server accessed by all users with different roles through the web interface. The server and users can be connected via campus network or Internet. Figure 2 shows the architecture of the system.

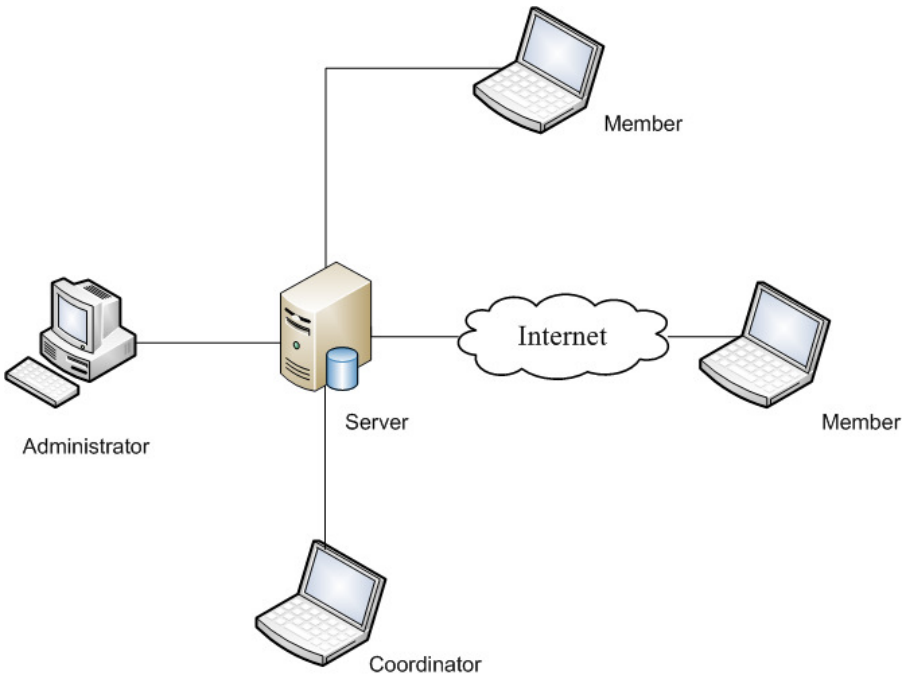


Figure 2: System Architecture

## System Implementation and Example

The system's web interface is implemented with HTML and JavaScript with CSS used for webpage styling. PHP is used to integrate the web interface with the database server. The ABET accreditation of a Computer Engineering Technology (CET) program is used as an example to demonstrate the idea of the preliminary system. Figure 3 shows the login page of the system. Based on the role of the users, the system directs them to different pages. Administrator will see a page that can create accreditation projects and assign them to coordinators. Coordinator will see a list of the accreditation projects assigned. Regular members will see a list of accreditation projects they are involved. From there, coordinator and members can select and enter a project.

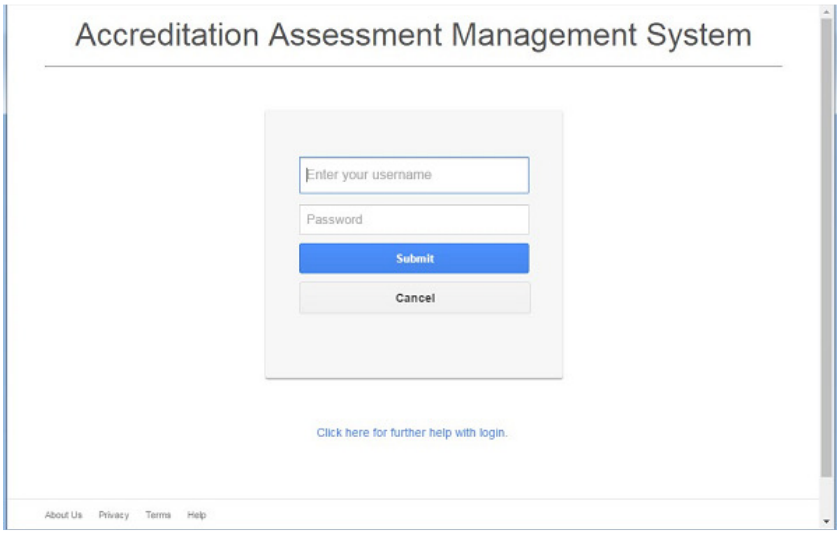


Figure 3: System Login Page

After entering an accreditation project, the coordinator will see the work page of the project as shown in Figure 4. On the left side are the tools that help the coordinator create and manage the tasks, while the right side is the work area. When working on the Current Project, the work area shows a network of tasks created so far. The user is supposed to arrange the tasks according to the order in which they should be conducted so that it demonstrates a clear timeline of the project. The completed tasks are in green color, the ongoing tasks are in red, and the unassigned ones are in grey. The coordinator can click each task to review or change its configuration, such as instruction, deadline, members assigned to, etc. The materials submitted by the members can be reviewed also.

