Employ.Me Design

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Motivation

We made minor changes to our Motivation to make our description and purpose contain the idea of messaging and make our idea of tags more concrete.

Description

Employ.Me is a web application to help employers find students and students find internships and jobs. We have a unique tagging system that allows Students to easily search for listings by what experience is needed and allows Employers to to find Students that have certain qualities. The service also provides a safe way to communicate between Students and Employers by having an in-app messaging system.

Purpose

1. Help students discover companies and positions that they may have interest in.

Students have a set of tags that represent their experience, and Employers have a set of tags that they are looking for. If we can find the intersection to these two sets in a way that is easy to use for both parties, we have created something genuinely useful.

2. Help employers find qualified applicants for their company.

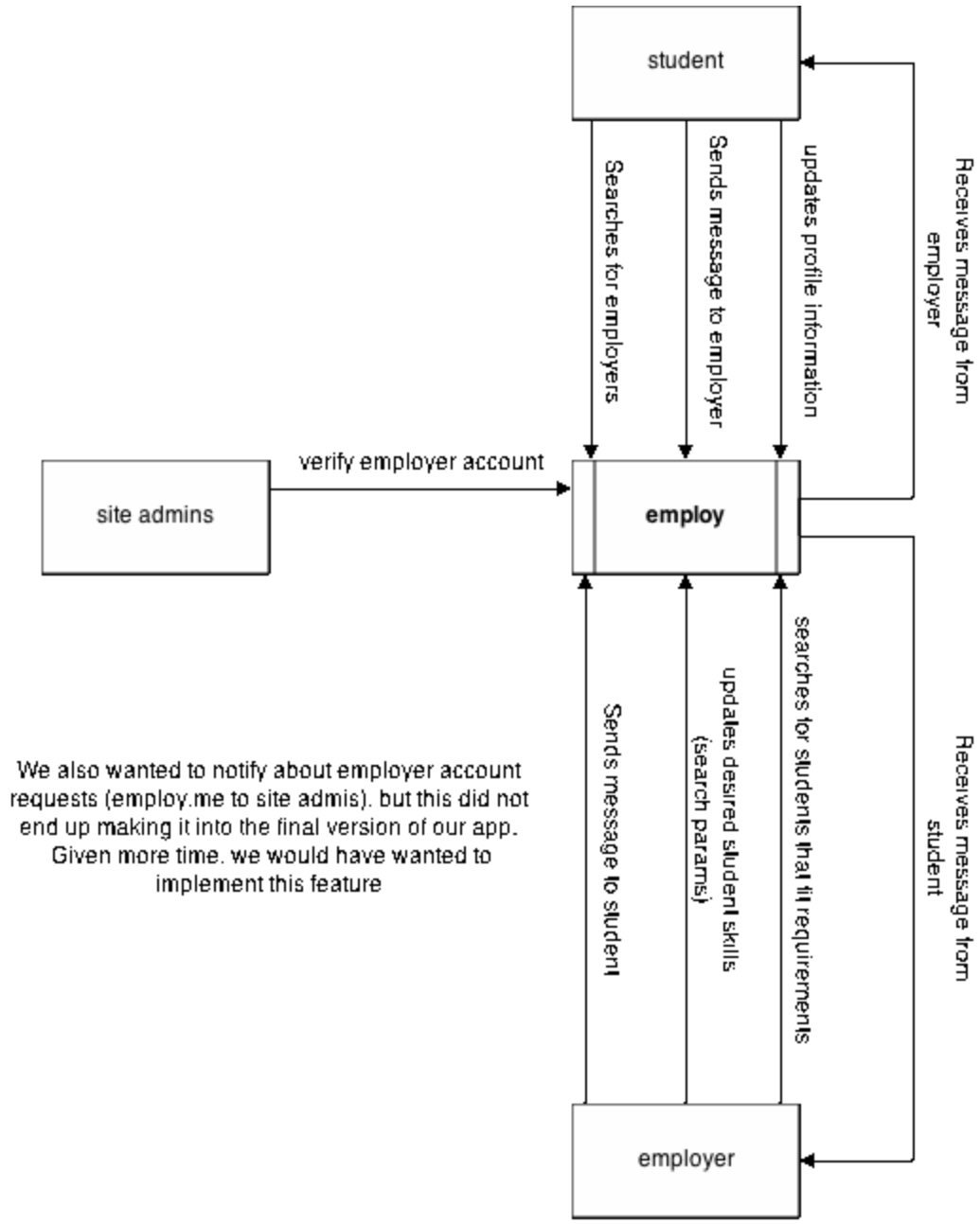
Employers want candidates who can do the job well. To aid in finding these candidates, Students will create profiles that accurately portray their strengths, as well as credibilities to these strengths in the way of Classes and Jobs. Employers can then search for candidates based on the job's criteria to find suitable matches, and make introductions to potentially interview or hire a candidate through our messaging system, or email.

