C.S.-A.C.T.I.O.N.S.

Detailed Design

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Contents

1. Product Overview and Summary

The clients, Dr. Breimer and Professor Matthews, need an easy to use application that keeps track of Computer Science alumni. C.S-A.C.T.I.O.N.S will be a web application with a collection of alumni profiles that will be accessible by other alumni, current Siena Computer Science majors, and high school students. The goal of C.S-A.C.T.I.O.N.S is to also allow current Siena Computer Science or prospective students a chance to see what career paths Siena Computer Science graduates have taken and allow them to reach out to a specific alumnus. C.S-A.C.T.I.O.N.S will also keep Siena College Computer Science alumni connected to each other.

2. Use Case Narratives

2.1 User (Student)

The user will navigate to the webpage. Once the user is on the webpage, the user is able to interact with the map. The user can click on pins and view the information available to the public on any of the Alumni profiles. If the user is interested in contacting an alumnus, they have the option to send the alumnus a request for contact using the user's own email address. The user will have to enter in contact information and a note indicating why the user wishes to contact the alumnus. The email entered in the contact information will indicate whether the user is a current Siena student or not.

2.2 Alumni

The Alumnus will navigate to the webpage. The alumnus will go to the login screen where the options to register, log on or change password will be offered. To register the alumnus will provide information and answer a survey to fill in the information on the profile. This information will not be shown to the public until the administrator approves the alum. To log on the alumnus will enter a unique username and password that was provided to the alumnus by email to log into C.S.-A.C.T.I.O.N.S. Once logged in, the alumnus has the ability to edit the alumni profile and the ability to change the password. The alumnus is able to disable certain content from being shown on the webpage such as contact information. As well, the alumnus may hide their profile all together from the map. The alumnus has the option to receive a new auto generated password if the alumnus forgets their password. The alumnus also has the ability to view the map and click on pins to view any other Alumni profiles. Alumni are able to send other alums a request for contact by sending the other alum contact information and a note indicating the reason for contact.

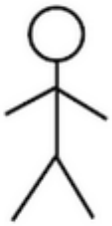
2.3 Administrator

The administrator is in charge of all alumni profiles. The administrator is able to log into C.S.-A.C.T.I.O.N.S with the username and password. Once the administrator has logged in, the administrator has the ability view all of the content generated from the alumni survey. The administrator has the ability to approve or deny pending alumni profiles. The administrator is also able to delete, create, or edit the content on any of the alumni profiles. The administrator can also delete inappropriate content. If the administrator wishes to contact the alumni, they have the option to send a message to all alumni with an account on the system. The administrator can also interact with the map in the same way as the alumni and users.

3. UML Use Case Diagram

3.1 UML Use Case Legend

An activity or action - Actors outside the system will interact with activities.



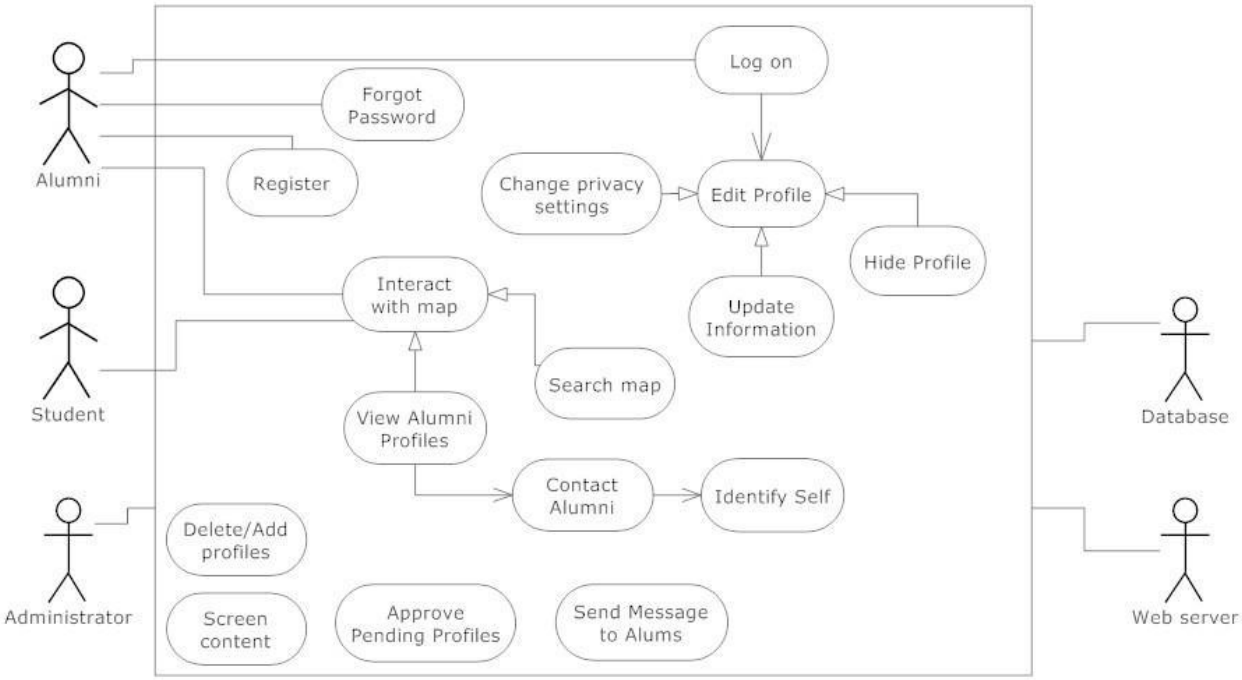
Actors - External entity that interacts with the activities.

Participation Line – Lines that connect actors with uses showing their participation.

Extends Arrow – Shows sub uses that may not necessarily be accessed when their parent use is accessed.

Includes Arrow – Shows items that are included in a use.

3.2 UML Use Case Diagram



4. Deployment Diagram

4.1 Deployment Diagram Legend

<HTTP>

HTTP: Hypertext Transfer Protocol defines the formatting and transmission of messages, and the actions servers and browsers should execute in response to commands.

<SCP>

SCP: Secure Copy Protocol is a way for hosts to securely transfer files.

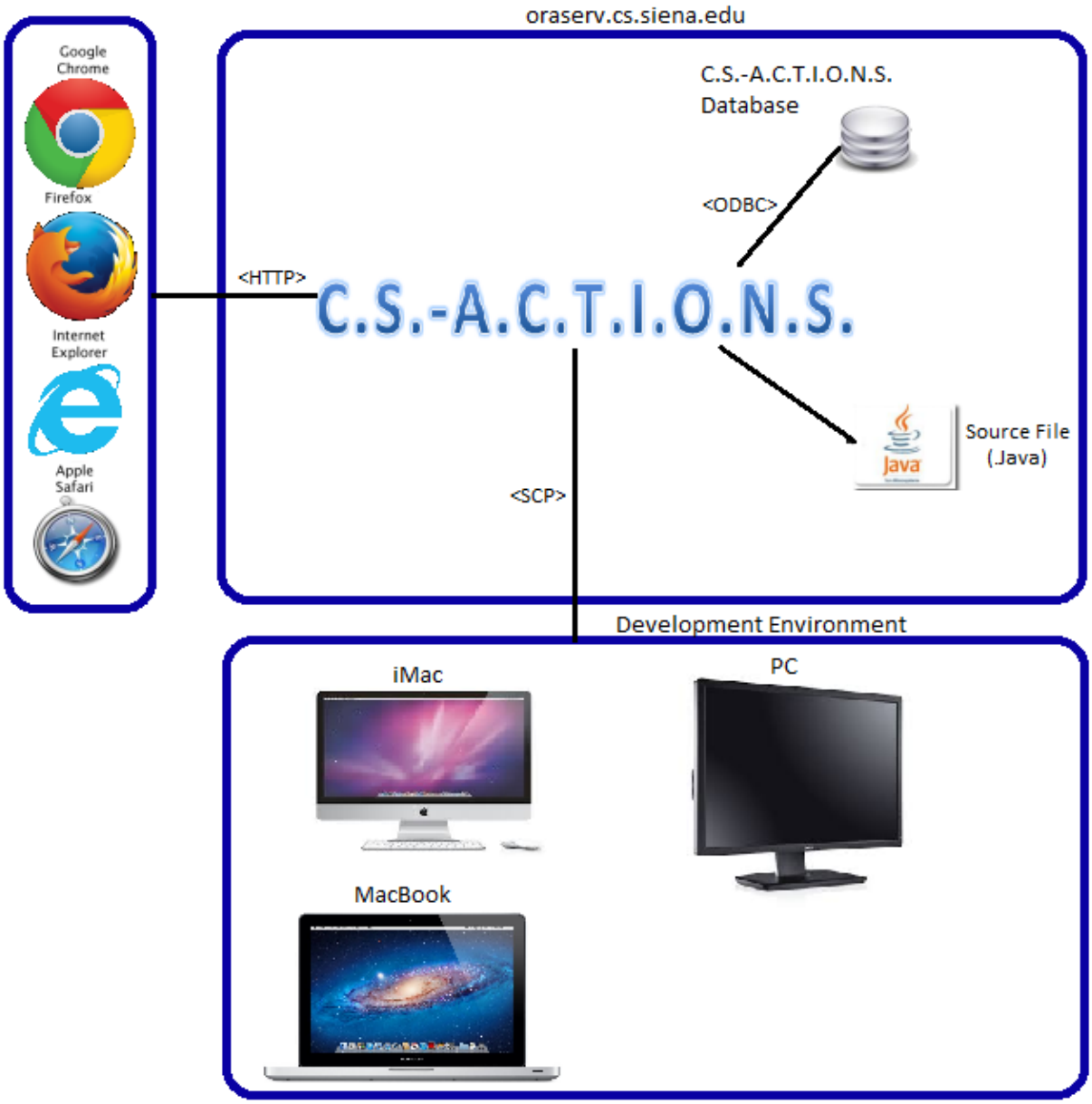
<ODBC>

ODBC: Open Database Connectivity is the standard for accessing a database.

System Boundary: Items within this boundary are considered to be of the same system.

Connection: Displays relationships between boundaries.

4.2 Deployment Diagram



5. Activity Diagrams

5.1 Activity Diagram Legend

Initial Node - The first node, where the process begins.

Final Node - The final node in the process.
Process is over when activity reaches this node.

Activity Node - Describes the activity or step that takes place at this position in the activity.

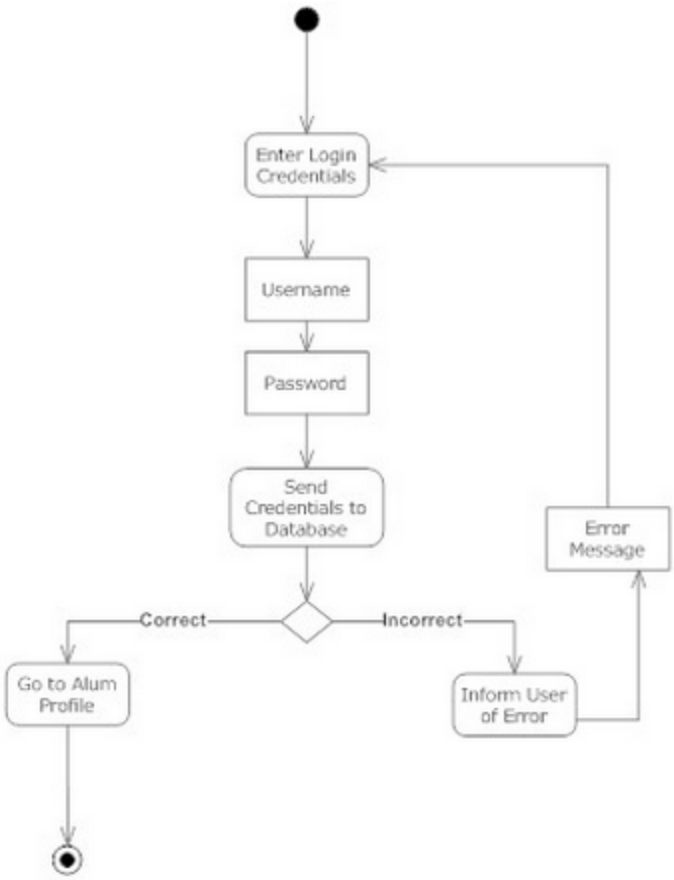
Data Object - Data used as input or output for the process

Decision Node - Used to branch in the activity. Usually branch in answer to a question. Flow must follow one of the arrows branching from this node.

