[JOBFOX]

CAPSTONE PROJECT

System Design Architecture

Group Member – [Zain-Qurashi]

Group Member - [Glenn Hintze]

Group Member – [Ryan Macwan]

Group Member – [Jonathan Leiva]

Group Member – [Nick Holyk]

Group Member – [David Andalcio]

Original Plan Date: [10/16/17, Monday]

Revision Date: [10/17/17, Tuesday]

Revision: [1]

Revision History

Revision Number	Date	Comment

1.0	October 16, 2017	

Document Overview

This is a technical blueprint for the project.
This document has been developed by Group 5 for Capstone Project. This document was developed and is intended to satisfy all the project requirements, objectives and expectations.

Scope

This document relates to a single hardware model and a single software model designed to solve for the Capstone Project requirements.

Audience

This document assumes the reader has an intermediate or better knowledge of web application backend and frontend systems, as well as an intermediate or better knowledge of SQL database design, as well as familiarity with all related terms and acronyms/abbreviations. This document is not appropriate for a layperson without aforementioned knowledge and/or experience.

Related Documentation

Other system documentation for this system should include:

- Capstone Requirements document (
- Web backend (out-of-the-box solution) (Siteground Technical Documentation: https://wzww.siteground.com/speed; https://www.siteground.com/datacenters, https://www.siteground.com/uptime)
- Content Management Solution (Joomla! Documentation: https://docs.joomla.org/Category:Top_Level)
- Business practice documentation (in development - release TBD)

Document Conventions

Flowcharts provided use standard conventions for symbols and semantics.
Database diagram uses ERD format.

System Overview

This section deals with a summary of the overall system design aspects.

Description

This system is a solution designed to address the requirements as defined by the requester in the Capstone Requirements Document. This system will be a web application. Users will interact with the system through a web browser. This system will be hosted by a web hosting provider. This system will be accessible and indexable on the World Wide Web. The web application backend is an out-of-the-box solution provided by a vendor. The web application frontend is a content management system.

System Architecture

This section includes high level overview of system including references to the items covered in System Architecture Document – SAD, and interfaces to other items such as hardware, peripherals and systems integration. If the hardware design is following architectural standards and buses , these are to be included here.

Software Architecture

All software not explicitly outlined is out-of-the-box software provided by the Joomla! Content Management System.

Proprietary software includes

- Job matching algorithm, written in Javascript and developed by Group 5.
- Data scraping script, developed by Group 5.
- Data analysis and aggregation script, written in Python and developed by Group 5.

Hardware Architectures

All hardware is provided by vendor Siteground. Siteground offers a Student Hosting Plan, which is the configuration used to host this system. All hardware is owned and maintained by Siteground.

Hardware Design

Hardware Components

An out-of-the-box hosting solution was deemed the most cost efficient and resource efficient solution for this system. As this system is a web application, building and maintaining web servers as well as the necessary networking infrastructure was not conducive to the success of this project. An all-inclusive, out-of-the-box solution that is owned and maintained by the vendor Siteground was chosen due to the low cost (free) and time and resource savings that outsourcing hardware provides.

Computer Systems

All computer hardware is provided and maintained by vendor Siteground. Some hardware configuration details are omitted, but the hardware includes at a minimum the following:

- 10 GB Storage Space
- SSD Storage
- Backup solution

Peripherals

All hardware peripherals are provided and maintained by vendor Siteground. No details are available on the specific peripheral configuration.

Networks

All network hardware is provided and maintained by vendor Siteground. Some hardware configuration details are omitted, but the hardware includes at a minimum the following:

- HTTP/2 Enabled Servers

Project Specific hardware items (e.g. Sensors, Transducers, Robotics, Enclosure Design)

All specific hardware is provided and maintained by vendor Siteground. No details are available on the specific peripheral configuration.

Hardware Integration

Logical Design

Hardware design is proprietary to vendor Siteground.

Physical Design

Hardware design is proprietary to vendor Siteground.

