SI Attendance Management

PROJECT PLAN

Team: May1709
Client: Iowa State Supplementary Instruction
Advisor: Simanta Mitra
Jon Haut – Team Lead
Leo Southwick – Webmaster
Levi Partridge – Key Concept Holder
Sam Christy – Key Concept Holder
David Lowry – Communication Lead
Xirui Wei – Webmaster
Email: may1709@iastate.edu
http://may1709.sd.ece.iastate.edu

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1 Introduction

1.1 PROJECT STATEMENT

With this project we are implementing a solution that will transfer data from Iowa State's A-track system into an Excel template stored on CyBox. A-track is an application designed internally by ISU Web Development.

1.2 PURPOSE

This project is designed to speed up the process of attendance tracking for Iowa State Supplemental Instruction leaders. Currently the process of moving the data from the A-track application to the Excel template in CyBox is handled manually, which is obviously tedious and slow. If we are able to speed up this process, SI leaders will be able to put their efforts towards their lessons instead of data entry.

1.3 GOALS

First and foremost, we would like to accomplish the project task, automating the process of data conversion from A-Track to CyBox. We will evaluate several different web technologies to determine the best solution to accomplish this conversion. All members of the group have some form of web development experience but no one is at a mastery level.

With the use of A-Track's API, it is a goal of ours to make the transition to our website easy. An easy transition is defined as the ability to operate our website without a tutorial or extensive directions. Any SI leader should be able to access our website and perform the data conversion intuitively.

SI leaders should never have to leave our website either. We will not require any software installations and will not require SI leaders download a spreadsheet and then reupload to CyBox. The website will access CyBox directly and make the changes to the specific file on CyBox.

In summary, our primary goal is to create an easy to use website that increases efficiency for the SI leaders.

2 Deliverables

We will be developing a web application that SI instructors can use to transfer all of the relevant data from their SI instruction section into the SI department's analysis tool. This web app consists of the front end User Interface and backend interfaces with A-Track and Box API's.

Front End

The front end of our project will be a mobile friendly web application. We are currently developing the User Interface in both React and Angular 2 so that we can decide which works best for our project. The front end of the application will require a user friendly process that any SI leader can operate intuitively.

Back End

User management is needed to allow users to create accounts and manage events that they created or are proctors for. The web app will use A-Track's API to find attendance data for the events specified by the user, create a new event, and check students into events. Since some SI leaders don't use individual events for each session there will also be the option to sort attendance by specific dates. In order to do this the app will need to perform an additional layer of processing to filter the JSON results (from the A-track API) by dates. The web app will then take the query result and format it for insertion into the SI analysis spreadsheet, download a copy of the existing spreadsheet from Box using their API, insert the changes before uploading the revised copy to CyBox.

Documents

- Design Document
- Project Plan
- Weekly Progress Reports
- Team Website

3 Project Requirements/Specifications

3.1 FUNCTIONAL

1. Users accounts should be used to prevent unauthorized use of the application.
   a. New users should be able to create an account (accessible from the login page).
   b. Existing users should be able to log-in from the login page.
   c. User passwords should be hashed before being sent to the server.
   d. Users should be able to log out of their account from any page on the site.
2. The system should get attendance data for specific events using the A-Track API.
3. The system should properly create A-Track events using the API.
   a. Each event's ID, start date, status, and proctor list should also be stored in the database.
      i. An event's initial status should be "Upcoming".
   b. The current user will automatically be made a proctor for the event.
4. The system should properly remove events using A-Track's API.
   a. Event information in the database should also be removed.
5. The system should be able to check a student into an event in A-Track's system using the API.
   a. The SI department's card swiper app should be able to access this service.
6. The home page should display all events for which the current user is a proctor.
   a. These events should be categorized as "Upcoming", "Ready for Processing" or "Done".
   b. Users should be able to delete an event from the home page.
      i. Users should be asked to confirm event deletion before it is performed.
   c. Users should be able to manually initiate processing for selected events from the home page.
      i. Only events in the "Ready for Processing" section can be selected.
7. The create event form should be accessible from the home page.
   a. "Name", "Start Date" and "Duration" should be required fields.
   b. The form will not be processed if any of the required fields are missing or if the "Start Date" is earlier than the current date.
8. The app will allow students to check into an event in the following ways.
   a. Using student's Iowa State net ID or email address.
   b. Using student ID number.
   c. Using the SI department's card swipers and iOS devices.
9. Attendance data should be processed and prepared for insertion into the analysis spreadsheet stored on CyBox.
   a. Users should be able to manually process specific events.
   b. Completed events ready for processing should be processed nightly.

10. Interface with CyBox to keep Iowa State's SI analysis spreadsheet up to date with student attendance.

3.2 Non-functional

1. Speed up the data transfer
   a. When using our solution, the time to transfer the data from A-Track to CyBox needs to be significantly faster.
2. No installs
   a. SI leaders do not need to install any new programs onto their computers.
   b. SI leaders do not need to download any excel files locally, all handled via the website
3. Security
   a. Due to the sensitivity of the data we will need to be accessing and storing all data in a secure fashion
4. Scalability
   a. The solution needs to work for all different SI courses, not just one
   b. Needs to be able to handle the addition of new SI courses
5. Usability
   a. The user interface is easy to operate and very intuitive even for non-tech savvy SI leaders
   b. Any SI leader can operate the site without a tutorial

4 Design

4.1 Previous Work

The current system uses a combination of A-Track, CyBox, and pencil and paper. The ISU WebDev Department has developed A-Track which some of the SI leaders use as a place to store their attendance data for all of their SI classes and events. Every two weeks the SI leaders are required to view their attendance in A-Track and then manually enter the students that attended their sessions into CyBox. If the SI leaders did not use A-Track their alternative is to have students sign in on paper and then two weeks later enter the data into CyBox. For users that will use A-Track there is an existing mobile application associated with a card reader that allows students to swipe their ID's to check-in at the SI session. Our plan is to use the existing A-Track API as the backend for our website where students will create events, check-in, and sync with CyBox. On CyBox the SI department has an excel template that we will need to automate the process of populating the spreadsheet that leaders currently fill by hand.