Existing Solutions

- Career Bridge
    - Deficiencies:
        - Interactions between candidates and employers are mainly placed under control of the candidate
        - Candidates may apply to a job opening thinking they have the right qualifications, but they may not be to the extent that they employer was looking for. Potential waste of time for both parties.
- Career Fair
    - Deficiencies:
        - Interactions between candidates and employers are mainly placed under control of the candidate

        - Candidates may visit a booth just because the company sounds cool, or because they want to see if they have a shot at a job with a company, without knowing much prior knowledge about the company beforehand. This could potentially waste time for the both the employer, and the candidate.
        - Candidates may not visit booths that they are good candidates for, either because they decided to leave the career fair, or they didn't know too much about the company and it didn't sound interesting, or whatever other reasons a candidate may have.
- Ann Hunter emails
    - Deficiencies:
        - Students filter emails because most of the employer related emails don't directly apply to them and it becomes a nuisance to sift through them all the time. Also, an employer must wait for responses from students. Therefore, they are probably missing out on students that would be a good match for their company and position they are looking to fill.
        - Employers can't send job information directly to students that they think fit their requirements.

Context Diagram [updated]



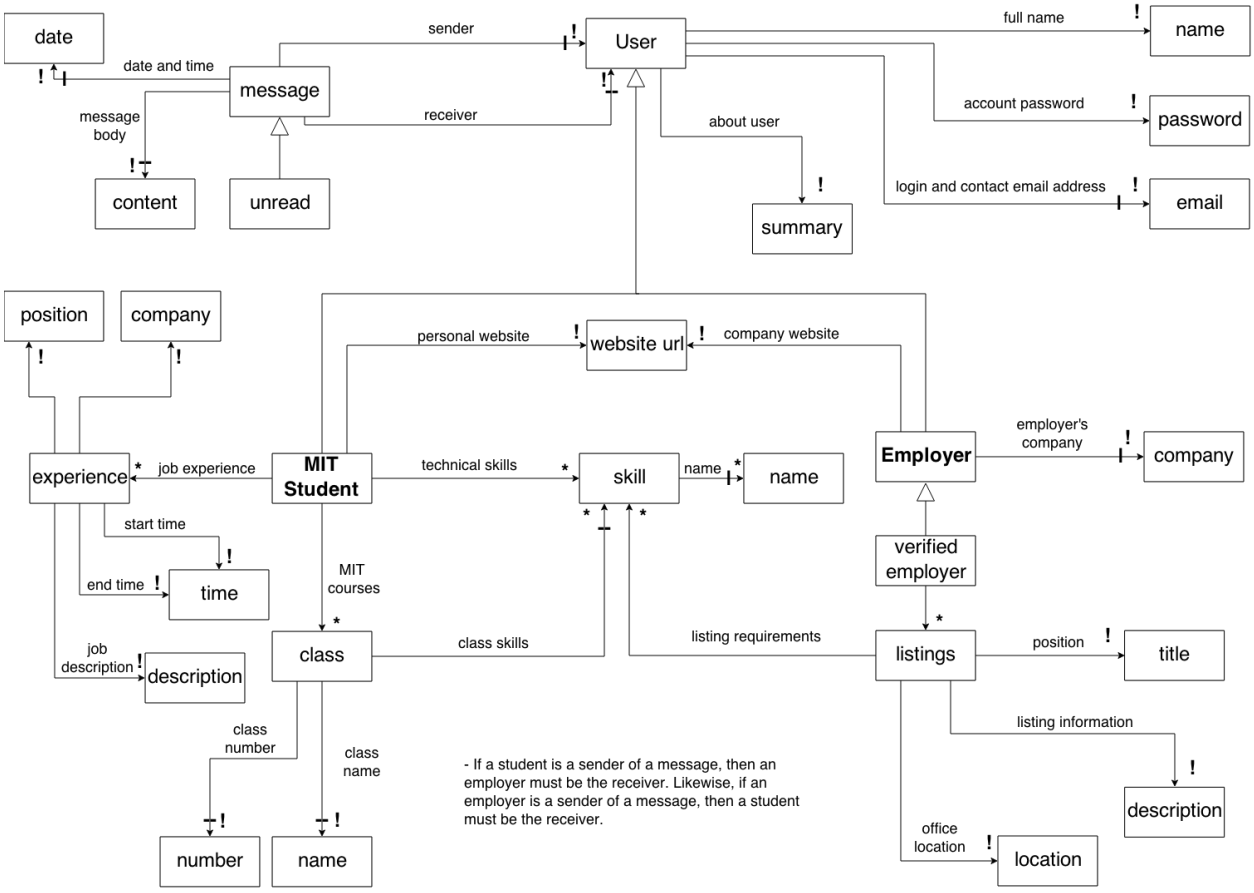
We also wanted to notify about employer account requests (employ.me to site admis). but this did not end up making it into the final version of our app. Given more time. we would have wanted to implement this feature

Concepts

We made minor changes to our Concepts that include giving Employers tags too and clarifying that Students search for Listing and Companies search for Students.