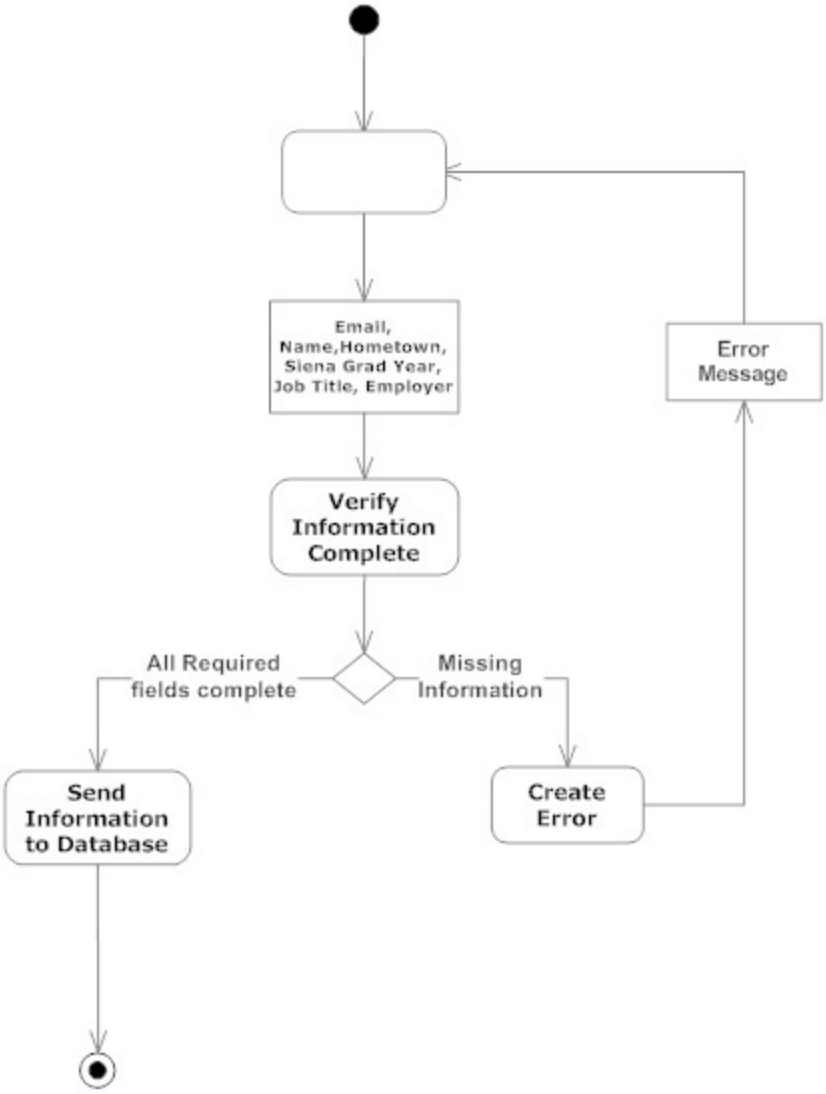
Split/Join - Either splits or joins two activities that are run simultaneously.

Flow - Shows movement of data from one node to another.

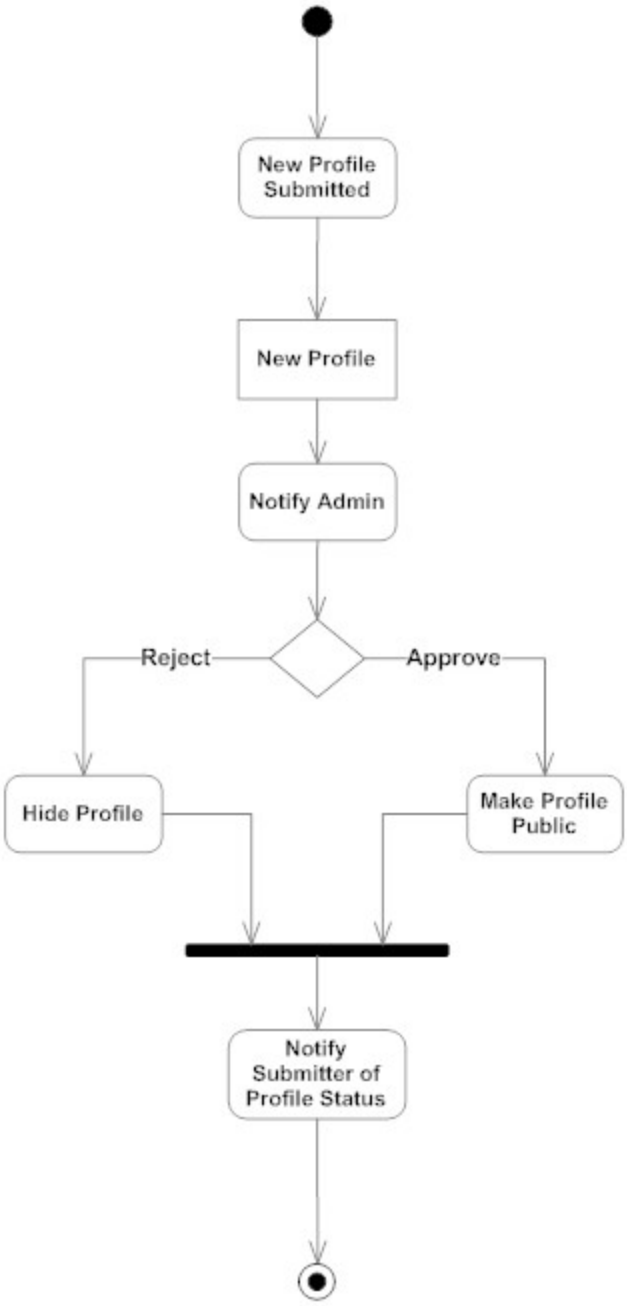
5.2 Activity Diagram: Login



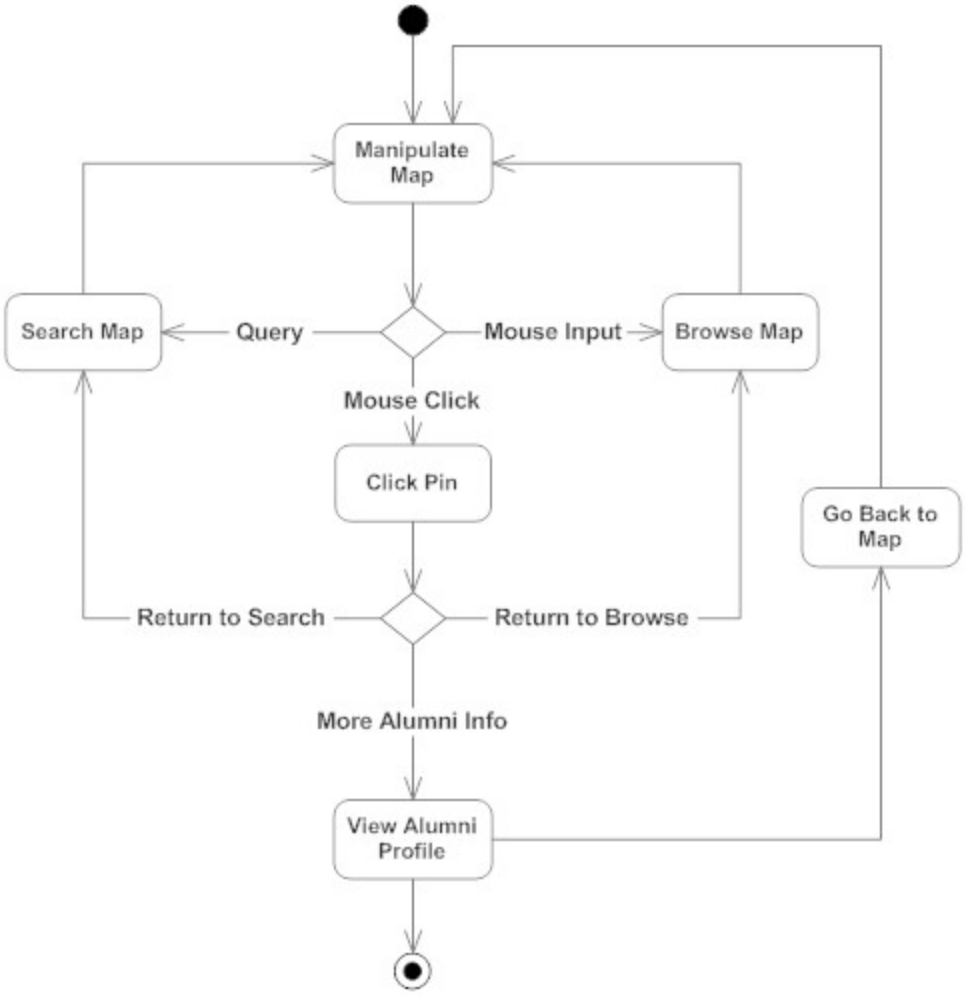
5.3 Activity Diagram: Register



5.4 Activity Diagram: Approve Pending Profiles



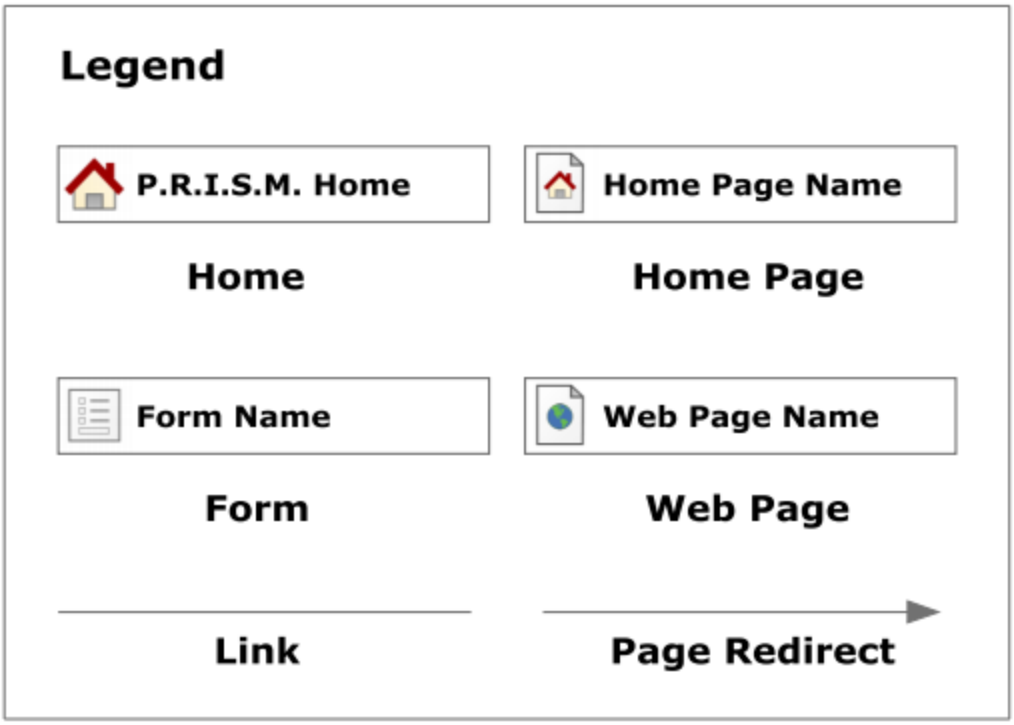
5.5 Activity Diagram: Interact With Map



6. Website Map

The web site map shows the structure of our C.S. ACTIONS application. The map indicates how the various web pages interact with each other and how to navigate through every part of our application. Below are the various symbols that help visual represent the planned structure of our application.

6.1 Website Map Legend



Home - This represents the main page of C.S. ACTIONS to a user..

Home Page - Represents the user's main page when they initially login to their account.

