

Team No. 10 Project Proposal Report

Team Members:
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Project Name

Individualized Education Tracker

Project Synopsis

Custom web form maker that allows teachers to create and customize data collection forms for the purpose of tracking Individual Education Plans.

Project Description

This project is being undertaken at the behest of a special education teacher in the Lawrence school district. The goal is to provide special education teachers with the means of collecting data for Individual Education Plans across multiple platforms and users. With their current resources, the teachers have to do all of the data collection with pen and paper and then store and collate the data sheets for later processing. Some have tried to use google forms for this data collection but it has not been flexible enough for their needs.

The end result will be to provide a custom form maker web application that will allow teachers to build custom data collection forms that will fit the varying needs of each child's Individual Education Plan. This will also require individual accounts and login and the ability to share forms between accounts so that whichever school personnel is assigned to the data collection will have access to the form. The project will also include a back-end database and service to store the form data for later retrieval and use. If there is time and sufficient data, we also plan to implement a means of manipulating, analyzing, and displaying the gathered data for tracking trends.

Project Milestones

First Semester	
Gather front-end and back-end requirements	10/21
Map out user-interface	11/23
Define and implement UI and database	2/1

Second Semester	
Finish First Implementations and Combine Front and Back Ends	2/15
Finish First Implementations and Combine Front and Back Ends	3/22
Finish Testing and Deployment	4/12

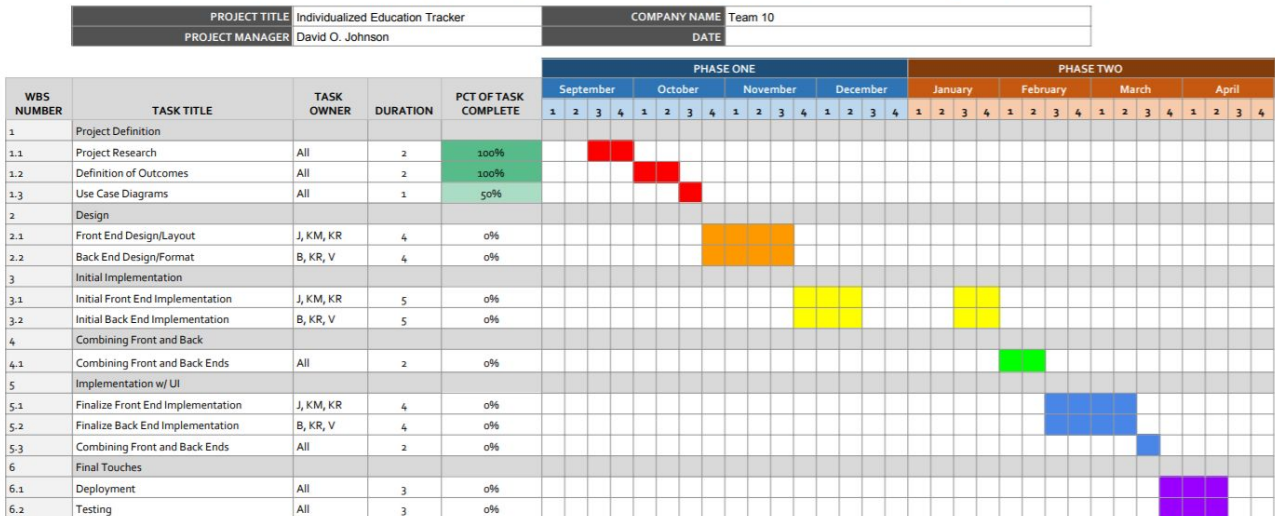
Project Budget

- Storage database
 - \$0 - 10/month
 - AWS DyamoDb
- Website Hosting
 - \$0 - 5/month for AWS Elastic Beanstalk
 - \$0 for KU servers

Work Plan

- Vivek Tallavajhala - BackEnd Developer
- Bisher Anadani - BackEnd Developer
- Kaiser Mittenburg - FrontEnd Developer
- Johnathon Bliss - FrontEnd Developer
- Kevin Ray - Full Stack Developer