Once assigned a project by administrator, coordinator can click the New Project to choose a project template and create a new project. The template could be a group of tasks suggested by the system for a specific accreditation, like ABET or ATMAE. Coordinators can start from there and change the tasks according to their own situations. If none of the suggested templates works, a new empty project can be created and the coordinator then can add new tasks from scratch.

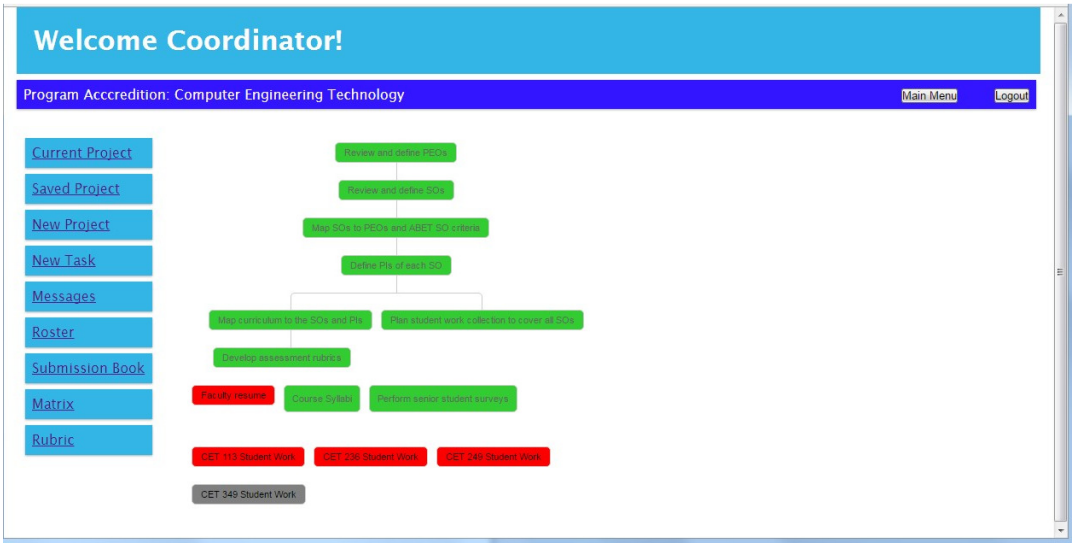


Figure 4: Coordinator's Project Work Page

When adding a new task, there are different types of tasks available. User can choose to add an online discussion task, material collection task, or information review task. The new task will be added to the work area and connected to other tasks if necessary. The configuration of a task includes the start and end times, the instruction, expected action (e.g., confirm to review the information), or required submission (e.g., course material). Coordinator can also set the task as completed or not. The completed task will show as green, while the incomplete is in red. For example, Figure 4 shows the collection course syllabi is completed, but not the faculty resume and the student work of some CET courses. The grey color of a task, such as CET 349 in Figure 4, shows that the task is inactive.

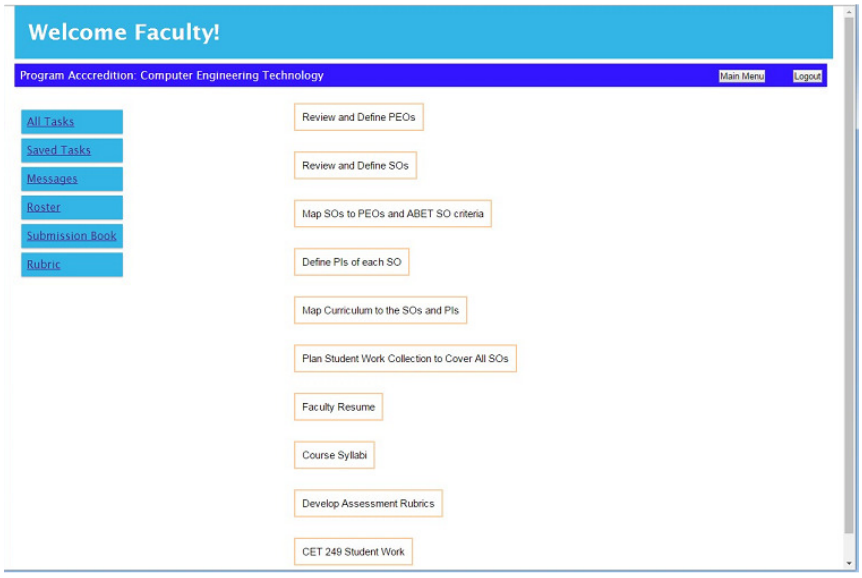


Figure 5: Member's All Tasks Page

After the tasks are created and assigned to the members, each member can see his or her own tasks. They then can take the required action and provide the information or materials according to the instruction of each task. Figure 5 shows the All Tasks page of a member.

