A Platform to Match Your Needs

SS16_ASE_INSO_01

Project Idea

Project owners are in need of people who turn their ideas into reality

- Ideas can range from designing simple web site, to larger projects
- Startups do not want to hire a lot of fixed employees

Web based platform for connecting project owners with suitable developers and designers

System will automatically match projects and people based on the required skills

Possible matches will then be presented to the project owner

Feature Overview

Creation of projects with positions and skills

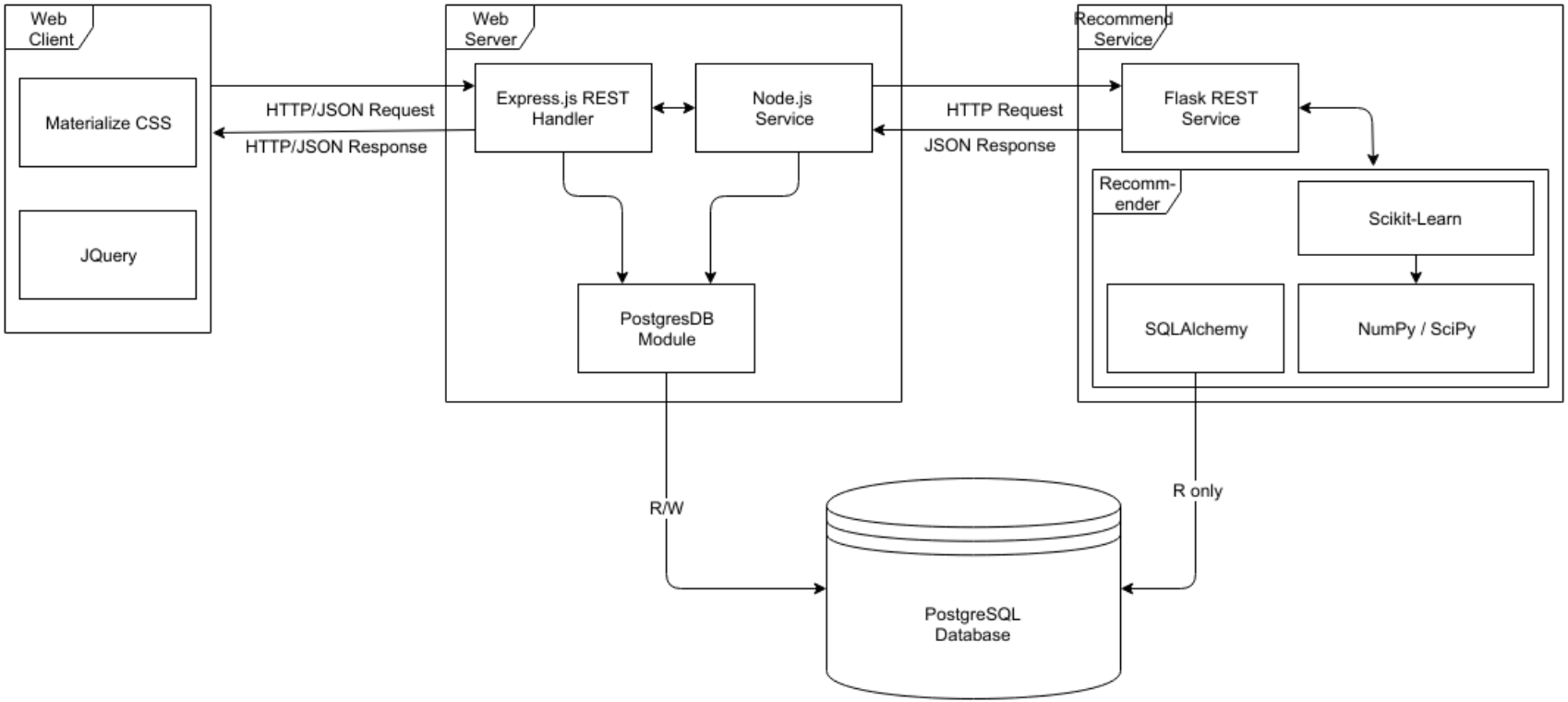
Developer/designer matching with machine learning

LinkedIn/Github/Xing/DeviantArt linking and import (skills)

Developer/designer rating

Chat and notifications

Architecture and Technologies



Architecture and Technologies - Web Server

- **Node.js** server using the **Express** framework for routing
- **Sequelize** as ORM for communication with **PostgreSQL** database
- **passportjs** as authentication middleware for authentication with username and password
- **Nunjucks** as templating language for JavaScript
- Internationalization module (**i18n-2**) for translation
- **winston** as logging library
- **Socket.IO** for Chat and Notifications Functionality
- **Redis** for Session Storage
- **SuperTest** and **should** as testing frameworks