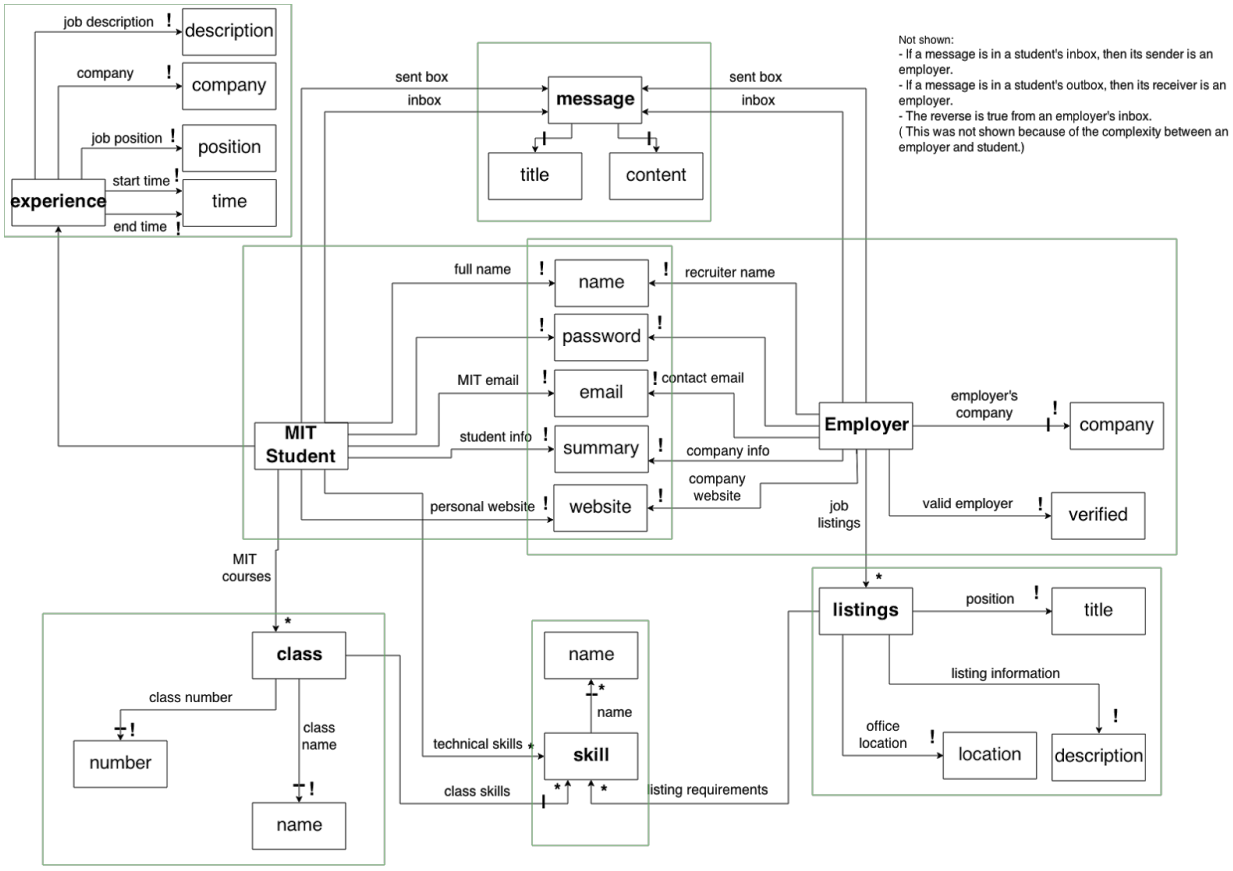
- Tags
    - Each tag represents a skill that a candidate has, or a company wants. Tags can gain credibility through relevant classes taken. In this way, classes can relate to specific tags that the user has, so that the employer knows why the candidate has this tag, and how much the candidate was able to develop their proficiency with that tag.
    - Motivated by both purposes because both Students and Companies rely on the other having tags to use their functionality.
- Search
    - Allows Students to search for Listings matching their own Tags.
    - Allows Companies to find Students who have the Tags they are looking for.
    - Motivated by both purposes because both Students and Companies have a Search functionality.
- Listing
    - Motivated by both purposes 1 because it gives Students something to look for.
    - Without Listings, Students would search for larger Companies with several unrelated Tags that they are looking for. For example, GE hires just about any field of Engineering, so a Student from many fields would come to the same Company and have no basis for the Company's Tags.
- Student Profile
    - The equivalent of a Listing, but for a Student. Also, Students have only one Profile of course.
    - If an Employer is going through a bunch of Students that match its wanted Tags, the Employer would want to see some information about the applicant before it reaches out. We have found that Companies are reluctant to hand out interviews to people before they know any concrete details about them.
    - Motivated by purpose 2 because it gives Employers the power to manually filter the concentrated selection they get from searching.
- Translate Function
    - A way of determining a Tag based on a class. The user can input a class, and the translate function will determine the appropriate Tags associated with this class.
    - Motivated by purpose 2 because it allows Companies to verify Experience Tags.

Data Model [updated]



Pieces of our data model are not currently being used in our application. However, they are in place if we decided to work on this project further after 6.170.
For example, our application currently does not use employer verification, but this is something that would be necessary if we made our app live.