The Matrix page allows the coordinator to create a table to map all the courses to the learning outcomes, as shown in Figure 6. Each cell can be connected to one or more tasks on the project work page. Usually, the task is the course material or assessment results required from that course on the related learning outcome. Different colors of each cell indicate the connected tasks are completed or not. Coordinator can also set it manually.

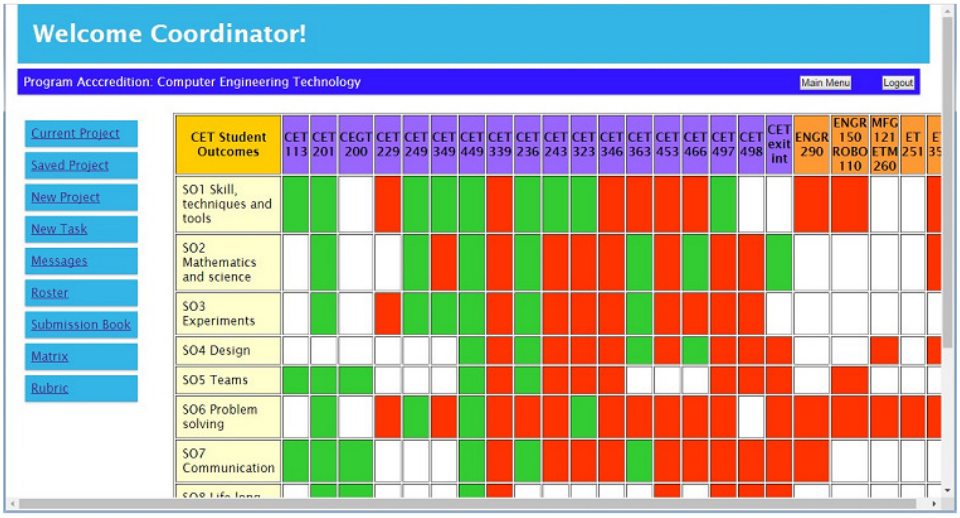


Figure 6: Coordinator's Matrix Page

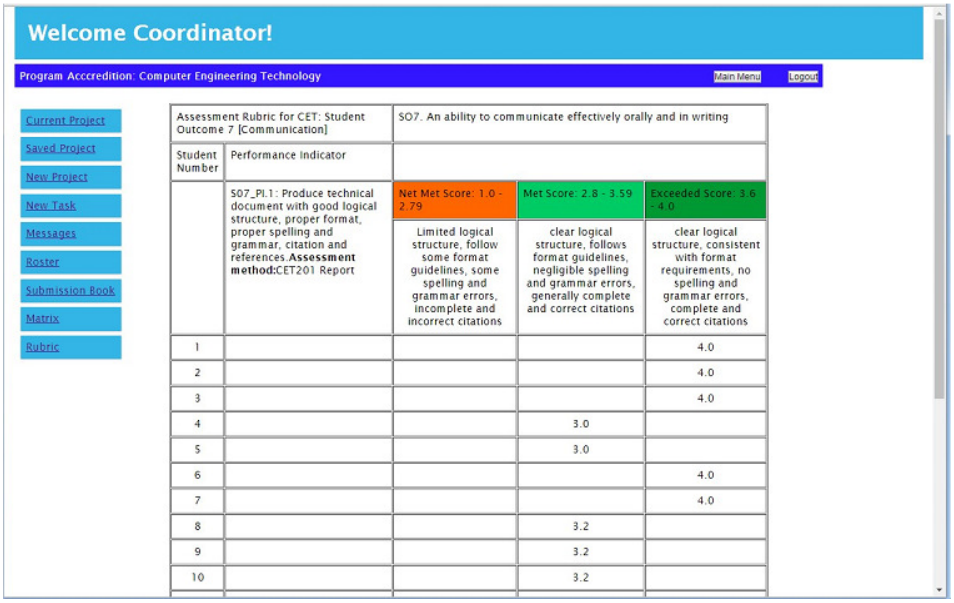


Figure 7: Coordinator's Rubric Page

The Rubric page allows the faculty members to submit the assessment data. It also allows the coordinator to view and analyze the data across multiple semesters or years. This is shown in Figure 7.

## Conclusions

This paper introduces the design and architecture of an accreditation assessment management system. The idea is to help institutions organize the accreditation activities and release the burden on the faculty, especially the periodic material collection and assessment work. A preliminary version of the system is developed with more features being added. These features include sending messages among project members, saving a copy of the created project and tasks, and a book/table to show all the tasks with submissions. The authors believe that there are many other features that can be integrated into the system to provide users more tools, such as more accreditation project templates for accreditations other than ABET and ATMAE, and more reports on data saved in the database to better facilitate the continuous self-assessment.

## References

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