Gantt Chart



Project Design

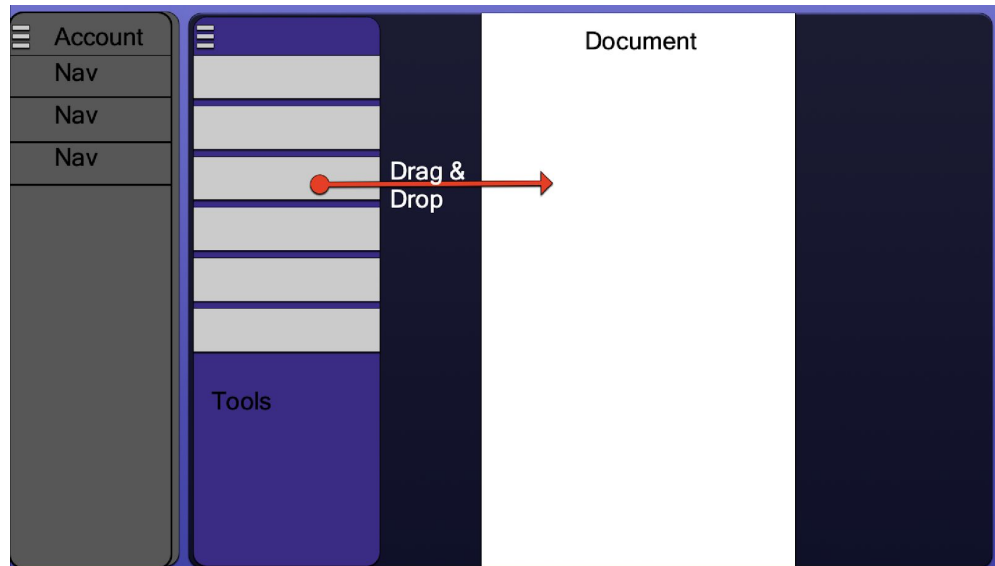
How The Software Works

Our software will be used in classrooms during evaluations and must be flexible, catering to desktops, laptops and tablets. Because of this, we have decided to create a web application that can be accessed in a web browser. We have decided to exclude mobile phones as a platform candidate, as there is often not enough “real estate” to work with effectively in regards to screen size, which can cripple usability. We may re-evaluate this once our primary goals and concerns have been addressed.

A major goal we would like to achieve aesthetically is to have our service look visually appealing, and to feel like a web app. We don’t want to constantly see large portions (or all) of the screen loading or buffering on simple button clicks, nor have the user feel like they are using a basic html website.

Facebook’s React javascript library will help us build a beautiful, consistent user interface, that will keep dimensions in tact and bring a polish to our web app that is hard to do with simple html/css alone.

Accommodating different screen sizes while keeping identical page layouts and relative dimensions is one of



the hardest things to do in a web environment. React will help us accomplish that.

The web app will support a few core workflows such as account administration, form creation, form use, and time permitting, data analysis. A simple navigation column will allow movement between these workflows. A teacher or para educator should be able to manage their collection of students, build forms to track their students, and use those forms. There are many use cases involved in using a form, such as filling it out, updating, printing, emailing and saving to file. We hope to address those, and any others that would be appropriate. The framework that we use and the interface that we make should support a “drag and drop” feature that will be the core of our form creation and must be intuitive and easy to use. There is no set standard for IEP forms. Each form is custom tailored to accommodate each student. In order to satisfy the relatively diverse set of goals that can make up an IEP, we will offer a collection of general data recording techniques that will allow for the recording of timed goals, affirmative observation, number of occurrences, accuracy, and more. A strong collection of recording techniques and a drag and drop system will give teachers a tool to suit all of their students.

Being a data driven application, we will store all of our data in a database. When needed, we will ping our AWS (Amazon Web Services) DynamoDB database. We have decided to architect our app using a non relational, “NoSQL”, schema in hopes of simplifying our page design and data handling at the same time. Form rendering will rely heavily on what type of data is being recorded in the form, thus, our technique of data handling will heavily impact rendering speed, as well as number of renders. Further rationale for choosing NoSQL is discussed in our design constraints section. If our application is a success, and we see high traffic, we may also implement a intermediary data service to act as a distribution layer, which will increase efficiency. If we choose to host the front end on AWS, we will likely get some of the intermediary data service perks “for free” - such as multiple instances, and traffic balancing. Our frontend could even be deployed on a customer-by-customer basis. The modern school district has a complex shared network, fully capable of hosting their own instance of the frontend, allowing use only on their secure network.