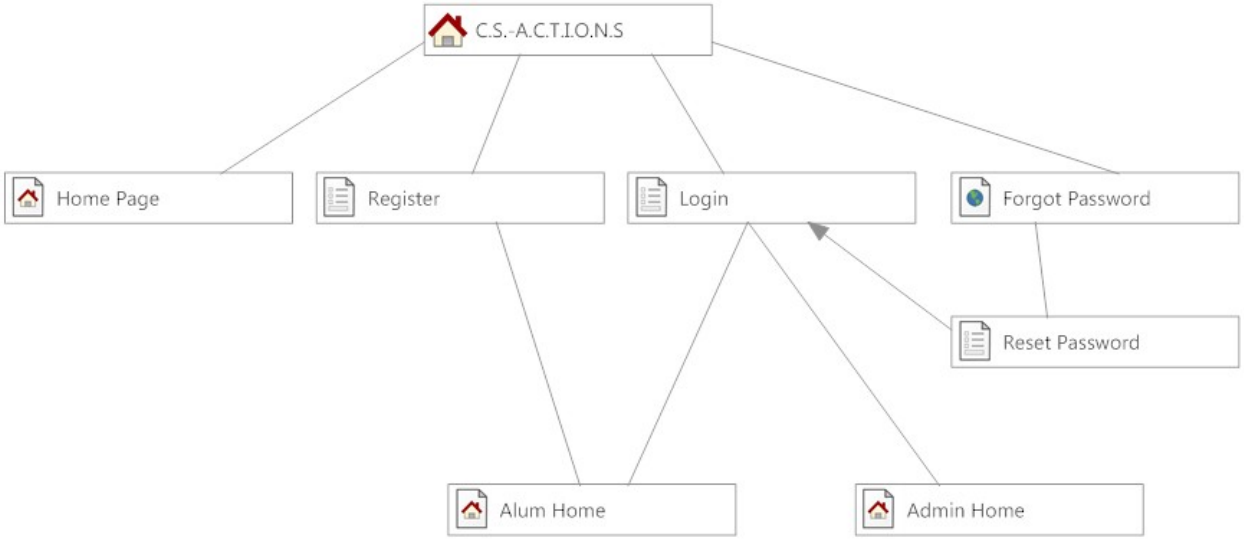
Form - Represents data fields which require user input.

Web Page - Represents a web page within our system.

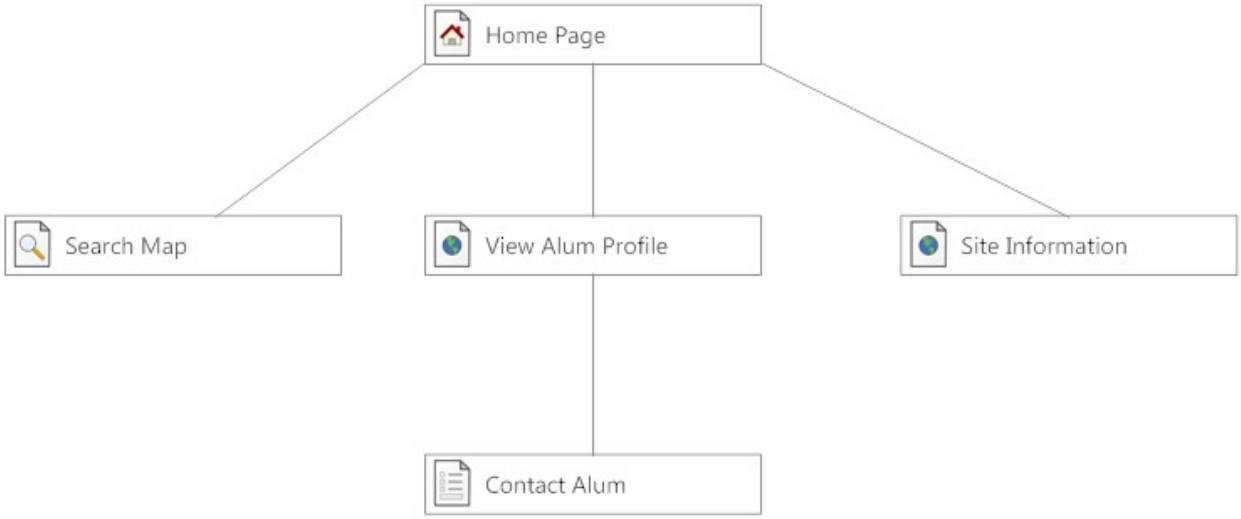
Link - Represents a page being accessible from another page.

Page Redirect - Indicates a forced reroute to a new page depending on the user's action.

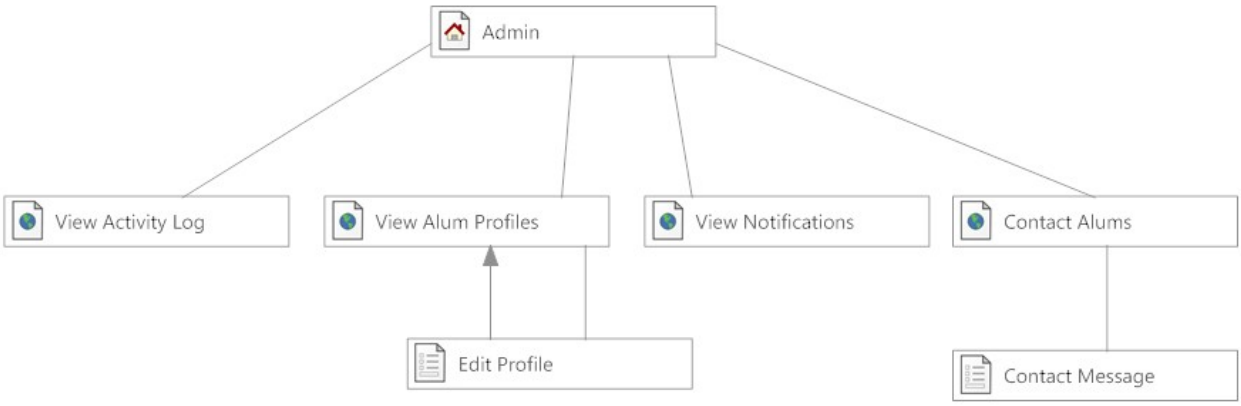
6.2 Website Map: Main Page



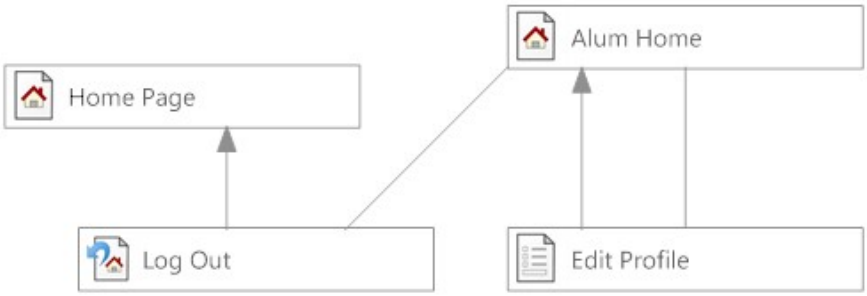
6.3 Website Map: Home Page



6.4 Website Map: Admin Home



6.5 Website Map: Alum Home



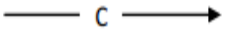
7. Data Flow Diagrams

7.1 Data Flow Legend

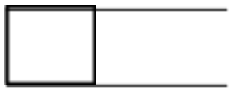
Data Flow Diagrams (DFD) show the movement of data as it flows through the system as well as data flows from outside entities. It is a means to document where data will be retrieved and stored through different processes. Each level of DFD's represent different levels of detail within the system.

External Entity: Outside source that contributes and/or receives information.

Process: Manipulates data



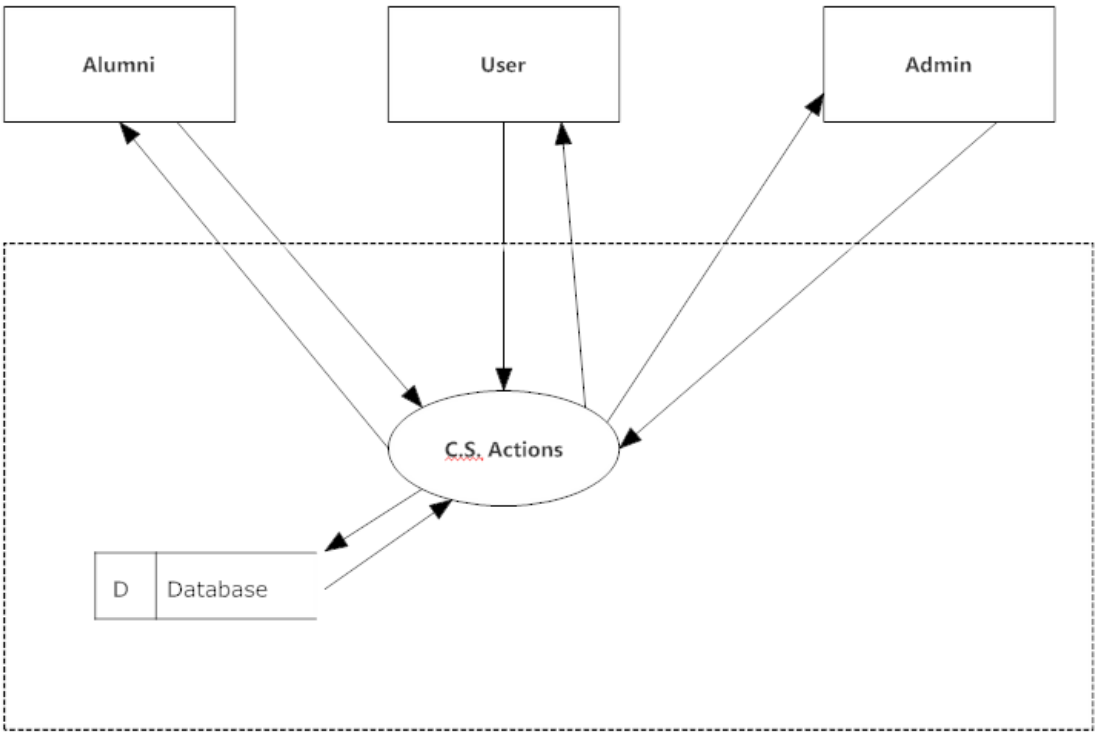
Data Flow: Shows flow of data between processes and/or entities. C is the data being transferred.



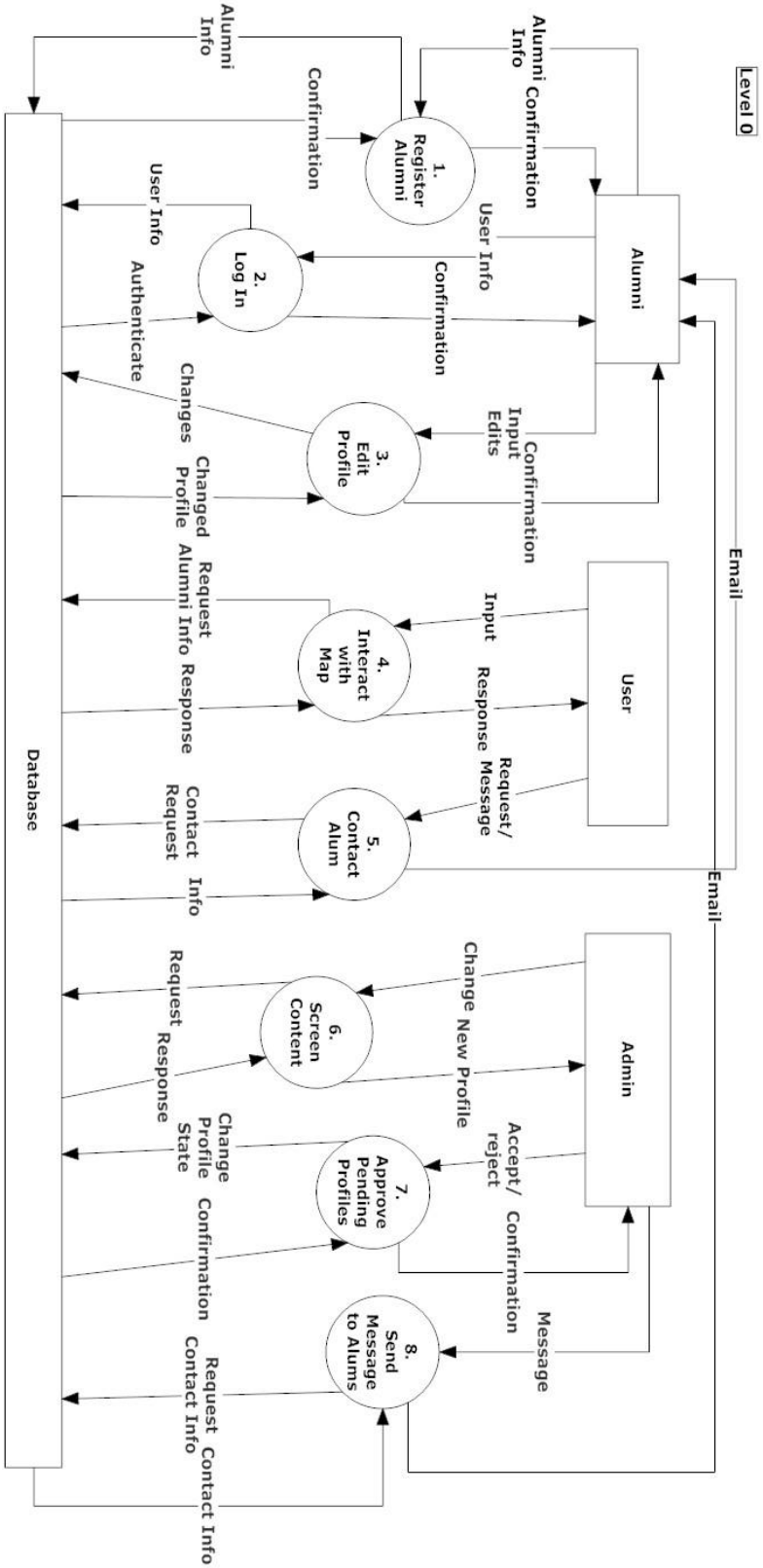
Data Store: Where data are held temporarily or permanently.