Data Design [updated]

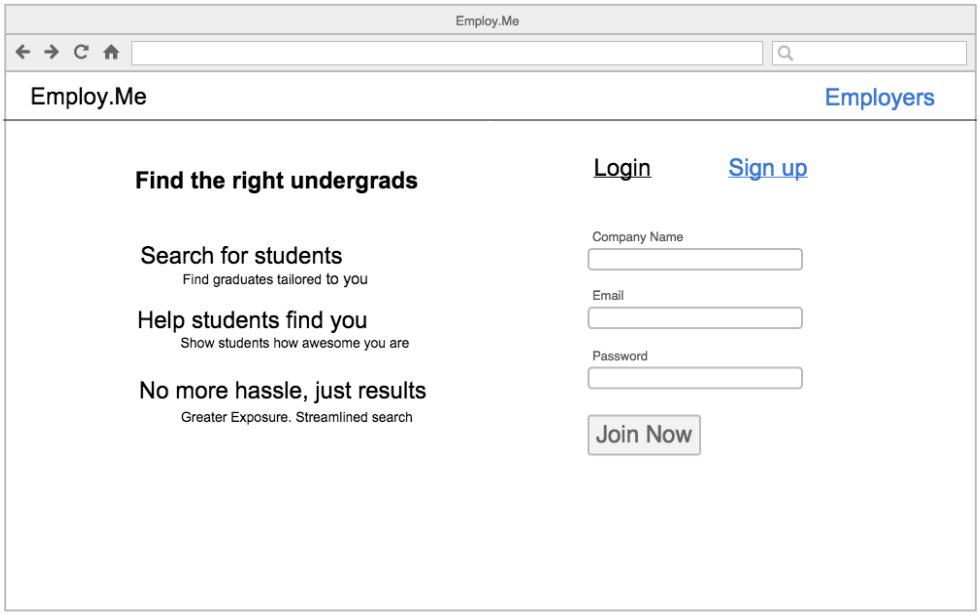


Security Concerns [updated]

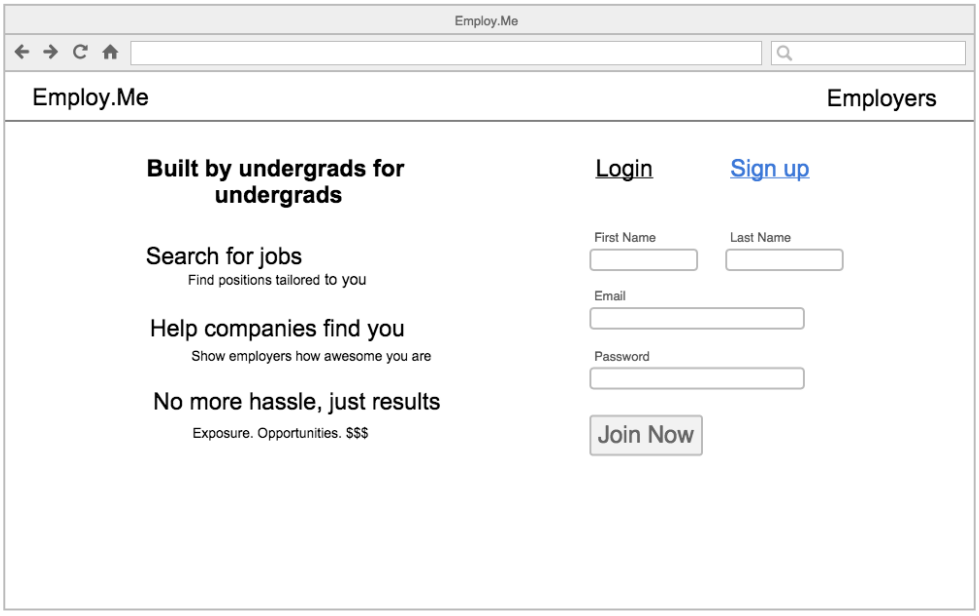
- **Requirements:**
    - Only employers can search for students: In order to create and view a search for candidates, you must be logged in to the site under an employer account.
    - Only students can search for job listings: In order to create and view a search for job listings, you must be logged in to the site under a student account.
- **Standard attacks:**
    - XSS: Escape all relevant user inputs, just to be safe.
    - CSRF: Generate a secret CSRF token for each user session, and send as a hidden field with all forms. Be sure not to show token in URL. (we wanted to implement this, but we could not do it with our QUnit tests)
- **Threat model:** What the adversary can do:
    - If adversary can impersonate a company by acquiring an employer account, they can fool candidates into giving them more personal information
    - If adversary can view candidate profile, they might be able to send a message to the candidate (again impersonating an employer/recruiter), asking for personal information.
    - Adversary can script an attack on the site in an input field if not escaped properly
        - Student can write a script in a message to a company, and potentially edit the company profile
- **Content Security Policy:**
    - Scripts:
        - Allow from: code.jquery.com, ‘self’, ajax.googleapis.com
    - CSS:
        - Allow from: ‘unsafe-inline’, ‘self’, code.jquery.com, netdna.bootstrapcdn.com, fonts.googleapis.com

User Interface [updated]