4.2 Proposed System Block diagram

4.3 Assessment of Proposed methods

Due to the confidential data in the A-Track database, we are doubtful about gaining complete access. This makes the method of direct database access unobtainable. The existence of an API to interact with the database however, makes the method of creating an application that utilizes the API through our personalized website the method to implement. The mobile application is still in consideration though, potentially as an add-on to give our clients multiple ways to solve the problem.

4.4 Validation

Our Project will be run in iterations that last 3 weeks each. We will be giving a demo of the project at the end of iteration to both our advisor and client. These demos will be good times to discover potential faults of our solution, or problems that could arise in the next iteration. We are also planning on running trials where several groups of SI leaders will use our system. We feel that these trials will reveal any problems with our design. These trial runs will most likely take place during the spring semester.

5 Challenges

One of the major challenges with this project is the sensitivity of the data we are working with. Data could potentially include student names and ID numbers, which brings up the possibility of violating the Family Educational Rights and Privacy Act (FERPA). We will have to ensure that our solution is secure and that we don't have any FERPA violations.

6 Timeline

6.1 First Semester
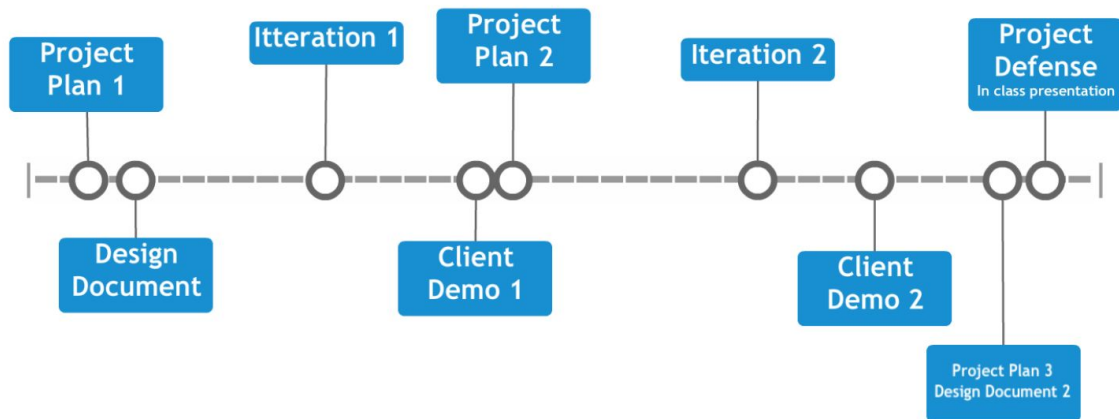
6.2 Second Semester
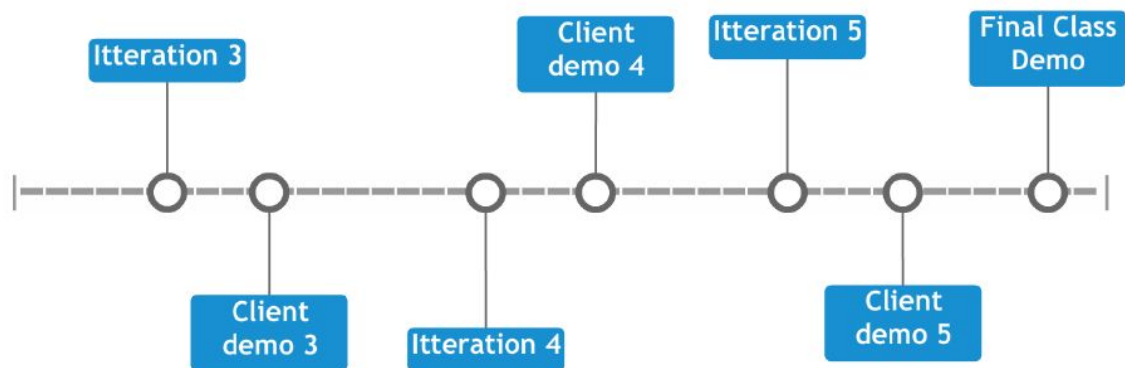
7 Summary

By the time of graduation we plan to have a working project that utilizes the A-Track API to convert the attendance data from A-Track's system to the CyBox attendance spreadsheet.

To do this, we will be working in multiple, three-week long iterations with a demo to both our Advisor and Client at the end of each iteration. To start we will need to be able to process the data that is received from A-Track. Once we are able to parse the data, we will then need to input data into CyBox spreadsheets.

In conclusion, there are two main steps. First, process the data from A-Tracks's API and second, input the data into the correct CyBox spreadsheet.

8 References

This project is in collaboration with the Supplemental Instruction program, the Attendance Tracking program, and our advisor, Simanta Mitra, a Senior Lecturer for software systems.

Information about the A-Track web application can be found at https://atrack.its.iastate.edu/.

Information about the A-Track API can be found at https://atrack.its.iastate.edu/api.

Information about the Box API can be found at https://docs.box.com/docs.

Information about the Supplemental Instruction Program can be found at http://www.asc.dso.iastate.edu/supplemental.