System Boundary: Anything within these bounds is considered part of the system. Anything outside is considered external to the system.

7.2 Context Diagram



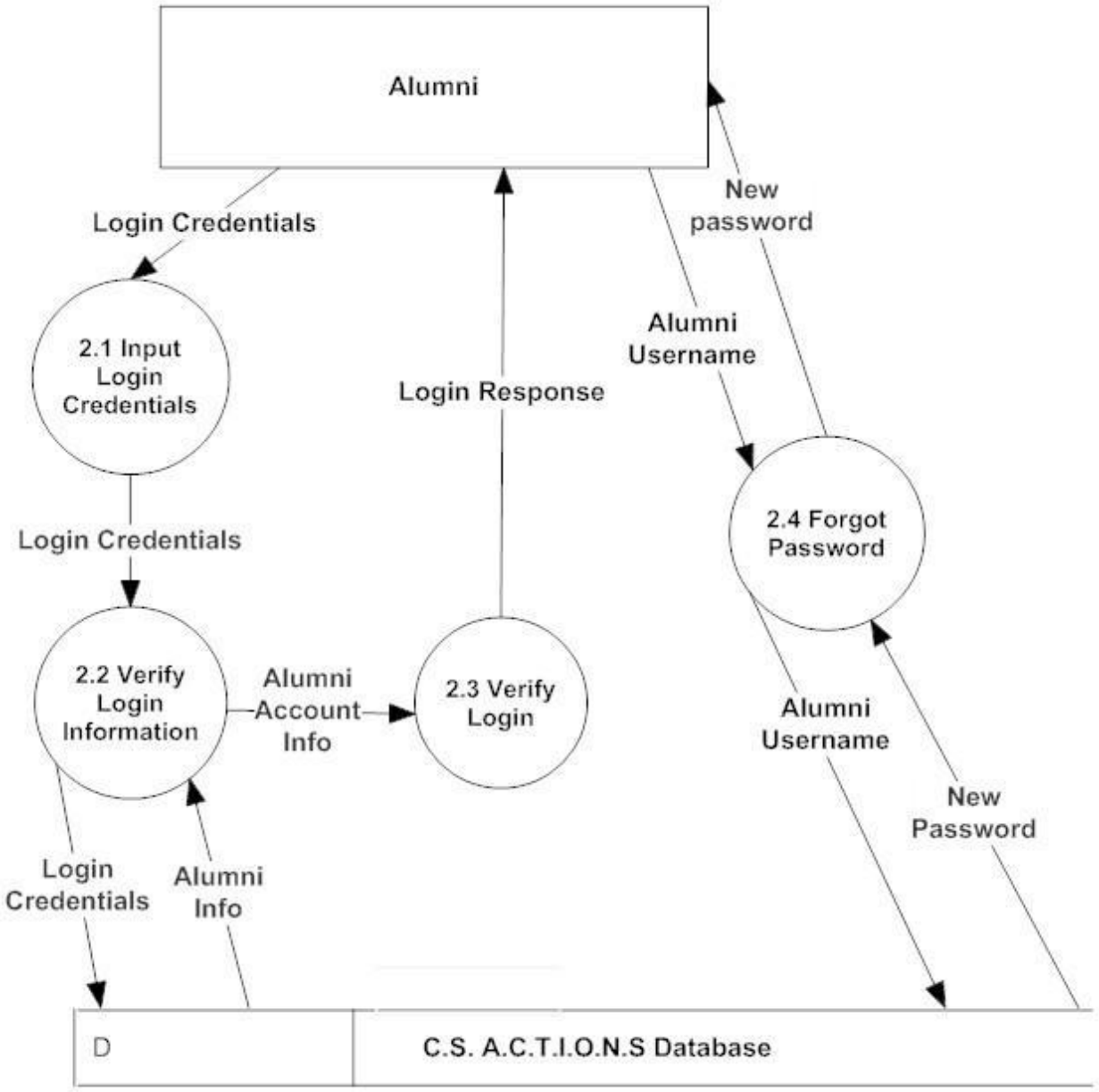
7.3 Level 0 Diagram[1]



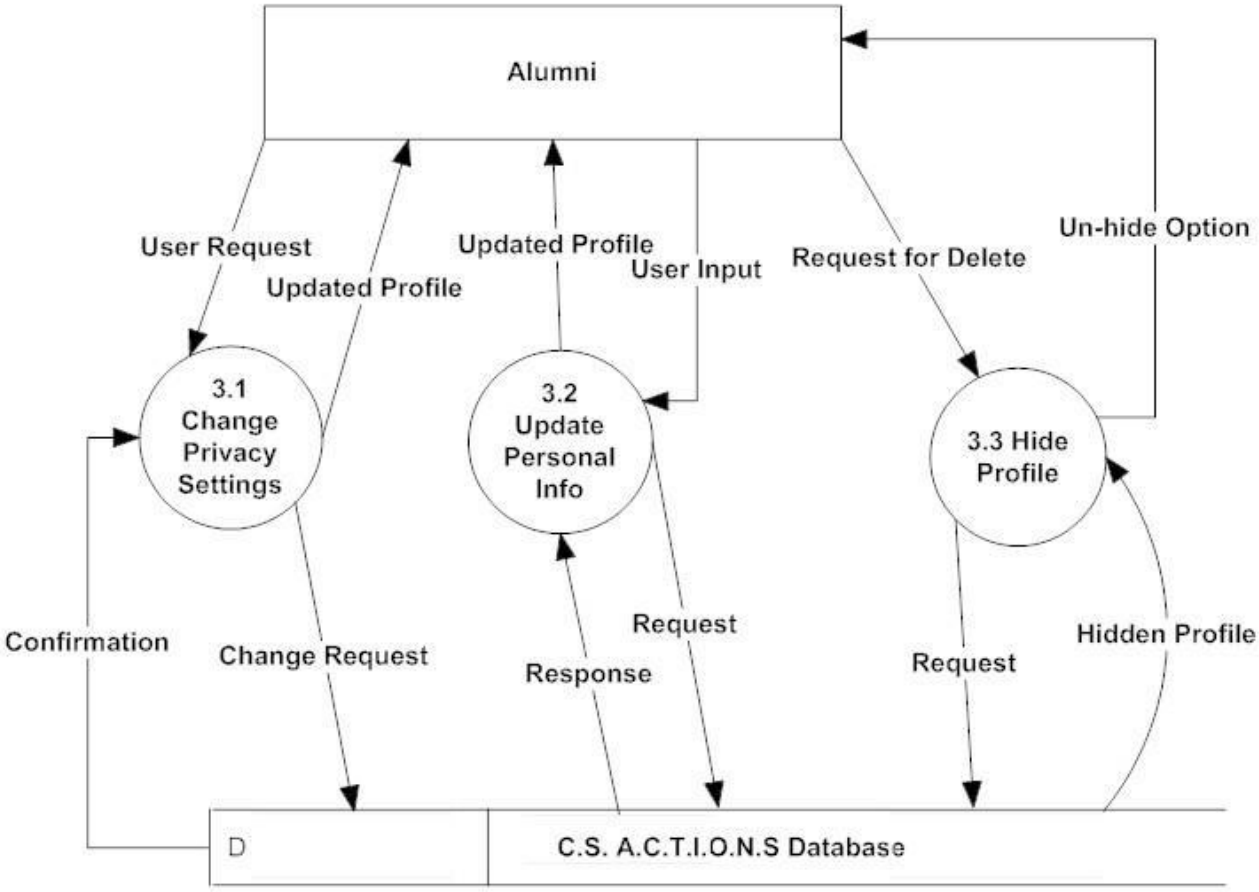
[1] An Admin has all the capabilities of an Alumni and the Alumni has all those of a User.