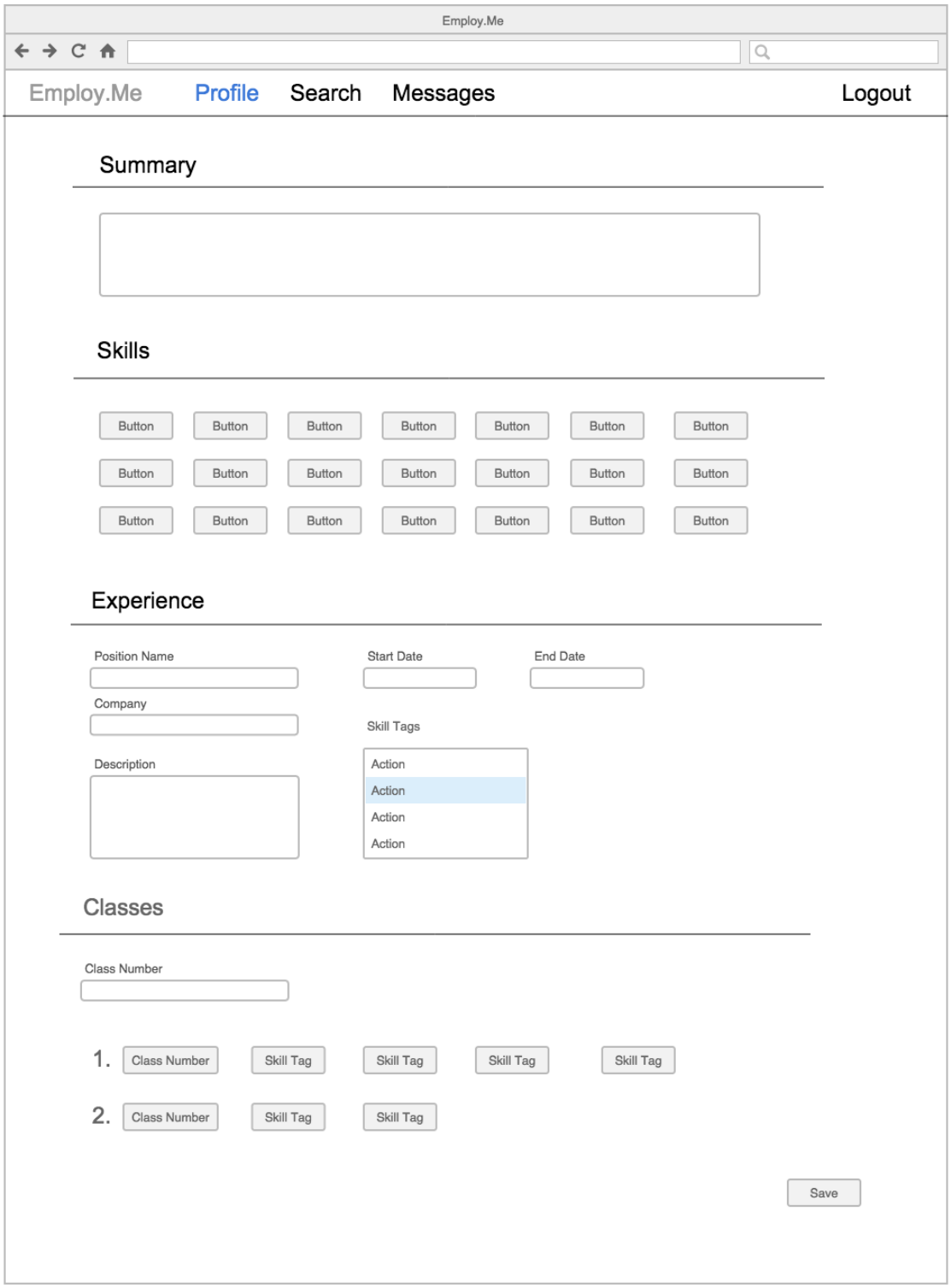
Employer Login



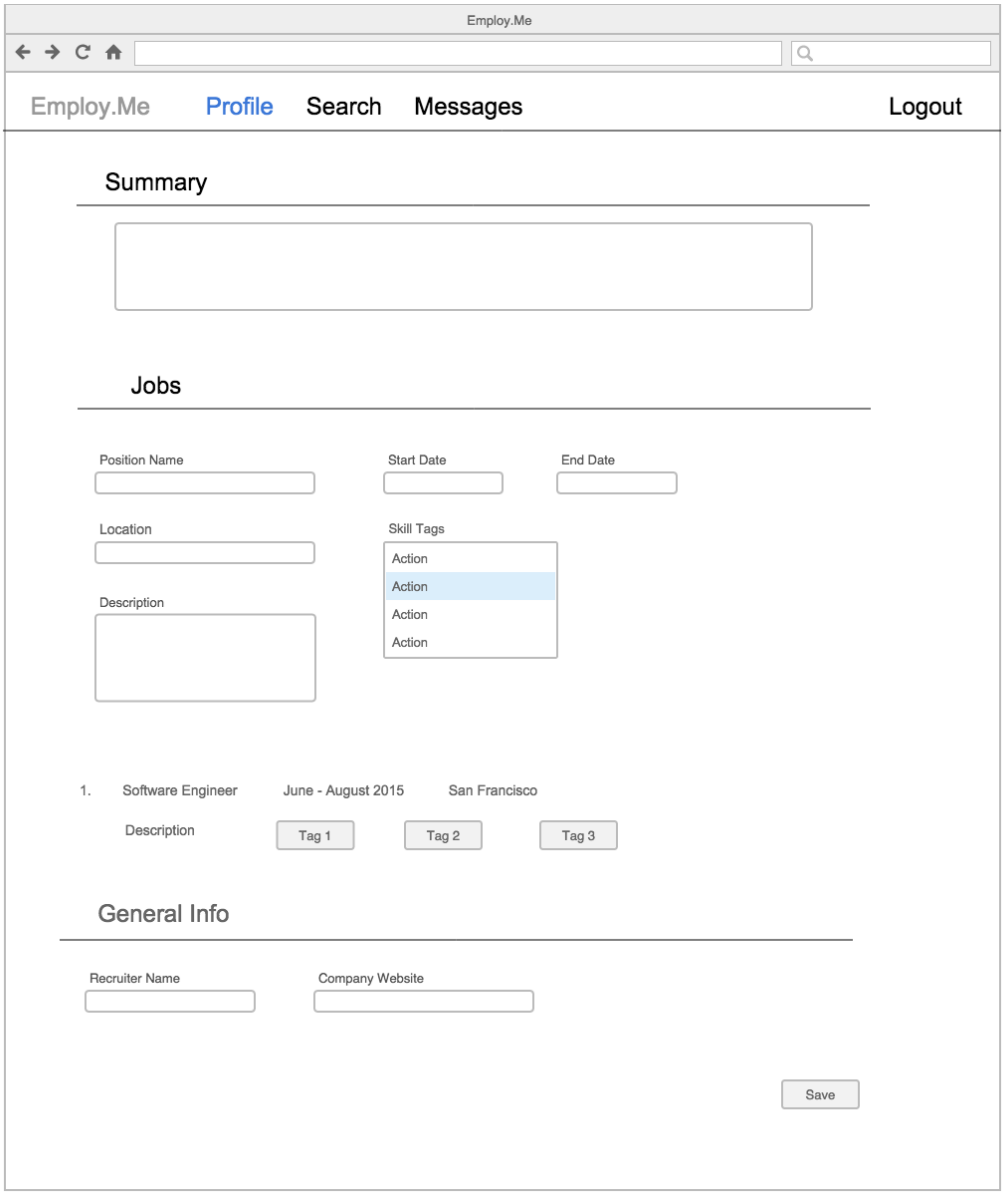
Student Login



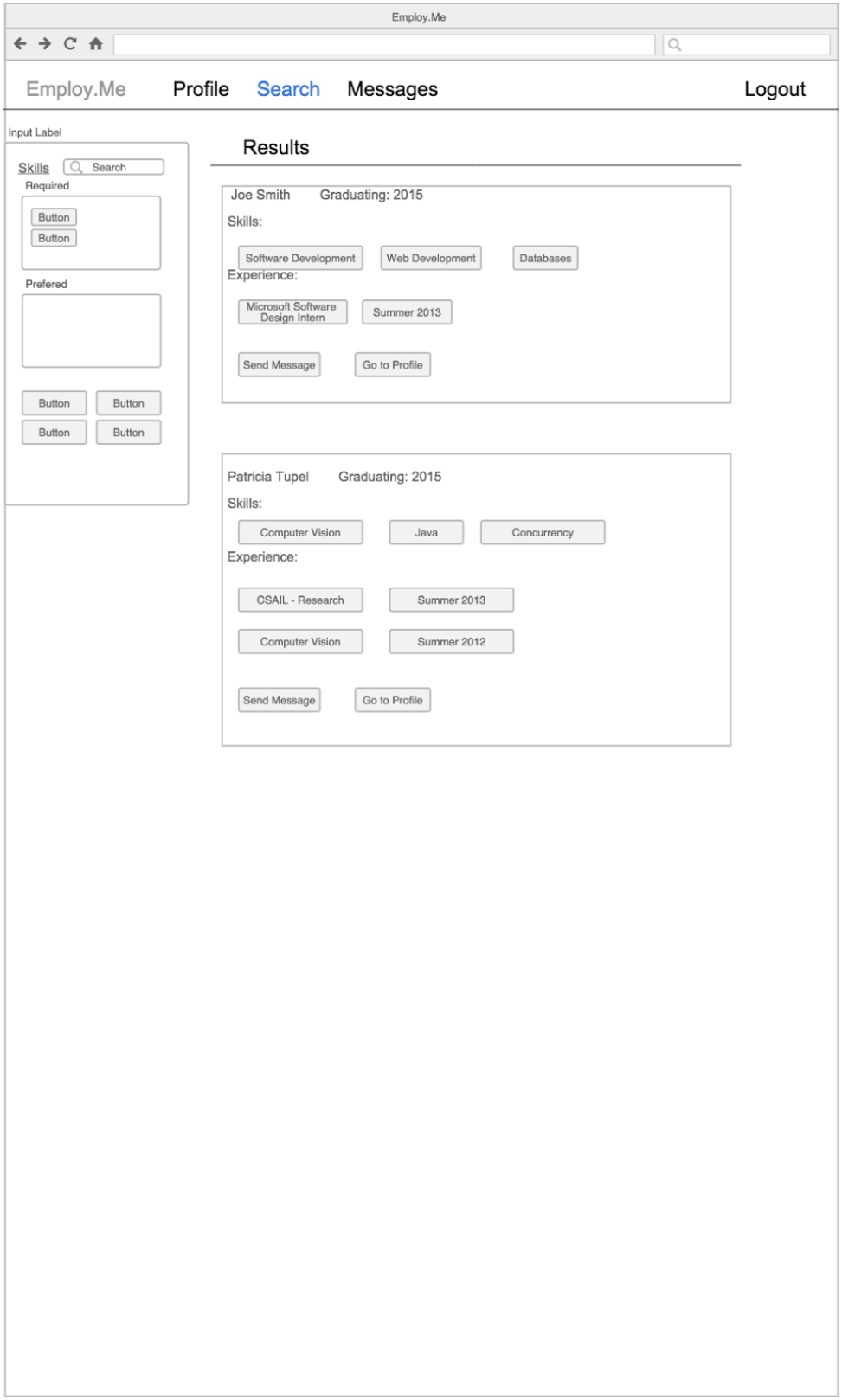
Student Profile View/Creation/Editing



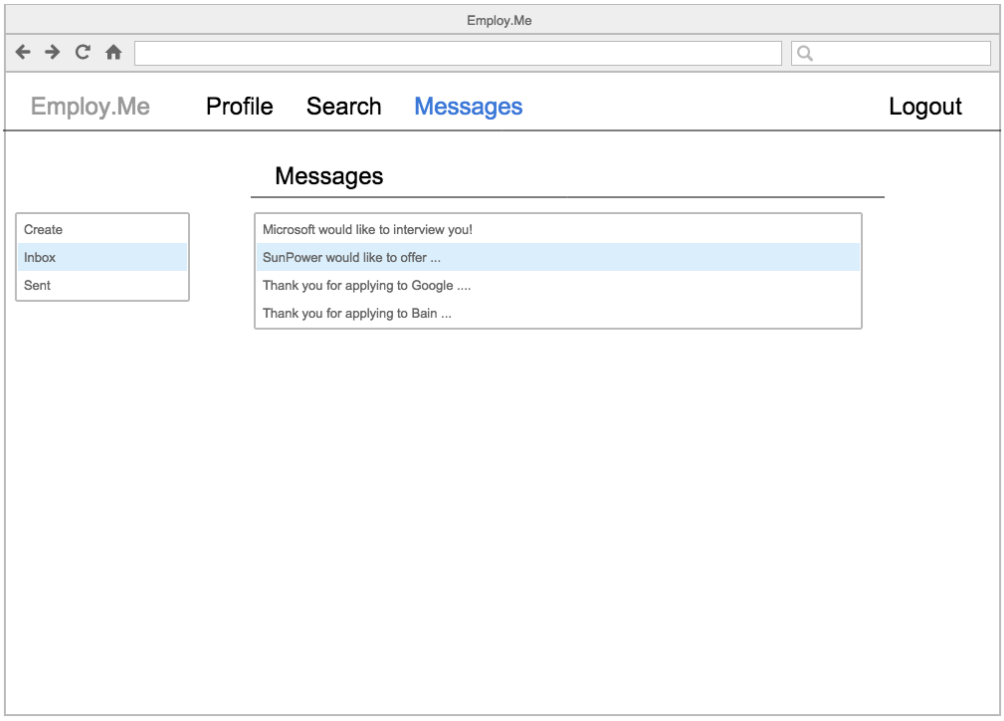
Employer Profile View/Creation/Editing



Search


Employ.Me
Employ.Me
Profile
Search
Messages
Logout
Input Label
Skills
Search