Recovery Design

Hardware design is proprietary to vendor Siteground.

Software Design

Software Packages

{Software Module #1 - Matching Algorithm}

This is an algorithm written in Javascript and deployed to the front end web application. The purpose of this module is to match a Student User with a job.

{Software Module #2 - Data Processing & Loading}

This is a module that contains a collection of scripts to collect, process, aggregate, and load data required for the site database. This module is one-use for the scope of this project; it will not be deployed or hosted within any version of the system.

Software Integration

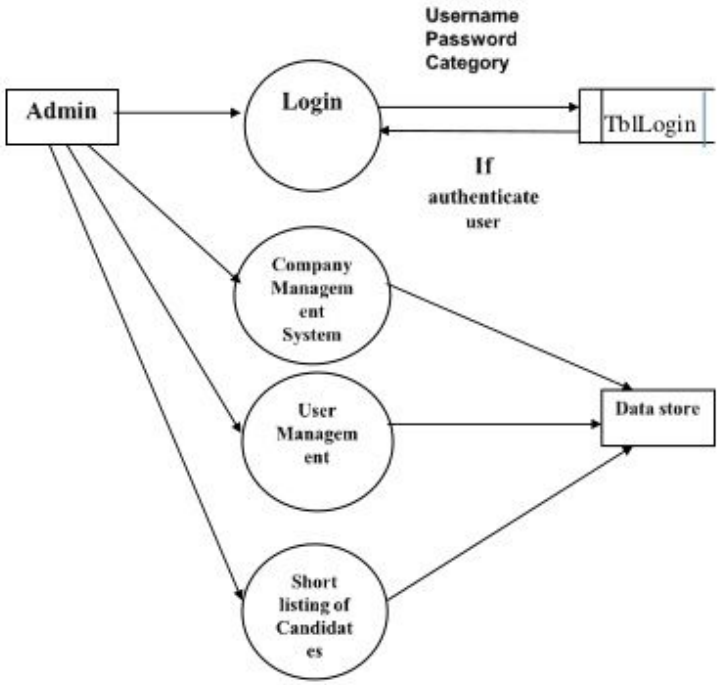
Software Module #1 is integrated directly into the web application front end. Software Module #2 is backend code that supports the Software Module #1 features.