7.4 Level 1 Diagrams

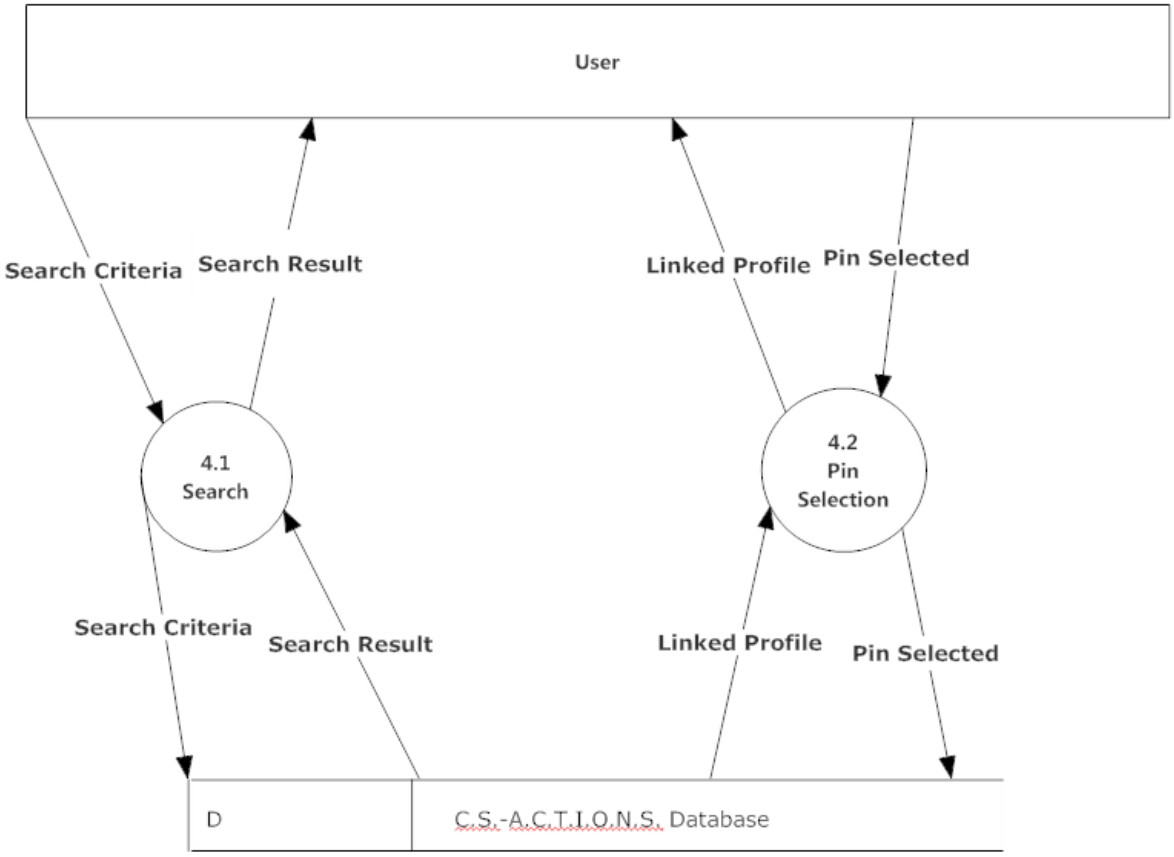
7.4.1 Log on



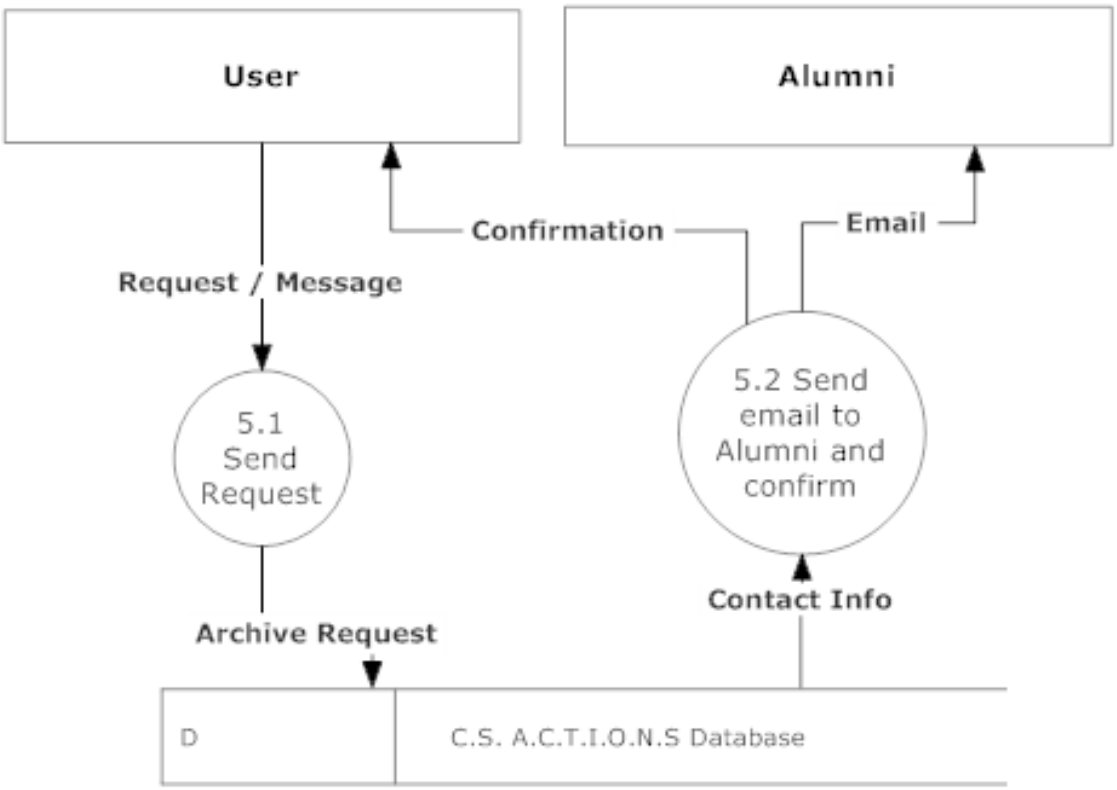
7.4.2 Edit Profile



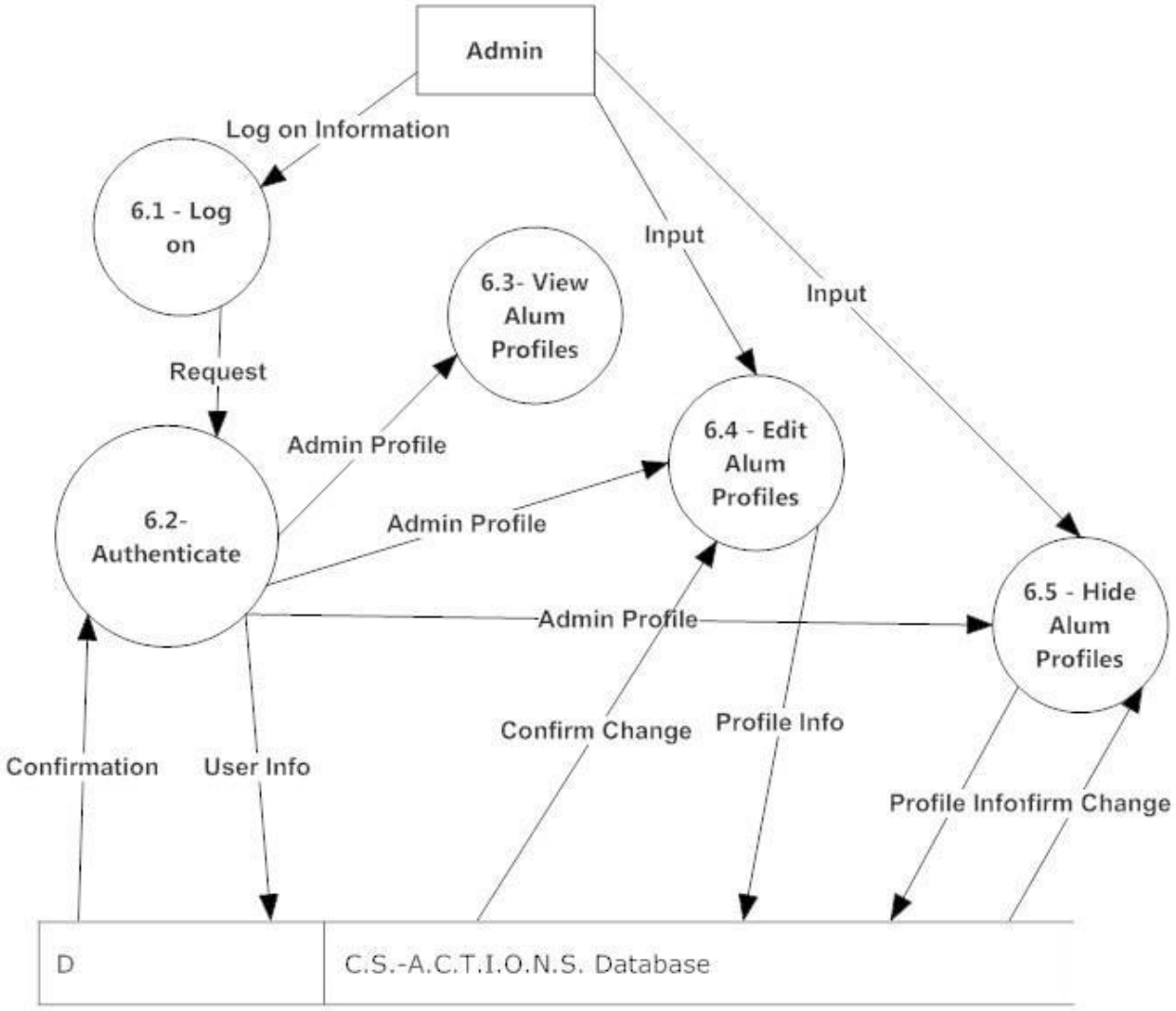
7.4.3 Interact with map



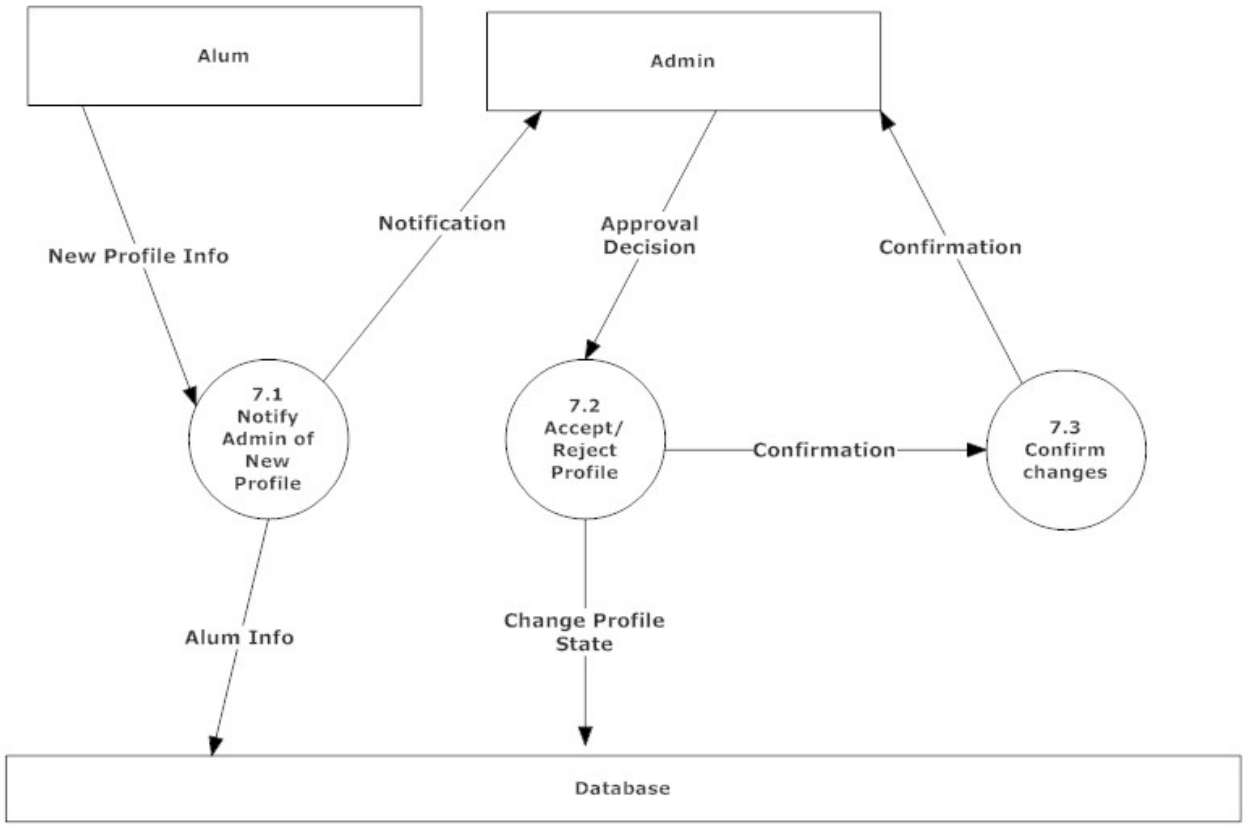
7.4.4 Contact Alumni



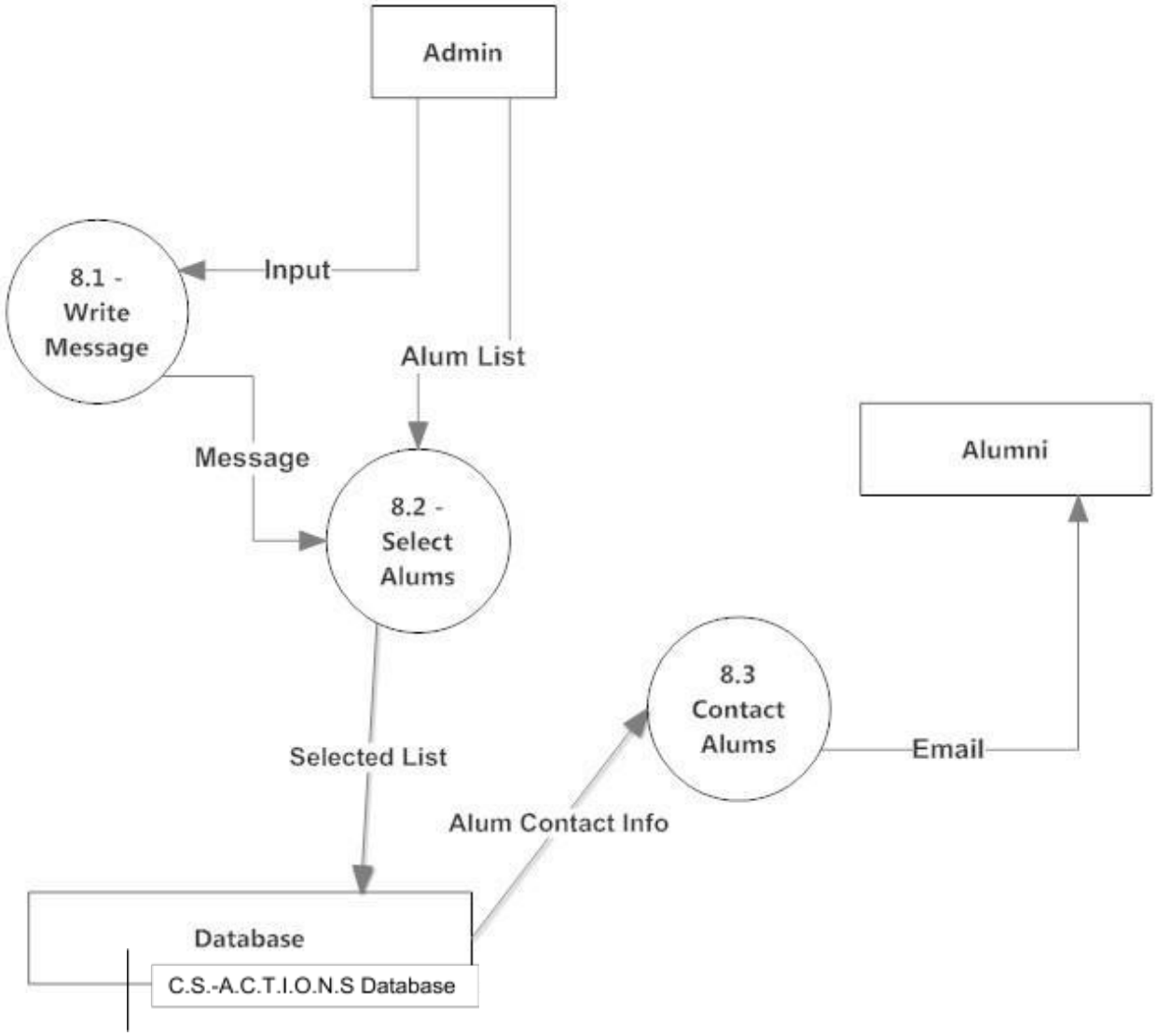
7.4.5 Screen Content



7.4.6 Approve pending profiles



7.4.7. Send message to Alumni



8. Functional Requirements Inventory

8.1 Alumni:

- Will be able to set up an account on C.S.-A.C.T.I.O.N.S.
- Will be able to log into C.S.-A.C.T.I.O.N.S.
- Will be able to change password
- Will interact with map using pins representing locations of alumni
- Will be able to view other Alumni profiles
- Will be able to edit/make changes to own profile
- Will be able to change privacy settings
- Will be able to log out of C.S.-A.C.T.I.O.N.S.