Required
Button
Button
Prefered
Button
Button
Button
Button
Results
Joe Smith
Graduating: 2015
Skills:
Software Development
Web Development
Databases
Experience:
Microsoft Software Design Intern
Summer 2013
Send Message
Go to Profile
Patricia Tupel
Graduating: 2015
Skills:
Computer Vision
Java
Concurrency
Experience:
CSAIL - Research
Summer 2013
Computer Vision
Summer 2012
Send Message
Go to Profile

Messages


Employ.Me
Employ.Me
Profile
Search
Messages
Logout
Messages
Create
Inbox
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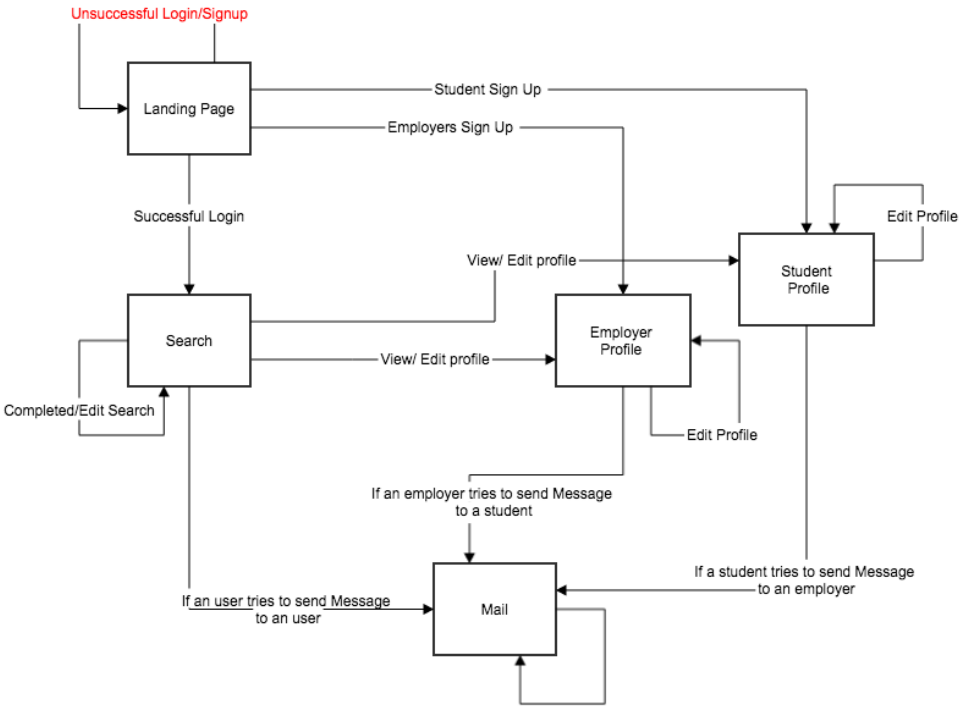
Microsoft would like to interview you!
SunPower would like to offer ...
Thank you for applying to Google ....
Thank you for applying to Bain ...