Linked Services

Xing

Only OAuth1

LinkedIn

OAuth2

No permissions for the r_fullprofile

“Solution”: scrape LinkedIn profile

DeviantArt

General Problems with Linked Services

Planned was to use **passportjs** for the connection to the linked services

- Used it local login (easy) and for the linked services (problematic)
- Issues with session management in the OAuth callback
- Threw passportjs away and implemented our own solution

Requestlimits

- E.g. Request to many tokens in a short time and a 4xx error is being returned from the DeviantArt load balancers
- Daily limits

Architecture and Technologies - Recommender

Python (Python3, NumPy, SciPy, Scikit-Learn, Flask)

Provides HTTP endpoint for **Node.js** backend

Returns JSON list of N best matching users

Algorithm:

1. **N-dimensional Euclidian distance**
   a. Find n candidate users (matching the position skill set)
   b. Find similar positions in other projects (matching the position skill set)
   c. Get match score of similar project's users

1. **Support Vector Machine**
   a. Create feature vectors from match scores and additional data (hours, ratings, project count, …)
   b. Build training set based on similar positions users
   c. Classify candidate users

Technological Challenges

The node.js framework is mighty, but also complicated

- Asynchronous calls and nested functions result in much code even for simple tasks
- Many dependencies & some behaved differently on UNIX vs Windows
- 45 (direct) & 738 (including transitive)

Reliance on integration of third party APIs like LinkedIn via OAuth

Recommandations done with machine learning

Positive Aspects

Little to no internal conflicts

Everybody mostly did what they were told to do

Low entry barrier of node.js

Sprints went mostly according to plan

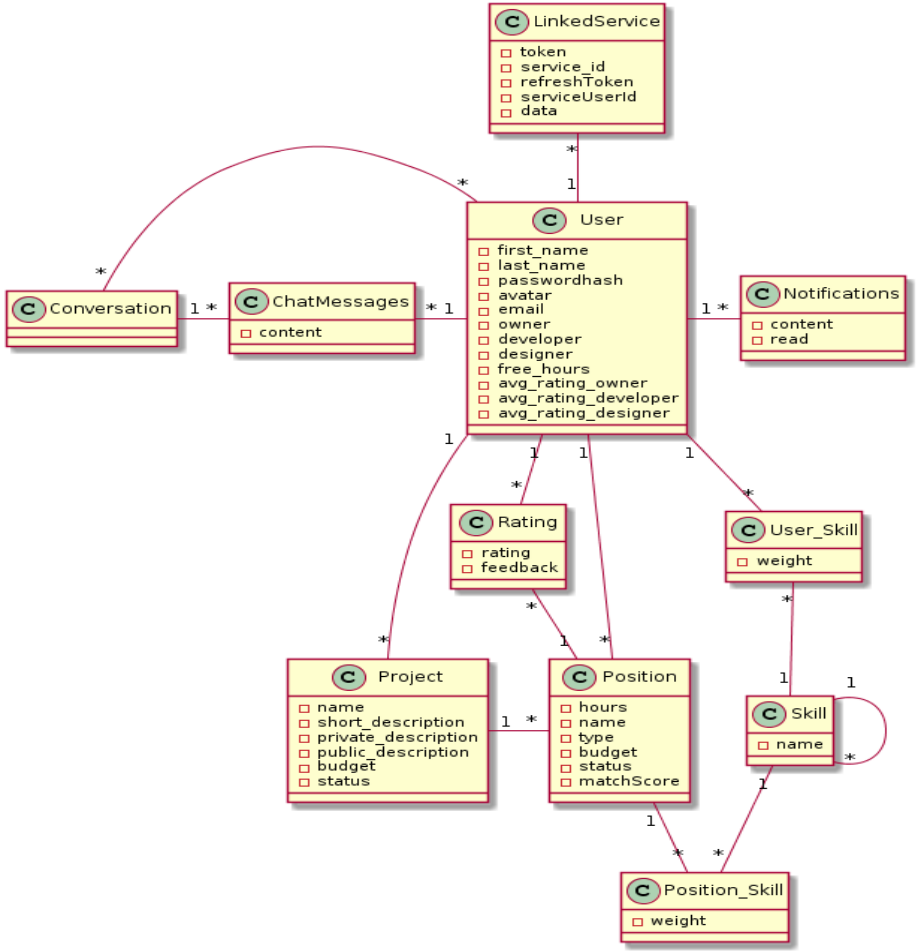
Negative Aspects

Project management in Redmine is a bit of a struggle

- Issue numbers (#) are global instead of project local
- Unnecessary many emails
- Can’t skip from develop to closed
- Moving a subtask to another parent changes start and end dates of new parent task
- No predefined basic views (like “my issue” or “open issues”)
- Commits with “#issue-number fixed” automatically closes the task, which makes it hard to find

Extensive (frontend) testing not as easy as we initially thought

DB Models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