8.2 User:

- Will interact with map using pins representing hometowns of alumni
- Will be able to view Alumni profiles
- Will be able to contact Alumni

8.3 Administrator:

- Will be able to log into C.S.-A.C.T.I.O.N.S.
- Will interact with map using pins representing hometowns of alumni
- Will be able to view Alumni profiles
- Will be able to send message to all Alumni
- Will be able to edit/make changes to any information in an alumni profile
- Will be able to approve/deny pending profiles
- Will be able to log out of C.S.-A.C.T.I.O.N.S.

9. Non-Functional Requirements

The following is a list of non-functional system requirements that specify how the system is intended to work.

- C.S-A.C.T.I.O.N.S will be user friendly
- C.S-A.C.T.I.O.N.S will run efficiently
- C.S-A.C.T.I.O.N.S will be easy to access
- C.S-A.C.T.I.O.N.S will be fully functional on multiple browsers
- C.S-A.C.T.I.O.N.S will be stable

10. Data Dictionary

Data Name	Applicable To	Data Type	Data Size	Description	Acceptable Input	Good Example	Bad Example	Notes
userName	Add user to system	varchar	6 - 30 characters	email to be used to log in to the system	email address	admin@siena.edu	username	Username must be unique
password	Add user to system	varchar	6 - 30 characters	password to be used to log in to the system	Ascii characters 65 to 122	KBC715r	password	Must include on capital letter and one number
firstName	Add user to system	varchar	1 - 30 characters	name to show on profile	A-z, a-z, -	Mark	M@rKy M@Rkk	
lastName	Add user to system	varchar	1 - 50 characters	name to show on profile	A-z, a-z, -	White	WH!t3	
sessionTime	alum/admin	date	Date	Date of log in	Date format	9:09 11/10/2014	0:00:00	
picture	Add user to system	varchar	0-64 characters	filename to profile picture	path of picture file	picture of alum	picture of bear	
alumnHometown	Edit profile, All users who view profiles	varchar	0-50 characters	hometown alum is from	Ascii characters 65 to 122	Brunswick	B-wick	
highschoolName	Edit profile, All users who view profiles	varchar	0-50 characters	high school alum graduated from	Ascii characters 65 to 122	Tamarac High School	T-rac	

highschoolState	Edit profile, All users who view profiles	varchar	2 characters	state high school is located in	A-Z	NY	11th state	
sienaGradYear	Edit profile, All users who view profiles	number	4 digits	year graduated from siena	0-9	2015	15	
jobTitle	Edit profile, All users who view profiles	varchar	0-128 characters	job position	Ascii characters 32 to 122	Software Engineer	I do important stuff	
jobResponsibilities	Edit profile, All users who view profiles	varchar	0-1024 characters	description of/responsibilites at job	Ascii characters 32 to 122	Write code, write test scripts to test code	Make that C@$H M0n3y $$$$	
employer	Edit profile, All users who view profiles	varchar	0-64 characters	name of company employed at	Ascii characters 32 to 122	Pitney Bowes	P!tn3y B0w3$	
aboutMe	Alum Profile View	varchar	0-2048 characters	Brief description about alum	Ascii characters 32 to 122	I like computers	I am ^&^%$	
pastJobTitles	Alum Profile View	varchar	0-512 characters	List of past job titles	Ascii characters 32 to 122	Software Engineer	Homeless	
pastEmployers	Alum Profile View	varchar	0-512 characters	List of past employers	Ascii characters 32 to 122	EMC	<>	

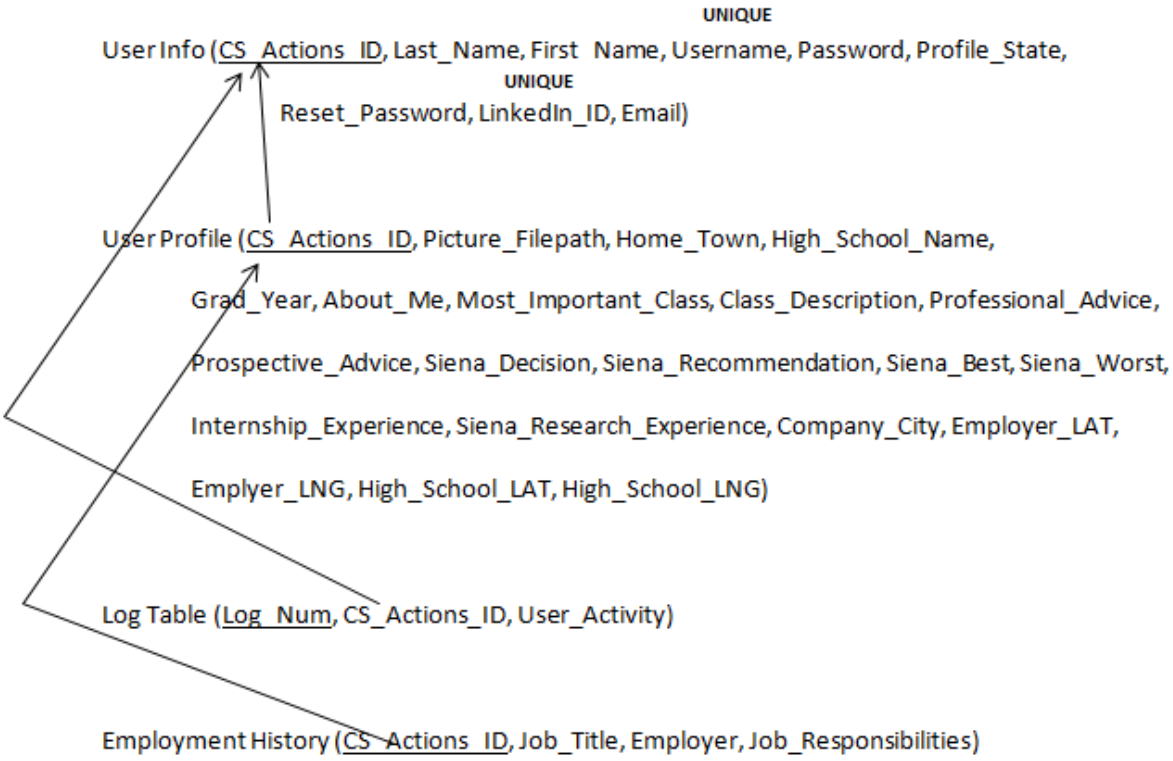
mostImportantClass	Alum Profile View	varchar	0-64 characters	most useful class at siena	A-Z, a-z	Software Engineering	Philosophy	Will be asked on entry survey
mostImportantClassDescription	Alum Profile View	varchar	0-2048 characters	Description of most useful class	Ascii characters 32 to 122	A paragraph describing why that course was important	An off topic answer	Will be asked on entry survey
professionalAdvice	Alum Profile View	varchar	0-2048 characters	Personal professional advice	Ascii characters 32 to 122	Professional Advice	An off topic answer	Will be asked on entry survey
prospectiveAdvice	Alum Profile View, Edit Profile	varchar	0-2048 characters	Advice to give to perspective students	Ascii characters 32 to 123	Advice for prospective student	An off topic answer	
sienaDecision	Alum Profile View, Edit Profile	varchar	0-2048 characters	Why the alum decided to come to Siena	Ascii characters 32 to 124	"I decided to attend Siena becauase they have the best Computer Science department in the world"	An off topic answer	
sienaRecommendation	Alum Profile View, Edit Profile	varchar	0-2048 characters	Would they recommend Siena and why they answered in that way	Ascii characters 32 to 125	I would/wouldn't recommend Siena because...	(*#&@	
sienaBest	Alum Profile View, Edit Profile	varchar	0-2048 characters	The best part of coming to siena	Ascii characters 32 to 126	"My best Siena experience was..."	An off topic answer	
sienaWorst	Alum Profile View,	varchar	0-2048 characters	The worst part of coming to Siena	Ascii characters 32 to 127	"My worst Siena experience was..."	An off topic answer	

	Edit Profile							
sienaInternshipExperience	Alum Profile View, Edit Profile	varchar	0-2048 characters	description of internships taken in college	Ascii characters 32 to 128	Pitney Bowes	P!tn3yB0w3$	
sienaResearchExperience	Alum Profile View, Edit Profile	varchar	0-2048 characters	descriprion of research done at Siena	Ascii characters 32 to 122	"My research at Siena included.."	Research done elsewhere or off topic	
userActivity	Interact with map, logon	varchar	0-128 characters	a log of profile updates	Ascii characters 32 to 122	<username> <fields updated> <time>	Someone changed something	name/field updated/ time
profileState	Approve pending profiles	number	2 bits	privacy state of profile 0: hidden 1: pending 2:public	0-2	0	10000	
companyCity	Map	varchar	0-64 characters	city job is located in	Ascii characters 32-122	1	Hogwarts	
resetPassword	Reset password	char	10 characters	auto generated password used when password is reset	A-Z, 0-9	a7s4vb9ds7	password	
employerLat	Interact with map	float	6 digits	Employer latitude coordinate	0-9, -	-42.6674	infinity	
employerLng	Interact with map	float	6 digits	Employer longitude coordinate	0-9, -	42.6677	infinity	
highschoolLat	Interact with map	float	6 digits	High school latitude coordinate	0-9, -	81.6677	infinity	

highschoolLng	Interact with map	float	6 digits	High school longitude coordinate	0-9, -	45.5657	infinity	

11. Entity Relationship Diagram

12. Relational Schema



13. Pseudo code

Ensures that the initial password created by the user meets our specification. It must be greater than length 6 and must contain a number.

```
function ensurePasswordSpecification( password )

        regEx ← Create regular expression containing digits 0-9
        if( password NOT regEx )
                return false
        if( password length < 7 )
                return false
        return true
```

14. Example Code

Code to get coordinates from an address

```
<script type="text/javascript">
        function GetLocation() {
            var geocoder = new google.maps.Geocoder();
            var address = document.getElementById("txtAddress").value;
            geocoder.geocode({ 'address': address }, function (results, status) {
                if (status == google.maps.GeocoderStatus.OK) {
                    var latitude = results[0].geometry.location.lat();
                    var longitude = results[0].geometry.location.lng();
                    alert("Latitude: " + latitude + "\nLongitude: " + longitude);
                } else {
                    alert("Request failed.")
                }
            });
        };
</script>
```