Flow Chart [updated]



Design Challenges

Accurately Depict a Student's Abilities

Options:

1. Require endorsements like LinkedIn does. Other students and employers would view your profile and endorse your skill tags so they are more reliable. The advantage to this is it is semi reliable if endorsements come from valid sources. Unfortunately, this approach can be gamed by people with fake accounts, friends, etc. Also, it will be difficult to implement, adds a lot of complexity to our app, and requires a larger community than we are going to be able to manage if we are restricting it to only MIT students.
2. Use classes as proof of experience and trust that manually-added experience tags are valid because an interview would show the person was lying. The drawback to this is it could waste employers' times if a bunch of invalid accounts creep up. Later we could possible add a report feature.

We choose option 2 for the reasons outlined in option 1.

Easy and Descriptive Profile

Options:

1. Require the user to enter in Sports, Activities, Clubs, etc. Have that be the profile and use the tags for searching. The Employer can decide whether to contact the Student based on his profile that acts as a resume. This is not great because it takes so long to set up. Also, profiles are constantly changing.
2. Have a general summary that the user can use to make a quick impression on the Employer. Keep sections for the most important attributes like previous jobs. The drawback of this is that people with non-job related experience may feel strained for room. On the other hand, the app is meant to create introductions, so that type of information would be communicated after a formal communication has been established.

We choose option 2 because it is more fitting with our app's purpose and makes for a better user experience.

Help Students Find Companies Based on Their Interests

Options:

1. Don't let Students search for Companies. Only let them see the companies that have contacted them, making Students passive. This is bad because it removes a big incentive for Students to join.
2. Have a sorted list of companies that users can look through. This isn't ideal either because it means we will need to sort the list based on some parameter. Most of the time this will favor some companies over others in some strategic manner, while we want Students to *match* with a company suitable to their skills.
3. Have an Employer search like there is Student search with tags as well. Companies will set tags based on what experience they are *looking* for. That way, Students can use their

own tags, or search on other tags, to see what companies they match up with. The only drawback is that it requires more setup on a company's part.

We choose option 3 because it allows for the most flexibility for our users. It also gives an incentive for Students to interact with the site, where before they were just passive users that got contacted.

Validate Companies

Options:

1. Build a system for automatically validating a company. We couldn't come up with a feasible way to do with within the scope of this project.
2. Email a moderator when a Company signs up. Allow the company to work while it is unverified but shut it's account down if it fails the verification process. This requires little work.

We want to use option 2 if we build this app for the public to use. Building an automated system to do this would be extremely difficult without requiring a lot of work on the Company's part to prove itself.

Messages

Options:

1. Messages as a separate collection. A message will have a sender and receiver that will contain a user id. This approach results in a message being stored in only one location. However, retrieving messages by a given user id will take time.
2. A user has a list of sent message subdocuments and received message subdocuments. This means that there will be two copies of a message in the database, one for the receiver and one for the user. It will be quick and easy to get the received or sent messages for a given user.

We chose to use option 1 because it made the most sense during implementation. It is easier to do searches and updates.

Client side rendering

1. Use handlebars. Some of the team is familiar with handlebars and has used it in the previous project. However, no one is entirely and expert with using it.
2. Use AngularJS. One team member is very experienced with Angular and highly recommends it because it has a lot of features that could make implementing our wireframes simple.
3. Use jade. Some team members are familiar with jade. Rendering client side templates can easily be incorporated into a Browserify build using Jadeify.
   Because we are using Browserify to require node modules on the client side, it made sense to do client side templates with jade. It easily integrates with our build system, automatically compiling files. However, it requires that some group members learn jade that had not used it before. Likewise, if we chose option 1 there would still be a learning curve for other members of the team.

We decided to do a mix of 2 and 3. Members that were familiar with Angular and wanted to use it could, while other members could use Jade.

Search creation

1. Drag and drop without autocomplete: would not require us to pass any data from jade into the client side model, but since there are so many skills, the user would need to take more time to find skills to drag and drop
2. Use of angular search with drag and drop: Requires us to pass data from jade into client side model, but when we do, user can search for skills, and then drag and drop the results much quicker. So now instead of scrolling in search of skills, the user can simply search for them. Because there will be no sensitive data being passed into the client side code, this is the preferred option.

In our MVP we implemented option 1, but we have chosen to use option 2 for our final product.