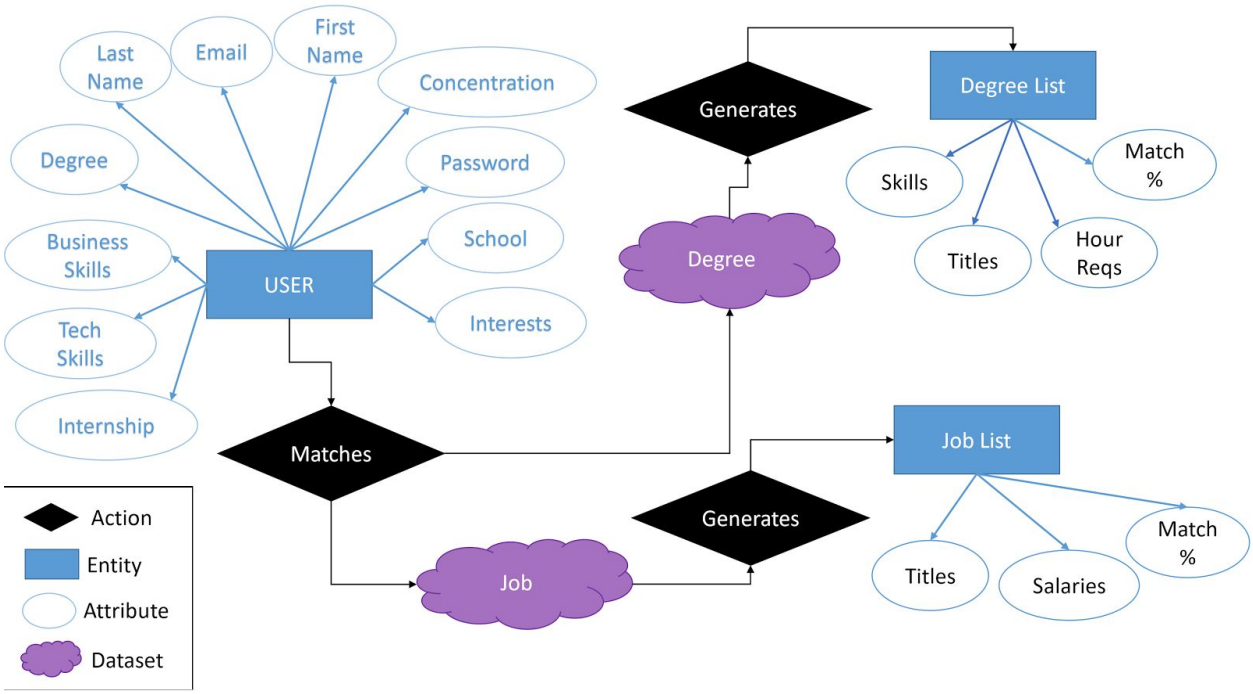
Data / Database / Files

Data Flow Diagrams

Provide different levels of DFDs: summary of top-level, system level (between system(s)/user/device), for each major software module, and one-layer inside the software module.

DATA FLOW DIAGRAM





Database Design

List and describe tables, fields, and entity relationships (also known as data dictionary and logical/ physical database design), schema, query language, key and indices, data management functions.
Database software: MySQL
Query language: SQL

Users table:
UserID (primary key),
Email,
password (hashed)

Students table:
StudentID int primary key,
FirstName varchar(255),
LastName varchar(255),
TechSkill1 varchar(255),
TechSkill1Weight int (1),
TechSkill2 varchar(255),
TechSkill2Weight int (1),
TechSkill3 varchar(255),
TechSkill3Weight int (1),
TechSkill4 varchar(255),
TechSkill4Weight int (1),
TechSkill5 varchar(255),
TechSkill5Weight int (1),
SoftSkill1 varchar(255),
SoftSkill1Weight int (1),
SoftSkill2 varchar(255),
SoftSkill2Weight int (1),
SoftSkill3 varchar(255),
SoftSkill3Weight int (1),
SoftSkill4 varchar(255),
SoftSkill4Weight int (1),
SoftSkill5 varchar(255),
SoftSkill5Weight int (1),

Advisors table:
TBD

Jobs table:
JobID int primary key,
JobTitle varchar(255),
TechSkill1 varchar(255),

TechSkill2 varchar(255),
TechSkill3 varchar(255),
TechSkill4 varchar(255),
TechSkill5 varchar(255),
SoftSkill1 varchar(255),
SoftSkill2 varchar(255),
SoftSkill3 varchar(255),
SoftSkill4 varchar(255),
SoftSkill5 varchar(255)

Degrees table:
DegreeTitle varchar(5),
DegreeName varchar(255),
DegreeConcentration varchar(255),
DegreeSchool varchar(255),

Classes tables (each degree from Degrees has a unique table with the following):
ClassNumber varchar(10),
ClassName varchar(255),

Files

All deployed files are contained within the web application Content Management System. Data files for population into database will be maintained for reference, but are not a deployed part of this system.

Registry / System Parameters

All frontend parameters are handled by the vendor Joomla.
Some Backend web server parameters include:
PHP 5.5.38
Mysqli 5.5.32
Zend engine 2
Hash
Gettext
Iconv
Imap
Intl
JSON
Mcrypt
Mcache
MHash
OpenSSL

System Interfaces

This frontend is a web application, and therefore interfaces with the World Wide Web. All interfaces with the web are handled by the vendor solution Joomla.
The backend system is a x86_64 linux web server maintained by siteground.

System Performance

Performance analysis is pending. Final date TBD.