API call for LinkedIn

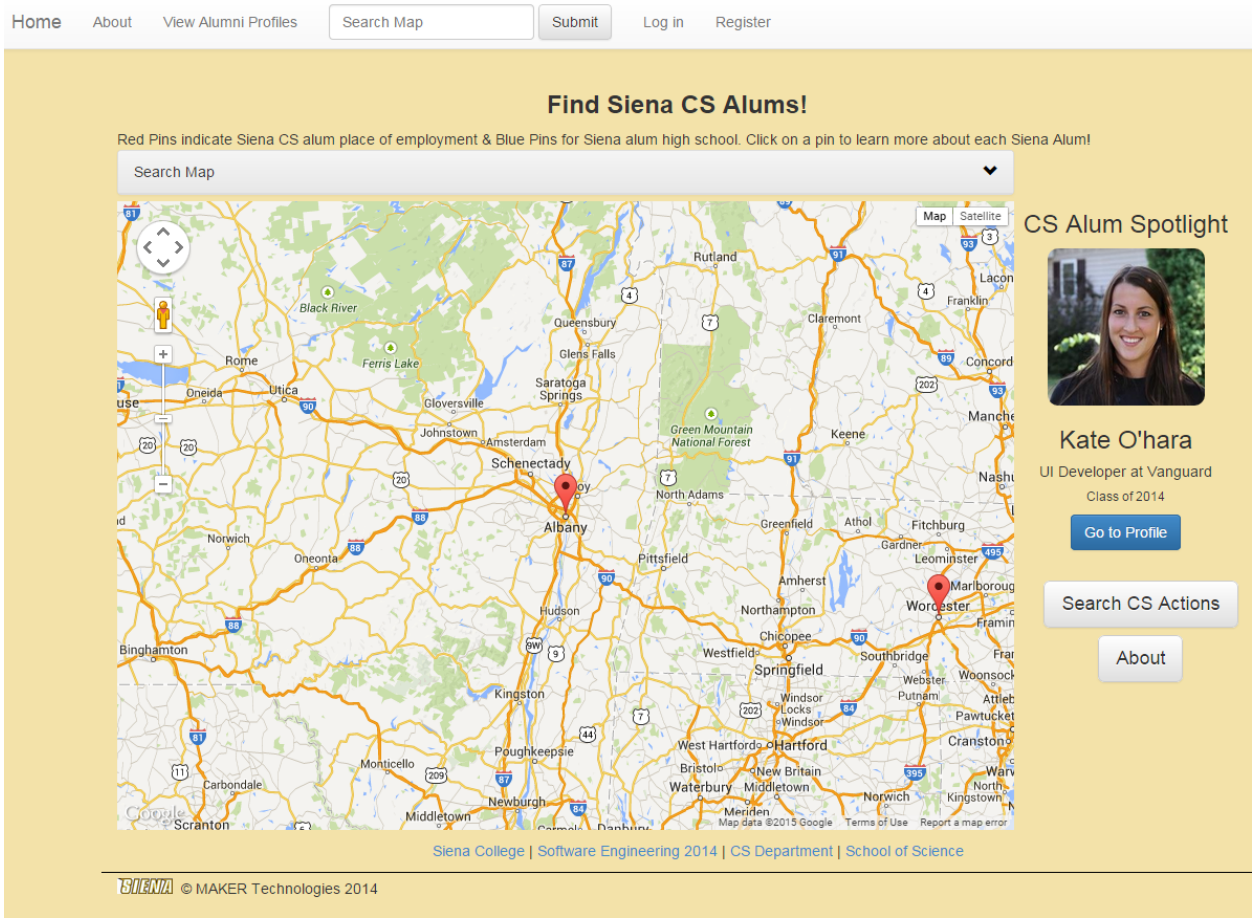
```
function onLinkedInLogin() {
        // we pass field selectors as a single parameter (array of strings)
        IN.API.Profile("me")
        .fields(["id", "firstName", "lastName", "pictureUrl", "publicProfileUrl",
"headline"])
        .result(function (result) {
            initializeRegistrationForm(result.values[0]);
        })
        .error(function (err) {
            alert(err);
        });
    }
    function initializeRegistrationForm(profile) {
        if (!profile) {
            profHTML = "<p>You are not logged in</p>";
        }
        else {
            var pictureUrl = profile.pictureUrl ||
"http://static02.linkedin.com/scds/common/u/img/icon/icon_no_photo_80x80.png";
            picHtml = "<img src=\"" + pictureUrl + "\">";
            $('#inputfname').val(profile.firstName);
            $('#inputlname').val(profile.lastName);
            $('#inputJobTitle').val(getJob(profile.headline));
            $('#inputEmployer').val(getEmployer(profile.headline));
            member_ID = profile.id;
            alert(member_ID);
            $(':input').removeAttr('placeholder');

            $('.linked-in-pic').html(picHtml);
```

```
            use_linkedIn = true;
        }
    }
```

15. Prototypes for Discovery

15.1 Home Page


Home
About
View Alumni Profiles
Search Map
Submit
Log in
Register
Find Siena CS Alums!
Red Pins indicate Siena CS alum place of employment & Blue Pins for Siena alum high school. Click on a pin to learn more about each Siena Alum!
Search Map
Map
Satellite
CS Alum Spotlight
Kate O'hara
UI Developer at Vanguard
Class of 2014
Go to Profile
Search CS Actions
About
Albany
Schenectady
Rutland
Springfield
Worcester
Hartford
Siena College | Software Engineering 2014 | CS Department | School of Science
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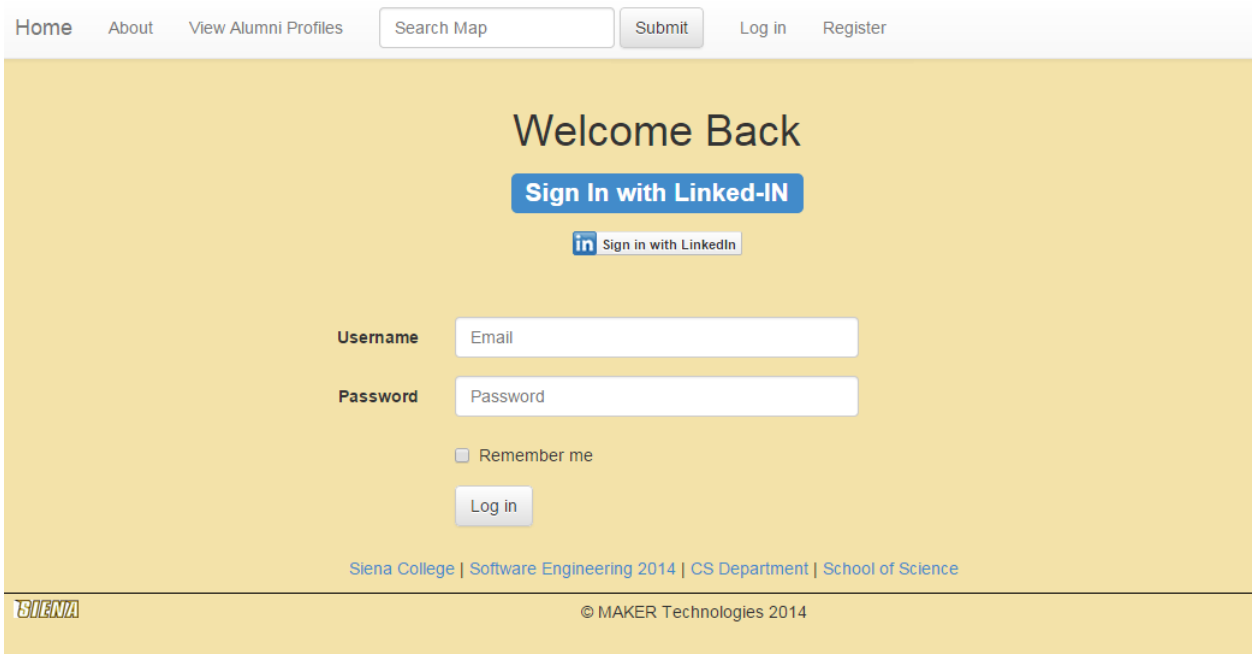
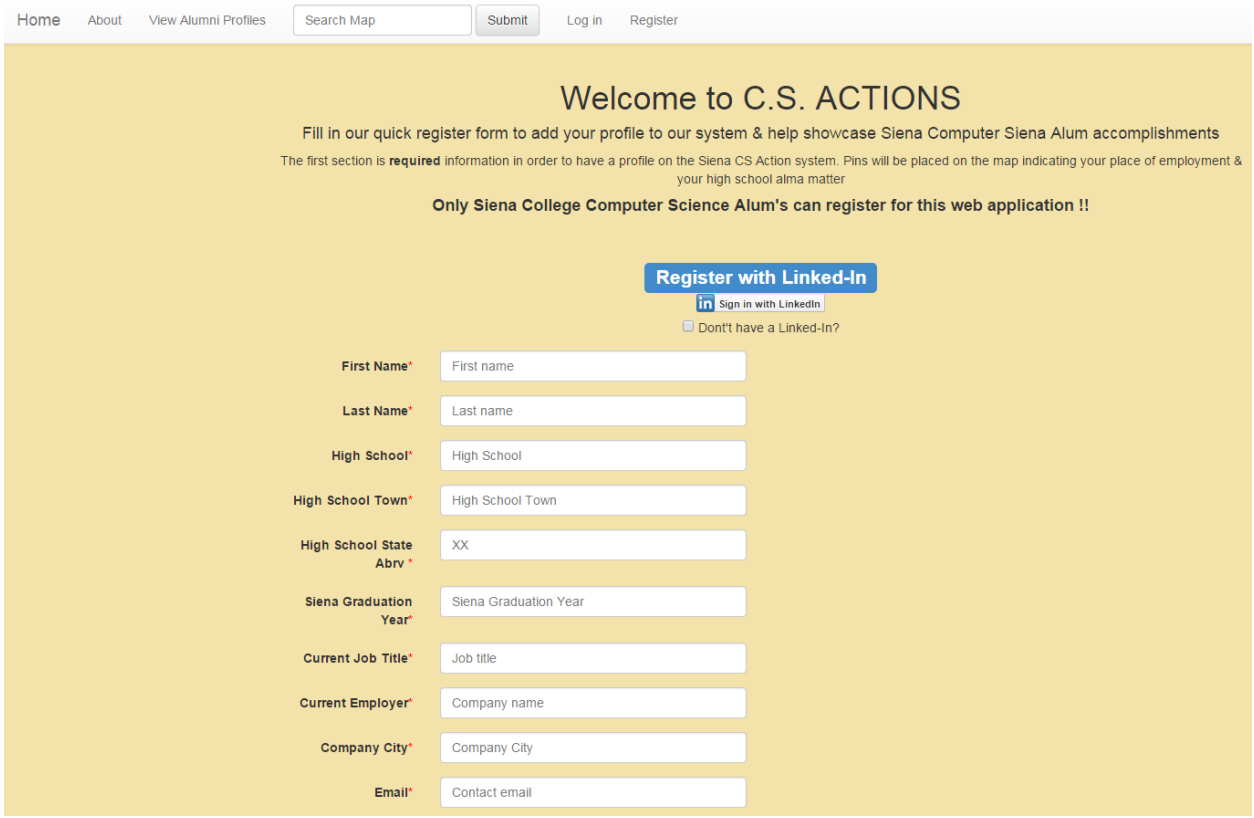
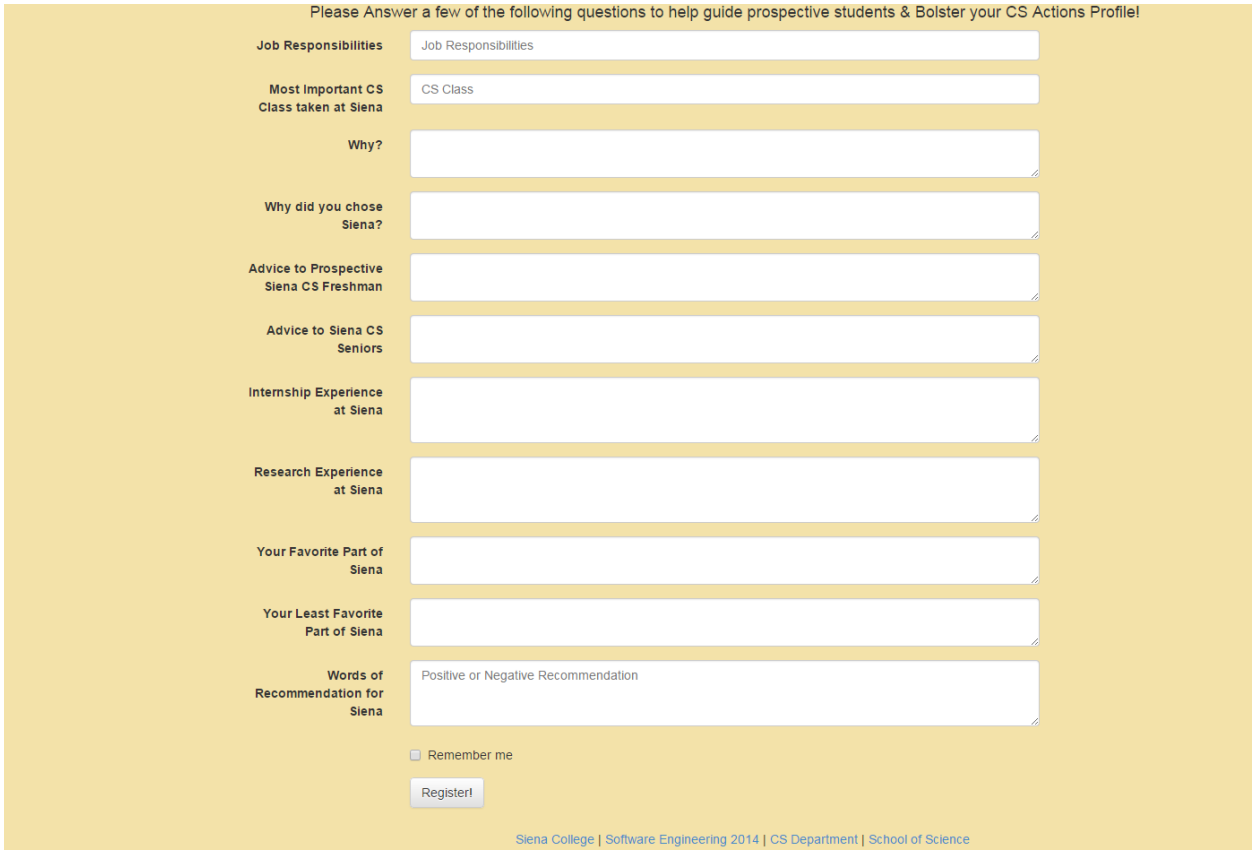
15.2 - Log in Form



