

# SI Attendance Tracking

## DESIGN DOCUMENT

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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

- Complete the project
  - Automate data conversion
- Easy transition to our site
- An all inclusive website
- Ease of use

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

- Database
  - Store and track SI sessions
  - Automatically process A-Track data
- Website
  - Mobile friendly
  - Used by the SI leaders to create events and check-in students
  - Also used to write to the files stored on CyBox
  - Interface with the A-Track API to create and get events
- CyBox Spreadsheet
  - A spreadsheet with all the attendance data filled in by our website

We intend to develop a mobile-friendly web application that interfaces with the A-track attendance API, Box's remote drive API, as well as the iOS card readers purchased by the SI department currently used for checking students into SI sessions. A database will be used to track SI sessions and automatically process A-track attendance data from all completed sessions nightly. This processed data will then be properly formatted to fit into the Excel document that the SI department uses to gather data on how effective the program has been. Interactions with the excel file itself will be done with the excel.js library. The document is stored on CyBox, so the Box API will be used to get the file and save the updated version after processing.

## 3 Requirements

### 3.1 SYSTEM SPECIFICATIONS

- Automate the way in which the attendance data gets transferred from the A-Track system to CyBox.

#### 3.1.1 Functional Requirements

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 user should be able to remove events from our database if they choose to.
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.

### 3.1.2 Non-functional Requirements

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 PROPOSED DESIGN

On the user's end, the final product will consist of a webpage that can be accessed either from the internet or through an existing app that interfaces with the card readers on the SI department's iPhones. From this webpage, SI leaders can log into their accounts, students can check into events, and everyone can access the "about" section. Once logged in, SI leaders can access settings which, when changed, are updated in the MySQL server. SI leaders can also create events which are stored in the SQL server. This action requires that a post request is sent to the ATrack API to get an ID+key from the system. Finally, SI leaders can "process" events. This action consolidates all of the event information into the Excel document.

(See appendix for flowchart)

### 4.2 DESIGN ANALYSIS

We have been working to figure out how to properly use the APIs provided to us by A-track and CyBox. Some of the initial testing has been successful we have gotten useful attendance data back from the A-track api for specific events and we have a user system in place for our site to track user accounts and details needed to interface with A-track events that they own or are a proctor for. Unfortunately we have not been able to get the create event API to work properly and have contacted a developer at A-track, who informed us that he will work on a fix and let us know when it is ready for use.

## 5 Testing/Development

### 5.1 SOFTWARE

Initially our testing will be a lot more low level (piecewise) and will only require our laptop and an internet connection. We first need to be able to make a GET call to the API to get all events we need. After that, we need to be able to make a POST call to create events. Then our final tests to run will be with reading and editing CyBox spreadsheets automatically. The GET test is important for ensuring we can receive all data we need consistently. The POST test is crucial for being able to create the event and store the event id and key. Finally, the CyBox spreadsheet test is what the SI leaders are really looking for with the project completion.

Once we have completed all of the low level tests individually we will need to work on the high level task of making the components all work together. First, we will need to work with the SI's iPods and the Swipr application. We will be testing to ensure that users can check-in to events using the same methods they have always done.

The final testing will be to ensure that an SI leader can do everything, start to finish, on our application. When that is completed, the primary functionality of the project will be complete.

### 5.2 PROCESS

Testing will be done at the end of each iteration. We will conduct our tests to ensure that the project meets the functional requirements that we set out to achieve during that iteration. In the 2nd term, once we have a fully functional prototype, we will put the app in the hands of a handful of its intended users, the SI student leaders. We will ask these student leaders to test out the new application and report back to us with feedback and/or criticism. This will allow us to fully customize the app to best fit our client's needs.

## 6 Conclusions

So far we have been working with a mock UI that allows us to make the GET call to receive the attendance data for the specified event. Our goal is that we will have a fully functional application that streamlines the SI leaders' attendance processes.

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. This solution is the best for us as it requires we stay accountable and on track while not taking up too much of our advisor or client's time.

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.



## 7 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.

More information about the A-Track database and 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>

## 8. Appendices

Estimated Flowchart of the UI/UX for the project.