Design Constraints

The largest project requirement is the need for customizable data collection forms. Since these forms need to be flexible enough to correspond to any child’s development goals, the ordering and types of entries can not be known prior to the forms creation. This has resulted in a technical constraint related

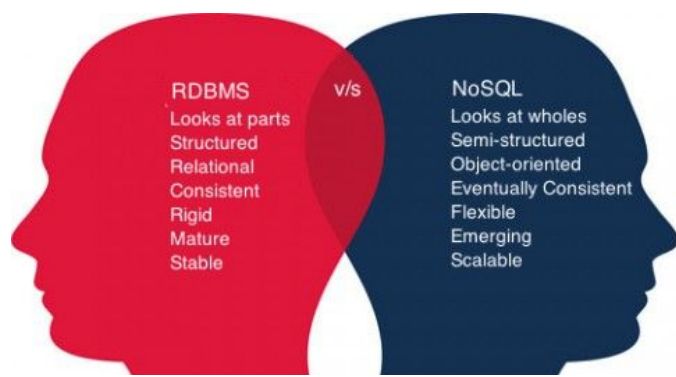
to how the form data is stored. The usage of a traditional relational database is impractical as this would require a table for each type of entry and a means of forwarding to know which field comes next. This would most likely result in longer load times since the form would have to be rebuilt each time it was loaded. Instead, this has forced

Example of Data Collection Form Currently Used

CSE Goal 1 (Basic Concepts): When participating in a small group or individual activity, X will be able to demonstrate an understanding of size and quantity concepts (big, little, more, less, small, large) with 80% accuracy over 5 data collection probes.

Benchmarks: Nov- 20%, Feb- 40%, May- 60%

Date:	Targeted concept:	Correctly ID'd? (+ or -)	Targeted concept:	Correctly ID'd? (+ or -)	Targeted concept:	Correctly ID'd? (+ or -)



us to consider the use of a non-relational database schema in order to store each form as a JSON. This allows each form to be stored as it was created and does not require the rebuilding of the form contents each time it is fetched.

Another constraint has emerged from the need for portability of the web application. Since this is an application that could be used across multiple school districts or states, it is unknown what browsers each will use. There are various ways to ensure this portability, but one of the simplest for our team was the use of the React JavaScript library. The React library is used and maintained by Facebook and as a result has functionality to support all major browsers.

There is also a budget constraint on the project. Since the EECS has available server space for web hosting, our budget does not include extra money for using external server space or web hosting. As a result, we have decided to use the provided web hosting to host the front end and user interface for the web application. Since we have decided to use a non-relational database, instead of setting it up on the EECS servers, we will use the free tier of the AWS cloud platform to host a DynamoDB non-relational database. The number of transactions and amount of data transfers we expect during development and testing should not incur any cost. If the use of the web application continues after the completion of the course, then it may become necessary to redeploy the front-end to a different web host.

Ethical & Intellectual Property Issues

Ethical Issues:

The primary ethical issue our project faces in regards to Data, specifically student data and how we protect it. Since we are creating a Web app for IEPs, we will be collecting data on students that will be stored in a database. The ethical issue we face is in regards to what kind of data we store, and making sure we are not in violation of FERPA. To protect against potentially violating FERPA and avoid crossing ethical boundaries, our plan is to only track data needed for the web app, and keeping student information out of it. This way our database isn't storing confidential information, and if it did, we would have an ethical responsibility to put extra effort in ensuring our databases are safe from cyber security threats. This is still obviously a concern for us, but by limiting the confidential information we store we can better control the ramifications if something negative was to happen.

Additionally we have an ethical responsibility to create a platform that is easy to use and intuitive for teachers to design their IEPs. The purpose of our project is assist teachers with the current, manual process in recording data for students, so to ethically and effectively solve this problem, we need to ensure we design our web app with simplicity of use in mind.

Intellectual Property Issues:

The first IP issue we face is in regards to using React. React is an open-source Javascript framework released to the public by Facebook. Facebook has released a licensing model for all their project, including react, called "BSD + patents". This BDS license grants us a copyright usage license, but we are only granted that license as long as we never sue Facebook for copyright infringement. In the situation we try to sue Facebook for copyright infringement, our

patent rights to react are immediately revoked. Additional intellectual property issues may arise depending on what future open source software we use. We will need to continually be familiar with the copyright policies for those software, and ensure we use them in a way following that policy.

Change Log

No current changes to initial project description.