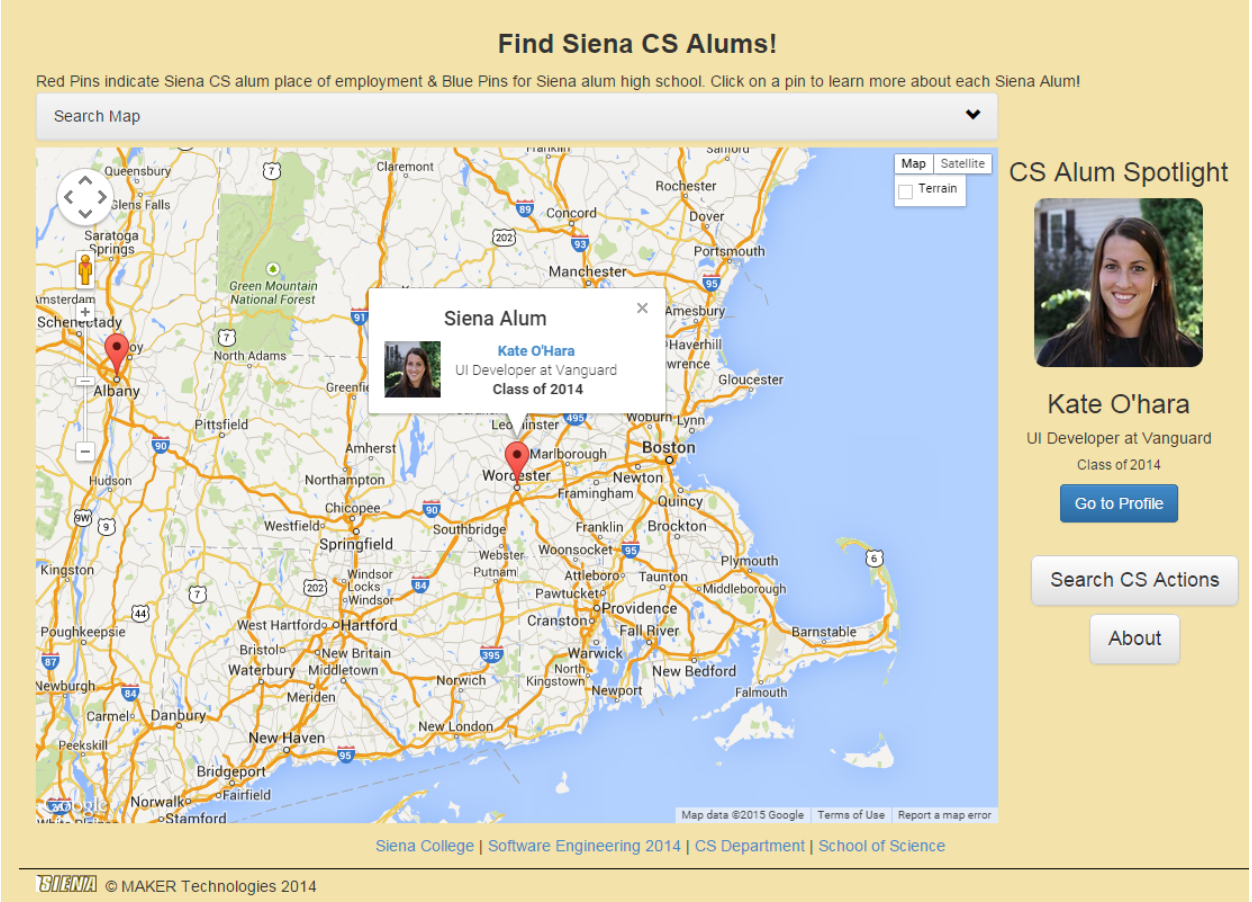
15.3 - Register Screen (1 of 2)


Home
About
View Alumni Profiles
Search Map
Submit
Log in
Register
Welcome to C.S. ACTIONS
Fill in our quick register form to add your profile to our system & help showcase Siena Computer Siena Alum accomplishments
The first section is required information in order to have a profile on the Siena CS Action system. Pins will be placed on the map indicating your place of employment & your high school alma matter
Only Siena College Computer Science Alum's can register for this web application !!
Register with Linked-In
Sign in with LinkedIn
Dont't have a Linked-In?
First Name*
First name
Last Name*
Last name
High School*
High School
High School Town*
High School Town
High School State Abrv *
XX
Siena Graduation Year*
Siena Graduation Year
Current Job Title*
Job title
Current Employer*
Company name
Company City*
Company City
Email*
Contact email

Register Screen (2 of 2)



11.4 - Display Pin



Testing Plan

Overview and Strategy

C.S.-A.C.T.I.O.N.S. is a web application; therefore, it will be tested to make sure it functions properly on each major web browser. The web browsers to be tested on are Google Chrome, Internet Explorer, Mozilla Firefox, and Apple Safari. A number of unit tests were created using the functional requirements and will be used to test C.S.-A.C.T.I.O.N.S. In addition, all non-functional requirements will be evaluated to ensure that all of them are met. The testing plan will be elaborated on more thoroughly in the detailed design stage of the waterfall model.

9.2 Acceptance Test

Once the unit tests have been completed, an acceptance test will be executed to ensure that all of the functional requirements have been met. Once the acceptance test is completed, MAKER Technologies and the clients, Dr. Eric Breimer and Professor Jim Matthews, will decide whether or not all of the requirements have been sufficiently met. MAKER Technologies will design the acceptance test plan using the functional requirements gathered in previous stages.

9.3 Unit Tests

The unit tests are specific tests that will be run to ensure that the system is running properly. The unit tests have directions in the each case to direct the tester on what to input and what to look for when a test is run.

9.3.1 Test Cases

The test cases for the C.S.-A.C.T.I.O.N.S system were outlined by the team members of MAKER Technologies using the functional and non-functional requirements gathered thus far. The test cases will be used to determine whether the system meets the needs of the clients, Dr. Eric Breimer and Professor Jim Matthews, and also to ensure that the system functions properly.

11. Testing Plan

12.1 Overview and Strategy

12.2 Acceptance Test

12.3 Unit Tests

12.3.1 Unit 1: Login Process

12.3.2 Unit 2: Alumni Edit Profile Process

12.3.3 Unit 3: Administrator approve pending profiles

12.3.4 Unit 4: Register

Register - Alumni

Unit 4

The purpose of this unit is to make sure that the registering process for Alumni works properly

	Test Cases									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
P	4.001	No first name	No input	Press "Join" button	Empty first name field	Error Message indicating empty first name field				
P	4.002	No last name	No input	Press "Join" button	Empty last name field	Error Message indicating empty last name field				
P	4.003	No email	No input	Press "Join" button	Empty email field	Error Message indicating empty email field				
P	4.004	No password	No input	Press "Join" button	Empty password field	Error Message indicating empty password field				
P	4.005	Enter first name, last name, email, password, and click join button	First name, last name, email, password, button action	Enter first name, last name, email, password, and click join button	First name, last name, email and password entered into appproriate fields	Message confirming successful registration				
P	4.006	Enter required fields (City and state, Graduation year, Job title, Company)	City, State, Graduation year, Job, Title, Company	Press "Create My Profile" button		Message confirming successful creation of profile				
Pass	**= Unit Summary**		**100% passing**			**6 passed**		**Date of last test =**		**3/4/15**
	6	**tests**				**0 failed**				

12.3.5 Unit 5: Interacting with Map

12.3.6 Unit 6: Administrator Screen Content Process

12.3.7 Unit 7: Contact Alumni from Profile

12.3.7 Unit 8: Administrator Contact Alumnus

12.3.8 Unit 9: Place Alumni on Map

12.3.9 Unit 10: Linkedin API Connection

12.3.10 Unit 11: Reset Password

12. Environments

12.1 Development Environment

PC:	
Operating System:	Windows 7 Enterprise (x64) Service Pack 1 (build 7601)
Processor:	3.20 gigahertz Intel Core i5-3470
RAM:	6100 Megabytes Usable Installed Memory
HDD:	499.78 Gigabytes Usable Hard Drive Capacity

MAC:	
Model Name:	iMac
Model Identifier:	iMac12,1
Operating System:	OS X Lion 10.7.5
Processor Name:	Intel Core i5
Processor Speed:	2.5 GHz
Memory:	4GB
HDD:	500GB

Server:	
Server Name:	oraserv.cs.siena.edu
Operating System:	CentOS 5.2 (final)
CPU:	Intel Xeon 2.66 GHz CPU
RAM:	8 GB of Memory

12.2 Operating Environment

CS-ACTIONS will be a web-based application and will be able to run on any operating system including, Mac, Windows, or Linux, and on any browser such as Google Chrome, Mozilla Firefox, Microsoft Internet Explorer, or Apple Safari.

12.3 Maintenance Environment

Most of the maintenance to this system will be done in the Software Engineering lab on the machines listed in section 1.7.1.

13. Testing Requirements

Our team will ensure C.S.-A.C.T.I.O.N.S. functions properly by continually testing throughout the development step. Our testing will include creating sample data such as test alumni profiles, test maps, and test alumni submissions. The test alumni profiles serve the purpose of ensuring our database can handle our desired amount of alumni information before our prototype is ready to be delivered to our clients. The test maps will ensure that our mapping interface will withstand a variety of different abnormal cases, such as alumni from out of the area and out of the country. The test alumni submissions will test our screening process that integrates an alumni survey into said alumni's profile on our system. Testing will not be done only at the conclusion of our first system but will be done continually throughout the year to ensure that all parts of the system can be integrated together with minimal errors. Testing will be done with input from our clients to ensure that the system will meet their every need. Before our system will be released for public use it will need to pass a strict series of tests that ensure it will be able to withstand rigorous use.

14. Appendices

Appendix B: Sources of information

Our primary source of information will come from Dr. Breimer and Professor Matthews through emails, and client meetings. Other sources of information include lectures from Dr. Meg Fryling in class, Dr. Lim in lab and through different reliable World Wide Web resources.

Appendix C: Glossary of Terms

API - Application **P**rogramming **I**nterface specifies a software component in terms of its operations, their inputs and outputs and underlying types
CS-ACTIONS – Computer Science Alumni Connection Through Interactive Open Networking System – This is the name and acronym for our system.
Gantt – a chart in which a series of horizontal lines shows the amount of work done or production completed in certain periods of time in relation to the amount planned for those periods.
HTML – HyperText Markup Language – language used to develop websites
Java - Object-oriented programming language developed by and maintained by the Oracle Corporation
JavaScript - Computer programming language used primarily in web browsers for based client-side scripts
SQL - Structured Query Language, language used to develop databases

Appendix C: Timeline

Task	Time Span (days)	Start	Finish
Form Teams	1	9/5	9/5
Build Software Plan	10	9/10	9/18
Build Team Website	15	9/15	9/29
Software Plan Due	1	9/19	9/19
Software Plan Presentation	1	9/23	9/23
Team Website Due	1	9/30	9/30
Requirements Specifications	34	9/24	10/27
Requirement Documents Due	1	10/28	10/28
Requirement Presentation	1	10/28	10/28
Preliminary Design	28	10/29	11/25
Preliminary Design Due	1	11/26	11/26
Preliminary Design Presentation	1	12/2	12/2
Team Meetings	83	9/10	12/1
Client Meetings	76	9/11	11/25